

# Annual Report 2025-26



Government of India  
Department of Science & Technology  
Ministry of Science & Technology  
New Delhi

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## OVERVIEW

The Department of Science & Technology (DST) is the nodal agency in the country responsible for strengthening science, technology, and innovation. It identifies gaps in S&T sectors and promotes new areas of Science & Technology (S&T) to meet future demands. DST also connects science and technology sectors with various other government departments, academia, R&D laboratories /institutions, and industries. It provides extramural research and development support to scientists across institutions and disciplines through a competitive process, thereby reinforcing education system, scientific and industrial R&D, and the overall Science, Technology, and Innovation landscape of the country.

The Department has been consistently working towards strengthening the National STI ecosystem to become a leader in science and technology, driving positive transformations for a safe, secure, and better society, and preparing the nation for future S&T disruptions. Some key success stories from the year 2025-26 are as follows:

- ❖ **India's ranking in global S&T indices continues to rise:** India ranked at 38th position in Global Innovation Index among 139 economies of the world as per Global Innovation Index (GII) '2025. As per WIPO Report 2024, India is ranked at 6th position in terms of Patent Filing activity in the world. India is ranked at 3rd position in term of number of research publications, as per S&E Indicators 2024 published by National Science Foundation (NSF), USA. India is ranked as 3rd largest startup ecosystem globally, behind only to US and China.
- ❖ **Research, Development and Innovation (RDI) Scheme:** The Union Cabinet approved RDI Scheme on 01 July 2025 to incentivize private sector participation in R&D, with a total outlay of ₹1.0 Lakh crore over Six years. The main objectives of Research, Development and Innovation (RDI) scheme are: 1) encourage the private sector to scale up research, development and innovation (RDI) in sunrise domains and in other sectors relevant for economic security, strategic purpose, and self-reliance, 2) finance transformative projects at higher levels of Technology Readiness Level (TRL) of 4 and above, 3) support acquisition of technologies which are critical or of high strategic importance, and 4) facilitate setting up of Deep-Tech Fund of Funds.
- ❖ **THE ANUSANDHAN NATIONAL RESEARCH FOUNDATION (ANRF)** has been established by ANRF act 2023 and the provisions of the ANRF Act, 2023 came into force on 5th February, 2024. ANRF represents India's pioneering efforts to unleash Indian research and innovation talent to achieve global scientific and technological excellence. The first meeting of the Executive Council of ANRF was held under the Chairmanship of Prof. Ajay K. Sood, Principal Scientific Adviser to the Government of India on August

22, 2024. Afterwards, Prime Minister Shri Narendra Modi chaired the first meeting of the Governing Board of Anusandhan National Research Foundation on 10<sup>th</sup> September, 2024. The meeting focused on discussion about India's Science and Technology landscape and redesigning of research and development programmes. This year, ANRF initiated following new programs:

- Partnerships for Accelerated Innovation and Research (PAIR),
  - Advanced Research Grant (ARG),
  - Mission for Advancement in High-impact Areas (MAHA) Scheme,
  - Convergence Research Centres of Excellence (CoE), and
  - PM Professorship.
- ❖ The Union Cabinet, approved **National Quantum Mission (NQM)** on 19th April 2023 at a total cost of ₹6003.65 crore for a period of eight years, aiming to seed, nurture and scale up scientific and industrial R&D and create a vibrant & innovative ecosystem in Quantum Technology (QT). So far, four Thematic Hubs have been established under NQM, each dedicated to a specific technology vertical;
- 1) Quantum Computing at IISc. Bengaluru,
  - 2) Quantum Communication at IIT Madras in association with C-DOT, New Delhi,
  - 3) Quantum Sensing & Metrology at IIT Bombay; and
  - 4) Quantum Materials & Devices at IIT Delhi

These T-Hubs comprise of 14 Technical Groups having 17 Project Teams bringing together a total of 152 researchers from 43 Institutions across 17 states and 2 UTs. This initiative reflects the nation's collective ambition to lead in the rapidly evolving field of quantum technologies. All four Hubs are now fully functional, driving technology development, nurturing human capital, promoting entrepreneurship, strengthening Industry partnership and advancing international collaborations. To strengthen quantum education and build a skilled workforce, UG Minor program in December 2024 and M.Tech. Programme in Quantum Technologies in August 2025 have been launched in collaboration with AICTE. Eight promising startups have already been supported under NQM.

- ❖ **Geospatial Data, Infrastructure and Technology Leading to Improved Citizen Services:** Government of India established the Geospatial Data Promotion and Development Committee (GDPDC), an apex body tasked with formulating strategies, guidelines, and programs to promote the geospatial sector and drive the development of the geospatial ecosystem. Operation Dronagiri was launched on November 13, 2024, at FITT, IIT Delhi, as a flagship pilot initiative in view of the National Geospatial Policy 2022.

- ❖ **National Mission on Interdisciplinary Cyber Physical System (NM-ICPS):** The NM-ICPS aims to develop the technology platforms to carry out R&D, Translational Research, Product Development, Incubating & Supporting Start-ups as well as Commercialization. 25 Technology Innovation Hubs (TIHs) have been established in several areas of advanced technologies. Initiative on Large Language Modelling (LLM)/ Generative AI entitled BharatGen Launched under NM-ICPS at TIH Foundation for IoT & IoE, IIT Bombay. BharatGen is India's sovereign, multilingual, and multimodal Generative AI initiative aimed at building inclusive and context-aware AI systems across 22+ Indian languages.
- ❖ **The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, approved merger of DST's three umbrella schemes viz.**
  - 1) Science and Technology (S&T) Institutional and Human Capacity Building,
  - 2) Research and Development and
  - 3) Innovation, Technology Development and Deployment into a single scheme namely '**Vigyan Dhara**' to improve the flexibility of funds flow among the programmes.

This scheme was introduced during the 15th Finance Commission (FC) period merging more than 20 sub-schemes/programs implemented under three umbrella schemes: While a detailed activities under each programme during the year are presented in relevant chapters, some of the key highlights of respective programmes are briefly summarized as follows;

- ❖ **Fund for Improvement of S&T Infrastructure (FIST) in Universities and Higher Educational Institutions** is supported in competitive mode. During the year, the respective Subject Expert Committees (SECs) have reviewed FIST-supported projects to assess infrastructure development, facility utilization, and research outcomes by organizing review/group monitoring workshops.
- ❖ **Promotion of University Research and Scientific Excellence (PURSE)** programme is aiming to strengthen the research capacity of performing Indian Universities. During the year, nine new universities were selected under DST-PURSE to foster mission-oriented research aligned with national priorities. The scheme now includes new features such as *Scientific Social Responsibility (SSR)* and *industry collaboration*. Currently, PURSE-supported projects are being implemented in 41 universities across the country. An amount of ₹57.03 crores has been allocated to nine new universities, while ₹13.45 crores has been extended to support 24 universities under ongoing projects.
- ❖ **Sophisticated Analytical & Technical Help Institutes (SATHI)** set up shared, professionally managed science and technology infrastructure facilities across India. The establishment of the SATHI Foundation as a Section-8 company enabled professional management, effective outreach, and optimal utilisation of facilities, resulting in revenue generation of ₹3.59 crore up to August 2025.

- ❖ **Policy Research Cell (PRC)** focuses on evidence based STI policy research in the identified thematic areas. During the year, 07 CPRs across different institutions have received support. So far, five cohorts under the DST-STI policy fellowship programme have been supported and currently, 6th Cohort of Policy Research Fellows are availing the fellowship.
- ❖ **National Science & Technology Management Information System (NSTMIS)** primarily entrusted with the task of collection, collation, analysis and dissemination of vital S&T information at national level. A number of national S&T reports providing vital information on national R&D indicators are published which serves as an evidence-base for S&T assessment and policy formulation. The **National S&T Survey Year 2024-25** on Resources Devoted to S&T Activities has been initiated with target to collect data for three years, 2021-22, 2022-23 and 2023-24. Data collection from more than 8000 R&D organizations comprising of public sector, private sector, MNCs, higher education, SIROs and NGOs spread across the country is in progress. DST in partnership with the Federation of Indian Chambers of Commerce and Industry (FICCI), organized 5 high-level workshops during the year.
- ❖ **WISE-KIRAN (Knowledge Involvement in Research Advancement through Nurturing)** programmes provide different opportunities to women in the Science & Technology domain with the ultimate goal to bring gender parity in the S&T ecosystem. Department has launched the program, **Women in Space and Allied Science Leadership Program (WiSLP)**, in collaboration with British Council (BC) to provide leadership training to early and mid-career level women scientists.
- ❖ **Cognitive Science Research Initiative (CSRI)** encourages research in highly interdisciplinary area of cognitive science that trying to address various questions through combining ideas, principles and methods of psychology, computer science, linguistics, philosophy, neuroscience etc. In view of the importance of the subject area and future requirements, in current FY 2025-26, the Department established a dedicated CSRI Division to promote advanced and focused research.
- ❖ **Innovation in Science Pursuit for Inspired Research (INSPIRE)** is a flagship programme of DST to attract meritorious youth to study basic and natural sciences at the college and university level, pursue research careers in both basic and applied science areas including engineering, medicine, agriculture and veterinary sciences and thus, build the required critical human resource pool for strengthening and expanding the Science & Technology system and R & D base of the country. In the Current year, 246 INSPIRE Fellowship applicants were offered INSPIRE Fellowship. Total of 3277 INSPIRE Fellows were supported for pursuing Doctoral degree both basic and applied science areas. Six hundred and eighty-eight (688) INSPIRE Fellows were promoted from JRF to SRF. 11,458 INSPIRE scholarships have been offered to the selected candidates.

- ❖ **INSPIRE-(MANAK) Million Minds Augmenting National Aspirations and Knowledge** is a flagship initiative aimed at fostering a spirit of innovation among school students. Targeting students from Classes VI to X, the program encourages young minds to conceptualize innovative ideas, providing them with opportunities to translate their concepts into tangible solutions. Nominations were invited from 15th June 2025 to 30th September 2025. Coverage of the program expanded to 97% of districts. This is the second consecutive year with more than 1 million nominations being received under the scheme. In the 124th episode of Mann Ki Baat, Hon'ble Prime Minister Shri Narendra Modi highlighted the INSPIRE–MANAK initiative, noting its significant role in nurturing a spirit of innovation among children
- ❖ **International Cooperation programme** deals with the S&T related activities, strategies, planning, diplomacy at global level through the multi- & bi-lateral cooperation, being a member of different types of international forums/bodies/agencies, and participating in global missions to strengthen the India's position worldwide. The 16th Round of Australia India Strategic Research Fund (AISRF) Call for proposals was announced. A total of 27 proposals were recommended for financial support. DST signed an arrangement with Finland in the areas of advanced communication, sustainable energy, microelectronics and power electronics (semiconductors) along with any other additional area/s of mutual interest. The 7th meeting of the Indo-Swiss Joint Committee Meeting on Science & Technology, between the Government of the Republic of India and the Swiss Federal Council was held in Bern on 1st September 2025. DST announced 3rd call of VAIBHAV Fellowships Programme in 18 thematic research areas on 15 April 2025.
- ❖ **Mega Facility for Basic Research** programme aims to enable participation of Indian researchers in state-of-the-art research facilities, especially from academic and scientific sectors, and to create such facilities in and out of the country. Indian researchers are participating in experiments at Large Hadron Collider (LHC), European Organization for Nuclear Research (CERN), Geneva, Brookhaven National Laboratory (BNL), USA, Elettra Synchrotron, Italy, Fermi National Accelerator Laboratory (Fermilab), USA. Also, India is partner in establishment of international facilities like Facility for Antiproton and Ion Research (FAIR) in Germany, Thirty Meter Telescope (TMT) in USA and Square Kilometer Array (SKA) in Australia and South Africa. In this reporting year, India ALICE collaboration developed a p-type silicon detector on 6" wafer. This is the first of the kind in India. CMS was awarded the Breakthrough Prize in Fundamental Physics 2025 for undertaking detailed measurement of Higgs boson properties . India was a recipient member of the prize in this collaboration.
- ❖ **Nano and Advanced Materials:** A call for pre-proposals on "*Advanced Materials*" , to promote the basic and applied research activities on the thrust research areas of advanced materials was launched during September-October 2024, which is in line with Vision of Vikshit Bharat 2047. 139 pre-proposals were short-listed for next round of evaluation under Phase I & II.

- ❖ **Climate Change Programme (CCP)** is coordinating two national missions under National Action Plan for Climate Change (NAPCC) viz. National Mission for Sustaining the Himalayan Ecosystem (NMSHE) and National Mission for Strategic Knowledge on Climate Change (NMSKCC) are being implemented. During the year four Centre of Excellence (CoE) were established to work on different aspects of CC science and adaptation and established new State Climate Change Cells (SCCCs) in the UT of Ladakh.
- ❖ **National Supercomputing Mission (NSM)** jointly implemented with MeitY envisages to empower our national academic and R&D institutions by enabling the High-Performance Computing (HPC) infrastructures of various capacities. 47 Petaflop (PF) of infrastructure has been created across 38 locations so far Secretary, DST inaugurated PARAM Rudra, state-of-the-art, 3 PF National Supercomputing Facility at IIT, Bombay on 8 January 2026. The HPC system has been developed and deployed under Build Approach of NSM. PARAM Rudra is based on indigenously designed Rudra servers developed by C-DAC and manufactured in India..
- ❖ **Technology Development Programme** supports R&D for development of innovative technologies in identified areas. It consists of Advanced Manufacturing Technologies (AMT), Waste Management Technologies (WMT), Technology Development Program (TDP), Biomedical Device and Technology Development Program (BDTD), Therapeutics Chemicals Program (TCP), Technology Enabling Centres (TEC). During the year, new projects in different thematic areas such as Advanced Materials and Processing, Agro Tech and Food Processing, Construction/ Infrastructure and Low-cost Building Materials and Spectroscopy/Sensors/ Devices/ Environmental Technology Solutions.
- ❖ **Clean Energy Research Initiative (CERI)** is to nurture S&T led breakthroughs to make clean energy affordable and accessible through strengthening Research and Innovation Eco-System for Clean Energy. During year 2025, several new dimensions were added to the CERI programme to accelerate pace of clean energy innovations to meet national needs. DST is the country focal point for the multilateral Mission Innovation (MI), a global initiative of 23 countries and the European Commission (on behalf of the European Union). MI 2.0 is mandated for a decade of action spanning from 2021 to 2030, aiming to scale up the deployment of innovative clean energy technologies to ensure affordable and accessible clean energy solutions for all. In Year '2025, India also renewed its membership at MI Steering Committee (MISC) and Technical Advisory Group (TAG). **CSIR–National Aerospace Laboratories (CSIR-NAL) and CSIR–Central Glass and Ceramic Research Institute (CSIR-CGCRI)** developed an indigenous **electrolyte-supported Reversible Solid Oxide Fuel Cell (RSOFC) stack** for power generation and hydrogen production under the Materials for Energy Storage (MES) program. Water Technology Initiative (WTI) initiative's goal is to promote R&D for sustainable water sourcing, quality augmentation, and recycling and reuse of water.

- ❖ **National Geospatial Programme (NGP)** aims to promote R&D and science & technology in emerging areas of Geospatial technologies, policy, solution, capacity building, entrepreneurship and international cooperation for sustainable socio-economic development. Development of an Integrated Geospatial Data-Sharing Interface (GDI) was initiated as pilot in November 2023. In order to create awareness and strengthen indigenous capabilities in the field of geodesy, the National Centre for Geodesy (NCG), established at IIT Kanpur, in collaboration with its six Regional Centers for Geodesy (RCGs), undertook a wide range of lecture series, training programs, workshops, and outreach initiatives during 2025. At the International Association of Geodesy (IAG) Scientific Assembly 2025 held in Rimini, Italy, the NCG–RCG consortium showcased 11 research contributions from India.
- ❖ **National Initiative for Developing and Harnessing Innovations (NIDHI)** focuses on promoting, nurturing start-ups, individual innovators, and entrepreneurship in technology. Hon'ble Minister of State (Independent Charge) of the Ministry of Science and Technology, inaugurated cutting-edge facilities on 25th August 2025 at Islamic University of Science and technology, Awantipura, J&K, IUST's inclusive- Technology Business Incubator (iTBI). DST's NIDHI – PRAYAS (PRomoting and Accelerating Young and ASpiring technology entrepreneurs) launched in 2016 is currently being implemented by 46 centers. At present, 39 NIDHI-TBIs supported by DST are actively contributing to the promotion and growth of startups and entrepreneurship across the country. During 2025-26, DST supported 15 accelerator programmes to **grow and scale-up** around 300 startups. seed support has been provided to 07 new incubators and 27 incubators with ongoing support as subsequent releases under NIDHI-SSP .
- ❖ **National Council for Science and Technology Communication (NCSTC)** largely aims at communicating and popularizing science and technology (S&T) to masses and stimulate scientific temper in interesting, informative and innovative formats at various platforms to enable delivery even up to the remote corners of India. Several activities related to low cost teaching aids, science communication through folk media, science exhibition, visit to industries, mathematics day celebration etc have been carried out during the year.
- ❖ **Science for Equity for Empowerment and Development (SEED) Programme** supports a variety of schemes towards the socio-economic empowerment and development of the disadvantage sections of the society through appropriate interventions of Science, Technology, and Innovation (STI).
- ❖ **Scheduled Caste Sub Plan (SCSP) & Tribal Sub Plan (TSP):** The department has been implementing two programmes, viz Tribal Sub Plan (TSP) and Scheduled Castes Sub Plan (SCSP), since 1991-92 and 1992-93 respectively, to empower SC/ST communities through Science and Technology. The People and Protected Areas (PPA)

programme was implemented with 16 NGOs, benefiting about 30,000 tribal people in forest fringe areas with site specific, affordable technology support.

- ❖ **Good Laboratory Practice (GLP)** a Compliance Monitoring Programme for certification of Indian Test Facilities (TFs)/ Laboratories currently there are 60 GLP certified TFs in the country including four government laboratories. India is a full adherent to OECD Council Acts related to Mutual Acceptance of Data (MAD) since March 3, 2011, which ensures that data generated by GLP certified Test facilities in India is acceptable in 39 member-countries of OECD and other countries, thus removing the technical barriers to trade. During the financial year, one new TF was certified as GLP compliant after thorough inspection and review of facilities. Further, 09 existing TFs were re-certified as GLP compliant as per the laid down procedures of NGCMA.
- ❖ **Technical Research Centres (TRCs)** promote translational research by translating scientific discoveries and technological inventions into products and services of societal and industrial relevance. 05 TRCs were established in 05 Autonomous Institutions.
- ❖ **National Spatial Data Infrastructure (NSDI)** established with a mandate to “*acquire, process, store, distribute and improve utilization of geospatial data*”. A proof-of-concept (PoC) of Cloud-based Geospatial Platform, Geo-platform has been made operational at Survey of India, Hyderabad for high resolution (1:2,000 scale) data life cycle management of Varanasi City, Uttar Pradesh under National Urban Information System (NUIS).
- ❖ Department nurtures 25 Autonomous Bodies (ABs). These include 16 research institutions, 05 professional bodies, and 04 specialized knowledge and S&T service organizations. These institutions, with long proven history occupy a very important place in the S&T eco-system of the country. Following are glimpses of some of the key achievements:
  - **Indian Institute of Astrophysics (IIA), Bengaluru:** In a major advancement in computational astrophysics, a team including scientists from IIA have developed a method to compute more realistic properties of stellar atmospheres. The method opens the door to more realistic simulations of stellar spectra — the primary tool astronomers use to decode the physical conditions in stars, circumstellar disks, and interstellar clouds. A peculiar star named A980 that is 25800 light years away was recently discovered. A closer look into this star by astronomers from IIA using the Hanle Echelle Spectrograph on the Himalayan Chandra Telescope in Ladakh showed something strange that has rewritten the known facts about stellar chemistry.
  - **Raman Research Institute (RRI), Bengaluru:** Shaped Antenna measurement of the background RAdio Spectrum (SARAS) is an indigenous correlation spectrometer designed for precision measurements of the cosmic radio background and faint features in the sky spectrum at long wavelengths arising from redshifted 21-cm from gas in the reionization epoch. The SARAS 3 model, the third-generation antenna, was deployed in remote, radio-quiet regions of the Andaman Islands, where it

collected 30 hours of data which RRI researchers are currently analysing. Current efforts are towards winter deployment in the Arctic. Complementing the ground-based observations, Probing ReionizATIOn of the Universe using Signal from Hydrogen (PRATUSH) will be its extension in space..

- **Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum:** Multiple license agreements were signed as part of the Technology Transfer during the period. Secretary, Department of Space & Chairman ISRO, inaugurated “Centre for Space Medicine and Research”, “Simulation and Skills Lab Facility” and launched “Post Doctoral Fellowship Course on Bioastronautics” ,November, 2025 at SCTIMST. The Simulation and Skills Lab Facility is a part of new initiatives in the areas of biomedical research and clinical training. Two products were launched commercially: Drug-Eluting Bioceramics Beads for Osteomyelitis in Bone – “BONYX” and Drug-Eluting Bioactive Cement for Osteomyelitis in Bone – “CASPRO”.
- **North East Centre for Technology Application & Reach (NECTAR), Shillong:** During the financial year 2024-2025, Implementation of NECTAR Honey Mission is ongoing. The project includes establishment of Honey Processing Unit of 1000 MT capacity, establishment of Packaging, storage, cold storage, etc. for Honey & other beehive products. To set up the honey testing laboratory, various scientific equipment to facilitate honey analysis is also in process.
- **Aryabhata Research Institute of Observational Sciences (ARIES), Nainital :** During Year 2025-2026 , an international team lead by ARIES scientists shed light on the X-ray secrets of High- Energy Blazars by detecting rare signatures from their jets. **Survey of India** and **NATMO** continued efforts for Strengthening Survey and Mapping activity and have made some significant contributions with several geospatial solutions catering to various domains. Government of India established the Geospatial Data Promotion and Development Committee (GDPDC), an apex body tasked with formulating strategies, guidelines, and programs to promote geospatial sector and drive the development of geospatial ecosystem. Operation Dronagiri was launched on November 13, 2024, at FITT, IIT Delhi, as a flagship pilot initiative under the National Geospatial Policy 2022.
- **Technology Development Board (TDB)** provides financial assistance to the industrial concerns and other agencies attempting development and commercial applications of indigenous technology or adapting imported technology for wider domestic application. It accepts applications for financial assistance throughout the year from all sectors of economy such as Health & Medical, Engineering, IT, Chemical, Agriculture, Telecommunications, Road Transport, Energy & Waste Utilization, Electronics, Defence, Civil Aviation, Textile, etc. During the year 2025-26, TDB signed seventeen (17) National Agreements and seven (07) International Bilateral Projects

for providing financial support to projects addressing various industrial concerns. TDB has been appointed as a Second-Level Fund Manager (SLFM) under the Research Development and Innovation Fund (RDIF) Scheme.

The Department has made sincere efforts to utilize the allocated budget fruitfully to implement its planned activities and programmes during the year. DST and its autonomous institutions have contributed to overall development of the nation with meaningful S&T interventions.

## VIGYAN DHARA SCHEME

The **Vigyan Dhara** is a unified Central Sector Scheme with the overarching goal to cultivate a dynamic and inclusive Science, Technology and Innovation (STI) ecosystem that propels innovation and scientific excellence. This scheme was introduced during the 15<sup>th</sup> Finance Commission (FC) period merging more than 20 sub-schemes/programs implemented under three umbrella schemes.

Vigyan Dhara Scheme came into force with effect from 16.01.2025. It merges three key umbrella schemes into one, focusing on:

- 1) **Science and Technology (S&T) Institutional and Human Capacity Building:** It focuses on strengthening India's scientific infrastructure and human resource pool. It aims to build and enhance research and development (R&D) labs across academic institutions, creating a robust environment for scientific research.
- 2) **Research and Development (R&D):** This segment emphasizes research in various critical areas, including basic research, translational research in sustainable energy and water, and access to international mega facilities. This component also fosters collaborative research through international bilateral and multilateral cooperation.
- 3) **Innovation, Technology Development and Deployment:** This segment of the scheme aims to drive innovation at all levels, from schools to higher education and the industry. It seeks to promote technology development and deployment, with a particular focus on increasing collaboration between academia, government, and industry, as well as supporting startups.

This merger was aimed to enhance efficiency and establish synergy among the sub-schemes/programs.

Vigyan Dhara scheme caters to build a robust R&D talent pool, augment research and innovation infrastructure, and support extramural research and development in diverse domains. It includes several flagship programmes that have played a pivotal role in advancing the National STI agenda.



These sub-schemes also play a crucial role in improving the nation’s standing on global STI indices and rankings. Key components of Vigyan Dhara contribute towards long-term sustainability and growth of the country’s STI landscape.



The budget has witnessed a substantial rise from ₹ **330.75 crore** in **2024-25** to ₹ **1425.00 crore** in **2025-26**. The proposed outlay for the implementation of the unified scheme ‘Vigyan Dhara’ is ₹ 10,579.84 crore for the period of 2021-22 to 2025-26, aligning with the 15th Finance Commission. (August 2024)

This increased investment underscores the government’s dedication to fostering science and technology as a foundation for national progress.

# SCIENCE AND TECHNOLOGY (S&T) INSTITUTIONAL & HUMAN CAPACITY BUILDING

## 1 Research and Development Infrastructure

The Research and Development Infrastructure programme aims to strengthen the National Science and Technology ecosystem through establishment of advanced research and development infrastructure in academic institutions and universities. These facilities enhance the research capabilities of institutions while promoting collaborative and interdisciplinary research. Emphasis is placed on fostering institutional synergies, encouraging inter-institutional cooperation, and enabling shared use of facilities. Details of programmes implemented under this scheme, along with their key achievements, are presented below.

### 1.1 Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions (FIST)

The Fund for Improvement of Science and Technology Infrastructure (FIST) is a flagship initiative of the Government of India designed to strengthen research and teaching at the departmental level through sustained support for scientific infrastructure. The programme facilitates laboratory modernization, acquisition of advanced research facilities, and creation of specialized infrastructure to enable globally competitive research. Over two decades, FIST has significantly enhanced capacity building in universities and higher education institutions, advancing Science, Technology, Engineering, Math, and Medicine (STEMM) disciplines and improving research quality. The support is provided in seven broad areas: Life Sciences, Physical Sciences, Chemical Sciences, Engineering Sciences, Earth & Atmospheric Sciences, Mathematical Sciences, and PG Colleges.

Since its inception in Year 2000, DST–FIST Programme has provided support to over **3,285 departments** and postgraduate colleges across the country (Indian map showing locations, be put up) through 23 funding cycles, with a total cumulative investment of approximately **₹3,459 crore**. An amount of **₹21.59 crores** has been allocated to **23** new Departments/ PG college while **₹26.81 crores** has been extended to support **20** under ongoing projects.

During the year, respective Subject Expert Committees (SECs) reviewed FIST-supported projects to assess infrastructure development, facility utilization, and research outcomes by organizing review/group monitoring workshops.

The Subject Expert Committee in **Chemical Sciences** subject area reviewed twenty-nine projects, assessing infrastructure development, research productivity, student achievements, and sponsored research activities.



**Fig.** Research infrastructure developed under DST-FIST Programme, including high-resolution mass spectrometry, NMR spectroscopy, single-crystal and powder X-ray diffraction, and EPR facilities at select institutes reviewed during the meeting at IIT Delhi.

Out of the twenty-nine departments reviewed, five departments demonstrated exemplary use of FIST-supported infrastructure were graded “Excellent” for effectively aligning facilities with their research priorities. The departments graded “Excellent” included IIT Jodhpur, where a High-Resolution Mass Spectrometer supported molecular synthesis for healthcare and environmental applications; IISER Pune, where Electron Paramagnetic Resonance and Variable Temperature Powder X-ray Diffraction facilities advanced research in functional materials and supramolecular systems; IIT Roorkee, where 500 MHz NMR and Single Crystal X-ray Diffraction facilities enabled chemical synthesis, sustainable catalysis, and energy materials research; IIT Guwahati, where advanced NMR and Single Crystal X-ray Diffraction facilities facilitated studies on multifunctional organic co-crystals; and IISER Mohali, where a 400 MHz NMR facility supported mechanistic investigations in photo switchable catalysis and reaction mechanisms.

A meeting of **Life Sciences** Subject Expert Committee was convened to review fifty-two FIST-supported projects. The review focused on infrastructure development, utilization of facilities, research outputs, student training, and overall implementation status.



**Fig.** Research infrastructure developed under the DST–FIST Programme, including high-resolution mass spectrometry, NMR spectroscopy, single-crystal and powder XRD, and EPR facilities established at some of the institutions reviewed during the meeting at IIT Delhi.

Institutions demonstrating exemplary use of FIST-supported infrastructure include Kumaun University, which employed UV–Visible Spectrophotometer, SDS-PAGE system, microplate reader, and fluorescence microscope to advance research in medicinal plant-based drug discovery and bioactivity evaluation with translational outcomes. University of Burdwan leveraged Nanodrop Spectrophotometer, RT-PCR, and Atomic Absorption Spectrophotometer for studies in plant stress biology, crop resilience, environmental stress responses, and biodiversity. BITS Pilani effectively utilized High-Performance Liquid Chromatography systems and an in vivo imaging system to strengthen teaching and research in pharmaceutical analysis, drug formulation, pharmacokinetics, and bioanalytical studies. A comprehensive review exercise was undertaken by the **Engineering Sciences** Subject Expert team. Committee assessed the progress of fifty-five FIST-supported projects.

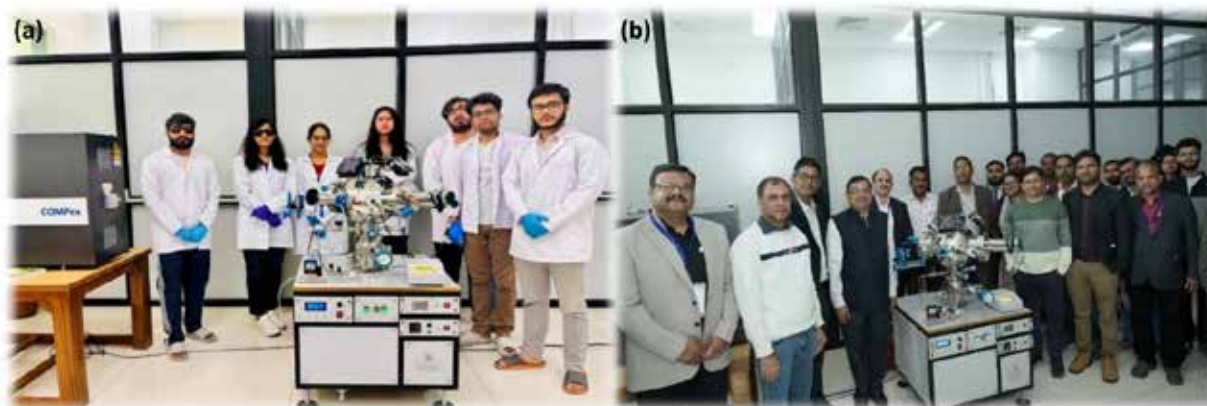


**Fig.** Research infrastructure developed under the DST–FIST Programme in Engineering Sciences, including power electronics laboratories, semiconductor device characterization facilities, thermal imaging and non-destructive testing systems, materials characterization tools, and mechanical testing equipment across participating institutions.

Institutions demonstrating exemplary use of FIST-supported facilities include IIT Gandhinagar, which employed Direct Current (DC) and Radio Frequency (RF) probe stations for semiconductor device characterization and CMOS technology development; IIT Bombay, which established a Medium Voltage Power Electronics Laboratory to advance research on silicon carbide-based power devices and grid-integrated solar inverters; and IIITDM Kancheepuram, which utilized thermal imaging and non-destructive testing facilities for work on advanced materials and thermal systems. NIT Rourkela leveraged an inductively coupled plasma optical emission spectrometer for research in materials and environmental engineering, while NIT Calicut utilized X-ray diffraction and field emission scanning electron microscopy with energy-dispersive spectroscopy for nanotechnology and biomaterials research. IIT Indore strengthened investigations into the mechanical behavior of materials through the establishment of a universal testing machine.

Also, a dedicated review session of the Subject Expert Committee for **Physical Sciences** was conducted to assess the progress of twenty-nine ongoing and completed FIST-supported projects.

The Pulsed Laser Deposition (PLD) facility, supported under the FIST–Physical Sciences programme, was commissioned at the Department of Physics, Indian Institute of Technology (IIT) Ropar and was opened for users from academia and industry. To promote awareness and encourage utilization of the facility, a Workshop was organized during the year.



**Fig.** User engagement and capacity-building activities at the Pulsed Laser Deposition (PLD) facility at IIT Ropar: (a) regular users of the PLD facility, and (b) participants of a workshop organized for hands-on training and familiarization with the facility.

### 1.2 Promotion of University Research and Scientific Excellence (PURSE)

The Promotion of University Research and Scientific Excellence (PURSE) programme, launched by Department of Science & Technology (DST), is a strategic initiative to strengthen research capacity of high-performing Indian universities and promote mission-oriented research aligned with national priorities. The scheme has been further enhanced through

integration of Scientific Social Responsibility (SSR) and increased industry collaboration, fostering stronger linkages between academia, society, and industry. Currently, PURSE-supported projects are being implemented in 41 universities across the country. An amount of ₹57.03 crores has been allocated to nine new universities, while ₹13.45 crores has been extended to support 24 universities under ongoing projects.

### 1.1.1 Key Research Initiatives

During the year, funds were released to selected universities to undertake cutting-edge, mission-driven research in areas of national importance. Central University of South Bihar is developing indigenous technologies for human health and climate change mitigation to support *Atmanirbhar Bharat*. Central University of Tamil Nadu is advancing human organs-on-chip platforms for drug discovery. Guru Ghasidas Vishwavidyalaya, Chhattisgarh, is validating traditional medicines used by the Baiga community for effective management of sickle cell disease. Hemwati Nandan Bahuguna Garhwal University, Uttarakhand, is pursuing multidisciplinary research in natural products, drug design, metabolomics, and climate studies. Maharshi Dayanand University, Rohtak, is focusing on advanced functional materials for energy storage, water purification, EMI shielding, and luminescent devices. Punjab Engineering College, Chandigarh, is developing sustainable biomaterials and diagnostic devices for healthcare. Rashtrasant Tukadoji Maharaj Nagpur University, Maharashtra, is adopting a convergent approach to develop advanced materials for clean energy devices while addressing environmental and health challenges.



**Fig.** Projects from 19 universities were reviewed, and completed projects from 6 universities were also evaluated by the Apex Committee, namely the PURSE Advisory Board, during its meeting held on 26–27 June 2025.

Through sustained investments in research infrastructure, interdisciplinary collaboration, and human resource development, the PURSE programme continues to strengthen India's academic research ecosystem. It plays a pivotal role in advancing national priorities in healthcare, climate resilience, clean energy, and sustainable development, while fostering innovation and societal impact.

Some glimpses of highly sophisticated instruments commissioned during the current year in universities supported in the previous year are presented below:



**Fig.** An Electro spray Ionization Mass Spectroscopy (ESI-MS) system has been installed at the University of Calicut under DST PURSE.

### **1.3** *Sophisticated Analytical Instrument Facilities (SAIF)*

The Sophisticated Analytical Instrument Facilities (SAIF) is a flagship initiative of the Department of Science & Technology (DST), conceived to address critical need for equitable access to advanced analytical instrumentation, which is essential for high-quality research across diverse domains of science and technology.

SAIF aims to provide state-of-the-art analytical facilities to researchers from academic institutions, R&D laboratories, industry, and start-ups, with a special focus on institutions lacking in-house infrastructure. By enabling inclusive access to sophisticated equipment,

the programme strengthens analytical capabilities, promotes interdisciplinary research, fosters industry collaboration, and supports capacity building through training in advanced techniques.

Currently, 15 SAIF centres operate across premier academic and research institutions in India, serving as national hubs for advanced characterization and testing. These centres are located at IIT Madras, IIT Bombay, CSIR-CDRI Lucknow, Panjab University Chandigarh, NEHU-Shillong, IISc-Bangalore, AIIMS-New Delhi, Gauhati University, C.V.M. Vallabh Vidyanagar, STIC-Kochi, Shivaji University-Kolhapur, IIT Patna, IEST Shibpur, Mahatma Gandhi University-Kottayam, and Karnataka University-Dharwad.

SAIF centres host a wide spectrum of advanced instrumentation, including X-Ray Photoelectron Spectroscopy (XPS), X-ray Diffractometers (XRD), Thermal Analysis Systems, Transmission and Scanning Electron Microscopes, Mass Spectrometers, Nuclear Magnetic Resonance (NMR) Spectrometers, Inductively Coupled Plasma (ICP) instruments, Small Angle X-ray Scattering (SAXS) facilities, and Focused Ion Beam–Scanning Electron Microscope (FIB–SEM) systems. Operating on an open-access model, these facilities are available to all users irrespective of institutional affiliation.

### 1.3.1 Major Achievements

- **Analytical Services and Outreach:** SAIF centres continued to serve as a vital national resource for advanced analytical characterization and testing, supporting applications such as material characterization, structural determination, qualitative and quantitative analysis, and surface morphology studies. Approximately 25,000 users, including a substantial proportion from non-host institutions, accessed SAIF facilities during the year. Around 1.25 lakh samples were analyzed, and nearly 2,300 research publications acknowledged SAIF support, underscoring its critical role in enabling high-quality research.
- **Financial Performance:** The centres collectively generated ₹12 crore, primarily utilized for equipment maintenance, consumables, and human resource support, contributing to financial sustainability.
- **Capacity Building:** SAIF centres organized 132 workshops and training programmes to enhance technical proficiency and awareness of advanced analytical techniques, benefiting researchers, students, and technical personnel from academia, R&D labs, and industry.



**Fig.** Glimpses of Workshops and Training Programmes conducted by DST SAIF Centres

The analytical and characterization capabilities of the SAIF Centres were further strengthened through the acquisition of state-of-the-art instruments. The SAIF Centre at IIT Bombay procured an IC-ICP-MS, enabling highly sensitive and precise elemental and ionic analysis for complex samples. Chandigarh augmented its surface characterization capabilities with an X-ray Photoelectron Spectroscopy (XPS) system for detailed chemical state and surface composition analysis. Guwahati installed a X-ray Diffractometer (XRD) to support advanced crystal structure determination, phase identification, and crystallographic analysis. In addition, CSIR-CDRI, Lucknow, acquired the SYNAPT XS high-resolution mass spectrometer, enhancing capabilities in proteomics, metabolomics, and complex molecular characterization.



**Fig.** X-ray Photoelectron Spectroscopy system at SAIF Centre at Panjab Univ, Chandigarh

#### 1.4 *Sophisticated Analytical & Technical Help Institute (SATHI)*

DST-SATHI scheme is one of the Department's key initiatives to set up shared, professionally managed science and technology infrastructure facilities across India. To date, five national-level Sophisticated Analytical & Technical Help Institute (SATHI) centers, equipped with advanced analytical instruments, have been established. These centers are located at IIT Delhi, IIT Kharagpur (West Bengal), BHU Varanasi (Uttar Pradesh), IIT Hyderabad (Telangana), and BITS Pilani (Rajasthan).



**Fig.** On September 27, 2025, review and monitoring of five DST-SATHI centres - three established in 2019 at BHU Varanasi, IIT Kharagpur, and IIT Delhi, and two more set up in 2024 at IIT Hyderabad and BITS Pilani were completed at JNCASR, Bangalore



**Fig.** Cryo-Electron Microscopy (Cryo-EM), Steady-State Photoluminescence (SSPL), Time-Resolved Confocal Microscopy (TRCM), and Stimulated Emission Depletion (STED) Microscopy etc at SATHI Foundation of IIT Delhi.

Operating under a unified governance framework and established as single-window facilities, the SATHI Centres are structured as Section-8 entities, each designated by the acronym of its host institute followed by “SATHI Foundation. In particular, the SATHI Foundation at IIT Delhi has made significant progress in charting a structured revenue-generation roadmap, with a strategic focus on high- end instrumentation such as Cryo-Electron Microscopy (Cryo-EM), Steady-State Photoluminescence (SSPL), Time-Resolved Confocal Microscopy (TRCM), and Stimulated Emission Depletion (STED) Microscopy.



**Fig.** Different facilities available at SATHI Foundation of IIT Hyderabad.

An annual Symposium on Advances in Materials Characterization was conducted at SATHI-CISCO, during Sep 8-9, 2025. With ambitious planning achieved and targeting for (a) training to 150+ proficient high-end microscopy users and upskilling >500 researchers in 5 years, through skill development workshops and short-term courses; (b) Facilitating prototype

creation for advanced in-situ microscopy, leading startups in high-end instrumentation; (c) Transforming high-end equipment into micro-/nano-labs for versatile applications; (d) In the process of inclusion of more partners viz: Altmin Pvt. Ltd., Hyderabad, Saint Gobian, Chennai, MRF, Chennai, & MIDHANI group to the cluster of SATHI.

The establishment of the SATHI Foundation as a Section-8 company enabled professional management, effective outreach, and optimal utilisation of facilities, resulting in revenue generation of ₹3.59 crore up to August 2025.

## 2 State Science and Technology Programme (SSTP)

Science and Technology Programme (SSTP) nurtures Centre-State S&T cooperation through support to State/Union Territory Science & Technology Councils to strengthen the Science Technology and Innovation (STI) ecosystem at their State/UT level through systemic interventions. The programme also extends support to Patent Information Centres established at the State S&T Councils to facilitate Intellectual Property Rights (IPR) related activities. Some of the significant achievements of S&T Councils during the year are summarized below:

### 2.1 RESEARCH, INNOVATION AND TECHNOLOGY DEVELOPMENT:

- **Arunachal Pradesh State Council for Science & Technology** facilitated the development and launched three patent-backed, industry-ready technologies: biodegradable tea bag substrate from banana pseudostem agro-waste, mobile cohobation essential oil distillation system with 5-15% yield enhancement, and cold-chain-free microbial preservation technology. The biodegradable tea bag substrate from banana pseudostem agro-waste and cold-chain-free microbial preservation technology have been transferred to National Research Development Corporation (NRDC) for commercialization.



Fig. Launch of the technologies during the Industry Academia Meet, 2025

- **Mizoram Science, Technology & Innovation Council** facilitated the development of a water-based rocket stove-driven biomass vegetable dryer with 200 kg capacity per cycle, addressing post-harvest challenges in ginger production. The State Government of Mizoram has shown strong interest in integrating this dryer into its flagship initiatives on ginger production and post-harvest management.



Fig. Water-based rocket stove-driven biomass vegetable dryer

- **Karnataka State Council for Science and Technology** achieved a breakthrough with the development of a repicon-based system for antiviral screening against Kyasanur Forest Disease Virus (KFDV). This BSL-2 compatible system enables safer research conditions and has led to the identification of effective non-nucleoside inhibitors, providing the first experimental evidence of their efficacy against KFDV.
- **Sikkim State Council of Science and Technology** conducted a field trial to reduce harvest-related injuries in large cardamom plants by applying organically permitted bio-fungicidal treatments-Bordeaux mixture, copper oxychloride, and chitosan to harvesting wounds. The intervention resulted in nearly a three-fold increase in tiller numbers compared to untreated plants, effectively preventing secondary infections and promoting healthy regrowth.

## 2.2 CAPACITY BUILDING

- **Sikkim State Council of Science and Technology** conducted the “*Smart Proposals, Smarter Governance*” AI training programme, training 626 government officials from 39 line departments across all six districts of Sikkim in AI-assisted DPR preparation and documentation tools.

- **State Council of Science Technology & Environment, Meghalaya** implemented STAR 30 Programme with 50% success rate, resulting in 17 students securing MBBS seats and others admitted to BDS and D.Pharm courses.
- **West Bengal State Council of Science & Technology** implemented WB-FIST scheme for laboratory infrastructure development in 34 high schools.
- **Assam Science Technology & Environment Council** has facilitated the establishment of Five Robotics Club at 5 Aryabhata Science Centres in collaboration with IIT Guwahati to nurture an environment of AI, Robotics, Data Science and Machine Learning among school students.

### 2.3 FACILITATION OF INTELLECTUAL PROPERTY RIGHTS

- Patent Information Centre (PIC) at Tamil Nadu State Council for Science and Technology facilitated the filing of 44 patents, 170 industrial designs, 19 trademarks, 12 copyrights and 11 GI applications.
- Gujarat Council for Science and Technology achieved a historic milestone by facilitating 218 provisional patent filings in a single day, now reflected in WIPO global records, demonstrating the state's rising innovation potential. PIC at West Bengal State Council of Science & Technology facilitated the filing of 60 patents, 15 copyrights, 10 trademarks, and 3 geographical indications (GI), and supported the granting/registration of 25 patents, 11 copyrights, and 8 GI registrations during the year.
- PIC at Haryana State Council of Science & Technology facilitated 15 patents, 12 trademarks, and 15 industrial designs, with 25 IPR awareness sessions conducted across institutions in 2025.
- PIC at Goa State Council for Science & Technology facilitated the filing of 2 GI applications, 1 patent and granting of 3 patents.
- PIC at Assam Science Technology & Environment Council facilitated GI registration for Axomiya Gohona (Assamese Jewellery) and filed 3 patents including innovations in tyre technology, silkworm products, and bioremediation.
- PIC at Telangana State Council of Science & Technology facilitated 15 patent applications, 5 copyrights, 2 trademarks, and 1 industrial design filing, with 2 patents and 2 trademarks granted.
- Nagaland Science and Technology Council completed documentation of traditional attires and ornaments for 15 indigenous tribes, publishing 10 books for GI registration purposes.

## 2.4 TECHNOLOGY DEPLOYMENT

- Himachal Pradesh Council for Science Technology and Environment- Aryabhata Geo-informatics & Space Application Centre, implemented the modernization of property monitoring & tax assessment in Himachal Pradesh through the deployment of drone-based high-resolution aerial surveys integrated with GIS tools Arunachal Pradesh State Council for Science & Technology facilitated the establishment of a Millet Processing Unit at Dadam Village, Tirap District, providing training to rural women on value-added millet products including flour, cookies, laddoos, and cakes, strengthening pathways for sustainable rural entrepreneurship.
- Punjab State Council for Science and Technology made significant strides in maternal health through low-cost interventions for Postpartum Hemorrhage (PPH) management. The initiative, implemented in collaboration with AIIMS Bathinda, saved 317 mothers (75 in Phase I across Bathinda and Faridkot, 242 in Phase II across 10 additional districts), contributing toward reducing the state's MMR from 105 to the SDG target of below 70 per lakh live births by 2030. Further, PSCST pioneered India's first paddy straw palletization technology, establishing 37 operational plants with 9.05 lakh TPA capacity and 40 additional plants (10.7 lakh TPA) under installation. The technology, now being replicated across South Asia by ICIMOD, has created demand for 5-6 lakh tones annually through government mandate of 20% coal replacement in brick kilns.

## 2.5 SCIENCE OUTREACH

- Gujarat Council for Science and Technology launched two flagship STEM programs: National STEM Quiz with 15 lakh student registrations nationwide and ROBOFEST-Gujarat 5.0 with 2,080 participations from IITs, NITs, and leading institutions.
- Himachal Pradesh Council for Science, Technology and Environment initiated a stargazing initiative in Spiti Valley to promote science-based tourism and support sustainable livelihoods in the high-altitude tribal region of Himachal Pradesh. The project was implemented in collaboration with the Central University of Himachal Pradesh and the Indian Institute of Astrophysics. The stargazing facility established at Kaza in Spiti Valley was inaugurated by the Hon'ble Chief Minister of Himachal Pradesh.
- West Bengal State Council of Science & Technology initiated establishment of an Astro Park on the Tropic of Cancer at Krishnanagar, Nadia District, in coordination with the Ministry of Culture (MoC), Govt. of India and the National Council of Science Museums (NCSM), providing a platform for demonstrating astronomical phenomena including Zero Shadow Day and eclipses.
- Andhra Pradesh State Council of Science and Technology engaged over 1,00,000 students through workshops, competitions, and outreach events

- Bihar Council on Science & Technology facilitated the operation of the Mobile Science Exhibition Bus that reached over 50 schools and engaged more than 3400 students in the 7 districts of Bihar.
- Goa State Council for Science & Technology organized thematic science project competitions with 40 participating projects, selected 10 best projects for National Youth Festival 2026, and conducted National Space Day celebrations across the state engaging over 100 students from higher secondary schools and colleges.
- State Council of Science, Technology & Environment, Meghalaya, through its PULSE programme, enabled 2,162 students from 68 schools across 12 districts to visit the Shillong Science Centre for hands-on science learning experiences.



Fig. SCSTE, Meghalaya's PULSE programme

- Puducherry Council for Science & Technology conducted 15 major awareness activities, including sky watching events, memorial lectures honoring eminent scientists, and competitions engaging over 1,960 students. The Dr. Abdul Kalam Science Centre and Planetarium recorded 29,394 visitors from 216 schools and 31 colleges, while participating in the State Level Science Exhibition attracted nearly 9,500 participants.

## 2.6 POLICY DEVELOPMENT

- Gujarat Council for Science and Technology completed drafting of the Science, Technology and Innovation Policy 2025-2030.

## 2.7 NATIONAL RECOGNITION AND AWARDS

- The CM's Climate Resilient Village Fellowship Programme of Assam Science Technology & Environment Council was featured as 'Granary of Solutions' at COP30 (Belém, Brazil).

COP30: Featured as Granary of solutions in COP30 at Belém, Brazil, highlighting innovative approaches to addressing climate challenges. Council's Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP) center received the Third Best Outstanding Centre award for two consecutive years (2023-24 and 2024-25) from the Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India.

- Gujarat Council for Science and Technology earned recognition as UN Patron Academic Institution for International Year of Quantum Science & Technology 2025.
- S&T Councils of Arunachal Pradesh, Tamil Nadu and Madhya Pradesh were conferred the “*Jury Special Mention Award*” under the Science–Technology–Defence–Space Exhibition category at IISF 2025.

## 2.8 INDIA INTERNATIONAL SCIENCE FESTIVAL (IISF) 2025:

- During “Thought Leaders Round Table Minister-Secretary Councils-CEO Conclave”, a session entitled “*State–Centre Dialogue on Strengthening the Science, Technology & Innovation (STI) Ecosystem: Gaps, Strengths, and the Way Forward*” was organized at the India International Science Festival (IISF) 2025. During the session, discussions focused on identifying key gaps and challenges at state level, showcasing strengths, best practices, and innovative initiatives, and outlining actionable recommendations for a resilient and collaborative STI framework. Emphasis was laid on Centre–State coordination, joint R&D, technology validation and scale-up, and nurturing regional and grassroots innovation to advance the national vision of Viksit Bharat@2047 through inclusive, innovation-led growth.



**Fig.** Session on State–Centre Dialogue on Strengthening the Science, Technology & Innovation (STI) Ecosystem: Gaps, Strengths, and the Way Forward at IISF 2025

- 17 State S&T Councils showcased their key STI achievements, flagship initiatives, and innovation success stories at the Science–Technology–Defence–Space Exhibition during IISF 2025. In recognition of its impactful scientific initiatives and exhibition display, S&T Councils of Arunachal Pradesh, Tamil Nadu and Madhya Pradesh were conferred the “*Jury Special Mention Award*” under the Science–Technology–Defence–Space Exhibition category.



Fig. Exhibition of S&T Councils at Science–Technology–Defence–Space Exhibition during IISF 2025

### 3 Policy Research Cell (PRC)

Department of Science and Technology (DST) has a mandate to develop and deliver the public policy support to strengthen the science, technology and innovations in the country. Building a robust institutional mechanism for evidence-driven policy and program planning had been identified as an important policy objective in the fourth national STI policy, STIP-2013. To realize this, DST has been continuing with the Policy Research Cell. The programme is being implemented in two broad components: Centres for Policy Research and STI Policy Fellowship to pursue research in different domains of STI policy. During the year, 07 CPRs across different institutions have received support. So far, five cohorts under the DST-STI policy fellowship programme have been supported and currently, 6<sup>th</sup> Cohort of Policy Research Fellows are availing the fellowship. Followings are the key highlights from the programme:

#### 3.1 Centres for Policy Research (CPR):

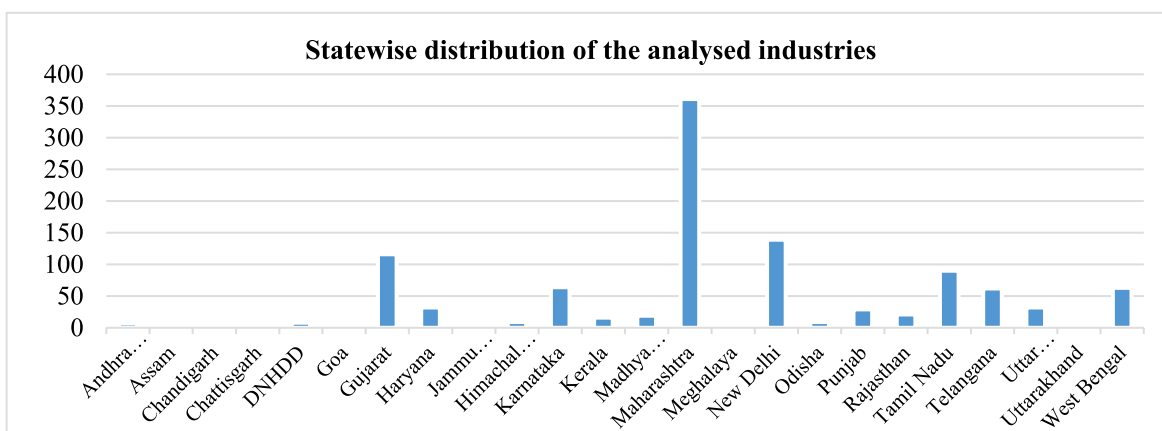
##### 3.1.1 DST-CPR at Panjab University, Chandigarh

The DST-CPR at Panjab University, Chandigarh is mainly focusing on STI policy and governance, promoting the private sector’s incentivization in R&D, and Intellectual Property

Ecosystem and other regulatory issues. The CPR's work progress during the year include generating insights in the domain of STI Policy & Governance to promote and enhance Industry-Academia Interactions for R&D, implementation of PPPs for STI, and strengthening system Interconnectedness to address the issues of collaborative R&D and Technology Transfer. Some of the major highlights during the year are as follows:

- **Trends of Corporate Social Responsibility Investment in Research & Development in India:**

A report titled “*Trends of Corporate Social Responsibility Investment in Research & Development in India*” has been published (<https://cpr.puchd.ac.in/archives/>) which examines the current status of CSR spending trends, identifies gaps, and highlights opportunities for CSR-driven R&D funding.



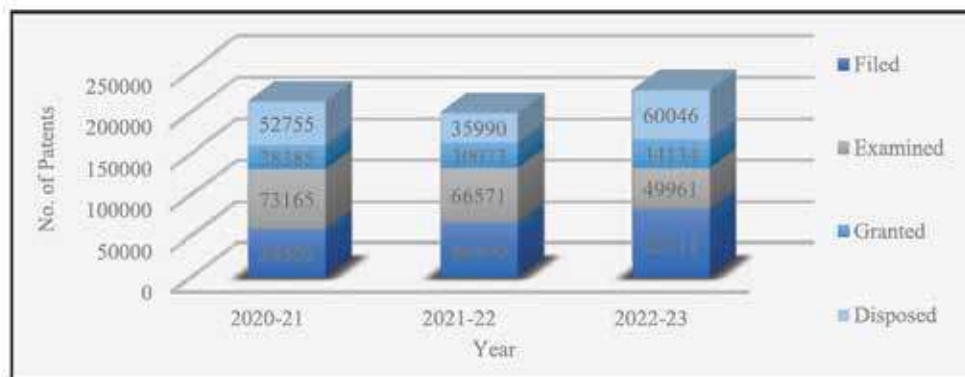
**Fig.** State-wise distribution of analyzed industries

In India, CSR investments have been concentrated in a few thematic areas. During FY 2023-24, approximately 35% of CSR funds were allocated to education, 20% to healthcare, and 10% to environmental sustainability—accounting for over two-thirds of total CSR expenditure. The study considered 1,092 industries for analysis. The figure above shows the state-wise distribution, highlighting the concentration of major industries across states and UTs.

- **A comprehensive analysis of India's Innovation Ecosystem by mapping patent landscape of Higher Educational Institutions and Research Organizations**

The academic and research institutions play a crucial role as hubs of IP creation and are acknowledged as knowledge centres of innovation and creativity, contributing to the National Innovation System (NIS) through publications (<https://cpr.puchd.ac.in/archives/>) or patents. There is direct correlation between the economy of a country and the scientific and innovative temperament of its research community. Research articles are a direct measure of academic excellence, whereas patents depict the capacity to

transform basics into an industrially or commercially applicable product/technologies It is observed that a constant increase in all the categories (patent filing/examined/granted/disposed) during the last three years FY 2020-21, 2021-22 & 2022-23 with increment percentage of 41.55%, 16.84% & 13.82% respectively were recorded in the patent filing, grant, and disposal respectively, while there was a decline in the number of patents examined at the IPD by 31.71%.



**Fig.** Trends in patent applications from 2020 to 2023

The trend of patent filing and granted points out to the fact that institutions in the Northern and Southern region are actively involved in securing their innovations through patents.

- **Key recommendations emerged from the studies undertaken by the CPR include:**
  - Creation of an Indian Patent Trust System: In IPO report 2024-25 total number of patents in force are 230480 out of which 3663 are reported as working patents, which is only 1.6% of patents in force. Mapping of such patents as they may lead to technological advancements and hand them over to industries for commercial exploitation. In order to overcome above mentioned issue Patent Trust system or National patent repository and facilitation portal can be developed. By virtue of this facility, any institution (Universities, public research laboratories and SMEs) that lacks financial resource or capability to protect and maintain the patent and is unable to utilize or commercialize the patent may handover the technology or a patent to this specialized agency for its management.
  - To ensure effective management and promotion of IP, it is essential to strengthen existing IP Cells and establishment of more IP cells, IPR Chairs, and IPMCCs in educational and research institutions.
  - Developing a tailored state specific IP policy is crucial, which can drive innovation in key sectors.

### 3.2 DST-CPR at Indian Institute of Science, Bangalore

DST-Centre for Policy Research (DST-CPR) at the Indian Institute of Science (IISc) is dedicatedly working on variety of topics under the broad themes of Scientometrics, emerging technologies, and Diversity, Equity and Inclusion. Followings are the theme-wise details of key activities:

- **Scientometric research:** One of the key contributions is to take up study and draft a report analyzing the research landscape of Indian STEM fields from 2014 to 2023, which is under finalization in consultation with DST. Previously, such reports were commissioned to external for-profit agencies like Clarivate and Elsevier (Scopus) at a significant financial cost. With DST-CPR now internalizing the entire process, this initiative not only builds national capacity for more refined, ecosystem-specific analysis but also ensures that data and insights remain within government agencies, preventing their appropriation by external entities.
- **Research Assessment:** The Centre compiled a report mapping global research assessment reforms and evolving frameworks for guiding research evaluations. As a part of this effort, DST-CPR contributed to an analysis of DST -STI Hub program call, demonstrating how effective research assessment frameworks can enhance program's objective of improving the livelihoods of marginalized communities. The team is actively working on research assessment framework for the Year 2025 NSTMIS call for proposals, leveraging AI and machine learning techniques to ensure a fair and transparent evaluation process.
- **Open Access and Open Science:** The CPR engaged with the open science vertical of CNRS, France in January 2025 to discuss potential collaborations in advancing open access and open science initiatives in India. Key recommendations included exploring collaboration with HAL and CEFIPRA.
- **Informing Urban Transport Policy:** The CPR is conducting research on decision-support tools aimed at informing urban transport policy. This includes research on: (1) analysis and planning of multimodal mass transit systems, (2) multimodal accessibility-based metrics to shift the focus of transport planning away from only easing vehicular movement to enhancing mobility and accessibility for people via a variety of other modes. This work aims at developing multimodal mobility demand modelling tools that Karnataka's Directorate of Urban Land Transport (DULT) plans to use for transport planning in Bengaluru and other cities.
- **Rural Healthcare Infrastructure (RHI):** RHI in India comprises Primary Health Centres (PHCs) and Mobile Health Units (MHUs), which together with healthcare workers, equipment, health finance and telehealth services forms the core of rural healthcare

delivery system. While there has been significant focus and advancements in telemedicine and health services, there are notable gaps in the functioning and operations of PHCs as well as the MHUs. Hence, this research adopts a systemic macro-level perspective on the design and operations of the RHI, exploring a systemic integration between PHCs and MHUs.

### 3.3 DST-CPR at the Indian Institute of Indore, Madhya Pradesh

DST Centre for Policy Research (DST-CPR) at IIT Indore is working on two thematic areas; Sectoral STI and Intellectual Property Ecosystem. Under sectoral STI, sub areas such as Water, Environment, Climate Change (Health, Agriculture, Disaster Risk Reduction, Clean Energy, etc) are studied. Under Intellectual Property Ecosystem, IPR policies, Patent innovation/ facilitation and IPR Vs. Open Science are studied. er

- **Sectoral STI:** The key outputs of the CPR include a comprehensive examination of water policy, management, and sustainability in India, offering insights into policy frameworks, technological advancements, and environmental challenges. The study provides global and Indian perspectives on groundwater management, emphasizing sustainable practices and policy enhancements. A significant focus is placed on next-generation wastewater management policies, incorporating AI, machine learning, and clean technologies to improve water treatment efficiency.
- **Patent Landscape Analysis** in Environmentally Sound Technologies (EST) such as Agricultural Technology, Biofuels and Pollution Control Technology sheds light on the innovation trends, major technology subdomains, and major patentees. Many patents are inactive due to various reasons, including lack of commercialization, expired filings, or withdrawn applications.
- **Geographic Indicators:** The policy brief on geographical indications revealed the challenges confronted by the stakeholders in Madhya Pradesh for instance, absence of a common facility centre, limited representation of women entrepreneurs, exaggeration of number of authorized users, occupational shifts due to declining profit margins, inadequate oversight and quality control, and proliferation of counterfeit products.

### 3.4 DST-CPR at National Institute of Science Education and Research, Bhubaneswar

DST Centre for Policy Research (DST-CPR) at National Institute of Science Education and Research, Bhubaneswar is mainly focusing on two areas; Energy Transition and Tribal Education, Innovations for Tribal Education. During the year, CPR carried out research activities on 1) Status of Energy Transition in Odisha, Jharkhand, Bihar and 2) Barriers and Facilitators to Education for Tribal Populations in India.

Key insights emerged out of the research done by CPR include:

- For promoting the adoption RTS under PM Surya Ghar Muft Bijli Yojana, Odisha Government needs to implement Hybrid System, instead of the present only on-grid system
- For the faster adoption of EVs government should encourage the establishment of Solar Powered Charging Stations on-highway Restaurants, Tea shops and Dhabas. PM Surya Ghar Muft Bijli Yojana can also be extended to start EV charging stations.
- Thermal Electricity producing states needs to be compensated by the net consuming states or by the Union Finance Commission. Otherwise, tax on Thermal Electricity production should be imposed by the Gol and transferred to the net selling states to compensate the negative Externalities.
- For the development Tribal Dominated Backward regions of Odisha, Government should constitute Aspiration Block Development Councils instead of Three Regional Development Councils.
- In order to reduce the drop outs of tribal children, government of Odisha should integrate higher secondary schools with the secondary schools. Every Panchayat should have at least one school with integrated secondary and higher secondary education.

### 3.5 DST-CPR at University of Hyderabad, Telangana

DST Centre for Policy Research (DST-CPR) at University of Hyderabad, Telangana is dedicatedly working on Innovation & Start-up Ecosystem, and S&T Communication. A detailed questionnaire on “*Startup Ecosystem in India and Related Challenges: Survey on Industrial Perspective*” was prepared from the insights of Prof. Lalitha Guruprasad, Co-Coordinator, DST-CPR-UoH and Dr. Rama Krishna, CEO, ASPIRE, UoH which covered different aspects of general information of the startup, financial metrics and challenges faced by the startup.

### 3.6 DST-CPR at Central University of Gujarat

DST Centre for Policy Research (DST-CPR) at Central University of Gujarat is having a primary mandate to develop indicators for assessing and advancing equity and inclusion in Science, Technology, and Innovation (STI) across Western India, encompassing the states of Rajasthan, Gujarat, Maharashtra, Goa, and the Union Territory of Daman and Diu. Key highlights of the CPR include:

- A comprehensive mapping of marginalization patterns across 18 major research institutions in Western India was carried out, identifying structural, cultural, and institutional barriers.

- Development and validation of assessment tools for measuring institutional inclusivity, across diverse STI environments is underway. Centre is developing a transparency indicator to address institutional dynamics in perpetuating or preventing implicit biases along with overt instances of discrimination against marginalized individuals in STEM.
- A comprehensive policy brief on physical disability inclusion in STI sectors has been developed. The process developing policy briefs on gender and caste-based marginalization in STI sector is underway. Practical training modules have been developed to augment capacity building assisting the long-term vision of policy advocacy.

### 3.7 DST-CPR at INSA, New Delhi

The main focus of the DST-CPR at INSA is to conduct advisory, advocacy and research in science policy, strategic scientific governance, capacity building, and international scientific and technological discourse. Key highlights of the work include:

- **Ensuring the Sustainability of AI- A Governance and Audit Framework for Ethical and Responsible AI Deployment:** This study is being conducted with the aim to explore the critical intersection of artificial intelligence (AI) and sustainability, with a focus on governance and audit mechanisms that ensure AI technologies align with environmental, social, and ethical goals. Through a multi-pronged research approach involving desktop research, expert consultations, and case study analyses, the project will assess the current landscape of AI governance, identify gaps in policies and regulatory frameworks, and examine real-world cases where governance and audit mechanisms have—or have not—promoted sustainability.

- **Centres for Policy Research:**

The STI Policy Fellowship Programme has been implemented since 2016. The fellowship allows professionals to work closely within public institutions, where they gain direct exposure to conducting policy research as well as policy formulation. This practical engagement helps build a two-way learning process—through which the fellows contribute their expertise while also learn from existing policy frameworks and institutional practices. This contributes to both individual capacity-building and institutional strengthening. At its core, the DST-STI Policy Fellowship reflects a commitment to:

- Strengthening institutional capacity in STI policy formulation
- Building long-term human capital for public policy in science and innovation
- Advancing inclusive and participatory approaches to evidence generation and policy design

Currently **five policy fellows** are being supported as part of 6<sup>th</sup> Cohort of Policy Fellowship. These fellows are placed in five DST-CPRs and working under the mentorship of CPR coordinators. Their work areas include, Technology Transfer Landscape of Academic Sector of India, Fostering Sustainable Agriculture- Innovation Governance Framework for Genetically Modified Crops in India, Role of Cultural Practices & Beliefs Regarding Ragi Cultivation, Identifying possibilities for promotion and development of food processing sector, and Agricultural Technology Adoption and Agriculture Schemes.

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## 4 National Science and Technology Management Information System (NSTMIS)

National Science and Technology Management Information System (NSTMIS) programme implemented since inception of the department, is responsible for assessment and benchmarking of S&T potential of the country. NSTMIS is primarily entrusted with the task of collection, collation, analysis and dissemination of vital S&T information at national level. Under the programme, a range of National S&T reports are published providing key insights on National R&D indicators serving as an evidence-base for S&T assessment and policy formulation. These publications are much sought after both nationally and internationally.

### 4.1 S&T Resources Studies

The National S&T Survey 2024-25 on resources devoted to S&T activities with the target to collect data for three years, 2021-22, 2022-23 and 2023-24 is in progress. A response rate of around 60% has been achieved so far from more than 8000 R&D organizations comprising of public sector, private sector, MNCs, higher education, SIROs and NGOs spread across the country. Validation of survey responses received and e-reminders to the non-respondent organizations is in progress. Based on the outcome of the survey, the next issue of national publication "*Research and Development Statistics*" is likely to be published early next year.

Towards enhancing the survey response rate from the industries, NSTMIS, DST in partnership with the Federation of Indian Chambers of Commerce and Industry (FICCI), have organized 5 high-level workshops in Delhi, Hyderabad, Bengaluru, Mumbai and Chennai during the year.



Fig. Secretary, DST addressing industry participants during the National S&T Survey Workshop in Mumbai



Fig. DST-FICCI workshop on National S&T Survey in Chennai

## 4.2 Information System/Database Activities

With a view to disseminate information on sponsored research and development (R&D) projects for the benefit of different stakeholders, NSTMIS since 1990-91, has been continuously engaged in compiling information on extramural R&D projects funded by various central S&T agencies and publishing an annual **Directory of Extramural R&D Projects**. The latest directories for the years **2021-22** and **2022-23** have been compiled and published. The directory for the period 2023-24 is under preparation. Some snapshots of the Directory

of Extramural R&D Projects, 2022-23 are depicted below

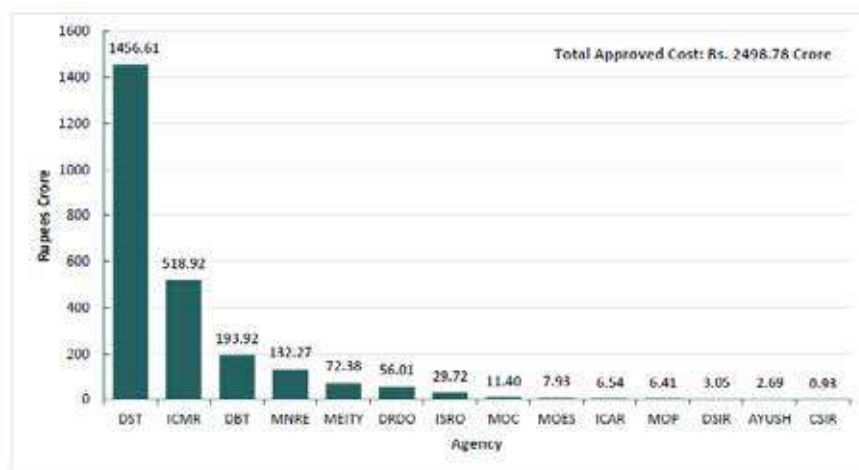


Fig. R&D project support by Central S&T agencies during 2022-23

- DST accounted for the maximum Extramural Research (EMR) support of ₹ 1456.61Crore (58.29%) followed by the Indian Council of Medical Research (ICMR) with ₹ 518.92 Crore (20.77%) and Department of Biotechnology (DBT) with ₹ 193.92 Crore (7.76%).

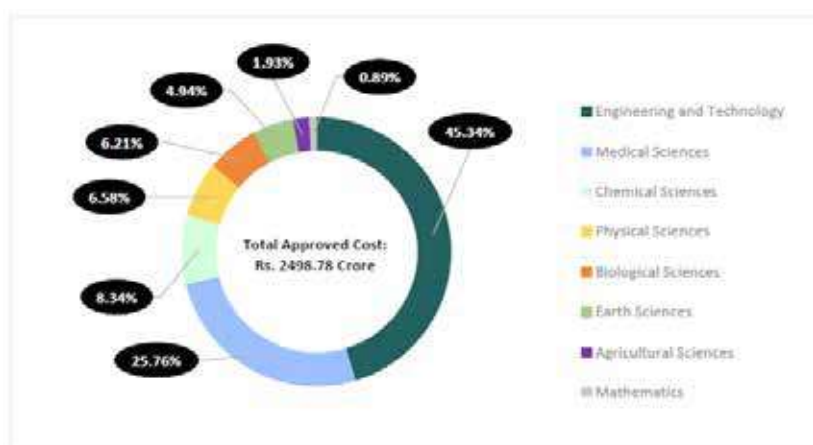
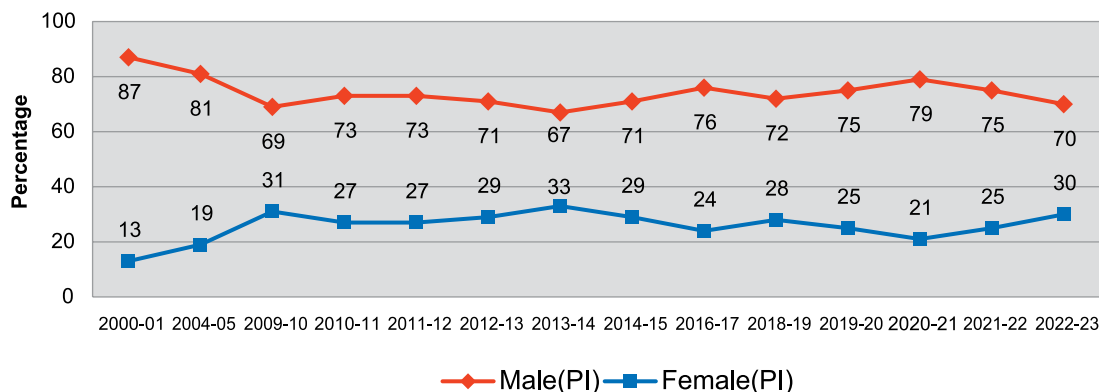


Fig. Subject area-wise distribution of Extramural R&D projects along with their total approved cost

- The women participation in extramural R&D projects increased significantly to 30% in 2022-23 from 19% in 2004-05 owing to sustained and targeted various initiatives undertaken by the Government in S&T sector. In absolute terms, 1289 women Principal Investigators (PIs) availed extramural R&D support during 2022-23. Further, women Co-PIs participation in extramural R&D projects was 28% during 2022-23.

### GENDER PARTICIPATION IN EXTRAMURAL R&D SUPPORT BY CENTRAL S&T AGENCIES



#### 4.3 Bibliometric Study

A bibliometric study titled “*Trends and Trajectories in India’s STEM Research (2014–2023)*” has been undertaken through the DST–Centre for Policy Research (CPR), IISc, Bengaluru, with the objective of providing a comprehensive, evidence-based assessment of national research performance, drawing on leading global bibliometric databases. The publication data for this study was collected from InCites database, Clarivate, which is built on the Web of Science platform. The study covers 10 years period i.e. from 2014 to 2023 limited exclusively to STEM disciplines.

#### 4.4 NSTMIS Sponsored Studies

As a part of its sponsored research programme, NSTMIS, against new call for proposal, 2024-25 received 959 new proposals out of which 64 were shortlisted through Internal Screening Committee and Committee of Expert Members. These proposals would be presented before NSTMIS-PAC for their consideration for funding support.

The NSTMIS programme sponsored several research studies/projects to various stakeholders viz. research institutions, universities, colleges, NGOs and consultancy organizations spread across the country. The reports/study findings from the completed projects are available in public domain through web-based digital repository (<http://www.nstmis-dst.org/NSTDRRepository.aspx>).

#### 4.5 International engagements in STI data

The Department participated in OECD Working Party of National Experts on Science and Technology Indicators (NESTI) and Management and Analysis of R&D and Innovation Administrative Data (MARIAD) meetings during 15-18, December 2025 in Paris, France. Participation of DST-NSTMIS in the OECD-NESTI platform is significant in terms of mutual

learnings that can contribute to development of the national STI data framework in India and abroad.

Department also actively participated and contributed to the UNESCO Institutes of Statistics (UIS) and other OECD meetings for the development and revision of standards/concepts/ definitions used for collection of Science Statistics and development of Science, Technology and Innovation Indicators. Department also provided information for the country on Science & Technology Indicators to UNESCO Institute for Statistics for the Global database on S&T Indicators and other related publications such as UNESCO Science Report etc.

## 5 Training of Scientists and Technologists Working in Government Sector

Department of Science & Technology (DST), in consultation with DoPT, other Scientific Departments and various organizations initiated an ambitious project of Human Resource Development namely “*National Programme for Training of Scientists & Technologists working in Government Sector for scientific and Technical personnel*”, during the Xth five-year plan to meet challenges of National development and international competitiveness in S&T area. Considering the efficacy of the Scheme, the Department decided to continue it in the XIth five-year plan, XIIth five-year plan and for financial years 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24, 2024-25 & 2025-26 as well. Training imparted to Scientists & Technologists strives to achieve better understanding of professional requirements, enhancing professional knowledge and skills needed for better performance of individuals and organizations in the profession of science and technology, creating awareness of latest technological, economic and social developments and infusion of scientific temper in the society.

Target groups for the training are “Scientists/ Technologists holding scientific posts/ working in scientific ministries/ departments of Govt. of India and State Governments, Autonomous Institutions/ Public Sector Undertakings of Central/State Governments, Research and Development Institutions/ Research Laboratories of Central/ State Governments, Central/ State Universities, State Science & Technology Councils.” Under this Scheme, 36 training programmes were approved in the FY 2025-26 and 800 scientists benefitted from these training programmes.

Government of India launched the National Programme for Civil Services Capacity Building (‘NPCSCB’) – “Mission Karmayogi” in September 2020 with an objective of enhancing governance through Civil Service Capacity Building. Capacity Building Commission (CBC) has developed Annual Capacity Building Plan (ACBP) in consultation with Capacity Building Unit (CBU) of DST and the same was launched by Hon’ble MOS(I/c)- S&T on 17.08.2023. DST ensured the registration of its employees on iGOT Karmayogi Platform and encourages them to complete the identified mandatory courses in stipulated time frame.

Department of Science & Technology (DST) is organizing a training session for its officials to instill “Seva-Bhav” under Rashtriya Karmayogi training initiative of Capacity Building Commission (CBC). In the Phase-I of the “*Rashtriya Karmayogi - Large Scale Jan Seva Programme*”, DST organized Seva Bhav Training sessions for its employees in the Headquarter through Master Trainers. In the Phase-II of this Programme, 3-day Master Trainer Programmes were conducted at DST’s three Autonomous Institutes across different regions to develop Institutional Karmayogi Coaches (KCs), through three Lead Trainers.

## 6 S&T Capacity Building

Brief Activities of S&T Capacity Building Division for the year 2025-2026:

S&T Capacity Building Division has mainly three Schemes:

- INSPIRE-MANAK,
- INSPIRE and
- WISE-KIRAN

Details of the activities of each scheme is given below: “***Innovation in Science Pursuit for Inspired Research (INSPIRE)***” is a flagship scheme of Department of Science & Technology for attraction of talent to science. The objective of INSPIRE Programme is to attract meritorious youth to study basic and natural sciences at college and university level, pursue research careers in both basic and applied science areas including engineering, medicine, agriculture and veterinary sciences and thus, build the required critical human resource pool for strengthening and expanding the Science & Technology system and R & D base of the country. “*INSPIRE Scheme*” is aligned with the ‘Minimum Government, Maximum Governance Model’ as it makes use of technology in its operations right from submission of application to the delivery of grants.

INSPIRE Scheme is implemented through the on-line web-portal and is also integrated with UMAANG and has its Mobile application for the INSPIRE aspirants/beneficiaries. INSPIRE scholarship(s)/fellowship(s) are released adhering to the revised fund flow mechanism.

### 6.1 INSPIRE–MANAK

INSPIRE–MANAK (*Million Minds Augmenting National Aspiration and Knowledge*) Scheme is being implemented by the Department of Science & Technology (DST) in collaboration with the National Innovation Foundation (NIF) - India to promote creativity, curiosity, and innovation among school students. The scheme aims to attract young students to study science and pursue research careers and foster creative thinking and nurture innovative ideas of students.

The programme targets student aged 10–17 years studying in classes VI to XII from all recognized schools across the country - Government, private, aided, unaided, and those run by State/Central/local bodies. Each school may nominate up to five students annually through an online submission on the E-MIAS portal.

Student nominations include basic personal and bank details and a brief description of the innovation concept. Shortlisted students receive financial assistance of ₹10,000/- each through Direct Benefit Transfer (DBT) for development of a working prototype/model and participation at District, State and National level exhibitions.

### 6.1.1 Key Achievements:

- Nominations were invited from 15<sup>th</sup> June 2025 to 30<sup>th</sup> September 2025. A total of 11,47,343 nominations were received from schools of various states, union territories, Kendriya Vidyalaya Sangathan, and Jawahar Navodaya Vidyalaya Samiti Schools. Notably, 55% of the nominations were from girls, while 45% were from boys. Coverage of the program expanded to 97% of districts. This is the second consecutive year with more than 1 million nominations being received under the scheme.
- A one-day State Nodal Officers Meeting held on 30<sup>th</sup> June 2025 in New Delhi with participation from all participating States/UTs. More than 60 awareness workshops were conducted in physical and virtual mode along with direct communication to 6.5 lakh registered schools to create awareness about the scheme at the grassroot level. Introduction of “*Idea Box*” campaign at school level, promotional materials including 12 videos from past awardees and dedicated WhatsApp outreach channel engaging 25,000 teachers were launched as part of outreach measures under the program.
- District/State Level Exhibition & Project Competitions (D/SLEPCs) are being organized for 46,926 ideas shortlisted from FY 2023-24 and 50,009 ideas shortlisted from FY 2024-25.
- Mentoring workshops were conducted for 9 States/UTs including Himachal Pradesh, Punjab, Tripura, Mizoram, Jharkhand, Manipur, Meghalaya and others state/UT winners at prestigious technical institutes like IITs, BITS, and NITs.
- Chatbot introduced on INSPIRE-MANAK portal for improved user experience and the E-MIAS portal & app upgraded to extend eligibility to Classes XI–XII students. The portal was improved for data synchronization with U-DISE and enhanced interface for efficient nomination processing and monitoring.
- 54 students selected out of National winners of the National Level Exhibition and Project Competition along with 3 supervisors visited Japan during June 15-21, 2025 under SAKURA Science High School Program. In Japan, the high school students and

supervisors visited universities, research institutions, attended lectures from distinguished professors, and experienced Japanese culture.

- To reciprocate, an “*Exposure Visit of Japanese School Students to India*” program was launched under INSPIRE-MANAK scheme inviting 20 Japanese School Students and 02 supervisors to visit India during 22-26 December, 2025. These 20 invited students and two supervisors were exposed to Indian science and technological advancements through visits to Indian academic and research institutes, Industry and also given exposure to cultural sites.
- In the 124<sup>th</sup> episode of Mann Ki Baat, Hon’ble Prime Minister Shri Narendra Modi highlighted the INSPIRE–MANAK initiative, noting its significant role in nurturing a spirit of innovation among children.
- Hon’ble Prime Minister also narrated the inspiring innovation journey of Ms Pooja under the INSPIRE-MANAK Scheme, highlighting how the program nurtures scientific temper and creativity among young students.

INSPIRE-MANAK continues to nurture curiosity-driven innovation among India’s youth, creating a strong pipeline of future scientists, innovators, and technology leaders. The programme is poised to expand further in scale and quality, aligning with national priorities to strengthen India’s science and technology ecosystem.



**Fig.** Japanese High School Students during their visit to India, 2025



**Fig.** Students selected for the SAKURA Science High School Program 2025

## 6.2 INSPIRE– Scholarship for Higher Education (SHE)

Scholarship for Higher Education (SHE) component under INSPIRE scheme aims to attract top 1% rank holder students to pursue their career in basic and natural sciences to earn

higher academic qualifications by providing scholarships and mentorship grants. The scheme offers 12,000 Scholarships every year @ ₹ 0.80 lakh per year (including Mentorship grant) for undertaking Bachelor and Master level qualification in natural and basic sciences for the talented youth in the age group of 17-22 years. Main feature of this component is to develop interest in scientific research among UG and PG level science students through research projects during their vacation period. In response to INSPIRE-SHE call-2024, 21,392 applications were received. 11,458 INSPIRE scholarships have been offered to the selected candidates. Selection of students was based on their performance in class 12<sup>th</sup> examination conducted by State/Central School Education Examination Boards and competitive examinations such as JEE (Main & Advance), NEET etc. All the selected students pursue the undergraduate / post graduate levels courses in basic and natural sciences. Out of the total students who were offered INSPIRE SHE scholarship, 57% are Female and 43% are male.

The Asian Science Camp (ASC) 2025 was hosted at Suranaree University of Technology, Nakhon Ratchasima, Thailand, bringing together delegates from 22 countries across Asia. This camp is an exceptional platform that allows talented young students to interact with Nobel Laureates, eminent scientists, and peers from diverse backgrounds, encouraging both scientific exchange and cultural understanding. INSPIRE scholars won a remarkable set of awards at ASC: 02 Silver Medals, 03 Bronze Medals, 03 Honorary Mentions, and the only Special Prize conferred by the International Committee. These achievements demonstrated not only the academic strength of our delegation but also our ability to work effectively in global teams.



The International Biology Olympiads was held in Quezon, Philippines having participation from 90 countries this year (2025 or 2026??). Similarly, 77 countries participated in International

Chemistry Olympiads held in Dubai, UAE this year (2025 or 2026??). Four Indian students participated in Biology Olympiad and four in Chemistry Olympiads. Indian students have been doing consistently well at the International Olympiads and are comparable with the best in the world fetching 02 Gold medals and 02 Silver medals in the respective Olympiads.

### 6.2.1 INSPIRE Fellowship

INSPIRE Fellowship component offers 1000 Fellowships every year for carrying out doctoral degree in both basic and applied sciences including engineering and medicine in the age group of 22-27 years. INSPIRE Fellowship is offered to students having secured 1<sup>st</sup> Rank in Basic & Applied Sciences including engineering, medicine, agriculture, veterinary at the University/ academic institute of national importance i.e. IITs, NITs, IISERs level examination. Students who have obtained scholarship at UG and PG level under INSPIRE-SHE are eligible for INSPIRE Fellowship if they have secured 70% marks in aggregate at the M.Sc. level and taken admission to the Ph.D. Program in any recognized university/ academic institutions in the country. The Fellowships are tenable for a maximum of five years (2 years as JRF and 3 years as SRF) period or completion of PhD, whichever is earlier to pursue full-time PhD program.

The Level-1 scrutiny of applications of INSPIRE Fellowship Call 2024 was completed and out of 2,704 received applications, 2158 applications were cleared level-1 evaluation. The applicants who clear level 1 evaluation and yet are not registered for Ph.D. are given one- year time to upload the requisite documents like research proposal etc. Upon Level-2 evaluation of applications, so far, 246 INSPIRE Fellowship applicants were offered INSPIRE Fellowship. Out of the awarded/offered INSPIRE Fellows, 67% are Female, 33% are Male and about 24% are INSPIRE-SHE Scholars who have joined doctoral degree program in science and technology after availing 5 years INSPIRE Scholarship. Total of 3277 INSPIRE Fellows were supported for pursuing Doctoral degree both basic and applied science areas including engineering, agriculture, veterinary and medicine. Six hundred and eighty-eight (688) INSPIRE Fellows were promoted from JRF to SRF.

On competitive selection, 08 INSPIRE Fellows have been participated in 16<sup>th</sup> JSPS-HOPE meeting during 09<sup>th</sup> - 13<sup>th</sup> March 2025 in Yokohama-city, Japan. 09 INSPIRE Fellows have been selected for participation in 17<sup>th</sup> JSPS-HOPE meeting scheduled to be held from 2<sup>nd</sup> - 6<sup>th</sup> March 2026 at Tsukuba-city, Japan.

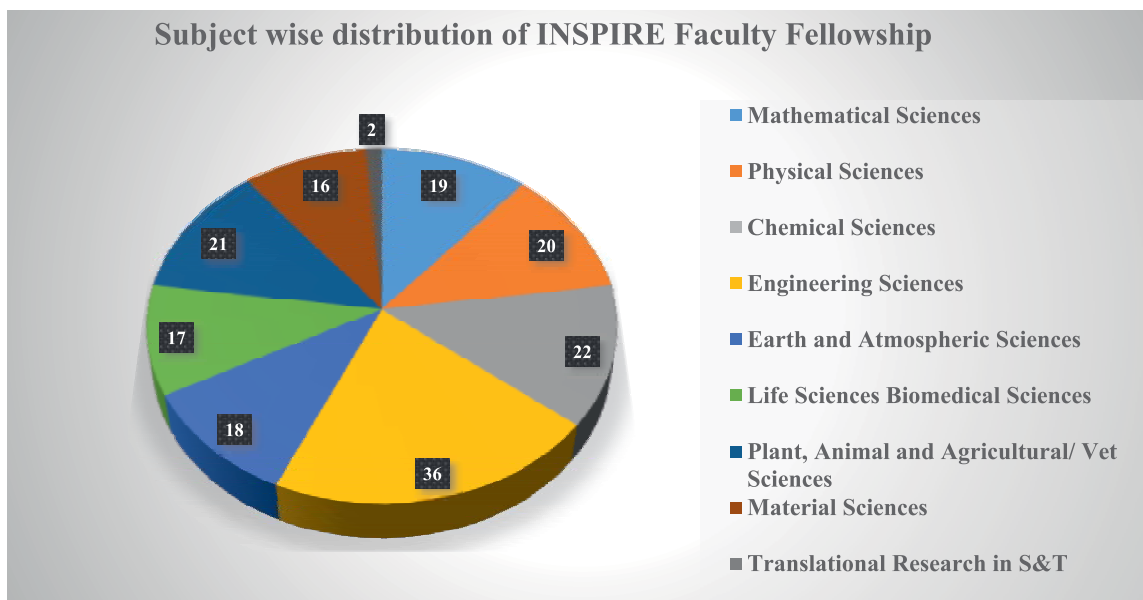
### INSPIRE Faculty Fellowship

INSPIRE Faculty Fellowship provides opportunities to the post- doctoral researchers in the age group of 27-32 years for 5 years. INSPIRE Faculty Fellowship in both basic and applied sciences area including engineering, agriculture, veterinary and medicine. Each fellow receives fellowship of ₹ 1,25,000/- per month with an annual increment of ₹ 2000/- and Research Grant of ₹ 7.0 lakh per year for 5 years. Its salient features are:

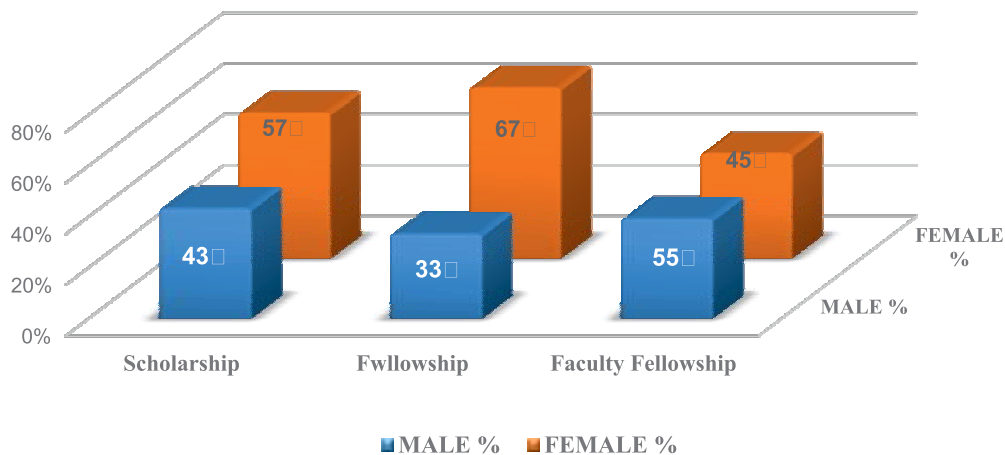
- To provide attractive opportunities to young achievers for developing independent scientific profiles and launch them in fulfilling long term careers.
- Expected to augment high quality scientific manpower for scientific and educational institutions, specially the Central and State universities.
- This component provides an independent research opportunity and not a guarantee for position beyond 5 years.
- While the vertical migration among students in different INSPIRE components is encouraged, the scheme also provides an opportunity to students for lateral entry into this component.

During the year, 352 INSPIRE Faculty Fellows received their fellowship and are pursuing the post- doctoral research through contractual and tenure track position for 5 years in both basic and applied science areas including engineering, agriculture, veterinary and medicine etc.

About 2753 applications were received against the 2024 call of INSPIRE Faculty Fellowship for award of INSPIRE Faculty Fellowship. 171 applicants selected and during the year, 121 INSPIRE Faculty Fellowships were hosted in academic and research institutions, out of which 45% are Female and 55% are Male. The research output of Faculty Fellows includes 81 publications in reputed international journals and 07 patents have been filed.



Gender wise distribution of INSPIRE Benficians (%)



### 6.3 Women in Science and Engineering–KIRAN (WISE-KIRAN)

The Women in Science and Engineering - KIRAN (WISE-KIRAN) scheme is DST's another flagship scheme which aims to encourage and promote women in the Research & Development (R&D) in Science & Technology (S&T) domain. It provides opportunity for women scientist, especially those who have had a career break, to pursue research in basic and applied sciences, address societal challenges, and receive training in the field of Intellectual Property Rights. The scheme is implemented through two modes: (i) fellowship programmes that directly support women researchers, and (ii) institutional programmes that create enabling ecosystems in schools/colleges/universities and improve institutional capacity.

There are following components under the program:

#### 6.3.1 Fellowship Programmes

**WISE-PhD:** Supports India's women talent pipeline by enabling women (27–45 years) to pursue doctoral research in Physical & Mathematical Sciences, Chemical Sciences, Life Sciences, Earth & Atmospheric Sciences, and Engineering & Technology. Age criteria: 27-45 Years. (relaxation of 3 years for SC/ ST/ PH candidates)

**WISE-PDF:** Supports women with break in career to pursue Post Doctoral Research in basic and applied sciences. Age criteria: 27-60 Years.

**WISE-SCOPE:** Supports women with break in career to provide translational "lab-to-land" solutions in applied domains: Energy/Water/Waste, Health/Food/Nutrition, Environment/Climate/Sustainable Development, Agriculture/Allied, and Engineering & Technology Development. Age criteria: 27-60 Years.

**WISE-IPR:** It builds national capacity in patent drafting, design protection, trademarks, copyrights and digital copyrights, expanding career pathways for women scientists into the innovation ecosystem. Age Criteria: 25-45 years

**WIDUSHI:** Enables senior women scientists under two categories viz. retired (Category-A) and not in regular employment (Category-B) to continue their scientific careers. Age Criteria; a. 57-62 years (for Category A), b. 45-62 years (for Category B)

### 6.3.2 Institutional programmes

**CURIE:** Consolidation of University Research through Innovation and Excellence programs strengthens research infrastructure in women's institutions to enhance participation in Research & Development.

**Vigyan Jyoti:** It encourages meritorious girls of Class IX-XII by mentoring them through mentoring, exposure, and academic support and various year-round activities to pursue higher education and careers in STEM, especially in the areas where the participation of women is low.

**GATI-WiSLP:** With the outcome of GATI pilot, DST implemented a Leadership Development Programme for women in collaboration with the British Council. Under this direction, WiSLP (Women in Space and Allied Science Leadership Programme) was launched with British Council and Coventry University (UK) as delivery partner, including a design workshop and a call inviting early/mid-career women scientists (35–50 years).

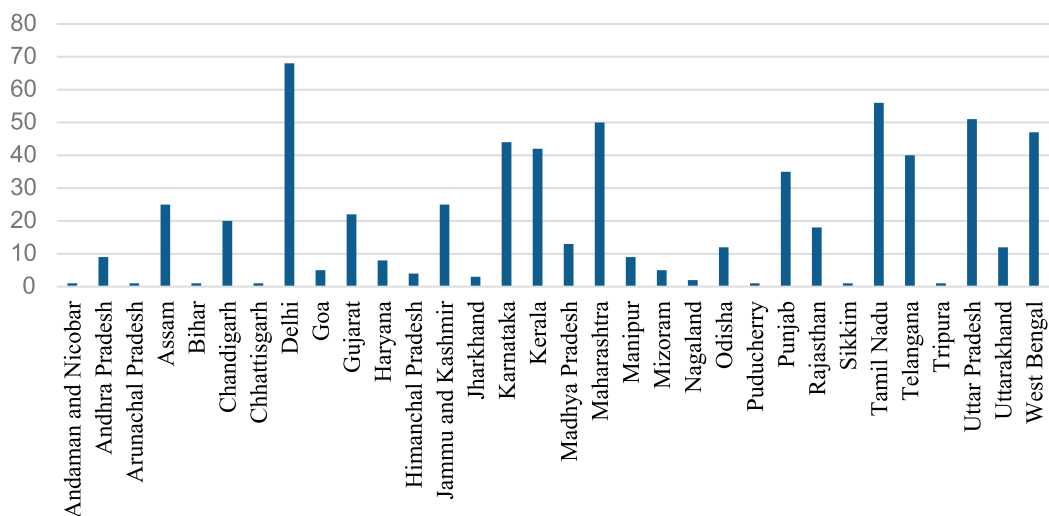
### 6.3.3 Key achievements and outcomes

- Total 180 no. of women researchers were supported for pursuing PhD degree under WOS-A and WISE-PhD program.
- Total 606 No. of women scientists were supported for pursuing Post Doctoral Research in Basic sciences, applied science and translational work for societal benefits.
- Total 26 no. of senior women scientists were supported for R&D.
- Total 27 no. of women only universities and colleges were supported for R&D infrastructure under CURIE.
- Total 29443 no. of School girls were supported in STEM under Vigyan Jyoti programme from 300 districts across 34 states with around 250 knowledge partners. 8 regional conclaves with 2000 scholars were organized.
- Through WiSLP program, total 168 no. of Women Scientists were trained in Leadership development in collaboration with British Council under the UKEIRI initiative. Further

shortlisted 12 women scientists were trained through trainers' training in UK to strengthen global leadership capacity in STEM in collaboration with Coventry University. After returning back to their respective institutions in India, these trainers have further trained approx. 300 number of women scientists till now.

- More than 110 women Scientists got employment.
- Total number of 431 projects were monitored and reviewed under WOS-A program. The programme has resulted in **more than 450 research participation, skill upgradation, and career re-entry of women scientists into mainstream R&D and innovation ecosystems.**
- Total 849 and 549 no. of fresh proposals have been evaluated under WISE-PDF and WISE-PhD programs across five disciplines.
- Two members delegation from WISE-KIRAN participated in the G20 Research and Innovation Working Group (RIWG) Side at Pretoria, South Africa. Event reinforced its strong commitment to advancing women and girls in STEM by showcasing flagship national initiatives and leadership pathways. The engagement enabled exchange of global best practices and strengthened international collaboration toward closing the gender gap in science, technology, and innovation.

Number of Women Scientists supported in year 2025 through fellowships for R&D



**Fig.** State wise representation of support provided in the year 2025 to Women Scientists under WISE-KIRAN through fellowship for R&D

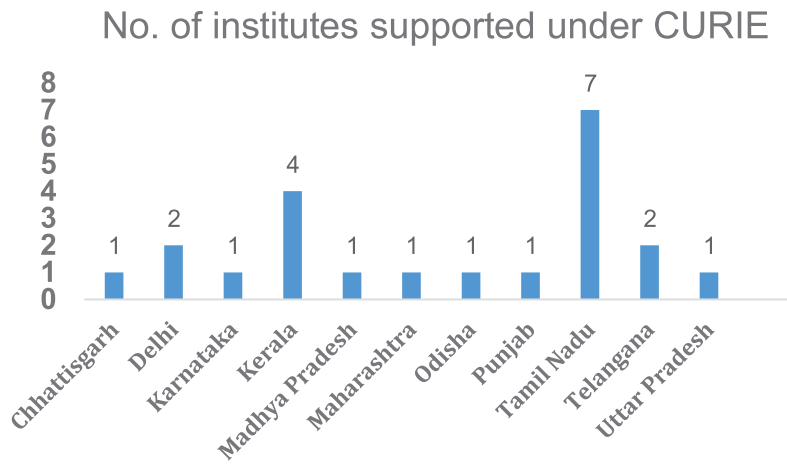


Fig. Graphical presentation of state wise support under CURIE program

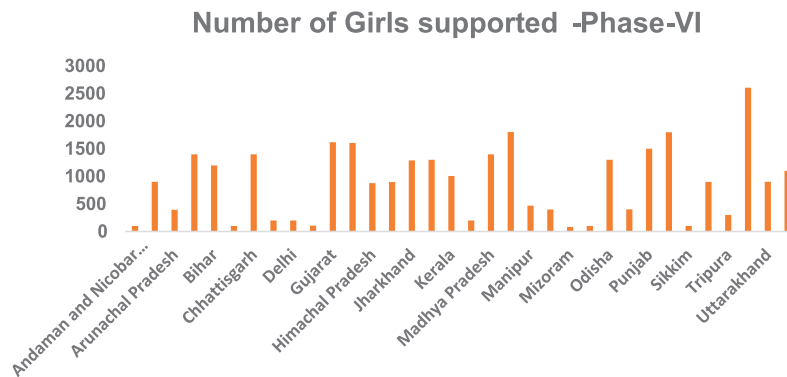


Fig. Graphical presentation of state wise support through Vigyan Jyoti program.

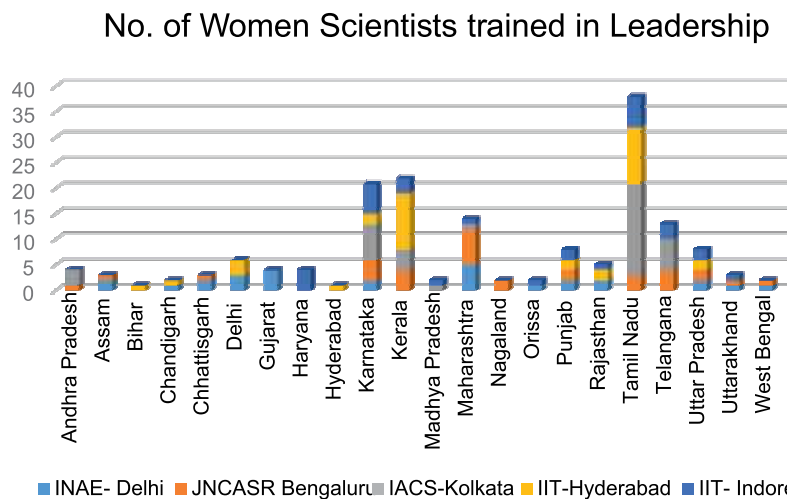


Fig. No. of Women Scientists working in the space and allied science areas trained at five premier institutions in Leadership program under WiSLP

## 7 Cognitive Science Research Initiative (CSRI)

The Department of Science and Technology has launched a unique programme '*Cognitive Science Research Initiative (CSRI)*' during Year 2007-08, and pioneered research in highly interdisciplinary areas of cognitive science. This initiative aims to study the human mind and brain, focusing on how mind represents and manipulates knowledge and how mental representations and processes are realized in the brain. In view of the importance of the subject area and future requirements, in current FY 2025-26, the Department established a dedicated CSRI Division to promote advanced and focused research.

This year, various activities have been conducted to encourage research in Cognitive Science.

### 7.1 Support for New CSRI Research Projects:

During Year 2025, 1270 new proposals were received against the call for proposal and the Task Force recommended 71 project proposals covering the versatile areas of Cognitive Science like Cognitive and Motor Dysfunctions, Epilepsy, Alzheimer Disease, Parkinson's Disease, Schizophrenia, Dementia, Depression and Anxiety, Neuroimaging, Rehabilitation, Dyslexia, Social Decision Making, Social Cognition, Educational Neuroscience, Linguistics, Computational Modelling, Machine Learning, Artificial Intelligence, etc. In addition, financial support has been extended to 36 ongoing projects under CSRI.

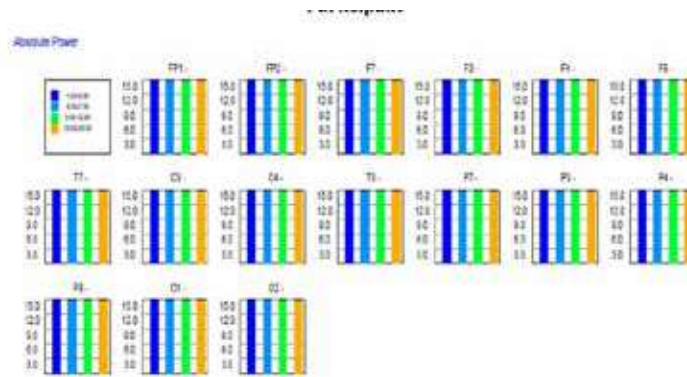
### 7.2 Support for CSRI-Post Doctoral Fellowship (PDF):

During this year, the CSRI-PDF Expert Committee recommended **10** projects for financial support. These projects covered research areas of cognitive decline, Psychotherapy, Cognitive Behavior prediction Model, Signal processing, Frequency sensing and Speech recognition, Artificial Intelligence Modelling for Personality Dynamics, etc.

### 7.3 Outcome of CSRI projects:

#### a) **Effect of Neurofeedback Intervention on Emotional Regulation, Impulsivity and Aggression in Juvenile Offenders:**

The demographic profile of Juvenile offenders in India reveals that most of these children are living in conditions of want, deprived of basic survival, subsistence and development opportunities, which has increased the problem of juvenile delinquency.



Enclosure 4: Compressed NFB (Absolute EEG Power) Reports of Control Group

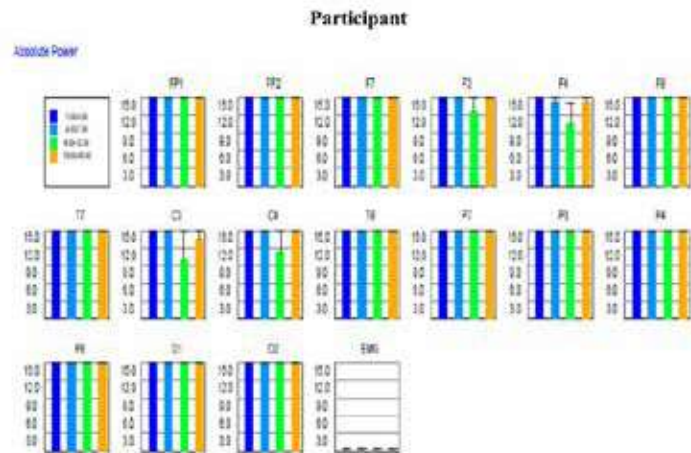


Fig. Effect of NFB interventions in Juvenile Offenders

The current study aimed to examine the effect of Neurofeedback (NFB) intervention training module targeting the theta/alpha ratio on the cognitive and behavioral outcomes of Juvenile Offenders.

These findings suggest that NFB interventions targeting brain wave imbalances hold promise as an effective therapeutic approach for addressing the underlying neurological and behavioral challenges faced by Juvenile Offenders.

**b) Community Yoga Protocol for Elderly to Promote Innate Immunity:**

A project has been supported under CSRI-SATYAM to develop and validate community yoga protocol for the elderly. Older persons are more vulnerable to infections due to their age and comorbid status. This project aimed to develop the protocol based on the elder’s vulnerability, categorizing them based on their mobility and immunity dimensions. Around 105 elders above 60 years of age participated in this study through online and offline modes and practiced one-hour yoga protocol for a month.



Fig. Practice of Yoga Protocol for Elderly

The results showed that the evolved yoga protocol enhances immunity and improves mobility among the elderly. Further, the practice of this specialized yoga protocol for elders also significantly affects the physiological variables, BP and the Biochemical Variable, Blood glucose, among the experimental group.

## 7.4 Outcome of CSRI-PDF project

### Development and Standardization of Science Activities for Early Childhood Education Centers:

The Cognitive Science Research Initiative has identified 'Educational Neuroscience' as one of the major focus areas. A project supported under CSRI-Post-Doctoral Fellowship aimed to design and develop a science experiment kit and ICT material for early childhood care and to evaluate the effectiveness of these science activities on understanding and other cognitive attributes of children. The PI selected Anganwadi teachers (60) and children aged 4-6 years (60) from rural and urban areas of Telangana to conduct the experiments.

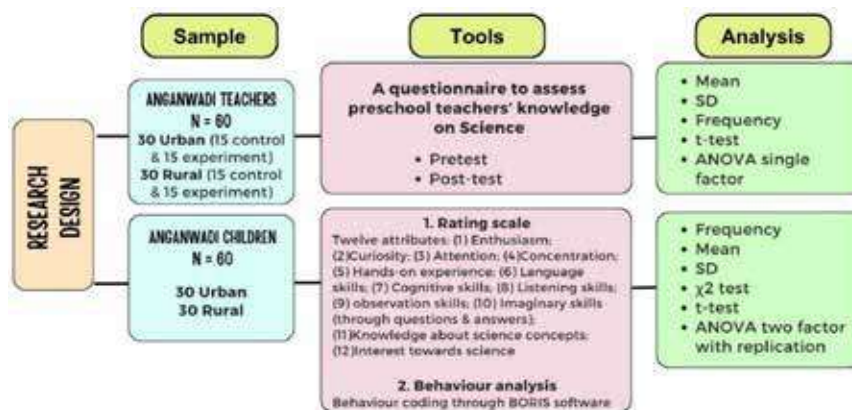


Fig. Research Design



Fig. Video analysis through BORIS software

The analysis of pre- and post-test results showed that there was a significant improvement in the Anganwadi children’s interest in science learning after the intervention program. Furthermore, Teacher Participants in the experimental group exhibited high interest and confidence relative to those in the control group.

- **Conferences/Workshops Supported:** The Division also supported 02 outreach activities as mentioned below:
- **12<sup>th</sup> Annual Conference of the Association of Cognitive Science:** DST supported 12<sup>th</sup> ACCS at Centre of Behavioural and Cognitive Sciences (CBCS), University of Allahabad, December 2025. The conference provided a platform to young researchers for discussion on interdisciplinary research and innovations and included scientific talks, on different domains under Cognitive Sciences
- **Experimental & Empirical Methods in Linguistics (EEL):** EEL was organized at Indian Institute of Technology Kanpur, during June, 2025. The workshop conducted intensive course on Language Sciences, which comprehensively covered Experimental Design, Statistical methods, Computational Modeling, and Corpus Linguistics.



Fig. Participants during EEL Workshop

## RESEARCH AND DEVELOPMENT

### 1 International Cooperation (IC)

#### 1.1 Bilateral Cooperation Programs:

##### I. Australia

The 16<sup>th</sup> Round of Australia India Strategic Research Fund (AISRF) Call for proposals was announced on 4<sup>th</sup> March 2025 with closing date on 11<sup>th</sup> April 2025. Overall, 43 proposals were received under this call in the thematic areas- Critical minerals processing technologies and methods; Quantum computing and communications and Remanufacturing and product end-of-use recovery including electronic waste recycling. The proposals have been evaluated for final recommendations.

##### II. Austria

A joint India Austria Call for bilateral exchange visits in all areas of S&T was announced on 15 September 2024 which got closed on 31 October 2024. A total of 150 proposals were received and were evaluated by the Project Advisory Committees. A total of 27 proposals were recommended for financial support during India Austria Joint S&T Committee Meeting held on 8 May 2025 in DST, Delhi.

##### III. Canada

DST, India and National Research council (NRC) Canada has announced a new joint call for proposals on 04 July 2025 in the areas of Advanced manufacturing, clean technologies and green technologies, Digital technologies, Health and bio-sciences, Food and agriculture technologies and Smart infrastructure. 08 proposals were received and are under evaluation.

##### IV. Denmark

Joint Science and Technology Committee (JSTC) meeting was held in Denmark in May, 2025 to review ongoing cooperation as well as to explore new cooperation in the emerging areas of Science and Technology.

## V. Egypt

Under India Egypt S&T cooperation, support was extended to 19 ongoing joint projects.

## VI. Finland

DST signed an arrangement with Finland in the areas of advanced communication, sustainable energy, microelectronics and power electronics (semiconductors) along with any other additional area/s of mutual interest. The cooperation includes partnership development activities in identified areas of collaboration, to enable information dissemination and promote networking of key enterprises, R&D organizations and funding agencies to identify common challenges and develop joint projects.



Fig. Agreement Signed between India and Finland

## VII. France

The 38<sup>th</sup> meeting of Governing Body (GB) of **Indo-French Centre for Promotion of Advanced Research (IFCPAR/CEFIPRA)** was organized on 24<sup>th</sup> February, 2025.

- Under Collaborative Scientific Research programme (CSRP), 07 proposals were recommended for support in areas Life and Health Science & Marine Sciences. These projects were supported in wide sub-areas like oncology, microbiology, neurosciences, genetics, seismology, etc. 212 Proposals received against the last Call are under evaluation. Currently, 123 scientific collaborative research projects are under implementation.

- Under Industry Academia Research and Development Programme (IARDP), 02 proposals were recommended for funding in areas of Renewable & Clean Energy (1) and Agricultural Science & Technology (2), while, 18 Industrial Research Projects are currently ongoing, 4 new projects were initiated under IARDP.
- Under Seminars/Workshops; a total of 16 Seminars/Workshops (12 in India & 4 in France) were organized which were attended by 1057 participants in areas of Agricultural Science and Technology-2, Computational Sci. (1) Life and Health Science (5); Materials Science (2) Pure and Applied Chemistry (2) Pure And applied Mathematics (2) Renewable & Clean Energy (1) Pure and Applied Physics.
- Under Emerging Project Partnership, 04 proposals were recommended in the area of Artificial Intelligence.
- Under High Impact Scientific Research Network Programme; 01 proposal was recommended in the area of Health Sciences.
- Under the Raman-Charpak Fellowship Programme-2025, Call for Applications was launched in 29th September, 2025 with deadline on 10th December, 2024. New Submission portal for receiving RCF and PROWIS applications was developed in house by CEFIPRA. A total of 430 applications were received and evaluations are likely to be concluded by January -March, 2026 by an Expert Committee comprising Indo-French Experts.
- Under the DST-Inria Targeted programme, 12th Call for proposals was launched in the Year 2025 in areas of Artificial Intelligence, Cyber security & Digital Health. New Submission portal of receiving DST-Inria Proposals was developed in house by CEFIPRA.
- Under the 3rd call of applications during Year 2025, the total 120 applications were received in Indo-French Programme for Women in Science PROWIS I and PROWIS II respectively.

### VIII. Germany

The 12<sup>th</sup> India-Germany Joint S&T Committee Meeting was held on 21<sup>st</sup> November 2025 New Delhi, India. The meeting was Co-Chaired by Prof. Abhay Karandikar, Secretary DST, Govt. of India and Dr. Silke Launert, Parliamentary State Secretary of the German Federal Ministry for Research, Technology and Space (BMFTR). Both sides discussed on evolving a roadmap towards revitalizing our bilateral engagement and shaping future-ready, mission-driven scientific cooperation. Discussions also focused on expanding research collaboration and deepening joint participation in major international science infrastructures such as FAIR and DESY (PETRA III).



Fig. 12th India – Germany Joint S&T Committee Meeting, Nov' 2025

### Indo-German Science and Technology Centre (IGSTC)

- The IGSTC was established to function as a flagship initiative of Government of India (DST) and Government of Germany (BMFTR) to promote research partnership in applied research of industrial relevance. Through its flagship program “**2+2 Projects**”, IGSTC is catalyzing innovation centric R&D projects by synergizing the strength of research/academic institutions and public/private industries from India and Germany. Proposals received under Year’ 2025 Call in the area of “**Advanced Materials**” are being currently assessed while the 2026 Call is being worked out with a focus on **Economic and Sustainable Solutions**. Another key initiative of the IGSTC is towards supporting women researchers through the WISER (*Women Involvement in Scientific and Engineering Research*) Program. WISER facilitates lateral entry for women in ongoing S&T projects and provides numerous advantages to women researchers. The call for WISER proposals in 2025 was in a paired mode under which a total 172 Pairs of Indian and German Women Scientists applied, and 20 Pairs of Women Scientists (20 Indian and 20 German) were awarded the WISER Grant.
- Under the joint call for proposal-2024 with German Academic Exchange Service (DAAD) and DST, a total of 120 proposals were jointly received and shortlisted for evaluation for financial support for exchange visits between scientists and researchers of India and Germany. Based on scientific merit, complementarities of the project objectives, scientific strengths of the project coordinators and national priorities, 25 proposals were recommended for support.
- During the 74<sup>th</sup> Lindau Nobel Laureate Meeting dedicated to Chemistry that was held from 29<sup>th</sup> June to 4<sup>th</sup> July 2025 at Lindau, Germany, DST, Govt. of India sent 29 students from different research and academic institutions from India for participating in the concerned Meeting. Young Scientists had intensive discussions, inspiring

sessions and an enriching experience during interactions with as many as 33 Nobel Laureates during the meeting. During the course of events, one of the Indian Young Scientists, Mr. Mohammad Faizan, NIT Warangal was selected to present his research work on “*Harnessing the ‘Frustration’ of Lewis Pairs for CO<sub>2</sub> ‘Sequestration’: A Machine Learning Expedition for Developing Frustrated Materials*” during the Next Gen Science Sessions on Artificial Intelligence in Chemistry. For the participation of Indian students in the 75th Meeting in Lindau, Germany during 28 June to 3 July 2026 dedicated to Interdisciplinary Sciences, the selection process is underway.



Fig. 74th Lindau Nobel Laureate Meeting at Lindau, Germany

## IX. Israel

13<sup>th</sup> Governing Board (GB) meeting of India Israel R&D Technological Innovation Fund (I4F) was organized in July 2025. During the meeting, the GB recommended 07 proposals including proposals for developing Rugged Autonomous drone for hazardous indoor and GPS denied environments, Multi sensor Driver monitoring system via Neuro Monitored connected Cars and Adaptive Digital twin framework for Urban Water distribution system. Support was extended to 11 ongoing and 19 ongoing/under closure joint industrial R & D projects under I4F. A new Call for proposal was announced for projects with a focus on Smart mobility.

## X. Italy

Italian delegation led by Deputy Prime Minister and Minister of Foreign Affairs Antonio Tajani, along with the Minister of University and Research Anna Maria Bernini visited New Delhi, India in April 2025 as a follow-up of the Joint Strategic Action Plan.

- A **Memorandum of Understanding (MoU)** for scientific research cooperation were signed on 11<sup>th</sup> April 2025 by Dr. Jitendra Singh, Hon'ble Union Minister of State (Independent Charge) for Science and Technology, India and Ms. Anna Maria Bernini, Italy in a major step to strengthen bilateral scientific cooperation in several frontier research areas.



Fig. Hon'ble Minister Dr. Jitendra Singh, Signed MoU between India – Italy' Apr' 2025

- **Joint Science and Technology Committee (JSTC)** meeting was held in New Delhi on 10<sup>th</sup> April 2025 as a side event of the Business, Science and Tech Forum. Prof. Abhay Karandikar, Secretary, Department of Science and Technology (DST), Ministry of Science and Technology, India and Mr. H.E. Antonio Bartoli, Italian Ambassador to India, Italy signed **Executive Programme of S&T Cooperation (EPOC) for the period of 2025-27** to jointly fund 10 proposals for mobility of researchers and 10 proposals for collaborative R&D.



Fig. Joint Science and Technology Committee (JSTC) meeting

## XI. Japan

- Indo-Japan S&T cooperation marked the year 2025 as celebration of 40 years of partnership in Science and Technology. During the visit of Hon'ble PM to Japan in August 2025, a joint statement of Intent was signed between Ministry of Science and technology of Republic of India and Ministry of External Affairs, New Delhi and

Ministry of Education, Culture, Sports, Science and Technology, Japan focusing exploring start-up and Industry.

- The 11<sup>th</sup> Joint Committee Meeting for cooperation in the Science and Technology was conducted in New Delhi on June 5<sup>th</sup>, 2025. Under the recent joint call 2024 of DST-JSPS exchange visit program, 23 proposals were jointly selected in Year' 2025.



Fig. 11th India – Japan Joint S&T Committee Meeting

## XII. Mauritius

A Memorandum of Understanding (MoU) on cooperation in the field of Science & Technology between DST and Ministry of Tertiary Education, Science and Research of Mauritius was signed on September 05, 2025. The key areas of cooperation agreed upon are (i) Elaboration of a National Science and Technology Strategy (ii) Assistance to set up a Science and Technology Directorate in the Ministry of Education, Tertiary Education, Science and Technology of Mauritius.

## XIII. Myanmar

As a follow up of Joint Working Group (JWG) a Programme of Cooperation (PoC) between DST and Ministry of Science and Technology, Myanmar was signed on July 29, 2025 for the duration-2025-28.



Fig. Programme of Cooperation (PoC) Signed between India - Myanmar

#### XIV. The Netherlands

India hosted Joint Working Group Meeting in February, 2025, wherein both sides highlighted the significant progress made in Indo-Dutch STI collaborations and the momentum gained in key sectors, including semiconductors, water management, and biotechnology. Both sides expressed optimistic views for future bilateral cooperation.

#### XV. Norway

India Norway Joint Committee meeting (JCM) was held in October 2025 in Oslo which was chaired by Head, International Cooperation Division from Indian Side and Director General and Deputy Director General, from the Ministry of Education and Research, Norway. It was planned to strengthen the cooperation in Ocean Science/Green Shipping, Polar Science and AMR. Programme of Cooperation (PoC) was signed between DST and Ministry of Education and Research, Norway and support was extended to ongoing/under closure 20 joint R&D Projects.



Fig. India-Norway Joint Committee meeting (JCM) at Oslo, Norway

## XVI. Philippines

DST signed Programme of Cooperation (PoC) for the duration 2025-2028 with Philippines to facilitate joint research and development, exchange of scientists, capacity building programmes, and sharing of non-proprietary scientific data. Blue Economy and Geospatial Technology have been identified as focus areas to strengthen the cooperation. Support was extended to all 03 ongoing projects.



Fig. Hon'ble Minister Dr. Jitendra Singh, Singed, Programme of Cooperation (PoC) between India – Philippines

## XVII. Russia

- The 14<sup>th</sup> Indo Russian Joint Working Group on Science and Technology was conducted on 14<sup>th</sup> August 2025 for strengthening Cooperation between the two countries.
- DST-Russian Science Foundation (RSF) finalized the joint research projects under the call 2024 on themes such as (i) New Materials; (ii) Clean energy; (iii) Smart healthcare and medicine; (iv) Safe food; (v) Smart transport and telecommunications; (vi) Plant and Animal Bio-Technology; (vii) Artificial Intelligence; and (viii) Earth Quake and Ocean Science.

## XVIII. Singapore

It was agreed to support 05 new Industrial R & D projects in the areas of semiconductors, smart agriculture and urban mobility. Support was extended to 04 ongoing Industrial R & D projects. A call for joint research proposals was announced in the areas of Digital health and green hydrogen. About 150 proposals were received against the call and are under evaluation.

### **XIX. Slovenia**

The Program of Cooperation for the period 2025-2029 is signed for India-Slovenia Joint co-operation in the field of Science and Technology.

### **XX. South Africa**

India South Africa Joint Committee Meeting was held in July 2025. It was agreed to strengthen cooperation in Advanced Materials & Manufacturing, Digital Infrastructure (HPC, AI and Quantum Computing) and Geospatial Technologies. Support was extended to 10 ongoing projects.

### **XXI. Spain**

Indo-Spain Joint Industrial R&D programme, RFP '2024 was launched under 05 major themes and was closed in June 2025. The jointly submitted applications were evaluated by both sides and recently a joint meeting was conducted in December 2025 to identify recommendations that are common for India and Spain. Both sides agreed to fund the jointly recommended projects.

### **XXII. Sri Lanka**

A total of 438 proposals were received under India-Sri Lanka R&D Call while 234 proposals were received under India Sri Lanka workshop call. The Proposals were evaluated by relevant Project Advisory Committees. After the joint selection committee meeting of India Sri Lanka, a total of 16 R&D and 22 workshop proposals were jointly recommended for financial support.

### **XXIII. Sweden**

Indo-Sweden Collaborative Industrial R&D RFP '2025 Call was launched focusing on 04 major themes towards green industrial transition. Various level meetings were conducted with Vinnova, Swedish Energy Agency and LeadIT to strategize and amplify the net zero emission target of both countries.

### **XXIV. Switzerland**

The 7th meeting of the **Indo-Swiss Joint Committee Meeting on Science & Technology**, between the Government of the Republic of India and the Swiss Federal Council was held in Bern on 1st September 2025. The Meeting was co-chaired by Prof. Abhay Karandikar, Secretary, Department of Science & Technology (DST) and Ms. Martina Hirayama, State Secretary for Education, Research and Innovation (SERI). Both sides reaffirmed their strong commitment to further deepen and expand Indo-Swiss cooperation in science, technology and innovation.



Fig. 7<sup>th</sup> Indo – Swiss Joint S&T Committee Meeting

As per the decisions during the joint committee meeting, DST and Swiss National Science Foundation (S-NSF) established an **Indo-Swiss Joint Scientific Board (ISJSB)** for stakeholders on both sides to develop and monitor thematic content of the long-term collaboration. The 1<sup>st</sup> meeting of the ISJSB is scheduled in January 2026.

## XXV. Thailand

Under India Thailand S&T cooperation, support was extended to 10 ongoing joint R & D projects.

## XXVI. Tunisia

A Call for proposal for joint research proposals was announced (when?) in the area of Geospatial Technology, E-health, Climate Change and Eco- Innovation and about 216 proposals were received against the call which are under review.

## XXVII. United Kingdom

- India UK Science and Innovation Policy Dialogue was held in London in May 2025 and chaired by Secretary, DST from Indian side and National Technology Advisor from UK side.



Fig. India-UK (SIC) Policy Dialogue meeting Chaired by Secretary, DST

- India UK call for Industrial R & D projects were announced in the area of Net zero technologies through TDB as implementation partner. 05 projects have been agreed upon for support, including a project to develop collaborative platform to identify opportunities for shared use of electric vehicle charging and digital twin for industry energy management. Support was extended for 04 ongoing Industrial R & D projects and 02 research projects in the area of telecom.

## XXVIII. USA (United States of America)

DST partnered with U.S. National Science Foundation (NSF) in a program entitled DMREF (*Designing Materials to Revolutionize Our Engineering Future*) that offers an excellent opportunity to get involved into advanced areas of materials research. DST – NSF joint call sought high pitch proposals in material sciences and total 56 proposals were received by DST out of which 02 proposals have been selected for support . DMREF will support activities that significantly accelerate the materials discovery-to-use timeline by building fundamental knowledge base needed to advance design, development, or manufacturability of materials with desirable properties or functionality.

The Indo-US Science and Technology Forum (IUSSTF) launched a Call for Proposals titled “*Transforming Technology Solutions through Advanced Materials and Critical Minerals (AMCM)*” under the United States–India Science and Technology Endowment Fund (USISTEF). The call received 71 joint India–US proposals. Based on the Joint Expert Panel evaluation, 11 proposals were shortlisted in the areas of New Energy Security Solutions, Bio manufacturing (Biomaterials), Interdisciplinary in the Subcategory, Semiconductor fabrication/design/assembly/testing, Quantum Computing & Communication.

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## 2 Multilateral Cooperation Programs

### 2.1 ASEAN-India Research Training Fellowship (AIRTF)

- The ASEAN-India Research Training Fellowship (AIRTF) program is a flagship initiative aimed at deepening science and technology cooperation between India and the ASEAN Member States. It offers fellowship to ASEAN researchers up to six months for undergoing training in Indian academia and research labs. The AIRTF call for Year’ 2025 was launched in April and the applications received are under review.
- Second edition of ASEAN India Scale Hub, 15<sup>th</sup> working group meeting and 9<sup>th</sup> ASEAN India S&T Governing Board meeting was hosted in Bali between 3-5 July 2025 A series of governance meetings were held between the two regions to review present status and the future trajectory of ASEAN–India collaboration.



Fig. Indian delegation to Scale Hub ' 2025

- The 15th working group meeting was conducted on 4<sup>th</sup> July 2025 , co-chaired by Head-IC and Head, COSTI-Indonesia, where the ongoing and 2025 S&T activities were discussed. Later, the 9<sup>th</sup> Governing Board meeting was convened under the joint chairmanship of the Secretary, DST, Government of India, and the Head of the Committee on Science, Technology and Innovation (COSTI), Indonesia.
- Supported the ongoing ASEAN–India Collaborative R&D Projects



Fig. Delegates of 15<sup>th</sup> Work group meeting

## 2.2 BRICS

### • BRICS STI Senior Officials and Ministerial Meeting

India participated in the BRICS 15<sup>th</sup> Senior Officials and 13<sup>th</sup> STI Ministerial Meetings, respectively, from 23<sup>rd</sup> -25<sup>th</sup> June 2025 in Brasília (Brazil). The BRICS Members had

detailed discussion on the overall BRICS STI activities under 13 different Working Groups in the Year' 2025. They further discussed ways to foster stronger cooperation in various fields on STI including support to startups. Following multiple insightful discussions, the draft declaration was finalized and was adopted for future Calendar of Activities.



Fig. 13th BRICS STI Ministerial Meeting

- **BRICS STI Working Group activities**

Indian Delegations also participated in BRICS STI Working Group Meetings such as Astronomy, Prevention and Monitoring of Natural Disasters, HPC and AI, STI and Entrepreneurship Partnership, Photonics, Geospatial Technologies and its Applications, Material Science and Nanotechnology, Research Infrastructure and Mega Science Projects, Social Sciences and Humanities Research as well as in events such as BRICS International Workshop on Foresight and STI Policy.

- **10<sup>th</sup> BRICS Young Scientist Forum and 8<sup>th</sup> BRICS Young Innovator Prize**

An Indian Delegation comprising 11 Young researchers participated in the 10<sup>th</sup> BRICS Young Scientist Forum (BYSF) and 8<sup>th</sup> BRICS Young Innovator Prize (BYIP) events in Brasilia, Brazil during 15<sup>th</sup>-17<sup>th</sup> September 2025. The themes were Climate Change Mitigation & Adaptation; Science Diplomacy in a Changing World and AI for Societal Solutions. Dr. Sakthi Jaya Sundar from Tamil Nadu, Representative from MGR Medical University, Chennai won 2<sup>nd</sup> Prize in the BYIP event for AI solutions in public services. This event served as a platform towards facilitating networking and exchange of experiences to foster stronger STI cooperation among young researchers of the BRICS Countries.



Fig. (L) Group picture of Indian Delegation; (R) 8<sup>th</sup> BYIP 2<sup>nd</sup> Prize Award Winner

### 2.3 Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)

India participated in 3<sup>rd</sup> Meeting of the BIMSTEC Expert Group on Science, Technology, Innovation Cooperation (EGSTIC) in Colombo, Sri Lanka from 11<sup>th</sup> – 12<sup>th</sup> September' 2025 in a virtual mode. Based on the topic, “*Advancing Evidence-Based STI Governance: Establishing Mechanisms for Policy Coherence and Regional Collaboration*” delegates from BIMSTEC Member States presented the initiatives of their respective countries in the field of shared effective practices such as policy labs and pilots, industry-academia collaboration models, targeted capacity-building, gender-inclusive research initiatives and measures to accelerate technology transfer and commercialization. The Expert Group reviewed the BIMSTEC Plan of Action on STI 2023-2027.

India participated in the 1<sup>st</sup> STI Forum and Boot Camp for BIMSTEC Member States, organised by Sri Lanka and was held virtually on 29<sup>th</sup> January 2025. The theme of the boot camp was aimed at harnessing STI interventions to address challenges related to Sustainable Development Goals including food security, poverty eradication, climate change, and women empowerment.



Fig. (L): Group Photo of the BIMSTEC Delegation; (R): Participants of 1<sup>st</sup> STI Forum and Bootcamp

## 2.4 India-European Union (EU)

DST renewed the agreement for Scientific and Technological Cooperation between the European Union and the Government of the Republic of India for an additional period of five years i.e. effective from 17<sup>th</sup> May 2025.

## 2.5 Indian Ocean Rim Association (IORA)

India participated in the 4<sup>th</sup> Meeting of IORA Working Group on Science Technology & Innovation (WGSTI), hosted virtually by South Africa, in its capacity as Chair of IORA WGSTI on 6<sup>th</sup> August 2025. During the meeting, discussions were held on key challenges and successes from the current work plan including revisiting the short-term, medium-term and long-term objectives. Delegations also focused on identifying shifting priorities, emerging issues and new proposals as well as areas of cooperation with the RCSTT, WRC, NAM S&T Centre and Dialogue Partners.

## 2.6 Shanghai Cooperation Organization (SCO)

India participated in the 9th Meeting of the Heads of Ministries and Departments of Science and Technology of the Shanghai Cooperation Organization Member States in a virtual mode that was held in Chengdu, People's Republic of China on 12 June 2025. The meeting focused on- (i) the draft Action Plan for STI Cooperation until 2030 between the SCO Member States; (ii) approval of the draft Roadmap for Implementing the Programme of Cooperation of the SCO Member States in the Development of Artificial Intelligence and (iii) progress in implementing the pilot competitive selection of multilateral scientific research projects within the SCO.



Fig. 9th Meeting of the Heads of Ministries and Departments of Science and Technology of the Shanghai Cooperation Organization Member States

### 3 Other Programs:

#### I. VAIBHAV Fellowship Programme

DST announced 3<sup>rd</sup> call of VAIBHAV Fellowships Programme in 18 thematic research areas on 15 April 2025. A total of 227 applications were received of which, the VAIBHAV Apex Committee recommended 21 VAIBHAV Fellowship proposals for financial support. The nomination received under Distinguished VAIBHAV Fellowship was also reviewed by the Apex Committee and was recommended for financial support.

The Minister Round Table on “विकसित भारत पर वैभव दृष्टिकोण” (VAIBHAV Vision on Viksit Bharat) was held on 4<sup>th</sup> Nov 2025 at Bharat Mandapam, New Delhi, chaired by Dr. Jitendra Singh, Hon’ble S&T Minister. The participation of 20 Indian Hosts and 19 VAIBHAV Fellows, representing Universities, Institutions, Industry and R&D centers from countries such as the UK, US, Canada, Sweden, Germany, Singapore, Finland, Australia and many more, highly praised the Indian Government’s efforts to institutionalize diaspora engagement through the VAIBHAV fellowship. They shared their ideas for improving collaboration between Indian institutions and Indian Diaspora faculty/scientists.



Fig. DST announced 3rd call of VAIBHAV Fellowships Programme

#### II. India Science and Research Fellowship (ISRF)

A new ISRF Call 2025 was announced on 31 December 2025 for researchers from Afghanistan, Thailand, Bangladesh, Bhutan, Maldives, Myanmar, Nepal and Sri Lanka, in various areas such as Life Sciences, Veterinary Science, Fisheries, Medicine, Agriculture, Geology, Chemistry, Mathematics, Computer Science, and Engineering etc.

## 4 Mega Facilities for Basic Research (MFBR)

### 4.1 Facility for Antiproton Ion Research (FAIR)

An outreach meeting was conducted at Punjab University, Chandigarh in association with Bose Institute Kolkata to familiarize FAIR activities under the title “*Theme meeting on FAIR Science*” during 23-25<sup>th</sup> April 2025. Around 100 people from High energy and nuclear physics society attended the meeting. The FAIR spokesperson for CBM and NuSTAR collaboration from Germany along with scientists across India joined the event.

India participated in the Administrative and Finance meeting of FAIR at Finland and Germany to review the status of the construction phase and understand the commissioning phase of FAIR experiments. India is a founding member of the consortia, also, a major player in the Compressed Brayonic Matter (CBM) experiment, an important facility that will help to understand heavy nuclei formation in the stars. The delegates attended the 39<sup>th</sup> AFC meeting in Finland is shown below.



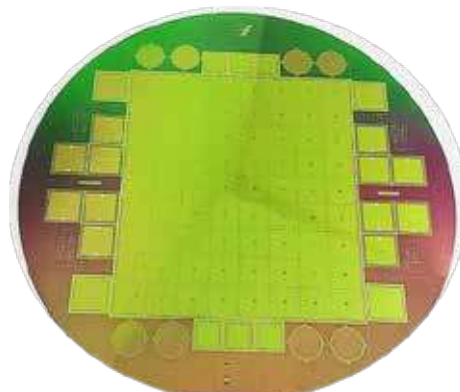
Fig. 39th AFC meeting in Finland

### 4.2 Thirty Meter Telescope (TMT)

DST contributed 2 million USD to TMT International Observatory (TIO) to support the immediate commitments and liabilities of TMT Hawaii.

### 4.3 CERN Large Hadron Collider (LHC) – Geneva

- India ALICE-STAR collaboration meeting was held at VECC, Kolkata in July 2025 to discuss scientific, technical, physical and administrative matters of the collaboration.
- In this reporting year, India ALICE collaboration developed a p-type silicon detector on 6” wafer. This is the first of its kind in India, it will be used in the ALICE Forward Calorimeter (FoCal) at CERN for the measurement of direct photons. The R& D has been accepted by the ALICE collaboration, and in the coming years, India is slated to provide 30% of the detectors to be used in ALICE FoCal.



*8X9 p-type detector array on 6-inch wafer*

**Fig. (L)** ALICE Experiment; **(R)**: 6-inch diameter P-type Silicon detector developed by India

- CMS was awarded the Breakthrough Prize in Fundamental Physics 2025 for undertaking detailed measurement of Higgs boson properties conforming symmetry breaking mechanism of the mass generation, the discovery of new strongly interacting particles, the study of rate processes and matter and antimatter asymmetry, and the exploration of nature at the shortest distance. India was a recipient member of the prize in this collaboration.
- Also, a CMS Data Analysis School (DAS) was conducted at IIT Hyderabad, in June 2025. More than 40 Indian and 10 international students attended this school, where hands-on training about CMS software and data analysis was provided.
- HSF-India Software Workshop was organised at Panjab University and University of Hyderabad. The HSF workshop focused on essential software and data analysis skills for research in Physics. This workshop was part of HSF-India initiative, which promotes international collaboration in the development of research software. About 50 PhD and master's students from across the country participated in the workshop, where they received hands-on comprehensive training in advanced software techniques and data handling methods that are directly applicable to real-world research in physics.
- An event was organised to celebrate 70 years of CERN scientific odyssey at IIT Madras in Feb 2025. Around 700 participants from high energy and nuclear physics community, including CERN collaboration members, students and scientists attended the event.
- Enabled Indian Industry and successfully delivered the full readout and drift boards for the entire ME0 upgrade project of the CMS experiment. Through the R&D support and engaging the Indian industry in cutting edge product design, enabled some of

our industries which qualified internationally and received high value orders from CERN.

- CMS experiment successfully collected the data from first ever O-O and Ne-Ne collisions in the LHC. India-CMS scientists are involved in the data analysis on these collisions.

## 5 Nano and Advanced Materials Divisions (NAMD)

### Nano & Advanced Materials Division

The Department of Science and Technology's initiatives on Nano Science & Technology got its term extended in the last two decades since its inception in the Year 2001, as outlined in the figure below. During the year 2024, various schemes/programs on Advanced Materials were implemented by DST, subsequently renaming the division as '*Nano & Advanced Materials Division (NAMD)*'. NAMD supports basic and applied research initiatives through various schemes/programs including Advanced Materials, International Beamline schemes and ongoing nano-science /technology-based projects.

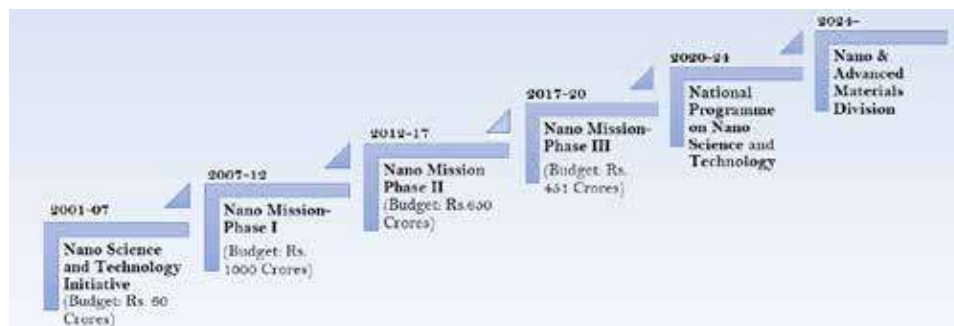


Fig. Journey of Nano & Advanced Materials Division

### 5.1 Advanced Materials Programme:

#### 5.1.1. Vision Document on Advanced Materials:

Taking into account of a future centered on self-reliance, sustainability, and inclusive growth, Advanced Materials Research will be crucial in driving innovative technologies in the country. In this direction, a vision document on, "Advanced *Materials Research Initiative for Technology Implementation (AMRITI)* was prepared by NAMD, encompassing 14 thematic research areas, with a focus on sustainability, indigenization, and global competitiveness to foster innovation, deepen industry-academia collaborations, and guarantee that research leads to practical uses. It was released by Honorable Minister of State for S & T and Earth Sciences, Dr. Jitendra Singh during ESTIC 2025 at New Delhi.



Fig. Release of Advanced Materials Research Initiative for Technology Implementation (AMRITI)

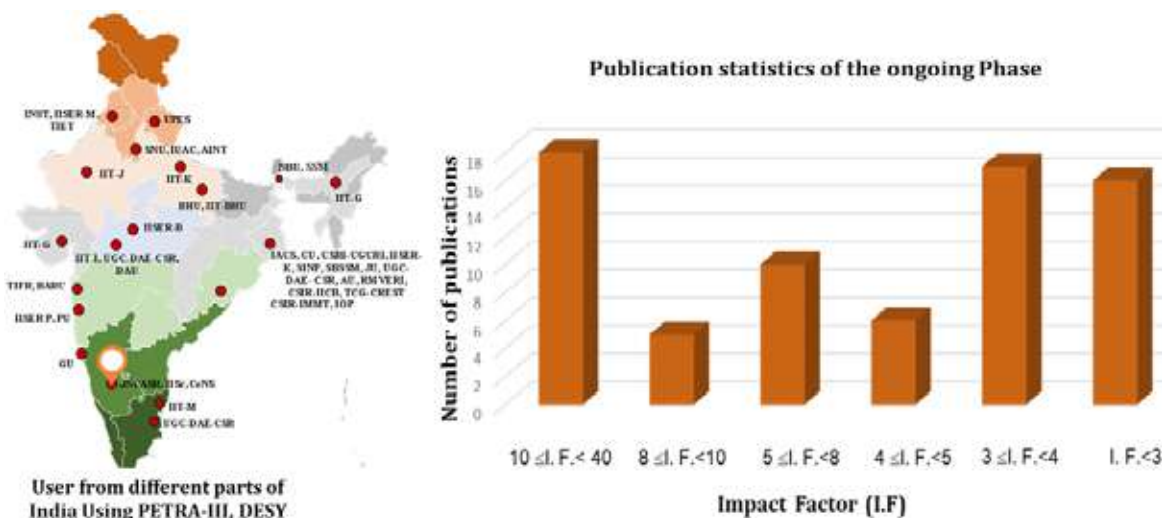
## 5.2 Funding support under Advanced Materials' Call for proposals:

To promote the basic research activities on thrust research areas of advanced materials, R&D infrastructure/facilities for meeting an ever-increasing demand of these materials towards various sectors in the coming years, a call for proposals on “*Advanced Materials*” was announced during September-October 2024. Of the 3235 pre-proposals received, after initial screening and technical reviews, 139 pre-proposals were short-listed for next round of evaluation under Phase I & II.

## 5.3 International Collaborations through Indian Beamline Facilities:

### 5.3.1 Indian Beamline for Nanoscience and Technology at PETRA III, Germany:

India's partnership with **DESY** for the dedicated Indian Beamline at **PETRA III** enables access to one of the world's most advanced synchrotron sources. The beamline supports high-resolution X-ray spectroscopy and diffraction studies and serves as a key platform for cutting-edge materials research. Researchers from across the country have benefited from this collaborative project including research institutes, universities, IITs and IISERs. Collaborative experiments, user training, and joint publications continued to advance scientific productivity and strengthen India's participation in global large-scale research infrastructure. The current Phase of collaboration resulted in ~ **200 research publications** in top international journals.



### 5.3.2 Indian beamline at ISIS neutron scattering facility at RAL, UK:

After successful completion of Phase-I (2016-2024), Phase-II of the collaborative project ‘**Scientific Collaboration with the ISIS neutron and muon source at Rutherford Appleton Laboratory, UK, for carrying out research and development in Nano Science and Technology**’ has been approved for a period of five years at Jawaharlal Nehru Advanced Centre for Advanced Scientific Research (JNCASR). In this phase, in addition to facilitate the regular users, new users’ community will be encouraged through Workshops, student training and advertisement of Indian beam time calls at national conferences. Also, components like Industry participation, student’s training and outreach activities have been planned.

This project is dedicated to advancing research in nanoscience and technology, focusing on quantum materials, energy, advanced engineering and healthcare. The main objectives of this project are to nurture researchers, enhance instrumental resources, and foster collaborations in neutron and muon techniques.

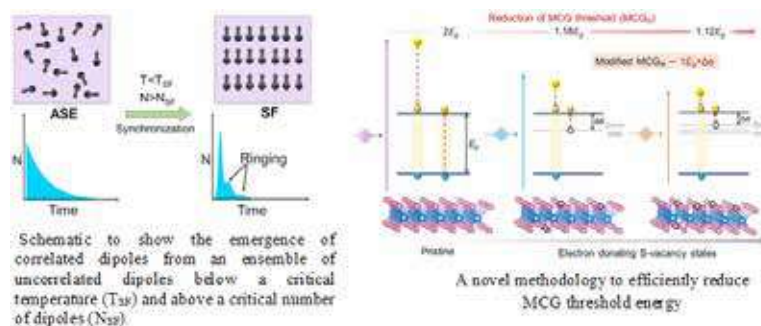
### 5.3.3 Indian Beamline at Photon Factory KEK, Japan:

The Photon Factory provides one of the four quantum beams (photons, neutrons, muons and positrons) for the Institute of Materials Structure Science (IMSS), which reveal atomic-level structures and electronic structures of all the materials, including living systems. On the successful completion of phase II, Phase III of the collaborative project **Indian beamline at Photon factory KEK, Japan** commenced in **2024** for a duration of **05** years. The Indian beamline at photon factory, KEK is designed to cater to the need of scientists from Indian institutes and universities for their research on broadly four categories of experiments- (i) powder diffraction at various sample environments like high temperature, low temperature and high pressure, (ii) Reflectivity and diffuse scattering from solid and liquid surfaces and interfaces, (iii) Diffraction from single crystals including epitaxial multilayered materials and (iv)

Small Angle X-ray Scattering (SAXS) experiments in transmission and reflection geometry. A total of ~ **65 researchers** benefited from the Indian beamline at the Photon Factory during FY 2025-26.

### Achievements from a few funded projects:

- A project on “**Emergent Phases in 2D Quantum Materials & Heterostructures**” was supported to IISER Bhopal. The PI & team successfully demonstrated **Superfluorescence from Electron-Hole Plasma at Moderate Temperatures of 175K** from this project. This work was published in *Physical Review Letters (APS)*. In addition to that they exhibited **Multiple Carrier Generation at an Exceptionally Low Energy Threshold**. Their study presents an innovative and straightforward approach to overcome these obstacles by harnessing the hot carrier interaction with electron-donating states strategically positioned below the conduction band of semiconductor materials.



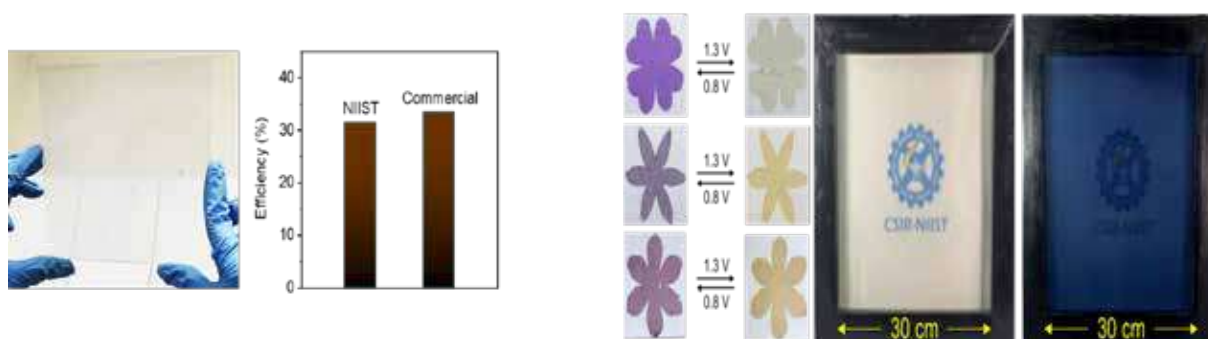
**Fig.** (L) Schematic to show the emergence of correlated dipoles from an ensemble of uncorrelated dipoles below a critical temperature ( $T_{SF}$ ) and above critical number of dipoles ( $N_{SF}$ ); (R) a novel methodology to efficiently reduce MCG threshold energy.

- A multi-institutional project “**Consortium for Collective and Engineered Phenomena in Topology Concept**” was supported with IISc as the network coordinator, and the initiative resulted in ~**30 research articles** during FY 2025–26. Also, infrastructure facilities were developed under this project at IIT Delhi.



**Fig.** Automatic dry transfer system installed inside argon-filled glove box

- A project on '**Organic–Inorganic Hybrid Nanomaterials for Non-Conventional Energy Technologies**' supported to CSIR-NIIST, Thiruvananthapuram, aiming at design and development of organic-inorganic hybrid nanomaterials for non-conventional energy technologies resulted in successful development of (1) scalable process for  $\text{TiO}_2$  nanopowder and screen-printable pastes, enabling the fabrication of dye-sensitized solar cells using fully indigenous  $\text{TiO}_2$  materials; (2) a library of 30 metal–organic hybrid materials exhibiting reversible responses to heat, electricity, and other stimuli; (3) FTO-coated soda-lime glass using spray pyrolysis, as a cost-effective alternative to ITO substrates, enabled the construction of DSSCs and smart window prototypes; (4) a robust metal–organic nanocomposite with superhydrophobicity.

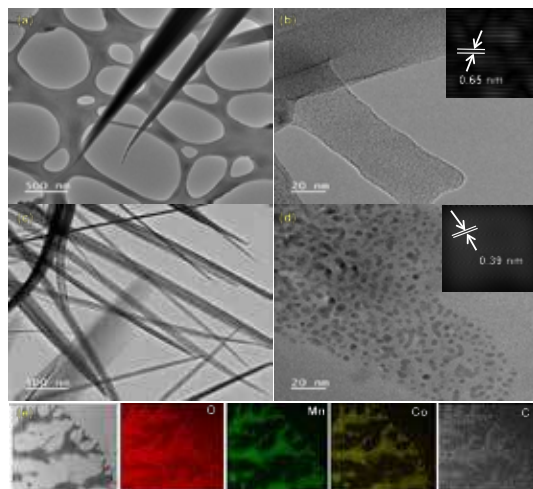


**Fig. (L)** Indigenous nanostructured TCO (FTO) glass and benchmarking with commercial FTO substrates; **(R)** Color-switching electrochromic smart glass prototypes.



**Fig. (L)** Transparency switching LCST-based thermochromic smart window prototypes; **(R)** Multi-substrate compatible hybrid superhydrophobic composite coatings.

- A project on '**Nature Inspired Fractal patterned micro-nano-structured catalyst modified electrodes; A novel approach for efficient hydrogen production by electrolysis of water**' was supported to CSIR- AMPRI, Bhopal. In this project, a non-noble metal-ions based fractal-like structure, inspired from leaf, has been developed for water electrolysis by a manually lifted Hele-Shaw cell. The study also correlated significant parameters related to the venation network, such as the vein length to the leaf perimeter ratio, confirming that a densely distributed fractal-like structure allows the current to be distributed over the whole network. The biomimetic hierarchical leaf vein network opens a promising path toward achieving the goal of alternative futuristic devices.



**Fig.** HRTEM images of (a, b) CoMnOx and (c, d) CoMnOx@rGO at 500 and 20 nm, respectively; (e) EDS elemental mapping of CoMnOx@rGO.

- A project on '**Translation of nanobased quinapyramine sulphate formulation into product and its evaluation against Trypanosoma evansi in animals.**' was supported to ICAR-National Research Centre on Equines, Hisar. The PI & team synthesized quinapyramine sulphate loaded nano formulations with targeted delivery and translated the formulations into product. They have been granted patent for these formulations. The nanoformulation (QS-NPs) at reduced doses and frequency provided 100% survivability in *T. evansi* infected mice and rabbits. They also synthesized and characterized new chemical entities (Antitrypanosomal diazo compounds) using the quinapyramine sulphate against *T. evansi* which revealed 100% efficacy in murine model & patent has been filed. Efficacy of the formulations and novel compound against *T. evansi* in murine model with 100% efficacy along with 100% survival of the mice with no parasitemia was observed



**Fig.** Quinapyramine Sulphate loaded nano formulations

## 6 National Supercomputing Mission (NSM)

The Mission is jointly funded and implemented by Department of Science and Technology (DST) and Ministry of Electronics and Information Technology (MeitY). This Mission envisages to empower our national academic and R&D institutions across the country by enabling High-Performance Computing (HPC) research infrastructures of various capacities. It is being achieved in a phased manner; Initial commissioning has taken place using the procured systems, followed by assembling the system in the country. Through this route, 47 Petaflop (PF) of infrastructure has been created across 38 locations so far. The final and current phase of infra-creation is based on indigenous developments like Rudra server, software stacks etc. Through this Mission, Government of India intends to enable the nation with HPC capacity to solve multi-disciplinary grand challenge problems.

- The key objectives of the Mission include; (i) to make India one of the world leaders in Supercomputing and to enhance India's capability in solving grand challenge problems of national and global relevance; (ii) to empower our scientists and researchers with state-of-the-art supercomputing facilities and enable them to carry out cutting-edge research in their respective domains; (iii) to minimize redundancies and duplication of efforts, and optimize investments in supercomputing; and (iv) to attain global competitiveness and ensure self-reliance in high-performance computing technology.
- The broad HPC Areas focusing in this Mission includes; (i) Astrophysics; (ii) Bioinformatics; (iii) Computational Material Science and Nanomaterials; (iv) Disaster Simulations and Management; (v) Molecular Dynamics; (vi) Weather Prediction; and (vii) Urban Modelling.
- The ongoing project activities continued in full swing by both the nodal implementing institutions, C-DAC, Pune and Indian Institute of Science (IISc), Bengaluru.
- During the year, three meetings of Technical Advisory Committee, Chaired by Dr. V. K. Saraswat, Member, NITI Aayog were organized, in which discussions on the ongoing developmental activities and activities to be pursued in NSM 2.0 were discussed.
- The progress made on the ongoing Applications projects were reviewed by respective Project Monitoring Committees.

A Consultative Meeting for NSM 2.0 Applications Roadmap was organized on 17 July 2025 at MeitY. In this meeting, a large number of stakeholder representatives from different academic institutions and subject areas along with officials from line Ministries participated and presented their needs for supercomputing facilities in pre-exascale and exa-scale in NSM 2.0 .

- DST organized a Brainstorming Workshop on Exa-scale Computing for Life Sciences Applications on 9 October 2025 in Technology Bhavan. In this Workshop, stakeholders from different academic institutions and agencies deliberated on the requirements of

Exa-scale computing in their respective domains of life sciences to address grand challenge problems in diverse areas.

- Supercomputing India '2025 was organized during 9-13 December 2025 at Manipal Institute of Technology, Bengaluru. The theme of the event was “Powering the Future, HPC, AI, Quantum”. Dr. Pratishtha Pandey, Head, NSM, DST, delivered keynote on the “Women in Technology”, highlighting global trends and Indian data on women in STEM.



Fig. Supercomputing India 2025

- The developmental work and deployment of NSM facilities continued in full swing. The details of latest deployments of NSM facilities are as under.

S. No.	State	Name of the Institution	Name of Supercomputer	Compute Capacity
1.	Bihar	Indian Institute of Technology, Patna	Param Rudra	838 TF
2.	Tamil Nadu	Indian Institute of Technology, Madras	Param Rudra	3 PF
3.	Maharashtra	Indian Institute of Technology, Bombay	Param Rudra	3 PF
4.	Haryana	Indian Institute of Technology, Delhi, Sonepat Campus	Param Pragya	250 AI PF/ 8 PF

- Prof. Abhay Karandikar, Secretary, DST inaugurated PARAM Rudra, state-of-the-art, 3 PF National Supercomputing Facility at IIT, Bombay on 8 January 2026. The HPC system has been developed and deployed under Build Approach of NSM. PARAM Rudra is based on indigenously designed Rudra servers developed by C-DAC and manufactured in India, reinforcing the Government of India’s Make-in-India initiative. The system is powered by C-DAC’s indigenous software stack and incorporates advanced Direct Contact Liquid Cooling (DCLC) technology for enhanced efficiency.



**Fig.** Inauguration of Param Rudra Supercomputer at IIT, Bombay

- The facility will cater to researchers from multidisciplinary fields for meeting their computational requirements for diverse science and technology applications, including Medical Imaging, Modelling of Lithium-Ion batteries, Transportation networks, Computational Fluid Dynamics, Epidemiology, Climate Change Risks, Effects of aerosols, Seismic Risk Assessment etc.
- The inauguration of Param Pragya, AI-based Supercomputing Facility at IIT, Delhi, Sonapat Campus is expected shortly.
- The establishment of Data Centre work continued at Indian Institute of Science (IISc), Bengaluru, Indian Institute of Technology (IIT), Kanpur, IIT, Kharagpur, CSIR – Fourth Paradigm Institute (CSIR-4PI), Bengaluru, CR Rao Advanced Institute of Mathematics, Statistics and Computer Science (AIMSCS), Hyderabad, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune and IIT, Jammu. The work on development of indigenous processor and chip also continued during the year.
- During the year, about 2300 researchers and college students were trained through different HPC awareness programs, totaling to 27717 HPC trained human resources since the start of the project.
- More than 14000 users from different institutions across the country have utilized different NSM HPC facilities so far.
- The documentation of Detailed Project Report (DPR) and Expenditure Finance Committee (EFC) Memo for next phase, NSM 2.0 advanced further.
- A meeting of the NSM Executive Board was also organized in which deliberations on ongoing NSM activities were made and the roadmap for NSM 2.0 was discussed.

# INNOVATION TECHNOLOGY DEVELOPMENT AND DEPLOYMENT

## 1 Technology Development Programs (TDP)

The Department of Science & Technology (DST) through Technology Development Programme (TDP) has been promoting and supporting activities related to indigenous development of innovative technologies in identified areas at various R&D laboratories/ institutions. Under this Programme, project proposals are supported to convert proof-of-concept for technologies/ techniques/ processes/products into advanced prototypes for validation and demonstration in actual field settings and also feasibility of fresh ideas/ concepts is assessed for their potential conversion into useful technology/product. These effort have resulted in development and deployment of technologies both in the advanced/emerging areas and in traditional sectors/ areas with subsequent transfer of know-how for their commercial production.

Some of the technologies developed under Technology Development Programme (TDP) of the Technology, Translation and Innovation (TTI) Division, are listed below.

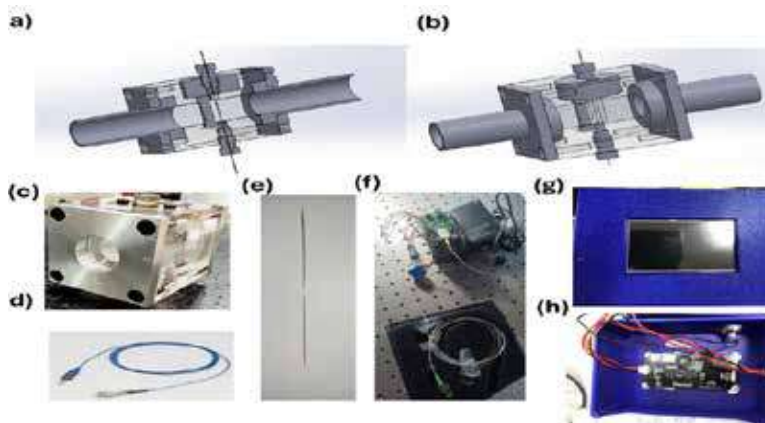
### 1.1 Technological intervention in the production process of environmentally safe and biodegradable novel packaging material/films from indigenous renewable raw materials seaweeds:

The study successfully developed biodegradable films from indigenous seaweed *Gracilaria canaliculata* in lab. These films demonstrated favorable physical and chemical properties, including appropriate thickness, solubility, and moisture content. The addition of natural plasticizers and additives improved the flexibility and overall properties of the films, making them suitable for environmentally safe packaging applications.



Fig. Biodegradable novel packaging material/films from indigenous seaweeds

- a) **1.2 Indigenous Development of Controlled Interferometry-Based High Temperature Industrial Flow Measurement Device:** An innovative 3D printing system has been designed for fabrication of cement-based structures using a layer-by-layer deposition technique. The printer utilizes a robotic system to control the movement of the print head, which is equipped with an extrusion mechanism capable of handling viscous cement paste.



**Fig.** (a) Cross sectional view of flow cell CAD design. (b) Full view of CAD designed Flow cell unit. (c) Fabricated flow cell unit consisting of bluff body and probe holder (d) Miniaturized photodiode unit (e) Encapsulated Probe (f) developed miniaturized SLED unit (g) Vortex flowmeter display (h) Micro controller-based signal processing unit.

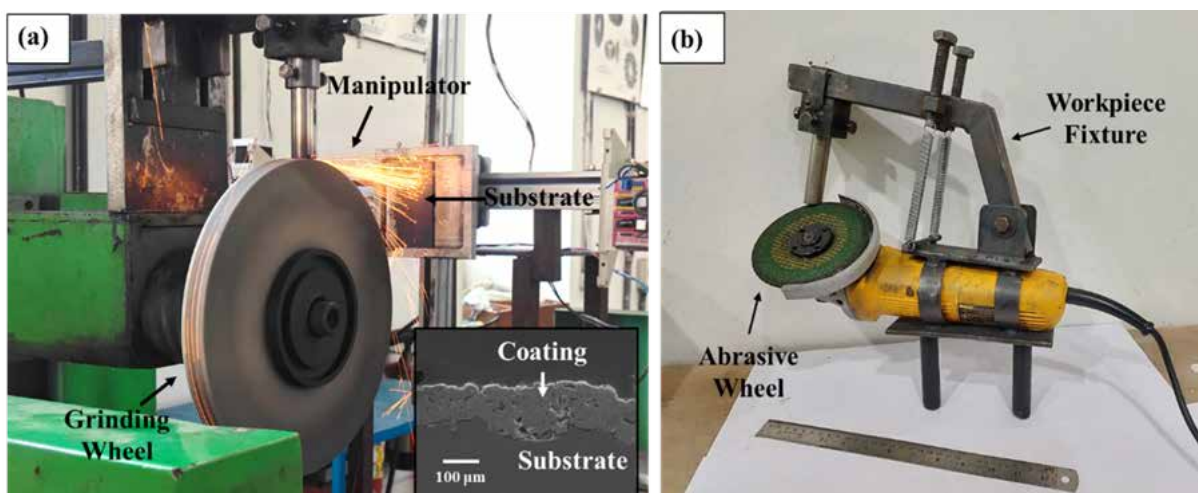
**1.3 Design and development of a Measuring Device for measuring and recording hydrological parameters in a Climate Zone Observatory for self-reliance and water security:** Under the project, an Automatic Weather Station (AWS) has been designed. It measures precipitation, temperature, humidity and soil moisture with a resolution of 0.2 mm for rainfall. The readings are automatically stored over a communication network (GSM) and can be read locally using a USB device or over Bluetooth. An app on Android is also developed for a convenient UI.



**Fig.** Installation of custom-designed Automatic Weather Station (AWS) on the top floor of V Block at IIT Delhi, alongside a size comparison with the ATMOS41 weather station.

#### 1.4 Centre of Excellence under Advanced Manufacturing Technology program for Degradation-Resistant Thermal Spray Coatings IIT Ropar

Department of Science and Technology established a Centre of Excellence (CoE) on Degradation-Resistant Thermal Spray Coatings for Indigenous Industrial Applications at Indian Institute of Technology Ropar. The CoE operates in collaboration with Metallizing Equipment Company Private Limited and Applied Materials India Private Limited, alongside academic partners including Punjab Engineering College (Chandigarh), BBSB Engineering College (Fatehgarh Sahib), Chandigarh University (Mohali), Thapar Institute of Engineering and Technology (Patiala), and CSIR-Institute of Minerals and Materials Technology. Key achievements include development of cold-sprayed rare-earth metal coatings; deposition of pure copper coatings on titanium; functionally graded Al–SiC composite coatings on Al-6061; WC–NiCr cermet coatings with validated cavitation and corrosion resistance; and a novel scanner-based laser remelting post-process to enhance cold-sprayed hard coatings.

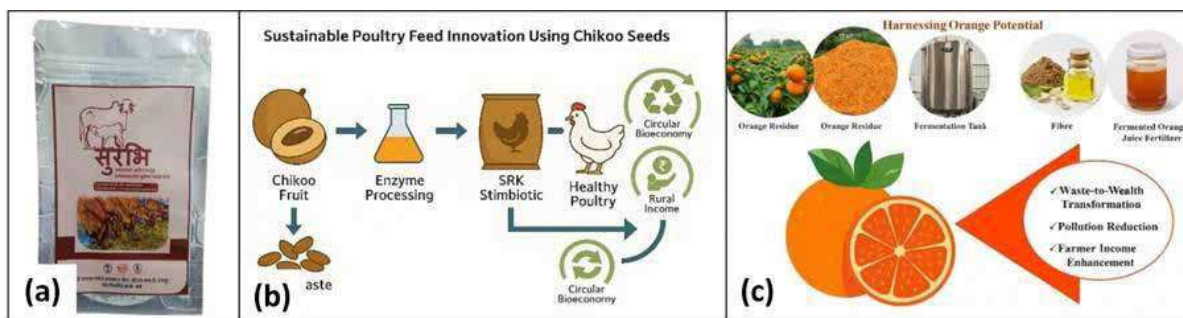


**Fig.** Grind Coating Systems developed at IIT Ropar (a) Indigenous grind coating system (machine) developed in CoE showing deposition of a Ni-based alloy on an SS316L (Inset: FE-SEM image of the coating cross-section) (b) Portable grind coating system developed at IIT Ropar for on-site applications

#### b) 1.5 Advancing Waste-to-Wealth Solutions through the DST–Merino CoE at VNIT Nagpur

Under Waste Management Technologies (WMT) programme, DST established –Merino Centre of Excellence at Visvesvaraya National Institute of Technology to advance waste-to-wealth solutions from agricultural residues and fruit waste. Key outcomes include the patented Surabhi enzyme-based fodder enhancer (Indian Patent No. 548754), enriched with cellulase and xylanase, delivering 14% higher digestibility, 7–8% increase in milk yield, and ~2% rise in fat content at a dose of 2.5 g per 5 kg dry fodder. Large-scale

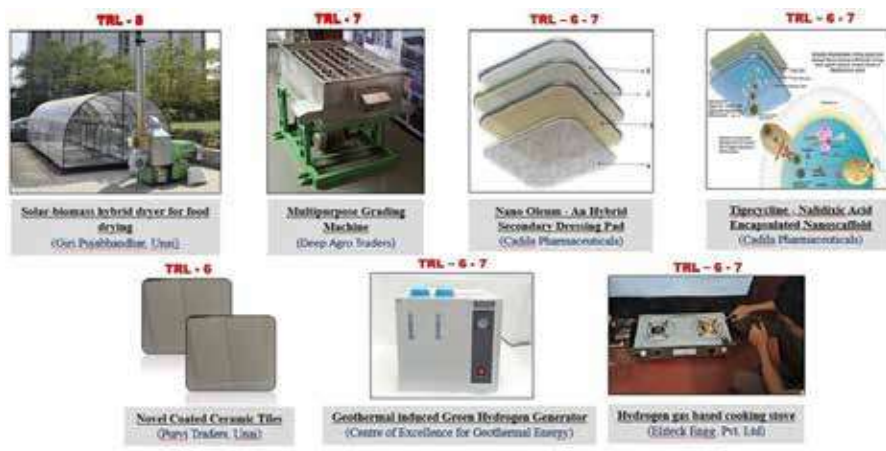
field trials (May–November 2025) involving 986 cattle and 228 farmers, conducted with National Dairy Development Board, KVK Ambajogai, and Merino Industries Ltd., validated improvements in milk quality and SNF.



**Fig.** Products developed by VNIT (a) Surabhi enzyme-based fodder fortification and milk yield response; (b) Chikoo seed valorization and SRK Stimbiotic poultry feed supplement; (c) On-farm orange waste biorefinery and value-added products.

### 1.6 Regional Innovation and Industry Engagement through DST’s Technology Enabling Centre at PDEU, Gujarat

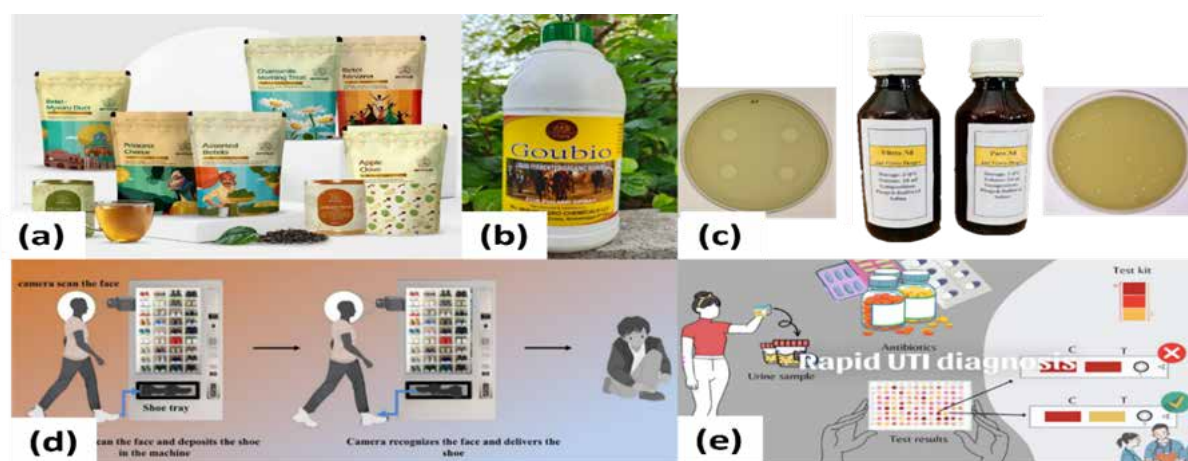
Department of Science and Technology (DST) established a Technology Enabling Centre (TEC) at Pandit Deendayal Energy University, to strengthen Gujarat’s innovation ecosystem. In Year 2025, TEC–PDEU successfully transferred five technologies to industry, including three patented innovations—novel coated ceramic tiles, an on-site drug-detection portable chip, and a solar biomass tunnel dryer. Technology Transfer Agreements were executed with Teamex Retail Pvt. Ltd. (drug-detection chip) and Balief Corporation (hydrogen blending equipment). In collaboration with Shell Gas, the Centre achieved in-house fabrication, testing, and national-level demonstration of a first-of-its-kind hydrogen blending with natural gas prototype.



**Fig.** Technologies enabled by PDEU-TEC, Gujarat

### 1.7 Strengthening Healthcare, Agriculture and Sustainability Solutions through DST's Technology Enabling Centre at Nitte University, Karnataka

Department of Science and Technology (DST) supported Technology Enabling Centre at Nitte University, Karnataka and commercialized three technologies: Betel leaf tea (BetelO; four flavours in tea bags), liquid fermented organic manure (GouBio; M/s Vasuki Agro Chemicals LLP), and a bacteriophage consortium for shrimp vibriosis (Vibrionil; Mangalore Biotech Laboratory LLP). Under the One Health theme, the Centre developed rapid, field-deployable molecular diagnostics for human, animal, and environmental pathogens.



**Fig.** Technologies developed (a) Betel Leaf Tea with different flavors; (b) Liquid fermented organic agri- manure- GouBio; (c) Phage therapy for vibriosis- Vibrio-Nil Mangalore Biotech Lab; (d) Automatic Shoe storage device-Roborack NMAMIT, Karkala; (e) ESKaPE kit for rapid detection of microbes Diagopreutics Pvt.Ltd

### c) 1.8 Development of Advanced Multifunctional Smart Wound Dressing for Chronic Wound Management

Under the Advanced Manufacturing Technologies (AMT) programme, the Department of Science and Technology (DST) supported a project to R.V.R. & J.C. College of Engineering, Guntur, A.P. for development of wound dressing material to address the critical challenges in the management of chronic wounds, including diabetic ulcers, burns, and infected wounds. The developed product, Smart Dre-M, is a multilayered smart wound dressing integrating electrospun biopolymer nanofibers on copper nanoparticle-coated cotton fabric. The nanofibrous layer mimics the extracellular matrix, supports cell migration, maintains optimal moisture balance, and provides effective protection against infection and inflammation.

### 1.9 Ultra Compact Smart Foundry at CSIR-NIIST, Kerala

DST-funded SMART FOUNDRY project, at CSIR-NIIST, Kerala, has culminated in successful development and technology transfer of an industry-ready, ultra-compact integrated foundry system named iFoundry 4.0. The system is specifically engineered for rapid, low-cost production of small and intricate metal components, including aluminium and metal matrix composites (MMCs), which are otherwise difficult to manufacture using conventional casting routes or direct metal 3D printing. iFoundry 4.0 enables seamless, end-to-end automation by integrating casting design and simulation, automated mould fabrication, efficient melting and direct pouring, metal matrix processing, and intelligent data sensing, analytics, and optimization



Fig. Industry ready Integrated version of SMART FOUNDRY (iFoundry 4.0)

### 1.2 Biomedical Device & Technology Development (BDTD) Programme

During the financial year 2025-26, 15 new projects were supported across the country under the Biomedical Device & Technology Development (BDTD) programme. These projects were supported in different thematic areas, viz. Healthcare and medical wearable sensors/devices, Portable medical imaging, medical device development, Bio-inspired technological solutions & wound care technologies, and Women & child healthcare devices. With formal inauguration of two biomedical hubs at Delhi and Karnataka, a total of four biomedical hubs are now fully operational, with two other hubs at Chandigarh and Chennai respectively. These biomedical hubs are serving as a translational platform for technology upscaling or prototype development leading up to market validation & commercialization. Dr. Jitendra Singh, Hon'ble Minister, Ministry of Science and Technology, on 24<sup>th</sup> September 2024 inaugurated the Dental Technology Innovation Hub (DTIH) at Maulana Azad Institute of Dental Sciences (MAIDS), New Delhi.



**Fig.** Inauguration of DTIH and facility round by the Hon'ble Minister Dr. Jitendra Singh

During the inauguration, the official website of the DTIH and the compendium detailing the report of DTIH activities was also released by Hon'ble Minister of Science & Technology.



**Fig.** Release of Compendium and address by the Hon'ble Minister Dr. Jitendra Singh

## **Key Technologies developed through the projects supported under the BDTD Programme :**

### ***1.2.1 SmartWear for Monitoring and Treatment of Gait Disorders in Parkinsonism***

SmartWear as a wireless and wearable device comprising: (i) waist belt housing Microcontroller-based Central Processor unit, (ii) pair of Instrumented Shoes, (iii) electronic Visual Cue Generator, (iv) pair of electronic Tactile Cue Generator units and (v) electronic Audio Cue Generator unit. This SmartWear can (a) quantify one's gait, (b) predict the possibility of FoG based on inter-step variability as measured by Instrumented Shoes and (c) trigger external cues in an individualized and Assist-as-Needed manner to help patients with PD avoid or at

least reduce the occurrence of FoG episodes.

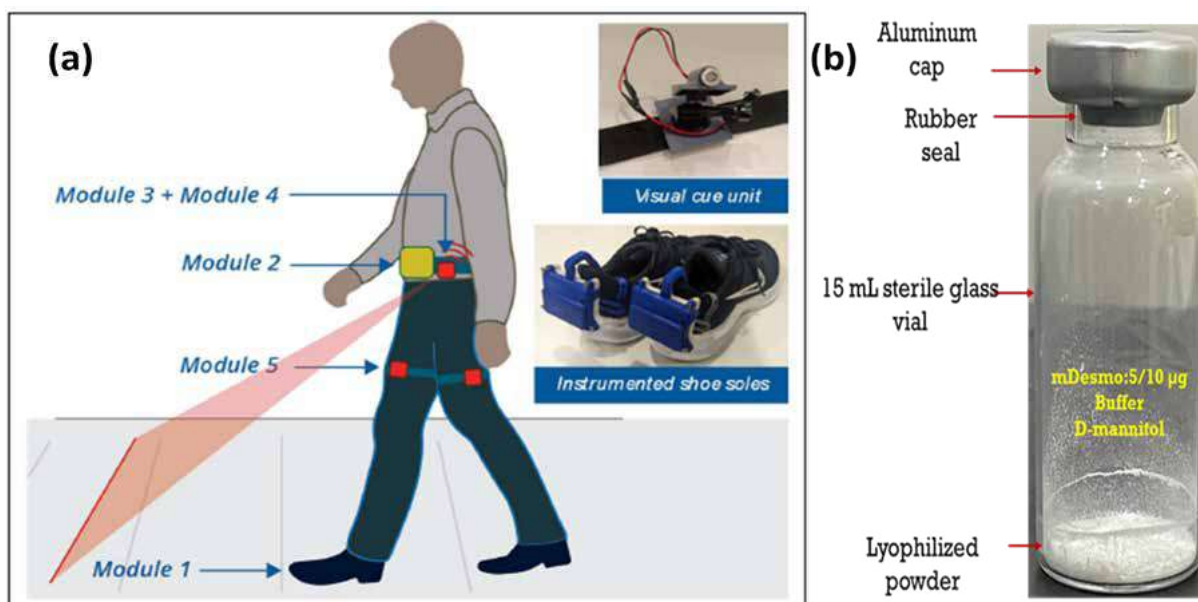


Fig. (a) Schematic diagram of the SmartWear prototype; (b) mDesmo Cold Kit

### 1.2.2 mDesmo Cold Kit for PET imaging to Localize ACTH dependent Cushing syndrome

Freeze-dried mDesmo cold kit was developed and optimized for radiolabeling with Ga-68 and PET/CT imaging applications. Also, bioevaluation of the radiotracer was successfully evaluated for its binding to overexpressed V1b receptors in corticotropinoma using *in vitro* experiments. Molecular imaging potential of Ga-mDesmo was evaluated in Cushing's Syndrome patients.

### 1.2.3 Transfer of Technology Ceremony of "TrueOxy+ High Flow Nasal Cannula (HFNC) System/Device"

The Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, on 12 January 2026, signed a Transfer of Technology (ToT) agreement with Clarity Medical Pvt. Ltd., Mohali, for the indigenously developed "TrueOxy+ High Flow Nasal Cannula (HFNC) System/Device", developed under a DST-supported research project. Initiated in 2021 and completed in March 2024, the project resulted in a clinically robust, user-friendly and cost-effective HFNC system tailored to Indian healthcare needs. The device offers precise control of flow rates up to 60 L/min, FiO<sub>2</sub> from 21–100%, temperature regulation, integrated monitoring, alarms and patient safety features, and has undergone rigorous laboratory testing and Phase-1 clinical evaluation.

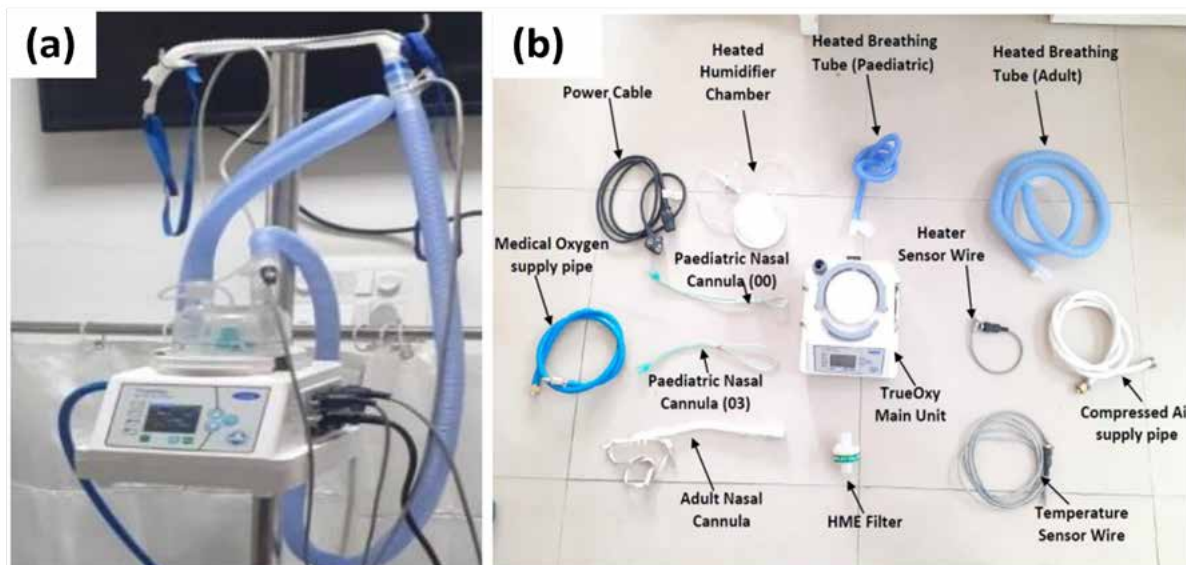


Fig. (a) Indigenously Developed “TrueOxy+ High Flow Nasal Cannula (HFNC) System/Device”; (b) “TrueOxy+ High Flow Nasal Cannula (HFNC) System/Device” Components.

## 2 Climate, Energy and Sustainable Technology (CEST)

Climate, Energy and Sustainable Technology (CEST) Division of the Department of Science and Technology (DST) is at the forefront of advancing and implementing cutting-edge solutions to address critical environmental and energy challenges. This division focuses on various key verticals, including Climate Change programme, Hydrogen and Fuel Cell technology, Building Energy Efficiency, Clean Coal technologies, Advanced Ultra Super Critical Technology, Smart Grids, Carbon Capture & Utilization Storage, Solar Energy Systems, Clean/Alternative Fuels, and Materials for Energy Storage and Water. CEST Division is committed to fostering research and innovation led clean energy transition and sustainable development for a clean and green future.

### 2.1 Climate Change Programme (CCP)

DST has been entrusted with the responsibility of coordinating two national missions on climate change as part of National Action on Climate Change (NAPCC). These are (i) National Mission for Sustaining the Himalayan Ecosystem [NMSHE] and (ii) National Mission on Strategic Knowledge for Climate Change [NMSKCC].

#### 2.1.1 New Initiatives

- **Urban Climate Research and Extreme Events:** Addressing the critical aspects on urbanization and growing impact of climate change, a new initiative ‘*Urban Climate Research and Extreme Events*’ was started under NMSKCC, with an aim to promote

research, innovation, and strategic knowledge development, for building strong human and institutional capacities to enable Indian cities to enhance their resilience, ensure sustainable development and improve quality of life.

- **State R&D Programme:** The State R&D Programme was initiated in Uttarakhand this year, under NMSHE following top-down approach. The programme focused on researchers, faculty and students in the state, to strengthen and build S&T capacities in the region. After peer-review and technical assessments two projects were supported to study: i) Snow/glacier melt runoff in the Upper Yamuna River Basin under climate change scenarios, Uttarakhand, at Doon University, Dehradun and ii) Assessment of socio-ecological vulnerabilities and community responses in climate-sensitive higher Himalayan rural ecosystems of the Uttarakhand Himalaya at Hemwati Nandan Bahuguna Garhwal University.

### 2.1.2 Achievements under Thematic Task Forces (TFs) under NMSHE

- **Task Force on Forest Resources and Plant Biodiversity:** The Host Institution GBPNiHE, Kosi-Katarmal, Almora developed an inventory of trees species, wild edibles, shrub and invasive alien naturalized species in the Indian Himalayan Region (IHR) and database on biodiversity research in the Himalayan region under NMSHE. The research was carried out for developing and investigating the tree-ring base model and simulated the assessment of growth dynamics and carbon exchange potential under climate change scenario in the IHR. Under the project, a book named “**Lichen Diversity of Indian Himalayan Region**” (Fig.) was released. This book captures the list of lichen diversity of 13 Himalayan states along with the current accepted name, family, habit, habitat, altitudinal range, secondary metabolites, endemism as well as distribution in India and world, including economic and medicinal importance.



- **Task Force (TF) on Micro Flora and Fauna and Wildlife and Animal Population:** This TF at Wildlife Institute of India, Dehradun aims to conduct action-oriented research to strengthen the knowledge of climate implications on the wildlife of the Himalaya. The project has generated spatially explicit information on observed and predicted impacts of climate change on wildlife populations (fauna and microflora) throughout the longitudinal and elevational gradient in the IHR and microclimatic pattern for assessing climate impact on wildlife species.
- **Task Force (TF) on Himalayan Agriculture:** The TF at Indian Council of Agricultural Research (ICAR) is focused on adaptation strategies under climate change scenarios for each state of IHR. This year the center conducted long-term studies on soil degradation, declining carbon stocks, and erosion in the fragile foothills of Indian Himalaya. This study offers the first scientifically quantified evidence of how microaggregate-mediated stabilization within macroaggregates drives long-term soil carbon sequestration under Himalayan agroforestry.

### 2.1.3 Outreach activities and Capacity Building Programmes

DST supported an International Conference on '*Hangul & Other Threatened Ungulate Conservation*' organized by SKUAST-Kashmir. During the conference, different stakeholders had a productive discussion on the development of adaptive strategies for effective management and conservation to ensure the long-term survival of this iconic species and other threatened ungulates worldwide.

Various public awareness programmes were organized this year on different thematic areas of climate change science such as impact assessment, local wildlife conservation, birding, promotion of Mission LiFE at grassroots level for lasting behavioral changes, etc. Further, plantation activities, cleanliness drive, and special lectures were also organized under some of the projects.

Farmers of Mirzapur District visited DST-CoE BHU and gained knowledge regarding crop-specific weather-based advisories. Punjab State Climate Change Cell organized "*Media Workshop on Heatwaves and Agriculture*" at Chandigarh, to equip journalists with scientific knowledge, climate data tools, and reporting strategies, bridging climate science and journalism. Around 300 workers and community members benefitted from various community outreach campaigns on heat stress prevention and awareness conducted by Sri Ramachandra Institute of Higher Education and Research, Tamil Nadu under the DST supported MRDP project.

### 2.1.4 Release of Reports

- **Executive Summary of Technology Needs Assessment (TNA)** was released by the Secretary, DST during TATWA event (**Fig.**) organized by CEST Division to commemorate Environment Day on 05<sup>th</sup> June 2025. The document highlighted priority sector-specific

technologies required for climate change mitigation and adaptation across energy, transport, industry, agriculture, and other key sectors.



Fig. Release of TNA report during TATWA event. b) Release of Climate Risk Assessment Tool (CRAT)

- **Climate Risk Assessment Tool (CRAT):** Puducherry Climate Change Cell (PCCC), along with Department of Science, Technology and Environment (DSTE), Government of Puducherry, and CSTEP Bengaluru, successfully developed Climate Risk Assessment Tool (CRAT) for the Union Territory of Puducherry (Fig.). This tool supports evidence-based climate planning and enhances risk preparedness at the regional and local levels.

## 2.2. Clean Energy Research Initiative (CERI)

The overarching objective of CERI is to nurture S&T led breakthroughs to make clean energy affordable and accessible through strengthening Research and Innovation Eco-System. CERI aims to accelerate India centric innovations developed around user needs; promote national, bilateral and multilateral collaboration between industry, academics, utilities and other stakeholders to gain value for such connections. Create national research competence in Clean Energy through human and institutional capacity development.

During year 2025, several new dimensions were added to the CERI programme to accelerate pace of clean energy innovations to meet national needs, which are as follows:

### 2.2.1 Mission Innovation (MI)

DST is country focal point for the multilateral Mission Innovation (MI), a global initiative of 23 countries and European Commission (on behalf of the European Union). MI 2.0 is mandated for a decade of action spanning from Year 2021 to Year 2030, aiming to scale up deployment of innovative clean energy technologies to ensure affordable and accessible clean energy solutions for all. The initiative focuses on maximizing the impact of research, development, and demonstration (RD&D) through collaborative efforts and partnerships with worldwide stakeholders. India is participating in the ongoing missions focusing on Zero-Emission Shipping, Clean Hydrogen, Green Powered Future, Carbon Dioxide Removal, Urban Transition and Integrated Bio-refineries. In Year '2025, India also renewed its membership at

MI Steering Committee (MISC) and Technical Advisory Group (TAG). Dr. Anita Gupta (Advisor and Head of CEST division, DST) represented India at the MISC while Prof. Shireesh Kedare (Director, IIT Bombay) is the TAG member from India.

- **India's Participation in MI and CEM Senior Officials' Meeting, Seoul**

India actively participated in the Mission Innovation Annual Gathering and the CEM Senior Officials' Meeting, held from April 9 to 11, 2025, in Seoul, Republic of Korea (**Fig.**). Led by Dr. Anita Gupta, Head, CEST Division, DST, the Indian delegation (**Fig.**) highlighted India's leadership in affordable clean energy technologies and inclusive innovation. Discussions focused on MI Mission progress, inter-mission synergies, and preparations for the MI-10/CEM16 Ministerial in Busan. Bilateral meetings with Korean institutions explored collaborations in hydrogen, bioenergy, and clean mobility.



**Fig.** Mission Innovation Annual Gathering and the CEM Senior Officials' Meeting, April 9 to 11, 2025, Seoul, Republic of Korea.

- **India's Participation at MI-10 and World Climate Industry Expo 2025, Busan**

India actively participated in the 10th Mission Innovation Ministerial (MI-10) and the World Climate Industry Expo 2025, held in Busan, Republic of Korea, from August 25 to 29, 2025. Led by Head, CEST-DST, the Indian delegation highlighted national advancements in green hydrogen, renewable energy, AI-enabled clean technologies, and industrial decarbonization. India showcased its achievements under *Panchamrit* commitments, reaching 50% non-fossil power capacity and advancing innovation through a one lakh Crores RDI Fund.

In high-level dialogues on Industry Decarbonization and energy and AI, Dr. Gupta emphasized India's leadership in digital innovation, including National Quantum Mission and the AI Centre of Excellence. The delegation reaffirmed India's commitment to achieving net-zero by 2070 and advancing *Viksit Bharat@2047*. The plenary also marked the launch of the Mission Innovation Impact Report, celebrating a decade of

global collaboration on clean energy.

### 2.2.2 Materials for Energy Storage

The Materials for Energy Storage (MES) program supports R&D activities aimed at innovative materials for energy storage, and to build energy storage device with enhanced output for multifunctional applications. The initiative works towards the efficient use and further increase of renewable energy, demonstrating its value in terms of flexibility in the energy systems. Some of the successful projects are highlighted below:

- **Indigenous Development of Electrolyte Supported Reversible Solid Oxide Fuel Cell (RSOFC) Stack and its Demonstration in Power Generation and Hydrogen**

**CSIR–National Aerospace Laboratories (CSIR-NAL) and CSIR–Central Glass and Ceramic Research Institute (CSIR-CGCRI)** developed an indigenous **electrolyte-supported Reversible Solid Oxide Fuel Cell (RSOFC) stack** for power generation and hydrogen production. The project successfully realized **large-scale fabrication of thin free-standing electrolyte membranes** with thicknesses of around **250 µm** and sizes ranging from **50 × 50 mm<sup>2</sup> to 100 × 100 mm<sup>2</sup>**, which are critical components of **SOFC and SOEC systems**, and the process was demonstrated for **8YSZ and 10ScCeSZ** electrolytes.

- **Development of High Energy Supercapacitors by Dry Coating Process for Smart Toys**

Central Institute of Petrochemicals Engineering & Technology (CIPET), Chennai, in collaboration with the International Advanced Research Center for Powder Metallurgy and New Materials (ARCI), Hyderabad has developed high-energy supercapacitor electrodes using a solvent-free dry coating process for smart toy applications. All fabricated electrodes exhibited uniformity, flexibility, and mechanical robustness as freestanding structures, and electrochemical performance evaluations are currently underway to validate their suitability for high-energy supercapacitor applications.

- **Smart Hydrogen Supply Chain supported Polymer Electrolyte Membrane Fuel Cell in Telecom Tower Power Backup**

A pilot demonstration by the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Chennai, showcased a smart hydrogen supply chain–supported Polymer Electrolyte Membrane Fuel Cell (PEMFC) system for telecom tower power backup. Designed for site-specific deployment, the system evaluates multiple hydrogen sourcing options, including bottled hydrogen from the chlor-alkali industry, hydrogen from an electrochemical methanol reformer, and methanol-based chemical reforming, to enhance techno-economic viability. The solution was demonstrated at Airtel’s telecom tower, supporting a maximum peak power demand of 4.8 kW using

an indigenously developed PEMFC stack (**Fig.**). This innovative approach enables shared and transportable backup power across multiple towers, offering a clean, reliable alternative to diesel generators, particularly in remote and hard-to-access locations.

#### Demonstration of PEMFC as Back up Power for Telecom Tower

Airtel's Telecom tower with a maximum peak power operation of 4.8 kW was supported by ARCI developed PEMFC



Place: Pune Municipal Corporation, Date: 22.02.2025



**Fig.** Airtel's Telecom tower with a maximum peak power operation of 4.8 kW was supported by ARCI developed PEMFC

- **Development of alkaline water electrolyzer stack prototype for green H<sub>2</sub> production from dynamic renewable energy devices using self-repairable electrocatalyst and stable membrane.**

A research initiative by Christ (Deemed to be University), Bengaluru, demonstrated the development of an alkaline water electrolyzer stack prototype for green hydrogen production using dynamic renewable energy sources. The project developed a self-repairable bimetallic NiCoPB electrocatalyst using a modified electroless deposition technique and fabricated a composite separator comprising polysulfone, graphene oxide, and TiO<sub>2</sub> nanoparticles. Long-term durability testing at 40°C for 1000 hours demonstrated excellent stability with a low voltage degradation rate of 21 μV/hr. Linear sweep voltammetry showed that the optimized TiO<sub>2</sub>-based membrane outperformed the commercial Zirfon separator while maintaining comparable hydrogen purity of 99.5%.

### 2.2.3 Carbon Capture Utilization and Storage CCUS

#### Advancing CCUS technologies through Clean Energy Transition Partnership (CETP)

Under CETP, DST participated in 2025, 2024 and 2023 Calls (CM04-CCUS under Transition Initiative 3). One approved project, with India as a partnering country, focuses on carbon capture and utilization technologies for copper smelting plants, involving BITS Goa, Aditya Birla Science and Technology Company Ltd., and KTH Royal Institute of Technology, Sweden (lead). Two additional multilateral consortia approved in CETP 2024 address CO<sub>2</sub>

sequestration in basalt formations and life cycle and techno-economic assessment of the CCS value chain. Under CETP Call in 2025, fourteen proposals were received and are presently under evaluation.

### **Specific New Calls under Steel Sectors**

A special call was launched on 23<sup>rd</sup> May 2025 to mobilize academia–industry consortia for deployment of Carbon Capture and Utilization (CCU) technologies in the steel sector through establishment of an innovative CCU test bed (Fig.). The initiative focuses on developing integrated CO<sub>2</sub> capture and utilization units in steel plants, capable of capturing 1–2 tonnes per day of CO<sub>2</sub> with 95–99% efficiency and purity from sources such as blast furnaces, coke ovens, BOF, DRI, and synthesis gas. The captured CO<sub>2</sub> will be converted into value-added products.

### **International Collaborations**

#### **a) United Kingdom**

CCUS Deep Dive Visit organized by British High Commission in United Kingdom (14th –18th July 2025) under the CCUS pillar of the Indo-UK Net Zero Innovation Partnership (NZIP), as part of the broader UK–India Net Zero Innovation Centre initiative. The visit brought together leading researchers, policymakers, and industry representatives through deep-dive sessions, facility tours, technical discussions, and field visits across Heriot-Watt University, British Geological Survey and Imperial Collage, London resulting in strengthened UK–India CCUS collaboration, agreement on formal partnerships, establishment of joint working groups, and development of priority research and demonstration project proposals with defined timelines.

#### **b) Sweden**

DST initiated and participated in the India–Sweden Industry Transition Partnership (ITP) Annual Summit held in Stockholm from 5–9 May 2025 (Fig.), aimed at strengthening bilateral collaboration to decarbonize the steel and cement sectors through innovation and public–private partnerships. Established under LeadIT, the ITP operates through five working groups, with the Innovation Group co-chaired by DST India, SEA, and Vinnova, which in 2025 launched parallel Indo-Sweden calls for feasibility studies supporting large-scale pilots and commercial deployment.



Fig. a) India-Sweden Call for proposals b) Indian Delegation at India–Sweden Industry Transition Partnership (ITP) Annual Summit held in Stockholm. c) Launch of CCUS R&D Roadmap

**DST and Swedish Energy Agency** announced four new Indo- Sweden projects to explore carbon capture, slag recycling, AI-driven concrete optimization and CO<sub>2</sub> reuse in steel/ cement. This is a major step towards greener heavy industries and ViksitBharat@2047.

### **Launch of R&D Roadmap to Enable India’s Net Zero Targets through Carbon Capture, Utilization and Storage (CCUS)**

The Department of Science and Technology (DST) launched India’s first R&D Roadmap for Carbon Capture, Utilization and Storage (CCUS) on 2 December 2025, led by Prof. Ajay Kumar Sood, Principal Scientific Adviser (PSA) to the Government of India, and Prof. Abhay Karandikar, Secretary, DST (Fig.). The roadmap aimed to guide coordinated action, foster collaboration, and mobilize investments to accelerate CCUS deployment, reduce India’s carbon footprint, and support vision of Viksit Bharat@2047, with DST leading implementation through initiatives such as ₹ 1 lakh crore RDI Scheme to strengthen private-sector-led industrial decarbonization.

#### **2.2.4 Solar Energy Research and Development (SERD) Program and Challenge Award**

The SERD program supports R&D in the solar sector through equipment development, technology demonstrations, affordable innovations, and applied research. The Challenge Award specifically aims to accelerate India’s transition to low-carbon electricity by promoting interdisciplinary, multi-institutional R&D in both silicon and emerging non-silicon PV technologies.

The initiative encourages standardization of devices and modules, creation of shared research infrastructure, and joint collaborative projects to overcome commercialization barriers. It emphasizes applied research for niche applications such as BIPV, wearables, IoT devices, and indoor energy harvesting.. It supports technology demonstration, prototyping, and industrial partnerships.

The key highlights are as under:

- **Development of Compact Heat Exchangers for Supercritical Carbon-dioxide Brayton Power Plants for CSP applications**

The team from IISc, Bengaluru is leading the indigenization of Printed Circuit Heat Exchanger (PCHE) technology for supercritical CO<sub>2</sub> (sCO<sub>2</sub>) Brayton power plants targeted at CSP applications, enabling higher cycle efficiencies and a significantly reduced plant footprint compared to conventional steam-based systems (Fig.). The DST-funded project addressed operation under extreme conditions of >700 °C temperatures and >20 MPa pressures, delivering high thermal effectiveness with low pressure drops. A major national milestone was achieved through establishment of India's largest diffusion bonding facility, developed in collaboration with ADA and Hind High Vac (HHV)-a capability previously restricted to a few countries. This breakthrough has strengthened industry confidence, with Triveni Turbines and BHEL moving towards commercialization of sCO<sub>2</sub> technologies using indigenous materials and processes

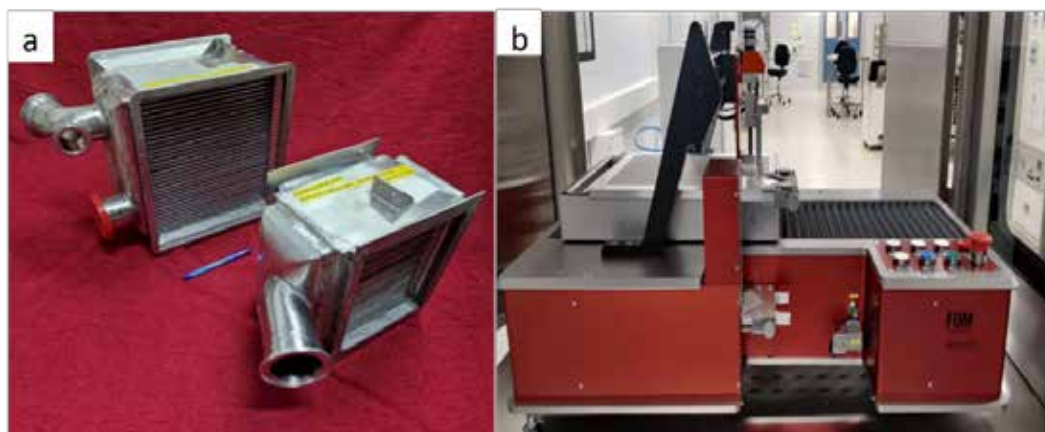


Fig. a) Diffusion Bonded Printed Circuit Heat Exchangers. b) Slot-die coater facility at IIT Madras

- **Demonstration of solution processable, slot-die coated organic photovoltaic modules with >8% efficiency**

ADST-funded project at IIT Madras, led by Dr. Debdutta Ray, focused on the development and demonstration of solution-processable organic photovoltaic (OPV) cells and modules using scalable slot-die coating techniques (Fig.). The team successfully fabricated and validated both fullerene and non-fullerene OPV devices, achieving cell efficiencies of up to 9.1%. The project also developed laser scribing processes for organic and ITO layers, facilitating module fabrication. Prototype OPV modules were fabricated and tested, establishing a strong foundation for further improvements in efficiency, fill factor, and scalable OPV manufacturing in India.

- **Development of a table-top equipment for measurement of the lifetime and**

### diffusion length of minority carriers in silicon solar cells

With the support of DST, AMISOLAR, a complete software-based system is conceptualized, designed and fabricated by Dr. V. K. Jain team, Amity University, which can measure the Lifetime and Diffusion Length for minority carriers in Solar Cells. It is the most important parameter which decides the performance and so the efficiency of solar cells. AMISOLAR can be utilized from any size up to the latest technology of 8" solar cells. AMISOLAR can build a positive benchmark and supports researchers and scientists, working in academic or other laboratory organizations for investigation of solar cells produced in their inhouse facilities. It provides a cost-effective solar cell testing tool, in comparison to any imported equipment. The technology is ready for commercialization.

- **Design and Fabrication of an LED-based solar simulator with integrated electrical and optical measurement capability**

A DST-supported project at IIT Palakkad, spearheaded by Prof. Arvind Ajoy and his team, delivered an indigenously engineered LED-based solar simulator with built-in optical and electrical characterization capabilities, strengthening India's domestic infrastructure for photovoltaic testing and validation (Fig.). The system was developed to meet Class AAA performance standards with high spectral match, spatial uniformity, and temporal stability, in compliance with international testing norms. An integrated GUI-based control system and modular hardware architecture were developed for flexible operation.

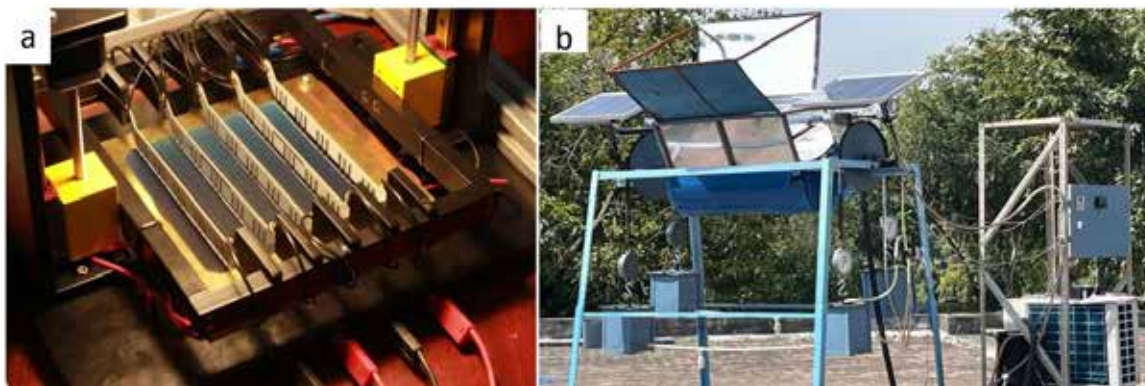


Fig. a) LED-based Solar Simulator System. b) Solar tracking system with collection (thermal and PV collector) and utilization

Key components including the LED light source, driver electronics, probing setup, and I-V tester were successfully designed and validated. The project has resulted in an Indian patent filing and demonstrates strong potential for a cost-effective and indigenous solar cell .

- **Concentrated Solar Air Heater with Passive Tracking Mechanism and Corrugated Receiver**

Dr. Tangellapalli Srinivas and his team at Dr B R Ambedkar National Institute of Technology (NIT) Jalandhar, has developed a concentrated solar air heater with a corrugated receiver, integrated with a passive, water-driven tracking mechanism to significantly reduce electricity consumption for solar tracking (Fig.). The solar thermal–photovoltaic (STPV) collector was assessed through comprehensive simulation and experimental studies, showing close agreement between predicted and observed performance with minimal tracking error. The study demonstrates the potential of low-energy, electricity-free tracking mechanisms for efficient and scalable large-scale solar thermal applications.

- **A 10-kW Pilot PV Plant-Based on Single Axis Solar Tracking System Using Second Lever Principle**

Dr. Sishaj's team at NIT Tiruchirappalli developed a 10-kW pilot photovoltaic plant based on a passive Single Axis Solar Tracking (SAST) system, using a novel water-weight-based second-lever mechanism to eliminate motors and electrical components, thereby lowering energy consumption and maintenance needs. The SAST system achieved an annual energy gain of ~22.9% and a high-performance ratio of 0.765. Techno-economic analysis indicated a payback period of ~6.7 years, highlighting the scalability, sustainability, and economic viability of the passive tracking approach for larger solar installations.

- **Advancement towards Stable and Highly Efficient Solar cell based on Halide perovskite (ASHESH)**

The project led by Dr. Pabitra from TIFR, Hyderabad, focused on developing novel dopant systems and additives to enhance the efficiency and stability of perovskite solar cells. Adduct-based and ambient-processible p-type dopants achieved efficiencies of approximately 24% with improved stability compared to conventional dopants. Three classes of structurally tunable additives were developed to enable material optimization. These additives successfully stabilized low-bandgap (1.49 eV) lead halide perovskites. The outcomes support the development of high-efficiency and stable perovskite solar cell technologies.

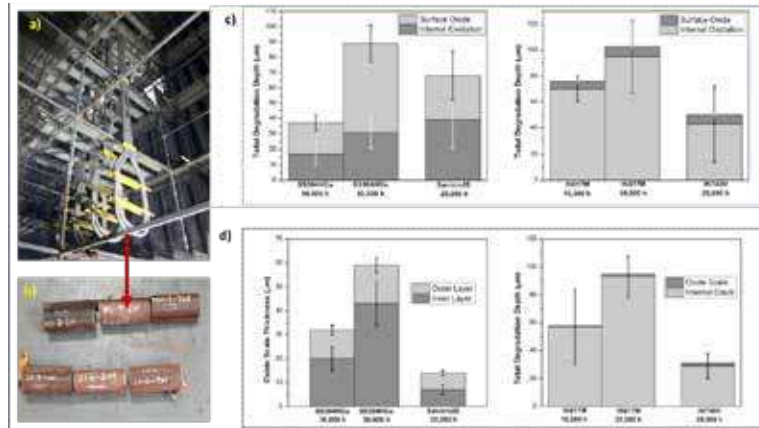
- **DST initiative for Recovery and Recycling of End-of-Life Solar PV Panels/Modules**

During the year, innovative research proposals were supported to develop efficient and environmentally sustainable technologies for the recovery and recycling of end-of-life solar PV panels and modules. The initiative aimed to address environmental and health concerns arising from improper disposal of solar PV waste by promoting optimal recycling and material recovery processes.

The programmes recorded **05 patents, 19 peer-reviewed publications, and 15 conference papers**, along with **one technology led demonstration**, reflecting strong research output and progress toward technology development and deployment.

### 2.2.5 Research & Development on Clean Coal Technologies

- The Fire Side Corrosion and Steam Side Oxidation (FSCTR) test rig was successfully established and operated at the NTPC Dadri 210 MW unit to complete 30,000-hour and 20,000-hour long-term exposure studies of AUSC materials under real boiler conditions, achieving target steam parameters of 710–720 °C and 310 kg/cm<sup>2</sup>. A specially designed heat-transfer test loop fabricated from Super 304H and Ni-based super alloys was deployed inside the boiler. Post-operation analyses carried out by NTPC, BHEL, and IGCAR evaluated fireside corrosion and steam-side oxidation of SS304HCu, IN617M, Sanicro 25, and IN740H. The consolidated results demonstrated superior fireside performance of IN740H and excellent steam-side oxidation resistance of Sanicro 25, validating a zoned material deployment strategy. BHEL and NTPC, in collaboration with IGCAR, have successfully worked together under the initiative of DST to advance AUSC development. .



**Fig.** a) Sample locations of IN740H and Sanicro 25 tubes subjected to long-term exposure studies under real boiler conditions at the NTPC Dadri 210 MW unit b) Samples prepared by cutting the test loop at BHEL–Trichy from IN740H and Sanicro 25 tubes. c) Comparison of fireside corrosion degradation and d) Comparison of steam side corrosion degradation of 10,000 & 30,000.

- The Climate, Energy and Sustainable Technology (CEST) Division, DST formally launched *A Compendium of Clean Coal Technologies* (Fig.) on the occasion of World Environment Day, 05<sup>th</sup> June 2025, at a special event held in New Delhi. The compendium represents a landmark outcome of DST’s Clean Coal Research & Development Programme initiated in Year 2017 and encapsulates results of over seven years of coordinated indigenous R&D efforts. It documents 34 technologies from two National Clean Coal Centres—14 from ARCI Hyderabad, 9 from IISc Bengaluru—and 11 from ten PI-led projects, spanning AUSC power systems, supercritical CO<sub>2</sub> cycles, coal gasification, bio-methanation, carbon capture, methane drainage, and advanced manufacturing, supported by high-performance materials, coatings, fabrication, evaluation tools, and methodologies that strengthen HPPGS and clean coal technologies in India.

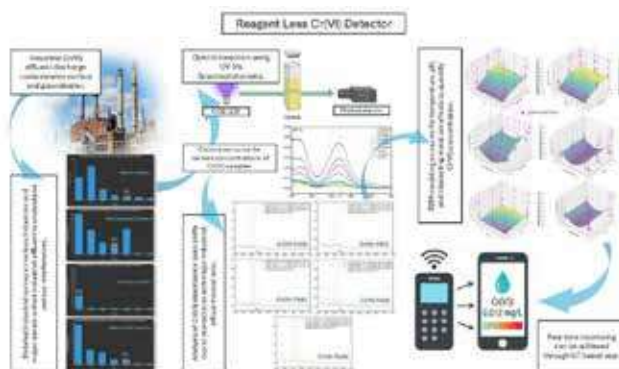


**Fig.** a) Cover page of Compendium of Clean Coal Technologies b) Launch of the Compendium of Clean Coal Technologies by CEST Division, DST, on the occasion of World Environment Day, 5 June 2025, New Delhi.

### 2.3. Water

The Water Technology Initiative (WTI) is a proactive, India-centric *solution science* programme focused on strengthening national R&D capacity and capability to develop research-based solutions for addressing existing and emerging water challenges. The overarching objective of the initiative is to promote R&D activities that facilitate sustainable water sourcing, application-specific water quality enhancement, and the recycling and reuse of water. Several achievements were made during FY 2025-26.

- **Optical Sensor for Chromium Detection in Remote and Rural Waterbody & Industry Water Outlet**



**Fig.** A portable optical sensor device prototype for on-site detection of hexavalent Chromium [Cr (VI)].

A portable hand-held optical sensor device prototype was successfully developed for on-site detection of hexavalent Chromium [Cr (VI)] in water samples across ranges (0.1-30 ppm) (Fig.). Chromium (Cr) detection in water comprising an optical assembly, electronic interface for signal processing & detection, and algorithm for display & remote sensing through app. This is upscaled through interference analyses for sensitive Cr detection,

replication via 3D printing multiple units, standardization and technology deployment, inter-device variability checking, and field sample testing.

- **Development of a Passive and Modular Interfacial Solar-Thermal Desalination System**

Under the support of the Department of Science and Technology (DST), a passive and modular interfacial solar-thermal desalination system has been developed by IISc Bangalore to address key challenges of salt accumulation and limited scalability in conventional solar stills. The project introduces a novel siphon-based desalination (Fig.) approach using a composite siphon formed by a fabric wick and a grooved metallic evaporator surface, enabling continuous water transport while efficiently flushing away salts. The system integrates textured evaporator and condenser surfaces with an ultra-low air gap of about 2 mm, significantly enhancing evaporation–condensation efficiency. By incorporating multiple evaporator–condenser stages, the system achieves effective reuse of latent heat and demonstrates high water productivity. The low-cost, solar-driven technology, developed using simple materials such as aluminum and fabric, shows strong potential for deployment in off-grid, coastal, and water-stressed regions, contributing toward sustainable and decentralized freshwater generation.

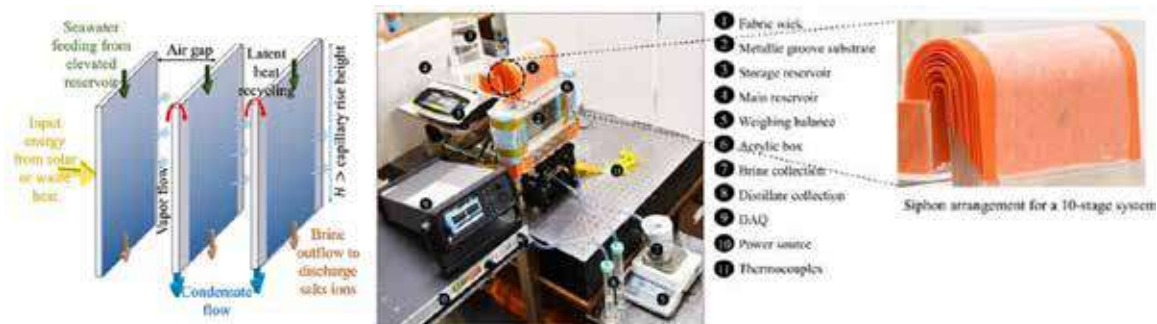


Fig. A multistage siphon desalination system tested in the laboratory

- **Centre of Excellence (CoE) on Membrane Technologies for Desalination, Brine Management, and Water Recycling.**

Under the Department of Science and Technology (DST) support, a Centre of Excellence (CoE) led by IIT Bombay on Membrane Technologies for Desalination, Brine Management, and Water Recycling (DeSaltM) has been established to strengthen India's capabilities in providing safe, reliable, and sustainable drinking water through desalination and wastewater recycling. The CoE focuses on the development of next-generation membrane materials, modules, and processes, including thin film composite (TFC) membranes, surface-modified and layered membranes, innovative pretreatment strategies, and advanced brine management solutions. During the reporting period, significant progress was made in developing high-performance RO, NF, FO, MD, UF,

and electroconductive membranes, along with scalable module configurations and novel interfacial evaporation technologies. The CoE has also advanced mathematical and quantum chemical modelling, membrane reuse and disposal strategies, life-cycle analysis, and pilot-scale testing facilities.

- **Technological Frontier towards Sustainable Treatment of Coal bed Methane Produced Water via Integrated Desalination Contrivance.**

Under Department of Science and Technology (DST) support, the project focused on developing a sustainable, multi-stage treatment system for CBM produced water, encompassing primary, tertiary, and post-treatment processes. The treatment approach targeted removal of oil, grease, suspended solids, and critical contaminants such as  $\text{Cl}^-$ , Cr,  $\text{Na}^+$ ,  $\text{F}^-$ , iron, and organic matter using coagulation/electro-coagulation, gravity filtration, and adsorption through indigenously developed metal-coated bio-sorbents derived from waste biomass. Advanced desalination was achieved using forward osmosis integrated with solar-driven membrane distillation, followed by disinfection through advanced oxidation processes to ensure suitability of treated water for agricultural and potable reuse. During the reporting period, a fully functional laboratory-scale integrated setup was established, primary treatment experiments were initiated, and a comprehensive review on CBM produced water treatment was published in a peer-reviewed journal acknowledging DST support.

- **Water Advanced Research and Innovation (WARI) Fellowship Program**

The Water Technology Initiative at the Department of Science and Technology (DST), Government of India, the University of Nebraska–Lincoln (UNL), the Daugherty Water for Food Global Institute (DWF) at the University of Nebraska, and the Indo-U.S. Science and Technology Forum (IUSSTF) collaboratively established Water Advanced Research and Innovation (WARI) Fellowship Program. This initiative was designed to strengthen long-term Indo-American scientific and technological partnerships by promoting cooperation between students and researchers in the field of water sciences and engineering. 05 interns and 05 fellows were supported under this fellowship in the Year 2024-25.

## **2.4. Overall Outcome and Impact**

Overall, the projects undertaken by Climate, Energy, and Water Technology Initiative have resulted in significant research and technology outcomes. Collectively, these efforts have led to 50 patents, 01 Book, 04 Reports, 238 research publications, 149 conference papers, 38 technology leads, 26 technology demonstrations, and 04 Test beds highlighting strong research productivity and effective translation of innovations toward application.

### 3 National Geospatial Programme (NGP)

National Geospatial Programme (NGP) of Department of Science and Technology (DST), Government of India, continues to strengthen India's geospatial ecosystem by building upon the legacy of the Natural Resources Data Management System (NRDMS), initiated in 1982. Envisioned to address emerging national and global needs, NGP is mandated to catalyse geospatial science and technology, policy support, solution development, capacity building, entrepreneurship, and international cooperation for sustainable socio-economic development at all levels of governance.

The division's recent initiatives and progress across various sub-programmes during this financial year, aimed at accelerating India's leadership in the global geospatial landscape are detailed below:

#### 3.1 Geospatial Science

The Geospatial Science Programme supports fundamental and applied research in domains such as geodesy, hydrology, and geospatial analytics etc. The details of the various initiatives under this program are given below:

##### 1. National Centre for Geodesy (NCG):

In order to create awareness and strengthen indigenous capabilities in the field of geodesy, the National Centre for Geodesy (NCG), established at IIT Kanpur, in collaboration with its six Regional Centers for Geodesy (RCGs), undertook a wide range of lecture series, training programs, workshops, and outreach initiatives during 2025. These efforts included short-term and advanced training programs for Survey of India officials (Fig.), expert brainstorming workshops on next-generation GNSS systems, and a regular NCG–RCG Joint Lecture Series with two lectures per month on geodesy and allied areas. Further, NCG is also planning GeodCon-26, the first national-level conference dedicated exclusively to geodesy, scheduled for March 2026, envisioned as a unifying platform for academia, government, industry, and research institutions.

Core research themes included high-precision GNSS-based reference frame realization, geoid and height system modernization, InSAR-based crustal deformation monitoring, space geodesy techniques (SLR, VLBI, DORIS), ionospheric and space-weather modelling, and emerging methods in Geo-AI and geospatial analytics. Collectively, these studies strengthened the scientific foundation for nationally consistent positioning, navigation, earth observation, and geospatial infrastructure.

These research efforts have generated substantial peer-reviewed scientific outputs, comprising **11** international journal publications, **09** peer-reviewed conference papers, and **18** international conference presentations in the current financial Year. At the International Association of Geodesy (IAG) Scientific Assembly 2025 held in Rimini, Italy, the NCG–RCG

consortium showcased 11 research contributions from India, receiving strong international recognition and inspiring interest among several countries to establish national geodesy centres on the Indian model (Fig.).



**Fig.** Participants of short-Term course on Modern Advanced Geodetic Techniques for Surveying & Mapping (September 15-26, 2025) at NCG



**Fig.** Research scholars of NCG-IIT Kanpur presented their work in Conference of IAG held at Rimini, Italy (Sep 01-05, 2025)



## 2. Regional Geodesy Centres (RCGs):

During this year, RCGs implemented coordinated programs to strengthen geodetic human resources, institutional capability, and field-ready expertise. Short-term and professional training programs were conducted across IIT Bombay, IIT (ISM) Dhanbad, IIST Thiruvananthapuram, IRS–Anna University, MANIT Bhopal, and MNNIT Allahabad, covering GNSS surveying, reference systems, geoid modelling, mine surveying, disaster mitigation, and modern geodetic applications. These efforts were supported by hands-on exposure to CORS, precise levelling, high-end GNSS receivers, and data processing workflows, along with laboratory upgradation, CORS operationalization, SOP development, and outreach activities including expert lectures, joint lecture series, school engagement, and participation of government surveyors and user agencies.

### 3.2 R&D in Geospatial Science

Keeping in view of the changing requirement and to strengthen the country's geospatial science domain, **14 R&D** project proposals supported in last years were on various themes such as geo-kinematics, spatial data generalization, ubiquitous mapping, improved geodetic positioning, geospatial data collection standards, Data exchange platform, Geoid Modelling and large-scale geospatial data cubes etc. Among these, the details of the major outputs in few supported projects have been provided below:

## 1. Integrated Geospatial Data-Sharing Interface (GDI) - as a Pilot Project (Foundation for Science Innovation and Development (FSID)-IISC Bengaluru):

Launched on 20<sup>th</sup> November 2023, GDI addresses persistent challenges of fragmented data availability, non-standard formats, and limited interoperability by enabling standards-based discovery, querying, and processing of geospatial datasets across distributed providers. As of now, the platform hosts over 1,430 datasets onboarded from 48 data providers, marking a significant step towards a federated national geospatial data ecosystem. A major scientific and technological achievement during 2025 was the successful pilot and technology transfer of a federated data-plane architecture (Fig.), demonstrating decentralized data hosting with centralized interoperability, to the IIT Tirupati Navavishkar I-Hub Foundation (IITTNiF) and an industry partner, SIRPI. These efforts were reinforced through close coordination with the Geospatial Data Promotion and Development Committee (GDPDC) of NGP\_2022, collaboration with IITTNiF to accelerate dataset onboarding, and active engagement with ‘Dronagiri’ startups to streamline data-access workflows with Survey of India (Sol) and systematically incorporate user feedback.

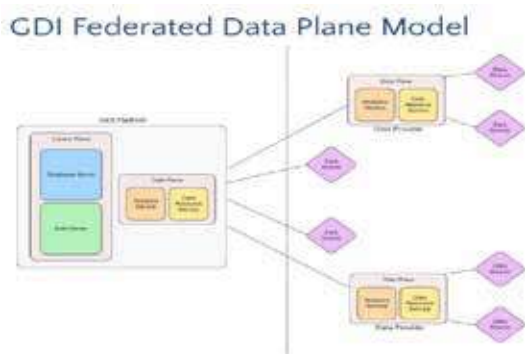


Fig. Federated Architecture of pilot GDI

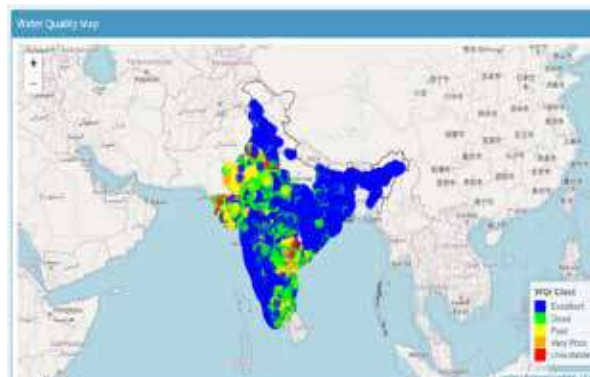
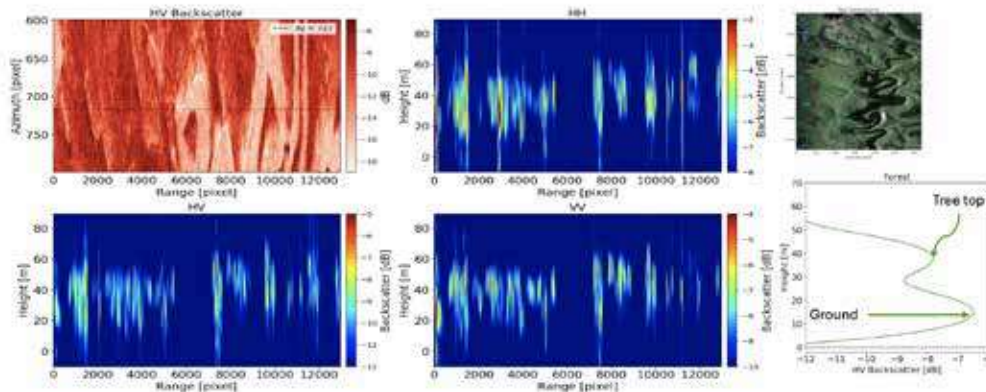


Fig. Water Quality Map on the GDI platform

Interoperability and capacity building were further strengthened through hosting the OGC Open Standards Code Sprint (India node) during March 2025, which advanced adoption of OGC Features, Tiles, and Processes APIs and the STAC community standard within the GDI ecosystem, leading to international recognition by the Open Geospatial Consortium. Complementary capacity-building programmes trained Survey of India officers through online and hands-on workshops at NIGST, Hyderabad. Knowledge dissemination included research outputs on remote sensing analytics and decision-support systems, while industry collaboration was exemplified by a Hexagon white paper demonstrating secure, standards-compliant integration of GDI with enterprise geospatial platforms, collectively reinforcing GDI's role as a core pillar of national geospatial data infrastructure (e.g, Fig.).

## 2. SAR-based 3D Degradation Mapping across the Madhya Pradesh Forest Region- A study by IIT Indore: This study focuses on developing advanced remote-

sensing methodologies for detecting and characterizing forest degradation using multi-temporal satellite observations. During the last year, the project demonstrated the use of time-series optical and SAR data to identify disturbance regimes in central Indian forests, with the Normalized Difference Fraction Index (NDFI) successfully delineating degraded areas in Madhya Pradesh. A major scientific achievement was the development and testing of P-band SAR tomographic techniques for 3-D forest structure retrieval, **positioning the team as part of the global calibration–validation group for ESA’s BIOMASS mission**. This is the **First global mission** capable of providing P-band SAR tomograms. Using simulated BIOMASS data, the project generated forest vertical structure tomograms through beamforming approaches, establishing a computationally efficient framework for future large-scale, three-dimensional forest degradation and biomass assessment once mission data become operational (**Fig.**).



**Fig.** Backscatter in HV Pol and Tomograms obtained in HH, HV, and VV Pol from Beamformer Technique & Pauli Decomposition in RGB over the Study area

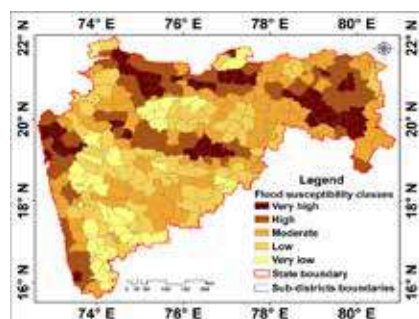
### 3.3 Geospatial Technology

The Geospatial Technology programme aims to catalyze the development of indigenous geospatial and location-specific technologies in India, focusing on strengthening innovation across technology domains, with a focus on enhancing the economic value of existing geospatial solutions and fostering demand-driven, forward-looking innovations.

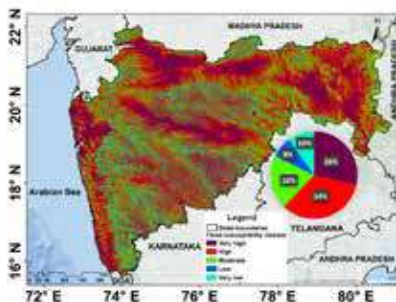
#### 1. Geospatial Information Science and Engineering (GISE) Hub at IIT Bombay

The GISE Hub established in Year 2022 at IIT Bombay, functions as a national multidisciplinary research platform advancing geospatial science, engineering, and systems-level integration. GISE-supported R&D activities which have resulted over **40 peer-reviewed research outputs**, development of deployable geospatial tools, and identification of patentable technologies addressing challenges in water resources, disasters, infrastructure, and environmental monitoring.

The IIT Bombay Campus Digital Twin initiative represents a flagship outcome, demonstrating large-scale integration of Building Information Modelling (BIM), geospatial survey data, and campus-scale spatial databases to create a dynamic digital replica of physical infrastructure. Complementary methodological research includes LLM-based tools for automated thematic classification of unstructured textual narratives, geomorphic flood susceptibility modelling using multi-parameter DEM-derived descriptors (Fig.) and Pareto-ranking frameworks, and near real-time drought monitoring based on the Standardized Precipitation Index (SPI), enabling scalable hazard and climate-risk assessment. The proof-of-concept implementation for the Lecture Hall Complex and Gymkhana, developed in collaboration with industry partners, establishes a research foundation for digital twins supporting infrastructure management, access routing, asset monitoring, and future sensor-enabled simulations (Fig.).



**Fig.** Sub-district-level geomorphic flood susceptibility map (357 sub-districts)



**Fig.** Geomorphic flood susceptibility map of Maharashtra at grid-scale resolution (classified as very low to very high)



**Fig.** Campus Digital Twin: Indoor Surveying of a classroom in LHC complex at IIT Bombay

### 3.4 Geospatial Capacity Building Programme

During this year, the National Geospatial Capacity Building Program significantly expanded geospatial literacy and spatial thinking across educators, students, and youth through structured offline, outreach, and digital initiatives (Fig.). Two offline orientation workshops were conducted in collaboration with State Councils of Educational Research and Training (SCERTs) in Maharashtra and Karnataka (Fig.), orienting 110 school teachers and educators from DIETs and CTEs to spatial thinking concepts and open-source geospatial tools such as Google Earth Pro, Google Plus Codes, and Epicollect5. Simultaneously, two school outreach programmes were held in Pune engaging 50 students from Classes 6–8, providing hands-on exposure to satellite image interpretation, land use–land cover change analysis, and location-based data collection to demonstrate the role of spatial thinking in everyday decision-making. Each programme engaged 25 selected students from Classes VI to VIII drawn from different schools, fostering early exposure to geospatial concept

Youth and higher-education engagement was strengthened through the “Youth for Spatial

Futures” national knowledge event, attended by over 185 school and college students and faculty members from across India, featuring technical and thematic sessions by national and international experts on geospatial science, SAR remote sensing, sustainability, and policy applications. Complementing physical engagements, sustained dissemination through social media platforms enabled continuous outreach, with the programme building a digital community of over 2,000 followers on LinkedIn and an expanding presence on Instagram. Collectively, these initiatives enhanced educator capacity, fostered early student exposure to geospatial technologies, enabled national-level knowledge exchange, and established a scalable framework for sustained geospatial capacity building in alignment with national priorities.

In addition, DST-IGET portal ([www.dst-iget.in](http://www.dst-iget.in)) supported by the Division, is continue to serve as a repository of knowledge and resources for aspiring geospatial professionals. With an extensive database of tutorials covering GIS, Remote Sensing, Spatial Analysis, the portal (dst-iget) has become a cornerstone of capacity-building efforts, attracting nearly 8000 visitors every month. The portal hosts a large bank of theme-specific tutorials on geospatial technologies that can be accessed from anywhere across the world



**Fig.** Young students building spatial thinking skills by mapping trees and recording field observations using Epicollect5.



**Fig.** Head NGP addressing the educators in Bengaluru outlining India's geospatial policy framework and the importance of spatial thinking in strengthening education and governance.

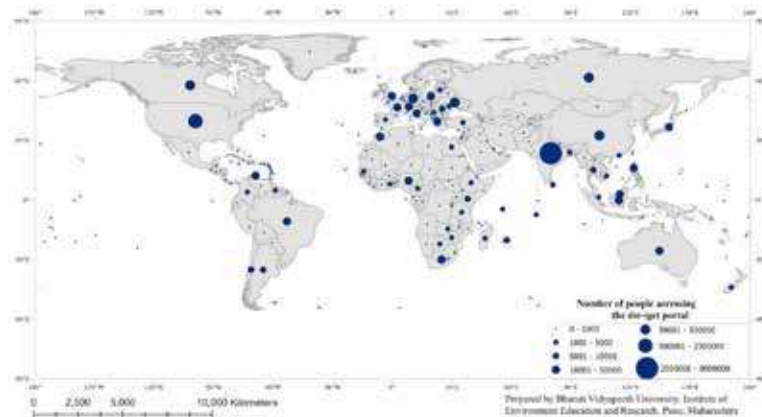


Fig. Major countries accessing dst-iget portal (<https://dst-iget.in>)

### 3.5. International Collaborations

The Division has made steady progress in enhancing India's geospatial capabilities through international collaborations with organizations such as United Nations Global Geospatial Information Management (UNGGIM), Open Geospatial Consortium (OGC), Brazil Russia India China South Africa (BRICS) Cooperation, Indo-Africa collaborations etc. Details of the notable activities are as below:

1. **Participation in the 4<sup>th</sup> Meeting of the BRICS WG on 'Geospatial Technologies and Applications'**: As one of the founder members of the BRICS, the Divisional officer participated virtually in the 4<sup>th</sup> Meeting of the BRICS WG on Geospatial Technologies held 30 September 2025, and delivered a presentation highlighting India's policy-driven and implementation-focused geospatial ecosystem. The presentation aligned the National Geospatial Policy 2022 with BRICS objectives, emphasizing AI-enabled geospatial infrastructure, data democratization, interoperability, and capacity building. Key initiatives such as Operation Dronagiri, the Integrated Geospatial Data Sharing Interface (GDI), and PM GatiShakti National Master Plan were showcased as scalable models for collaborative research, disaster resilience, sustainable development, and evidence-based governance across BRICS member states.
2. **61<sup>st</sup> Plenary of ISO/ TC 211 at Gothenburg, Sweden**: As a part of the Indian Delegation, Divisional officer participated in the 61<sup>st</sup> ISO/TC-211 Plenary Meeting held in Gothenburg, Sweden, from 19-21 November 2025, highlighting country's approach to implementing geospatial standards in line with global best practices. The engagement outlined India's multi-layered strategy for mainstreaming geospatial standards across the national ecosystem, including the creation of accurate and authoritative datasets aligned with globally harmonized geodetic reference frameworks, and the development of an open-standards-based national geospatial platform for seamless data discovery, access, and integration.

## 4 National Initiative for Developing and Harnessing Innovations (NIDHI)

The program focuses on nurturing ideas and innovations (knowledge-based and technology-driven) into successful startups through a series of interventions and initiatives. The focus of the program is on building an innovation-driven entrepreneurial ecosystem with an objective of national development through promoting problem-solving innovative solutions with market potential to make India Atmanirbhar. NIDHI is a comprehensive end-to-end startup support scheme to nurture startups from ideation to commercialization. It includes a variety of components for Startups like PRAYAS (for early-stage funding and mentoring), seed funding and accelerators. For institutions, programs such as NIDHI Technology Business Incubator (TBI), NIDHI inclusive-Technology Business Incubator (iTBI) and NIDHI Centre of Excellence provides support for operation and capital expenditure for setting up of startup incubators.

The different components of program and key activities undertaken during the year are as follows;

### 4.1 NIDHI - CoE (Center of Excellence)

The NIDHI–Centre of Excellence (NIDHI-CoE) initiative aims to strengthen and upgrade the existing incubation capabilities of Technology Business Incubators (TBIs), enabling them to evolve into world-class, state-of-the-art startup incubation centres, which further support promising startups in translating technological innovations into market-ready products and scalable, high-growth ventures. The Department of Science and Technology (DST) has supported nine NIDHI-CoEs across premier institutions in the country, located at CIIE–IIM Ahmedabad; SINE, IIT Bombay; PSG-STEP, Coimbatore; TBI–Vel Tech University, Chennai; KIIT-TBI, Bhubaneswar; EDC, NCL Pune; FITT, IIT Delhi; T-Hub, Hyderabad; and FIRST, IIT Kanpur.

NIDHI-CoE at IIM Ahmedabad was inaugurated by Dr. Jitendra Singh, Hon’ble Union Minister of State (Independent Charge), Ministry of Science and Technology on 12 January, 2026



Fig. NIDHI CoE at IIM Ahmedabad, inaugurated by Hon'ble Union Minister of Science and Technology, Dr. Jitendra Singh

## 4.2 NIDHI TBI (Technology Business Incubator)

The Technology Translation and Innovation (TTI) Division of the Department of Science and Technology support Technology Business Incubators (TBIs) in and around academic, technical, and management institutions. Their goal is to harness indigenous innovations for venture creation by leveraging institutional expertise and infrastructure. DST-supported TBIs offer comprehensive support to startups and innovators, including physical workspace, research and laboratory infrastructure, intellectual property facilitation, networking and mentoring opportunities. At present, 39 NIDHI-TBIs supported by DST are actively contributing to the promotion and growth of startups and entrepreneurship across the country. Some of these incubators are NIDHI TBI at IISER, Kolkata; Shri Vishnu Engineering College for Women, Bhimavaram, and IARI PUSA, New Delhi, amongst others.

## 4.3 NIDHI – iTBI (inclusive-Technology Business Incubator)

The initiative aims to inculcate the spirit of Innovation & Entrepreneurship (I&E) amongst the students, innovators and entrepreneurs, encourage and support innovative ideas, startup creation through incubation. The i-TBI program focuses on promoting entrepreneurship and supporting i-TBIs primarily in Tier-2 and Tier-3 cities, with an emphasis on inclusivity in terms of geography, gender, and persons with special abilities, etc. Currently, 48 inclusive-Technology Business Incubators (iTBI) are operational across the country. Collectively, these iTBIs have onboarded more than 1,000 startups and innovators, of which over 225 startups have received financial support. The total revenue earned by these supported startups exceeds ₹ 48.39 crore, reflecting cumulative business performance over multiple years. Women entrepreneurship has shown strong representation, with 162 women-led/founded startups, out of which 52 have successfully commercialized their products. Since the inception, the programme has facilitated the filing of over 200 patents, and 120 patents and other intellectual property rights have been granted, demonstrating significant progress in innovation and knowledge creation.

In a landmark development to boost innovation and entrepreneurship in Jammu & Kashmir, Dr. Jitendra Singh, Hon'ble Union Minister of State (Independent Charge), Ministry of Science and Technology, inaugurated cutting-edge facilities on 25th August 2025 at IUST's inclusive-Technology Business Incubator (iTBI).



**Fig.** Hon'ble Minister of Science & Technology, Dr. Jitendra Singh Inaugurating DST iTBI at Islamic University of Science and technology, Awantipura, J&K, on 25th August 2025



**Fig.** Dr. Jitendra Singh, Hon'ble Minister of Science & Technology at DTU-Innovation and Incubation Foundation (DTU-IIF) established under DST's NIDHI-iTBI Programme

Some of the promising products from startups incubated at NIDHI CoEs, NIDHI TBIs and i-TBIs are given below:

**a) Exodrone Systems Pvt. Ltd.**

Exodrone Systems incubated at NIDHI TBI at JNTUH, Hyderabad is a drone manufacturing startup that distinguished itself as a designer, developer and a manufacturer of Carbon composite Multicopters, fixed-wing and VTOL systems in India. These platforms have been used across agriculture, defense, and industrial applications with payloads like multispectral, thermal and LiDAR sensors. Recently, the company has signed collaborative business partnerships in South Africa, Morocco and Cyprus and has exported systems to Germany, USA and Dubai among others.



**Fig.** Drones developed by Exodrone Systems Private Limited

### b) Tectogreen Drone & Robotics Private Limited

Tecto Green Technology Pvt. Ltd. incubated at NIDHI TBI at IARI-PUSA, Delhi operates in the domain of precision agriculture, leveraging drones, IoT, AI, and mobile ICT to address labor shortages, chemical exposure risks, and inefficient pesticide use in Indian farming. The company has developed a patented dual-spraying drone apparatus enabling both solid (seed/granular) and liquid spraying, integrated with real-time disease identification and precision application via a user-friendly mobile app. Tecto Green's autonomous drone system combines disease detection, localized treatment recommendations, and precision spraying in a single platform.



Fig. Agri-Tech solutions developed by Tectogreen Drone & Robotics Pvt. Ltd.

### c) SetV Global

SETV Global incubated at NIDHI CoE at T-Hub, Hyderabad addresses the challenge of high costs and long timelines for synthesizing complex pharmaceutical intermediates through a multi-divisional model: SETV.W delivers AI-powered diagnostic tools integrated with existing medical imaging; SETV Pharma operates as a CDMO accelerating API timelines through advanced intermediates; and SETV Learn builds future-ready healthcare talent.



Fig. Illustration of technology developed by SetV Global

**d) Gigaton Research Pvt. Ltd.**

Gigaton Research incubated at NIDHI CoE at SINE, IIT Bombay is revolutionizing large-scale graphene production in India using proprietary microwave-assisted technology to produce high-purity, defect-free graphene with consistent flake size and thickness. The startup provides customized graphene solutions for applications across energy storage, composites, conductive inks, electronics, aerospace, and defence, along with R&D support for material integration.



**Fig.** Products developed by Gigaton Research Pvt. Ltd.

**e) Pragyani AI Pvt. Ltd.**

Pragyani AI Pvt. Ltd. is an AI-driven hardware and software startup focused on developing affordable and indigenous solutions for precision agriculture and smart automation in India, including GNSS-based land leveling, tractor auto-steering, and smart irrigation systems. The startup was nurtured by the DAVV Incubation Centre, Indore under the DST NIDHI i-TBI scheme.



**f) Suka Smart Solutions Pvt. Ltd.**, an incubatee of NEC iTBI, Kovilpatti, is pioneering grassroots innovation from a Tier-3 city by reusing electronic components from discarded

devices to reduce e-waste and make technology accessible to rural students. Suka Smart aims to expand pan-India, impacting millions of students and thousands of institutions, while driving its vision of “Driving Innovation with E-Waste” to bridge the urban–rural innovation divide and foster an inclusive, sustainable innovation ecosystem.



**Fig.** Aftermarket Components extracted from E-Waste and sorted for use in new innovative hardware projects.

#### 4.4 NIDHI- Promoting and Accelerating Young and Aspiring technology entrepreneurs (PRAYAS)

DST’s NIDHI – PRAYAS (PRomoting and Accelerating Young and ASpiring technology entrepreneurs) launched in 2016 is currently being implemented by 46 centres. Over the years, following impact has been generated :

- Total of 2408 innovators have been supported cumulatively
- Around 1790 prototypes have been successfully developed
- ~900+ patents have been filed by the innovators
- Cumulative funding raised ~₹ 975 crores
- Revenue generated ~₹ 410 crores
- 8800+ jobs generated

**Some of the success stories of NIDHI PRAYAS are as follows:**

- **Akashalabdhi Pvt Ltd** incubated at TIDES, IIT Roorkee, PRAYAS Centre developed a portable communication hub designed for disaster response and remote areas. Featuring a low-power mainboard with flexible frequency ranges and protocols, it supports hundreds of connections, local encrypted data storage, and battery backup. Easily powered by standard power banks, it ensures reliable connectivity in emergencies.



Fig. Portable communication hub

- **Plenome Technologies Private Limited** incubated at HTIC, IIT Madras PRAYAS Centre is building a unified healthcare ecosystem, enabling secure medical data interoperability powered by consortium blockchain and vertically integrated AI that empowers patients, doctors, and enhances efficiency in care delivery.



Fig. Product developed by Plenome Technologies Private Limited

- **Coratia Technologies Private Limited**, incubated at FTBI, NIT Rourkela PRAYAS Centre developed a heterogeneous communication system enabling seamless data exchange between an underwater ROV, an aerial drone, and an autonomous surface vehicle (ASV). The system ensures coordinated operations across air, surface, and underwater domains for applications in inspection, surveillance, and environmental monitoring.



Fig. Communication system developed by Coratia Technologies Private Limited

#### 4.5 DST- NIDHI Accelerator Programme:

Department of Science and Technology, in its quest to accelerate growth-stage companies, supports NIDHI Accelerator programmes every year. NIDHI Accelerators are positioned as post-incubation initiatives linked with the existing incubators to supplement, complement the scaling up of the start-up value chain. NIDHI Accelerator is aimed to help aspiring entrepreneurs in the country, including the ventures already being incubated at TBIs, to be guided in a rigorous and more structured manner, through a deep mentoring process and access to funding and market networks. During Year 2025-26, DST has supported 15 accelerator programmes to **grow and scale-up** around 300 startups. The outcomes of these programmes are mentioned below:

Jeevtronics Pune

the world's first dual & triple powered hand cranked bi-phasic defibrillators



Ahamune Pune

Topical treatment for vitiligo



Craste (Fuma Labs),  
Morena Madhya Pradesh



Toxin-free, green Furniture material from Agro waste



Fig. Products developed by the cohort startups under the Leap Global Accelerator implemented at Venture Center, Pune

#### 4.6 NIDHI- Seed Support Program (SSP)

NIDHI- Seed Support Program (SSP) provides early-stage financial assistance through incubators to potential startups with promising ideas, innovations and technologies. During the Year 2025-2026, seed support has been provided to 07 new incubators and 27 incubators with ongoing support as subsequent releases under NIDHI-SSP to further extend financial assistance to deserving startups. During this period, 100+ startups benefited under NIDHI SSP. A few notable success stories of the NIDHI-Seed Support Program for this year are as under:

- **NadiPulse Prognostics Pvt. Ltd** - A health-tech startup pioneering the convergence of Ayurvedic diagnostics and modern biosensor technology was supported under the NIDHI-SSP through SIDBI-Innovation & Incubation Centre (SIIC), Indian Institute of Technology (IIT), Kanpur. The company launched the nPulse, a non-invasive pulse-based diagnostic device integrated with mobile applications for doctors and patients. The solution has been clinically tested on over 5,000 patients, achieving diagnostic accuracy of 98.54%, and has resulted in the creation of a proprietary dataset spanning 20+ health conditions.



Fig. nPulse developed by NadiPulse Prognostics Pvt. Ltd



Fig. Ayush IT Solutions Award to NadiPulse Prognostics Pvt. Ltd

- Indiesemic Private Limited** - a fabless semiconductor startup specializing in the indigenous design of RF modules and AI-enabled IoT System-on-Chips (SoCs) based on a VEGA processor architecture, enabling intelligent, low-power edge applications was supported under NIDHI- SSP through Gujarat University Startup & Entrepreneurship Council (GUSEC), Ahmedabad. The startup launched India's first *Indigenous IoT Evolution Board* in collaboration with C-DAC during SEMICON-2025, effectively bridging academic research with industrial deployment.



Fig. Launch of Indigenous IoT Evolution Board during SEMICON-2025

- Abyom SpaceTech and Defence Private Limited** was also provided NIDHI- SSP through GUSEC, Ahmedabad. Abyom is India's first SpaceTech company focused on full-stack space engineering solutions for reusable launch vehicles, space infrastructure, and dual-use defence technologies.



Fig. Rocket engine testing facility developed by Abyom

Abyom has been featured in Forbes 30 Under 30 Asia 2025 and Forbes Select 200 Companies with Global Business Potential (2024). The startup established India's first premier commercial rocket engine testing facility and successfully completed a pilot program with IIT Bombay.

- **Vemsa Biotech Pvt. Ltd** supported under NIDHI-SSP through Science and Technology Park University of Pune has successfully developed and commercialized a first-of-its-kind nano-engineered nasal drug for Parkinson's disease, designed for direct nose-to-brain delivery. The formulation enables effective bypassing of the blood–brain barrier, leading to faster onset of action, enhanced brain bioavailability and significantly reduced systemic side effects compared to conventional therapies.



Fig. Products developed by Vemsa Biotech Pvt. Ltd

- **Ekosight Technologies** - an agritech startup supported under the NIDHI-SSP through CIBA, working to make scientific soil testing and farm advisory accessible at the grassroots level. The NIDHI-SSP support enabled Ekosight to move from concept and prototyping to full product development, pilot deployments, and commercial rollout. The solution has reduced farmers' dependency on centralized laboratories and enabled faster, data-driven decision-making at the farm level.



Fig. Soil testing kit developed by Ekosight



Fig. Interaction with agri-entrepreneurs

- **Rymo Technologies Pvt Ltd**, incubated at IKP EDEN Bangalore and supported with NIDHI-SSP has developed compact, robotic, game-based rehabilitation devices: Mobi-L and Mend to empower both patients and rehabilitation professionals with affordable, engaging, and modular solutions for physical therapy. Mobi-L delivers 20+ upper- and lower-limb exercises with VR/gaming and objective progress tracking, deployed across

rehab clinics nationwide, with 120+ devices in India and pilot programs in Italy, the UAE, and Southeast Asia.



Fig. Products developed by Rymo Technologies

## 5 National Council for Science and Technology Communication (NCSTC)

The programmes of National Council for Science and Technology Communication (NCSTC) Division, Department of Science and Technology (DST), are largely aimed at communicating and popularizing science and technology (S&T) to masses and stimulate scientific temper as per article 51 A, as enshrined in the Constitution of India. The initiatives taken by NCSTC have been towards dissemination of knowledge in interesting, informative and innovative formats using multiple means to enable delivery of S&T in every nook and corner of India.

**Highlights of various activities and achievements are summarized here under different areas:**

### 5.1 31<sup>st</sup> National Children's Science Congress (NCSC):

The 31<sup>st</sup> National Children's Science Congress (NCSC) was held in Bhopal, Madhya Pradesh from 3<sup>rd</sup> to 6<sup>th</sup> January, 2025 wherein 607 child scientists selected from state level CSC presented their projects. The theme for the 31st National Children's Science Congress (NCSC) was "*Understanding Ecosystem for Health and Well-being*". 53 evaluators from various institutes of India evaluated the projects of child scientists in various parallel sessions under the supervision and guidance of National Academic Committee (NAC) of National Children's Science Congress (NCSC).



Fig 3.5.1. Glimpses of 31<sup>st</sup> National Children's Science Congress (NCSC) , Bhopal

## 5.2 Release of Theme and Activity Guidebook of National Children's Science Congress (NCSC):

Theme and Activity Guidebook of National Children's Science Congress (NCSC) – 2026-27 developed by National Academic Committee was released during India International Science Festival (IISF 2025), Panchkula, on 6<sup>th</sup> December, 2025 by Dr. Jitendra Singh, Hon'ble Minister of S&T and ES, Prof. Ajay Sood, Principal Scientific Advisor and Prof. Abhay Karandikar, Secretary, DST. The theme of NCSC-2026-27 is “*Science and Innovation for Sustainability*”



Fig 3.5.2. Release of Theme and Activity Guidebook of National Children's Science Congress (NCSC) during India International Science Festival (IISF ' 2025)

### 5.3 National Science Day- 2025 (NSD-2025):

For the celebration of National Science Day on 28<sup>th</sup> Feb 2025 throughout the country in befitting and coherent manner, different state councils were clubbed in three groups like northern, southern and northeastern regions. Northern zone consists of state councils from Gujarat, Punjab, Bihar, Uttarakhand, Haryana, Himachal Pradesh, Madhya Pradesh and Uttar Pradesh. Southern zone consists of state councils from Kerala, Chhattisgarh, Tamilnadu, Maharashtra, Karnataka, Goa, Telangana and Jharkhand. Northeastern zone consists of Assam, Mizoram, Arunachal Pradesh, Manipur, Nagaland, Meghalaya, and Sikkim. Various engaging scientific activities like Science Kit/video/app making, Poster presentation, VIGYANOTSAV – National Science Day Quiz 2025, Rally, Seminar/Workshop were conducted in schools, colleges, institutes, and universities. Technology enabled special sessions for especially abled students were also conducted. These activities benefited more than 6,35, 894 students, teachers and common men across India.

To popularize science, technology, research and innovation among Indian youth, an inspiring lecture from Union Minister of State (Independent Charge) Science & Technology; Dr Jitendra Singh was delivered on 28<sup>th</sup> Feb 2025 at Vigyan Bhawan.

First National Science Day lecture on topic “*Preparing for an are Artificial Intelligence Powered Future*” was conducted by Shri Shashi S. Vempati, Co-Founder AI4India to give a brief overview of Indian AI models, LLMs and Generative AI in domains like Indian Knowledge System, India’s cultural Diversity and Health sector.

Second National Science Day lecture on topic “*Bummock*” was conducted by Prof. Sanjay Behari, Director, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Kerala to spread importance of not so visible aspects of education, research and innovation from life.

Apart from these activities, technology launch/transfer, like flag- off of S&T road show through E tractor and E tiller, inauguration of inclusive technology business incubators and felicitation of PURSE universities were disseminated.



Fig. 3.5.3 Glimpses of National Science Day , 28<sup>th</sup> Feb 2025 , Vigyan Bhawan, New Delhi

#### 5.4 Science on Wheels:

National Council of Science and Technology Communication (NCSTC) Division commenced Science on Wheels in the State of Maharashtra, West Bengal, Andhra Pradesh and Delhi. In Maharashtra, the bus travelled across 22 schools in 16 tribal villages of Trimbakeshwar Tehsil, Nashik District. Till date, 9348 beneficiaries including 240 teachers have been benefited through interactive science learning using hands-on activities, STEM demonstrations, and exposure to emerging technologies to spark scientific curiosity. In West Bengal, the bus travelled across 36 schools of North 24 Paragana District, benefitting 8,000 students with interactive science education especially in Scheduled Caste and backward areas.

In Andhra Pradesh, the bus travelled across 60 schools of Alluri Sitharama Raju District benefitting 40,500 students thus reviving the glory of Indian Science and Technology through interactive sessions and exhibits on Indian Mathematics, Astronomy, Art & Architecture, Ancient Archaeological System, Food Culture, Crafts, Weaving, Handloom Textiles, Pottery, Metal Work, Healthcare System, Metallurgy, Soil Conservation, and Power Generation in ancient times. In Delhi, the bus created awareness among 4150 students on the highly relevant theme '*Clean and Green Energy*'.



Fig. 3.5.4 Science on Wheels

#### 5.5 Low-Cost Teaching Aids

The program is to empower teachers and trainers in understanding the importance of learning through hand-on and/or through one's own personal experience and not simply based on what is written in text books. The program will specifically benefit teachers and students, particularly those who have limited or no access to laboratories or explore, discover and carryout experiments of themselves at home/school. A total of 32 programmes for capacity

building of 1200 teachers with low-cost teaching aids were organized in different states to motivate science teachers to perform hand on activities that would enable students for easily grasping the basic principles of science with fun. Approx. 5,00,000 students of the country were encouraged through these programmes.



Fig. 3.5.5 .1 Describe the motion of waves and explain the structure of DNA, Determining the value of pi using thread.



Fig. 3.5.5.2 Centripetal Force and Centrifugal Force

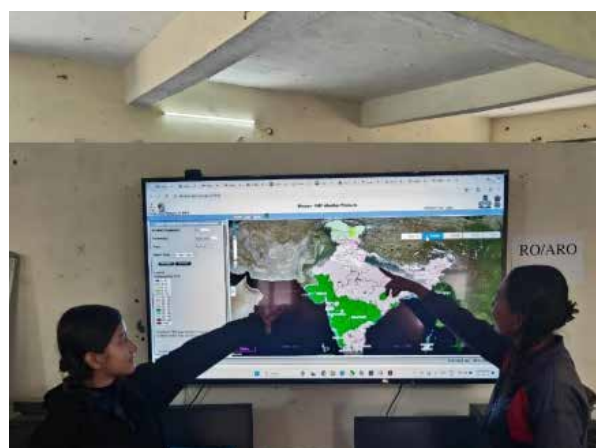


Fig. 3.5.5.3 Hands-on activities in Rajasthan

## 5.6 A training program has been initiated using ISRO Bhuvan App & Data Collection Devices on Climate Change Monitoring and Analysis in 50 selected schools of Pauri Garhwal, Almora and Rudrapur District of Uttarakhand.

This program aims to enable students and teachers to integrate sensors (temperature, pressure, humidity, light intensity, gas, etc.) with controllers, gaining practical experience in electronics and coding. It will also introduce students to data visualization and interpreting sensor data. It will also familiarize students with ISRO BHUVAN software to explore satellite imagery, maps, and geospatial data layers for understanding real-world applications. This will help students comprehend the importance of geospatial data in environmental monitoring

and climate change analysis. It will also provide students and teachers with the knowledge and tools to understand the diverse micro-climate zones in Uttarakhand, where climate data changes significantly over just a few kilometers, impacting climate predictions.



Fig. 3.5.6 Students using ISRO Bhuvan app & Data Collection Devices

## 6 Science for Equity Empowerment and Development (SEED)

The Science for Equity Empowerment and Development (SEED) Division supported around 152 new and on-going projects aimed at the socio-economic development of disadvantaged communities through targeted Science, Technology, and Innovation (STI) interventions. These projects were implemented under various schemes, including the Scheme for Young Scientists & Technologists (SYST), Technology Interventions for Disabled & Elderly (TIDE), Strengthening, Upscaling & Nurturing Innovations for Livelihood (SUNIL), Science & Technology for Women (STW), Scheduled Caste Sub Plan (SCSP), and Tribal Sub Plan (TSP), enhancing livelihoods and quality of life.

SYST encourages young scientists and technologists towards delivery of science and technology (S&T) led solutions for identified socio-economic challenges including areas such as artificial Intelligence, Robotics and IoT for Societal Application in—Agriculture—Rural Development—Health, Nutritional Supplements and Value-added Food Products for Human and Animals, Natural Resource Based Livelihood Systems etc. During the year, a total of 37 ongoing projects were supported.

The TIDE programme focuses on the development of affordable and adaptable Science and Technology (S&T) solutions to enhance autonomy and quality of life for Persons with Disabilities (PwDs) and the elderly. 21 new projects have been supported under the theme of assistive and rehabilitative technologies for disabilities, including solutions for speech and hearing disorders, digital accessibility tools for the blind and visually impaired, and mobility-enhancing devices such as exoskeletons, prosthetics and adaptive vehicles.

The SUNIL programme is designed to promote social enterprise development for the Economically Weaker Sections (EWS) of society by supporting networked projects and location-specific technology delivery models. During the current year, 21 ongoing projects

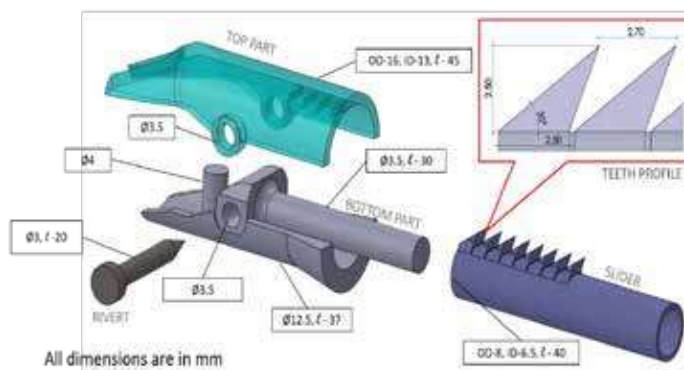
have been supported. The programme places strong emphasis on enhancing science and technology (S&T) knowledge, skill development, and capacity building, with the broader goal of improving livelihoods and overall socio-economic well-being.

The STW programme contributed to the Mahila Kisan Sashaktikaran Pariyojana (MKSP), sub component under the Deendayal Antyodaya Yojana- National Rural Livelihood Mission (DAY –NRLM) for improving the income of the rural women population. Four Women Technology Parks (WTPs) have been set up in Uttar Pradesh, Tamil Nadu, Sikkim, and Arunachal Pradesh to promote gender equality and empower women through science- and technology-based solutions.

**Key achievements of the programmes are highlighted below:**

### **6.1. Design and development of self-locking shoes for obese/diabetic/elderly persons by SASTRA Deemed to be University**

An affordable, low-cost self-locking shoe to enhance daily mobility for individuals who face physical challenges in wearing traditional footwear. This technology addresses common hurdles such as bending down or manual lacing, which can be difficult for the elderly or those with limited flexibility. A linear ratchet and pawl mechanism was engineered to allow smooth sliding and secure interlocking. A patent for this proprietary self-locking mechanism has been filed.



**Fig.** 3D model of the proposed self-locking shoe with integrated mechanism

### **6.2 Automatic Brushing device for Oral Hygiene maintenance in Elderly population by CSIR-CSIO Chandigarh**

An automatic U-shaped toothbrush to enable elderly individuals with restricted manual dexterity to maintain oral hygiene independently. This device reduces the physical effort required for effective dental care, addressing the needs of populations who may otherwise depend on caregivers for daily activities. The system features a replaceable mouthpiece

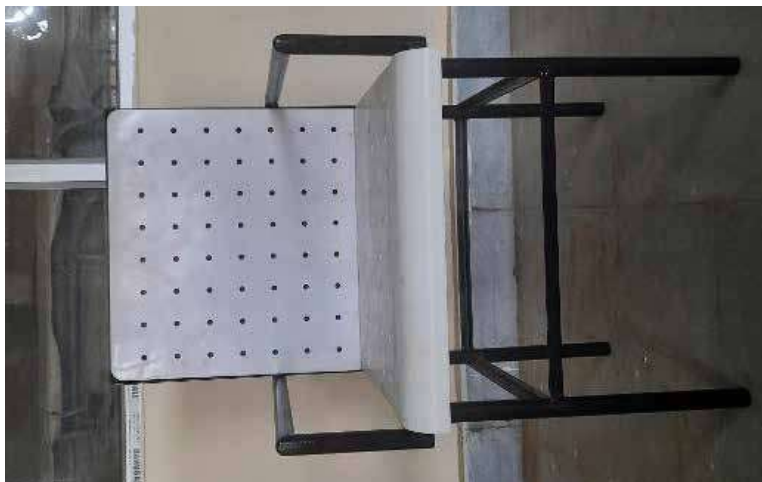
and an external control module that automates water delivery, paste application, and waste suction. High-quality, biocompatible materials were utilized in the construction to ensure user safety and comfort.



**Fig.** Prototype of the automatic brushing device featuring distinct mechanical movements

### **6.3. Design and Development of bath-chair for safe bathing of elderly by National Institute of Technology Silchar**

A specialized bath-chair has been engineered to provide a secure and comfortable bathing experience for elderly individuals. The design is specifically tailored for use in personal bathrooms, old-age homes, and care facilities where safety during personal hygiene tasks is a priority. The chair can be easily manufactured and assembled, making it suitable for small bathroom settings. A functional prototype was successfully completed with a focus on ergonomic support and user safety.



**Fig.** Functional bath-chair prototype designed for safe use in residential bathroom environments

#### 6.4. Voice-Enhanced Assistive and Safety Device for Elderly Persons by Karunya Institute of Technology and Sciences

Communication challenges for elderly individuals with weak or disordered speech are addressed through a handheld assistive device and mobile application. The system clarifies and amplifies the user's voice in real time, enabling clearer communication with family and caregivers. It offers two modes: a speech amplification and a command mode for audio messages in multiple languages. Integration with home automation allows users to control household fixtures via voice commands, fostering greater independence.



Fig. Handheld voice-enhanced assistive device designed for clear and independent communication

#### 6.5. Development of a Contextually Adaptive Travel Aid for the Visually Challenged by Indian Institute of Technology Delhi

Safe and independent travel for the visually impaired is facilitated by a modular travel aid that integrates obstacle detection with real-time navigation. The system is designed to provide environmental awareness through a combination of haptic feedback and smartphone connectivity. A body-attachable sensing unit was fabricated to detect obstacles and communicate distances via vibrations. Gesture-based controls, such as forward or twisting motions, were integrated to trigger emergency calls or navigation updates on a paired mobile application. User trials validated the system's effectiveness in improving orientation and reducing navigation errors.



Fig. AI-based Exercise Chair designed for personalized therapeutic movement and monitoring

### 6.6. AI-Based Healthcare Solutions for Elderly and Diabetic Individuals by Christ College of Engineering

Physical therapy is transformed into a passive yet beneficial activity through an AI-based Exercise Chair. The system aims to improve circulation and cardiovascular health in patients who may face physical or psychological barriers to traditional exercise. The chair utilizes artificial intelligence to adapt exercise intensity dynamically based on real-time sensor data from the user. An engagement-based feature was also incorporated, where exercises are synchronized with video content to encourage adherence. This development has transitioned into a startup venture for large-scale commercialization.



Fig. Inter cropping of Cucumber & Sponge Gourd at Hazaragrant

### 6.7. Design and Development of a Wearable Device for Motion Assistance in Paraplegic Patients at B V Raju Institute of Technology

Mobility for individuals with lower-body paralysis addressed through a wearable robotic assistive device. The system provides powered assistance and structural support to enable

users to stand and walk with reduced fatigue. An aluminium-based mechanical structure was designed to support body weight and transfer torque from actuators to the legs. This innovation represents an advancement in improving the quality of life and independence for individuals with paraplegia.



**Fig.** Robotic assistive device prototype designed for paraplegic mobility and support, and evaluation of the wearable device during sit-to-stand-to-sit movement trials

**6.8.** A fully standardized process for Lactose-free milk powder (LFMP) with enhanced solubility, nutritional value for lactose-intolerant consumers has been developed at National Dairy Research Institute Karnal, Haryana

**6.9.** An integrated bioprocess for the production of value added compound from the waste marigold flowers has been developed at Visvesvaraya National Institute of Technology, Nagpur, Maharashtra. The final products include an enzyme concoction rich in cellulose and xylanase, high quality compost following FCO norms and poultry meal rich in oligosaccharides with antioxidant and antimicrobial properties.

**6.10.** An IoT enabled Solar-VRFB storage integrated smart charging station for sustainable e-mobility has been developed at Birla Institute of Technology and Science (BITS), Pilani, Hyderabad Campus, Telangana. This comprehensive technology package/solution will help the beneficiaries at different levels of EV penetration (2-Wheeler, 3-Wheeler, 4-Wheeler Battery powered EVs).

**6.11.** Strengthening Resource Efficiency by GEAG, Gorakhpur in Small Farm-Based Livelihoods through Biologically Integrated Farming Systems in Flood-Prone Areas of Eastern Uttar Pradesh: A science-based integrated farming programme was implemented in 10 flood-prone villages of Campierganj Block (Rapti catchment) to improve small farm livelihoods. Through the Land–Lab–Land approach, crop diversification, multilayer farming, soil testing and green manuring, fertilizer costs were reduced by 39.7% and irrigation costs by 28%, while soil organic carbon increased from 0.47% to 0.61%. Restoration of three wetlands improved

water-holding capacity by over 20%, benefiting 76 households, around 100 farmers and four women-led SHGs, and strengthening climate-resilient and sustainable livelihoods.

**6.12.** Livelihood generation for rural youth through innovation, training & entrepreneurship promotion by Vigyan Ashram, Pune: A solar PV–based climate control system for polyhouse farmers was developed using DC-powered evaporative cooling with low-cost temperature and humidity sensors. The system was field-tested with 10 farmers across Pune, Ahillyanagar and Solapur districts and also supports AI-based pest identification using image recognition, backed by over 5,000 images and climate datasets for a farmer-focused mobile app. Additionally, Black Soldier Fly rearing technology was standardized to convert 2 MT/day of urban bio-waste into protein-rich poultry feed for tribal farmers, with a patent filed for the BSF breeding chamber.

**6.13.** Strengthening Livelihood Systems of Rural Communities through On-Farm and Off-Farm Interventions by University of Dharwad, Karnataka: The Initiative developed an integrated livelihood technology and skill package to boost income and resilience among rural households in Dharwad taluka. A baseline survey of 500 households guided demonstrations of drudgery-reducing tools and micro-enterprise technologies, including improved cookers, biomass stoves, weeders, millet processing machines, and harvesting tools. Hands-on training enabled beneficiaries, especially women, to diversify incomes through on- and off-farm activities. The initiative earned a UAS Dharwad Incentive Award and featured in NASE and Krishimela exhibitions.

**6.14.** Strengthening the Local Innovation Systems through S&T Interventions for Enhancing Livelihood System Efficiency of EWS in Villages of Haridwar District, Uttarakhand PSI: Dehradun introduced climate-resilient agriculture and precision irrigation technologies to improve water use efficiency, rural livelihoods, and support 118 EWS households. Farmer-friendly Packages of Practices, developed via soil health studies and demonstrated with KVK Haridwar, increased yields of 16 crops by 13–35%, enhanced soil fertility, water productivity, and farm incomes, while reducing market dependence. Additionally, 147 SHG women received training in Aipan art and cow-dung products, and 120 cattle keepers benefited from improved livestock health and milk yields.



**Fig.** Inter cropping of Cucumber & Sponge Gourd at Hazaragrant

**6.15.** Ensuring Energy security and green livelihood of rural communities of Tripura using affordable Solar Energy and local resources by NBIRT-Tripura: A localized, resilient Green Livelihood Ecosystem to enhance energy access, value addition, and market resilience for farmers and artisans. Hybrid Solar Cold Storage (5 MT) prevented potato spoilage was established, while PVT-based Hybrid Solar Dryers enabled year-round, low-contamination processing. Solar-powered Bamboo Common Facility and Innovation Centres improved bamboo product quality, and Bamboo Reinforced Ferrocement panels provided sustainable housing. Around 90 artisans witnessed 50–65% income growth, 92 farmers benefited from storage, dryers, and biogas units, and seven SHGs gained direct market linkages.

**6.16.** Medicinal plants in Himalayan Mountains as major source of health and livelihood security by HRG Shimla, developed and commercialized FSSAI-compliant Chirayita Tea Sachets, marketed as Chirayita Liver Detox Herbal Infusion since March 2025, fulfilling over 100 orders. Scientific validation through phytochemical, trace element, and antimicrobial analyses confirmed key bioactives in *Swertia cordata*. Cultivation, value addition, packaging, and marketing were strengthened via the Farmer Producer Company “*Mountain Grains*,” benefiting ~500 rural households at ₹ 300/kg while conserving wild stocks. The initiative delivered a trusted wellness product and earned Dr. Lal Singh the Himachal Gaurav Puraskar-2025, alongside the Environment Leadership Award.

## 7 Scheduled Cast Sub Plan (SCSP) and Tribal Sub Plan (TSP)

Established to empower SC and ST communities through science-led development, the SCSP and TSP Schemes supported around 73 new projects across agriculture, health, energy, sanitation and livelihood technologies during the reporting period. The People and Protected Areas (PPA) programme, has been implemented with 16 NGOs, benefited about 30,000 tribal people in forest fringe areas with sitespecific, affordable technology support. In addition, 20 Science, Technology & Innovation Hubs (13 for SC and 7 for ST) have been set up nationwide to address livelihood challenges, strengthen local capacities, improve productivity and skills, and foster inclusive, sustainable growth for SC/ST populations.

### 7.1. Geospatial Empowerment for Inclusive Development

**SC/ST Cell at KSCSTE, Kerala,** established a dedicated SC/ST Cell in Kerala to enhance scientific awareness and sustainable livelihoods among SC/ST communities. The initiative developed a GIS-enabled Sustainable Livelihood Framework by integrating participatory surveys from over 1,200 settlements with AI-driven spatial analytics, resulting in a Geospatial Livelihood Information System to identify gaps in agriculture, NTFPs, skills, water access, housing, and connectivity. Alongside this, 16 skill-based training programmes and the ASPIRE Programme provided tribal students with hands-on exposure to research labs and STEM learning, strengthening scientific empowerment, preserving traditional knowledge, and promoting viable micro-enterprise opportunities.



Fig. Snapshots from skill-based training programmes on agriculture, allied livelihoods, NTFP value addition, and women-led microenterprises conducted by the SC/ST Cell, KSCSTE

## 7.2. Tiruvallur District Coir-Based STI Hub for SC Livelihood Enhancement by S.A. Engineering College, Tiruvallur, Tamil Nadu

The STI hub transformed traditional coir processing into a technology-driven, value-added set up. By introducing mechanized systems such as automatic fiber extractors, rope-making units, and coir pot-making machines, the project reduced drudgery by over 60% and increased productivity. Targeting Scheduled Caste (SC) communities, over 320 beneficiaries, including 30% women, were trained in fabrication, value addition, and entrepreneurship. With three IPRs secured (one utility patent and two design patents), the initiative enabled micro-enterprise creation, promoted eco-friendly bio-composite products, and supported sustainable rural livelihoods.



Fig. Display of Innovative Coir Products fabricated by PI & his Student Teams

### 7.3. Natural Resource–Led STI Advancement for Primitive Tribes in North Sikkim

The GBPNiHE, with MLAS Dzongu, strengthened livelihoods of 1,178 ST households in Dzongu and Kabi by reversing declining large cardamom productivity and diversifying incomes. Interventions included improved seed and sucker propagation, soil health management, polyhouses, composting units, low-cost solar kilns, and development of 35 value-added products. Community-based ecotourism and market linkages, including Dalley chilli exports added income streams. The project empowered SHGs, enhanced climate resilience, and established an STI Hub and Common Facility Centre for sustained, long-term tribal livelihood growth.



Fig. SHGs developed and sold value-added food products at the GBPNiHE, SRC stall

### 7.4. Ladakh Organic Seed Innovation for Tribal Livelihoods Implemented by HMAARI, Leh

The project revitalized temperate vegetable seed production in Leh, Ladakh, supporting 56 Scheduled Tribe (ST) farmers. Through focused training, scientific selection of onion, cabbage, and Swiss chard varieties, distribution of 5,600 Swiss chard seedlings, use of low-cost inputs, and establishment of an underground vegetable cellar for vernalization, farmers were enabled to produce quality seed locally. The initiative helped beneficiaries attain national-level seed yields, secure premium prices reduce reliance on outside seed markets, and strengthen income and livelihood security in the cold-arid region.



Fig. Field awareness and displaying of harvested onion seeds

## 7.5 Mariculture Innovation Hub for Sidi Tribal Livelihoods established by ICAR–CMFRI, Kochi

The STI Hub at Veraval, empowers the Sidi Scheduled Tribe (ST) community by strengthening indigenous marine skills for technology-enabled livelihoods. The Hub introduced sea cage and seaweed farming systems, an indigenous RAS, laboratories, and a customized vessel with simplified protocols for first-generation practitioners. Through hands-on training, continuous guidance, 46% women's participation, beneficiaries gained modern mariculture skills, reduced dependence on irregular wage labour, and accessed structured, technology-enabled income pathways, fostering long-term economic resilience and inclusion.



Fig. STI Hub ICAR, featuring a custom vessel for seaweed and sea cage farming

## 7.6 Rajasthan Tribal TB Initiative

Technology-Driven Detection and Control in Udaipur AIIMS Jodhpur, in collaboration with NTEP and district health systems, implemented a community-based TB detection program for Scheduled Tribe (ST) communities across Udaipur, Sirohi, Dungarpur, Banswara, and Chittorgarh, Rajasthan. The initiative included door-to-door screening, sputum collection, Microscopy/TrueNAT/CBNAAT testing, local-language counselling, and TB-Mukt Panchayat awareness workshops. Over 4,013 individuals from 805 households were screened, identifying 39 confirmed TB cases (5% drug-resistant). Training 81 frontline health workers and engaging over 1,000 community members reduced stigma, improved early treatment,

and supported tribal livelihoods by minimizing health-related income loss and migration-linked TB transmission.



**Fig.** Beneficiaries benefiting from community-based TB detection and awareness, improving health and livelihoods

## 7.7 Innovating Thar

Natural Fibre Geotextiles for Soil Conservation and Rural Livelihoods in Marwar, Rajasthan, IIT Jodhpur, in collaboration with local departments, technologies were demonstrated in Marwar, Rajasthan to combat soil erosion and desertification by cultivating local fibres—Aakda, Saniya, Coir, and Khimp—and producing durable geotextiles on transformed Anugraha looms. Eco-friendly fibres enhance soil carbon, prevent erosion, and replace plastic nursery pouches. Over 41 SC beneficiaries received artisan cards, while 11 satellite centres generated incomes. The initiative promotes sustainable, climate-resilient livelihoods and safeguards the Thar landscape.

## 7.8. Science-Led Valorization of Monpa Heritage Foods for Sustainable Livelihoods in Arunachal Pradesh by CSIR–North East Institute of Science & Technology

An initiative for the Monpa ST community addressed low incomes and inconsistent quality in traditional food practices like manual oil extraction and fermentation. By scientifically validating and standardizing indigenous products—including Bhim Kol fermented beverages, pineapple-based ferments, jams, and juices—hygienic, market-ready foods were developed while preserving cultural heritage. Village-scale processing units and optimized protocols tripled beneficiaries, raised household incomes by 125%, promoted agro-waste valorization, and strengthened SHGs, empowering women and youth with sustainable livelihoods.



Fig. Developed value-added products: Ethnic beverage, juices, jams, and sauces

## 7.9 From Fish Waste to Future Livelihoods Transforming Leather Value Chains in Bhangar, West Bengal

In Bhangar I and II Blocks, South 24 Parganas, CSIR–CLRI implemented an STI-based initiative to uplift Scheduled Caste communities by converting invasive janitor fish and market skin waste into high-value leather. A decentralized network sourcing ~400 kg skins daily from 110+ markets trained local collectors in scientific preservation. Optimized processing yielded durable fish leather. Six hands-on programs trained 87 beneficiaries—about 70% women—in value addition, entrepreneurship, and sustainable production, reducing bio-waste, addressing ecological challenges, and creating stable, resilient livelihoods.



Fig. Fish Skin Preservation Training, Fish Skin Processing and Community Capacity Building

### 7.10 Revitalizing GI Marayoor Jaggery through Clean Technology and Tribal Livelihood Innovation in Idukki, Kerala by STI Hub

With CSIR National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram at Marayoor and Kanthaloor in Idukki district, an energy-efficient, steam-based non-centrifugal sugar system was demonstrated to modernize jaggery making and preserve the GI-tagged uniqueness of Marayoor Jaggery by reducing energy use, health risks, and carbon footprint while increasing income. Hygienic FSSAI-compliant processing and nutritional profiling improved product quality and market trust. Training and APEDA-linked exports strengthened awareness and access, especially for ST communities like the Muthuvan tribe.



Fig. Marayoor Jaggery modernized through energy-efficient STI Hub processing

### 7.11. Tribal Tech to Market: Araku–Paderu STI Hubs for Sustainable Livelihoods in Andhra Pradesh by GITAM Institute, Visakhapatnam

An innovative STI-led livelihood model was implemented in the Araku Valley and Paderu Division for remote tribal regions integrating scientific beekeeping, Niger seed cold-press oil extraction, solar cold storage, vegetable processing, and quality testing enabled over 1,000 ST beneficiaries from 27 villages to shift from subsistence activities to value-added enterprises. Community resource persons, women-led SHGs were trained and, the intervention achieved 30–40% higher honey yields, 20–30% lower post-harvest losses, and 3–4 fold income gains from Niger.



Fig. Premium “Araku Honey” developed through the STI Hub using scientific beekeeping and hygienic processing, supporting tribal livelihoods.

### 7.12 Solar-Powered Sanitation Innovation Empowering SC Women in Sulur, Tamil Nadu Coimbatore

A solar-powered garbage collection system was co-developed with Bannari Amman Institute of Technology to support SC women sanitation workers and strengthen urban waste management. Smart roadside bins with solar drying and fill-level alerts, along with a lightweight solar pushcart using BLDC motor and battery swapping, enable hauling up to 350 kg. Source-segregated compartments improve hygiene, safety, dignity, skills, and income stability, creating cleaner, energy-efficient surroundings and a replicable model for inclusive urban livelihoods.



Fig. Solar Powered Garbage Collection Vehicle and Redesigned Roadside Garbage Bin as a Solar Power Generator

### 7.13. Advancing Biomedical Careers and Empowering SC/ST Communities in Kerala through Participatory Research and Education at SCTIMST, Kerala

55 SC/ST beneficiaries gained advanced biomedical education, hands-on research training, and exposure to healthcare innovation. Through fellowships, scholarships, mentorships, and

laboratory experience, participants published 30 papers, presented at 22 conferences, filed 03 patents, and delivered award-winning presentations. The initiative enhanced technical skills, employability, and socio-economic mobility, creating a sustainable pipeline of skilled biomedical professionals from marginalized communities.



**Fig.** Student training sessions at SCTIMST empowered SC and ST community members in Kerala with hands-on biomedical research skills, mentorship, and career opportunities.

#### 7.14. Digital Tribal Hub Empowering Konda Reddy Livelihoods in Telangana with Malla Reddy Engineering College, Hyderabad

Addressed livelihood and sustainability challenges of the Konda Reddy tribe by creating a science-driven, culturally rooted digital ecosystem. A PVTG portal integrates an AI-based plant scanner, ethno-medicinal knowledge repository, GIS-enabled eco-tourism mapping, and a Tribal Market e-commerce platform. Co-created with the community and refined through local data, it strengthens income, preserves traditional knowledge, enables direct market access, builds digital skills, diversifies livelihoods, and improves nutritional and economic security, offering a scalable model for sustainable PVTG development.



**Fig.** Empowering Konda Reddy Tribal Livelihoods through a Community-Led, Technology-Enabled Knowledge and Market Platform

### 7.15. Coimbatore Red Tamarind Innovation Hub for Tribal Livelihoods by Institute of Forest Genetics and Tree Breeding Coimbatore

A novel, low-cost technology extracts stable, high-quality red anthocyanin from unripe red tamarind for jams and cosmetics using field-adapted steps—depulping, deseeding, maceration, filtration, evaporation, and simple formulations. Rich in cyanidin-3-glucoside, the pigment offers superior colour stability with antioxidant, antimicrobial, and preservative benefits. Patented and scaled via women SHGs, the innovation trained 170 tribal members, established two FSSAI-licensed hubs, reached 22 hamlets, and now sustains incomes for nearly 300 households while building skills, confidence, entrepreneurship, and local market access, nationwide visibility.



Fig. Red tamarind jam prepared by tribal SHGs using innovative, patented anthocyanin extraction

### 7.16. Green Putola Kendra Empowering ST Women through Biodegradable Toy Innovation in Assam by IIT Guwahati

The Green Putola Kendra created a technology-enabled livelihood ecosystem for Scheduled Tribe (ST) women in Assam by combining biodegradable polymer science with 3-D printing and craftsmanship. Over 65 women gained skills in digital manufacturing, printing, finishing, and entrepreneurship to produce eco-friendly, market-ready toys. Two 3-D printing labs, national and international exposure, and participation in events like Advantage Assam 2.0 enhanced visibility and demand. The initiative promotes sustainable alternatives to plastic toys, women-led income generation, and a scalable model for green rural entrepreneurship.



**Fig.** women in Assam creating sustainable toys through 3D printing, eco-friendly polymers, and skill-based livelihoods

## 8 National Good Laboratory Practice (GLP)

**National GLP Compliance Monitoring Authority (NGCMA)** was established by the **Department of Science & Technology (DST), Government of India**, with approval of the Union Cabinet on April 24, 2002. A vast number of countries require manufacturers of chemicals viz. Industrial chemicals, Pharmaceuticals (Human and Veterinary), Agrochemicals, Cosmetics Products, Food/ Feed Additives, Medical devices, etc., to establish through data that use of these chemicals does not pose any hazards to human health and the environment. Non-hazardous nature of chemicals needs to be established through studies and data, which will be examined by the regulatory authorities of the concerned countries.

**Good Laboratory Practice (GLP)** is a quality system, which has been evolved by **Organization for Economic Co-operation and Development (OECD)** used for achieving the above goals. GLP-compliance is **voluntary** in nature. Industries/ test facilities/ laboratories dealing with above chemicals and looking for approval from regulatory authorities before marketing them, may approach to the NGCMA for obtaining GLP Certification. India is “full adherent to OECD Council Acts related to Mutual Acceptance of Data (MAD)” since March 03, 2011. This facilitates sharing and acceptance of results/data generated in GLP certified TFs among 38 member-countries of the OECD and 7 non-member full adherent countries to MAD, thus removing the technical barriers to trade.

**Beyond compliance monitoring, NGCMA has placed strong emphasis on capacity building, awareness creation, and harmonization of GLP understanding across stakeholders.**

Some of the major achievements of GLP Programme during the year are given below:

- i. **India as Chair of the OECD’S Working Party on GLP:** Head- NGCMA, DST chaired the 38th meeting of Working Party (WP) on GLP at OECD Headquarters, Paris, France

during April 16-18, 2024. India is first non-member, full adherent to MAD country in South-Asia to be designated on the Bureau as the Chair of the WP on GLP.

- ii. **GLP Certification:** During the financial year, one new TF was certified as GLP compliant after thorough inspection and review of facilities. Further, 09 existing TFs were re-certified as GLP compliant as per the laid down procedures of NGCMA. Also, surveillance inspections for the certified TFs, under the National GLP programme were conducted by NGCMA, as per procedures.
- iii. **Training Courses and Capacity Building Programmes:** To augment capacity building in the area of GLP, NGCMA organized the following training programs/ workshops during the year:

#### **1. Sensitization Workshops on GLP for Students and Researchers**

The workshops served as an introductory platform for academic participants to understand regulatory expectations and quality-driven research practices. The sessions addressed OECD GLP principles, roles and responsibilities under GLP, documentation systems, test item and test system management, archiving, and the National GLP Programme in India. The workshop also highlighted the importance of GLP awareness in academia and research, particularly in preparing students for careers in regulated scientific environments. Through the three Sensitization Workshops (August 26, 2025, October 29, 2025 and December 18, 2025) around 300 participants, were exposed to OECD Principles of GLP.

#### **2. Training Programme for Quality Assurance Personnel of GLP Test Facilities**

NGCMA organized a three-day Training Course for Quality Assurance (QA) Personnel of GLP Test Facilities during October 15-17, 2025 at New Delhi. The training was designed to harmonize understanding of GLP requirements among QA professionals from different GLP Test Facilities across the country. The programme covered advanced topics including risk-based QA programmes, facility-based and study-based inspections, auditing of critical phases, computerized systems, data integrity, archiving inspections, and multi-site studies. In addition, the interactive sessions, workshops and discussions among participants contributed to strengthening QA Unit's competence across GLP test facilities. Approximately 75 participants attended the training course.



Fig. GLP training course for Quality Assurance personnel

## 9 Technical Research Centres (TRCs)

The Technical Research Centres (TRCs) were established as a follow-up of the budget announcement made by the Hon'ble Finance Minister of India in his Budget Speech in FY 2014-15 to achieve translation of research into products and processes for greater economic and societal benefits. Accordingly, 05 TRCs were established in 05 Autonomous Institutions of Department of Science and Technology (DST) viz. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram; International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad; Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru; Indian Association for the Cultivation of Science (IACS), Kolkata and S. N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata during Year 2015-16. The TRCs are contributing towards strengthening country's excellence in science by striking right balance between fundamental research, directed development and deployment in the following areas

S. No.	TRC	Broad Areas of Translational Research
1.	SCTIMST, Thiruvananthapuram	Medical Device Technologies (Cardiovascular, Neuroprosthetics, Hard Tissue Devices, Biological & Combinational Products and In Vitro Diagnostics)
2.	ARCI, Hyderabad	Alternative and New Energy Materials & Systems
3.	JNCASR, Bengaluru	Nanotechnology and Materials Science
4.	SNBNCBS, Kolkata	Materials Science, Nanoscience, Nanotechnology and Biomedical Science
5.	IAIACS, Kolkata	Nanomaterials, quantum materials, functional polymers and other organic molecules and systems

The first phase of 05 years of the TRC programme was completed in Year '2021 and the second phase of 05 years will conclude in March' 2026.

TRCs have been instrumental in building R&D translation ecosystem by supporting advancements in technology readiness levels (TRLs) and intellectual properties (IP), streamlining multi-stakeholder involvement (including industry-academia partnerships), technology out-licensing, setting-up platforms for start-ups, and strengthening state-of-the-art R&D infrastructure. Several technologies have been commercialized and many of them are at different stages of developments for transfer to the industries. The significant achievements and the work done by the TRCs during the FY 2025-26 are given below.

### 9.1. International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad

The activities encompass several sub-programs organized into four main areas: (i) Energy storage (including batteries and supercapacitors), (ii) Energy conversion (fuel cells), (iii) Energy efficiency (such as magnets for motors and waste heat recovery), and (iv) Renewable energy generation (including Solar Concentrated Solar Power (CSP) and photovoltaic (PV) systems. Some of the major achievements are given below:

#### Energy Storage (Batteries and Super capacitors)

1. The Centre has demonstrated large scale demonstration (20kg/batch) of sodium vanadium phosphate (NVP) cathode powder material by solid state method which delivers a capacity of  $108 \text{ mAhg}^{-1}$  at 0.1C. An agreement has signed with M/s. Voltasun Pvt Ltd for the fabrication and supply of NVP pouch cells using large scale synthesized NVP cathode material for field trials.



**Fig.** Large scale demonstration of NVP cathode material by solid state method with the production capacity of 20kg/batch

2. Demonstrated large scale production (20kg/batch) of  $\text{LiFe}_{0.5}\text{Mn}_{0.5}\text{PO}_4$  (LFMP). The scaled-up material delivered specific discharge capacity of 113, and  $85 \text{ mAh g}^{-1}$  at 1C, and 5 C, respectively.
3. LFP-LTO cylindrical (18650) cells and pouch cells have been fabricated using indigenous electrode materials, LFP as cathode, and LTO as anode suitable for drone and EV

applications. The cells exhibited high-rate capability up to 12C-rate and good cycle life with a capacity retention of 96% for 1000 cycles at 1C-rate. The field trial of LFP-LTO cells is in progress.

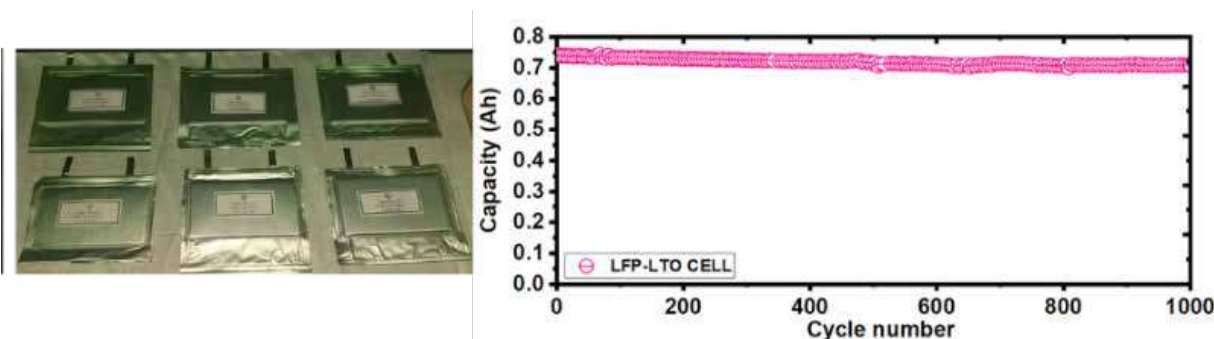


Fig. Fabrication of LFP-LTO (cylindrical & pouch) cells and its cycle life

### Energy Conversion (fuel cells)

4. A unique process has been developed for hydrogen generation through Proton-Exchange-Membrane (PEM) based Electro-Chemical Methanol Reformer (ECMR). The above technology has been scaled up to 5.0 kg/day Hydrogen production capacity along with required BoP components and the agreement for transfer of technology to M/s Infihydro solutions, LLP, Ahmedabad was signed during ESTIC 2025.
5. In a first-of-its-kind demonstration, ARCI showcased a mobile PEMFC-based backup power solution for telecom towers using a plug-and-play model. The demonstration was conducted at a telecom tower of a reputed service provider in the Pune Municipal Corporation limits, with Resicorre Technologies, Nashik, as the industrial partner



### Renewable energy generation (CSP and PV systems)

6. Scaled up the production of  $\text{TiO}_2$  quantum dot coating sols and established super hydrophilic-based anti-soiling coating on 1 m x 2 m PV panels using a semi-automated spray system. Field validation is in progress using ARCI's PV test rig facility.
7. Stoichiometric single cation perovskite ink with extended shelf-life were synthesized in large-scale. Perovskite solar cell module developed using industrial slot-die coating process delivered power conversion efficiency 14.3%



Fig. 1kWh TES integrated with existing PTC Test Rig at ARCI

8. A 1 kWh indigenous thermal energy storage (TES) prototype system was successfully integrated and demonstrated with ARCI's parabolic trough collector (PTC) test rig. The TES prototype showed a high thermal efficiency of 76 %. The focus is on developing high-temperature stable selective absorber coatings for the collector (with solar absorptivity > 95% and thermal emissivity < 0.2 at 400°C) as part of ARCI's efforts to indigenize CSP technology.

### 9.2 Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram

37 new projects are being implemented under TRC Phase 02 in the broad areas of Neuroprosthetics, IVDs & combination products, Cardiovascular devices, Orthopaedics and Dental devices. Several new facilities like Human Amniotic Membrane (HAM) Bank, Usability Engineering Lab, Common Infrastructure Management Platform and IP Management System have been created. A National exhibition was held at INSA, New Delhi and 22 indigenously developed medical technologies that have been transferred to industry were showcased as

a part of outreach activities under TRC. Significant achievements during the current year are given below :

- The MoU for Certification of Reference material as Bhartiya Nirdeshak Dravyas (BNDTM) for Biological Evaluation of Medical Devices/Biomaterials was signed with CSIR – National Physical Laboratory on 9th May 2025.
- A MoA has been signed with ICAR-CTCRI (Central Tuber Crops Research Institute) on the development of starch-based membranes for oral drug delivery. The formal signing ceremony has been organized in CTCRI Office, Trivandrum, on 11.07.25.
- MoU between SCTIMST and M/s Faith innovations for the collaborative development of HOCl releasing gel systems was signed on 19th December, 2025
- BONYX – a Drug-Eluting Bioceramic Beads and CASPRO – a Drug-Eluting Bioactive Cement were commercially launched.
- License agreements for Deep Brain Stimulator (Shree Pacetronix Ltd), Intracranial Electrodes (Synapticore Technology Pvt. Ltd), Plasma Protein Purification Technologies (Synapticore Technology Pvt. Ltd), Chitosan-based Antibiotic-Eluting Wound Dressings (Vranova Biotech Pvt. Ltd) and Surgical Bioprosthetic Heart Valve (BL Lifesciences Pvt. Ltd) were executed

### 9.3 S. N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata

TRC-SNBNCBS aim at translational research in the areas of health care and food security, environmental protection, spectroscopic techniques and optical instrumentation and value addition to metal and alloy industry

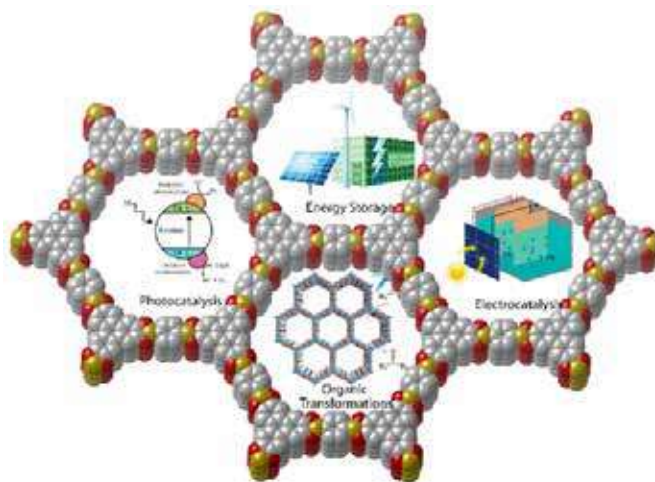


Fig. Covalent Organic Frameworks

1. Covalent Organic Frameworks (COFs) is a major research focus at TRC-SNBCBS, particularly for developing green photocatalysts to produce clean hydrogen fuel from sunlight and water, and for challenging chemical transformations like breaking tough C-F bonds. Functional COFs for Water Splitting and Energy Storage,  $H_2O_2$  from water splitting under ambient conditions and sunlight has been demonstrated. COFs tunable structures, porosity, and electronic properties were used for tasks like hydrogen peroxide production and C-N bond formation, showing promise for sustainable energy and advanced chemical synthesis.

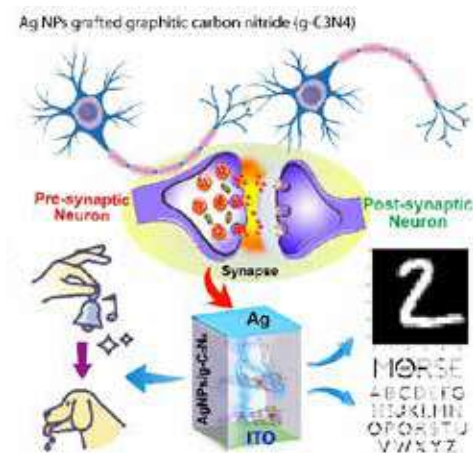


Fig. (Ag NPs) grafted onto graphitic carbon nitride (g- C3N4g)

2. Advanced, hybrid materials composed of Ag nanoparticles (Ag NPs) grafted onto graphitic carbon nitride (g- C3N4g) nanosheets for applications in both energy-efficient computing and photocatalysis has been demonstrated. An “AgCN” system where Ag nanoparticles are embedded within mesoporous g-C3N4g to create a robust, biomimetic, memristive system has been developed. These devices enable gradual and continuous resistance modulation, essential for next-generation AI, learning, and pattern detection.

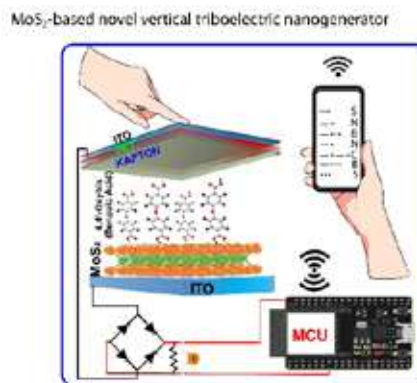


Fig. MoS<sub>2</sub> based Novel TENG

- Advanced Triboelectric Nanogenerators (TENGs), focusing on novel materials like 2D transition metal dichalcogenides (TMDCs) for high-performance, self-powered systems, creating devices that harvest energy from mechanical motion (like walking, wind, or touch) for applications in wearable tech, self-powered sensors, UV detection, and the Internet of Things (IoT), often integrating them with other technologies for enhanced functionality and output are being developed at TRC-SNBNCBS. A Self-Powered Triboelectric Nanogenerator for internal pressure monitoring in prosthetic sockets, using flexible and biocompatible polymers is also developed.
- Emissive n-type doped semiconductor nanocrystals for mid-infrared sensing and ReRAM applications, 2D Perovskite Material-Based Non-volatile, stable memory device with low switching voltage (+0.58 V) and an AI-Based Cancer Stem Cell Profiler which Quantifies and identifies CSCs with 98.7% accuracy from bulk RNAseq biopsy data have also been developed under TRC-SNBNCBS

#### 9.4 Indian Association for the Cultivation of Science (IACS), Kolkata

The TRC in Molecules and Materials in IACS, Kolkata covers a wide range of areas such as nanomaterials, quantum materials, functional polymers and other organic molecules and systems, materials with spintronics applications, strongly correlated electron systems, bio-materials and biology-inspired material.

- In an attempt to highlight the potential of G4-targeting agents in designing precision medicine strategies for leukemia, a small molecule named T112 (a triazolyl-indole derivative) has been shown to induce synthetic lethality in leukemia cells by targeting specific G-quadruplex structures. Research on T112-mediated synthetic lethality in Leukemia cells (specifically K562 cells), is significant because it introduces a novel, dual-target, non-toxic small molecule approach to treating cancer. T112 effectively kills cancer cells by simultaneously suppressing two crucial oncogenes, c-KIT and KRAS, while leaving normal cells unharmed.

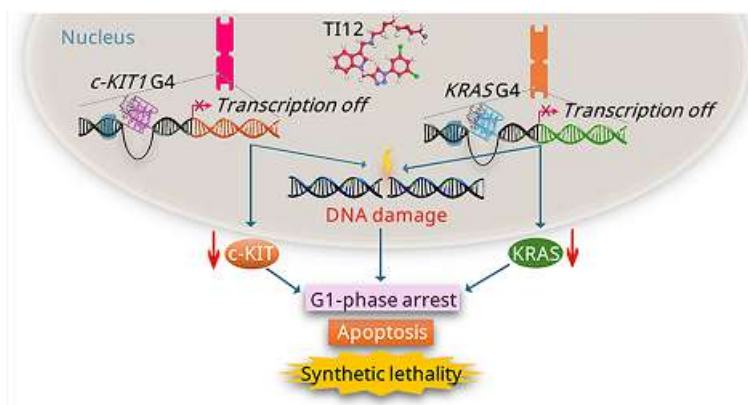


Fig. Schematic representation of T112 mediated synthetic lethality in T112

2. TRC-IACS is actively pursuing research on DFT/TDDFT (Expand) studies on doped plasmonic Au clusters for N<sub>2</sub>-to-NH<sub>3</sub> conversion significant for unraveling complex reaction mechanisms, identifying key descriptors, and guiding catalyst design, revealing how plasmonic effects and dopants (like N) boost activity through enhanced light absorption, charge transfer, and altered electronic states, crucial for replacing energy-intensive Haber-Bosch. The research focuses on novel photocatalysts and electrocatalysts for sustainable ammonia synthesis, using computational tools (DFT/TDDFT) alongside experimental synthesis (like Au-MOFs, N-doped materials). These theoretical studies are crucial for understanding the fundamental physics and chemistry of plasmonic catalysis, paving the way for new, sustainable methods to produce ammonia, a vital chemical, by overcoming the limitations of traditional methods like Haber-Bosch.

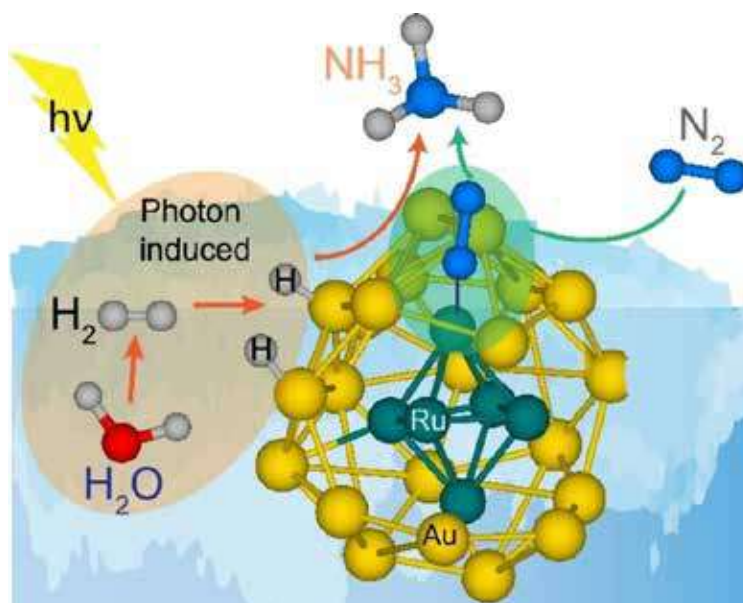


Fig. DFT/TDDFT studies on pathways on N<sub>2</sub> conversion to NH<sub>3</sub> on doped Plasmonic Au Clusters

3. Major National Facilities like TEM ARM3000F2, AFM, Element Analyzer, Single Crystal X-Ray Diffractometer, Ultrafast laser spectroscopy facility, Advanced high-performance computing infrastructure (NVIDIA A100 and L40S GPUs) have been created under TRC

### 9.5 Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru

The major research breakthroughs at TRC-JNCASR are given below:

- Heat-to-Power Conversion: Developed defect-free metal/semiconductor superlattices for efficient energy conversion.
- Modular Nuclear Fusion: Advanced modular nuclear fusion reactors for clean energy.

- Green Hydrogen Catalyst: A metal-free catalyst for sustainable hydrogen production has been created.
- Sodium-Ion Battery: An ultra-fast charging, long-life battery has been developed.
- Autism Treatment: A nanosphere-based delivery for autism treatment has been demonstrated.
- Alzheimer's Therapy: An RNA-based therapy using miR-7a and Honokiol for treating Alzheimer's has been developed.
- Oral Cancer Insights: Gene mutations driving oral cancer in Indian women have been identified.
- Five Patents were granted (03 from India and 01 each from US and Europe) and several agreements signed for translational research.

## 10 National Spatial Data Infrastructure (NSDI)

The National Spatial Data Infrastructure (NSDI) is a governance structure established to manage geospatial data. It is responsible for acquiring, processing, storing, distributing, and enhancing the utilization of geospatial information to support various stakeholders. A brief outline on the activities of NSDI and their significance are given below :

- 1. Strengthening the Spatial Data Infrastructure (SDI) in States:** NSDI had supported setting of Spatial Data Infrastructure (SDI) in fourteen (14) States. Geoportals were established for coordinated development of National and State Level Geospatial Fundamental Sectoral Data Sets and Applications. Few examples are given below :

The Jammu and Kashmir (J&K) State Spatial Data Infrastructure (SSDI) initiative has made significant strides in integrating technology with governance, specifically through



**Fig.** Interface of the Android Mobile App Developed under J&K SSDI Project

- GIS-based mapping, land record modernization, and environmental management.

**Jammu & Kashmir Remote Sensing Information System (JKRIS)**, a spatial data infrastructure initiative, and the **g-SAM (Gram Panchayat Spatial Assets Mapper)** mobile app were launched for GIS-based tracking of assets, planning, and development. The initiative has allowed integration of data across departments, reducing duplication and improving efficiency in governance, for instance, disaster management and urban planning.

- The Arunachal Pradesh State Spatial Data Infrastructure (APSSDI), facilitated by the State Remote Sensing Application Centre (SRSAC) and established with the support of Department of Science and Technology has achieved significant milestones in digital mapping, natural resource management, and governance. Key achievements include:
  - **Comprehensive Data Repository and Geoportal:** APSSDI acts as a centralized clearinghouse for geospatial data, utilizing OGC-compliant standards for data sharing. This includes the creation of a “State GIS Portal” for multi-layer data visualization.
  - **High-Resolution Mapping:** The initiative has completed high-resolution mapping, including large-scale land use/land cover, forest fire risk areas, and 1:10,000 scale mapping of shifting cultivation.
  - **Developmental Project Monitoring:** SRSAC has developed dashboards and mobile apps for satellite-based monitoring and geo-tagging of projects funded by state and central governments.
  - **Disaster Management and Hazard Mapping:** Significant work has been done in hazard zonation, including mapping for landslides, floods, and earthquakes.
  - **Infrastructure and Resource Planning:** The platform supports road alignment studies, groundwater prospect mapping, and site suitability studies for horticulture (kiwi/walnut) and infrastructure.
  - **Advanced Technologies:** Implementation includes Mobile LiDAR survey, Ground Control Point (GCP) collection for high accuracy, and AI-based geo-analytics for data-driven decision-making.
  - **Precise Positioning:** APSSDI has been crucial in generating Digital Elevation Models (DEM) and has established Ground Control Points to improve positioning precision for development.

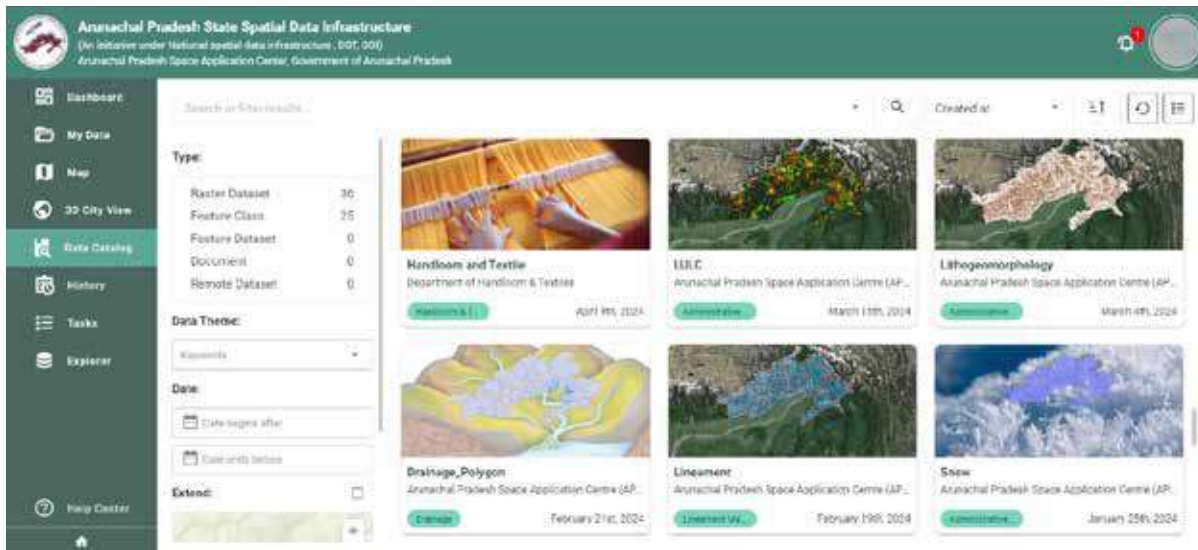


Fig. View of Data Catalogue in APSSDI Geoportal

3. **National Data Registry (NDR) and Cloud-based Geospatial Platform:** The NDR built over a set of open standards from OGC, ISO and BIS in under operationalization with an accessible set of 611 registers/ catalogue of data sets and services. A proof-of-concept Geospatial Cloud-based Data Centre (NSDI-SOI private cloud) has been established at the Survey of India (Hyderabad campus) to evaluate the efficacy of cloud computing in the management, sharing, and processing of high-resolution geospatial datasets of NSDI partnering agencies. The surveyed datasets of Varanasi city (Uttar Pradesh) are being managed on a cloud platform for provision of data and application services to the end users.
4. **Development of Geospatial Standards and Support:** NSDI had extensively contributed to Panel 3 of LITD 22 of BIS for development of Standards on LiDAR and Panel 05 of LITD 22 of BIS on Land Admin-Cadastral Data Content Standards (DCS) which were submitted to BIS. NSDI has been directly involved with its nodal agencies like ICAR NBSS&LUP and GSI for development of Data Content Standards (DCS) for Soils and Geology which were at final stage of publication by BIS.
5. **Interim Data Sharing Framework (IDSF):** Based on the recommendations of the Geospatial Data Promotion & Development Committee (GDPDC)'s Technological Sub-Committee in June'2022, the Interim Data Sharing Framework (IDSF) is under implementation. As of now, every month, the data sharing reports of 38 organizations are being compiled.
6. **Operation Dronagiri:** Launched on November 13, 2024, by the Department of Science and Technology (DST) to bolster the National Geospatial Policy 2022, Operation Dronagiri achieved significant milestones in 2025 regarding Startup innovation, data

infrastructure, and field deployments across five states (UP, Haryana, Assam, Andhra Pradesh, and Maharashtra). **Operation Dronagiri** demonstrated the applications of geospatial technologies in sectors like agriculture, skilling & livelihoods, transport & infrastructure and the Geospatial **Innovation Accelerators (GIAs)** at IIT' Tirupati, IIT' Kanpur, IIT' Bombay, IIM' Calcutta, and IIT' Ropar oversaw the operations. Intensive regional stakeholder meetings were held (e.g., Varanasi in December'2024, Washim in January' 2025, Vizianagaram in February' 2025) to onboard local departments and stakeholders, focusing on insurance, logistics, and infrastructure, with partners like SBI General Insurance, Delhivery, and DeHaat.

Over 838 applications were received in the Phase 01 Startup Challenge, with 133 Startups advancing to further stages as of early 2025. Through 05 GIAs, the initiative finalized 40 Startups (35 early-stage and 5 growth-stage) for the accelerator program, aimed at solving sector specific problems in the fields of agriculture, skilling & livelihoods, transport & infrastructure. A Demo Day was held on December 04, 2025, to showcase the practical applications of geospatial tools developed by incubated startups, such as TerrAqua UAV Solutions and ScaNxt Technologies. Pilot projects focused on utilizing geospatial data for crop management, precision agriculture, and improving last-mile delivery and route optimization were deployed in the 5 target districts. As a part of Operation Dronagiri, Clear Skies Challenge '2025 was also launched with an aim to tackle air pollution by deploying AI and geospatial solutions using Google's AirView+ data in cities like Gurugram, Varanasi, and Vizianagaram.

7. **Space Tech Applications in Governance & Development:** NSDI also spearheaded DST Working Group for promoting Space Tech Applications in Governance & Development. A Report on '*Effective Use of Space Technology Tools in Department of Science & Technology/Ministry of Science & Technology*' has been prepared in collaboration with Indian Institute of Remote Sensing (IIRS) Dehradun. The report also contained Future requirements of space technology applications and space infrastructure in Department of Science & Technology/ Ministry of Science & Technology.

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## 11 Science and Heritage Research Initiative (SHRI) Cell

Science and Heritage Research Initiative (SHRI) Cell, DST supports research and development activities intended to promote, preserve, and protect the tangible and intangible heritage across the country. SHRI Cell also includes various components such as digitization, structural health monitoring, heritage practices for holistic wellness, traditional foods, heritage materials, etc. SHRI Cell has following major achievements for the Year 2025:

1. **Conservation of Indian Heritage Structures using non-destructive techniques:** CSIR-CBRI Roorkee has developed a machine learning-based mobile application for defect detection in heritage structures. It can detect 12 different kinds of defects in

the heritage structures by non-destructive testing, material characterization, structural assessment and analysis, suggesting appropriate repair or restoration technique etc. The mobile application can be installed in any Android-based mobile. The Center investigated the structural analysis at (a) Tunganath Temple (world's Highest Siva Temple), (b) Taj Mahal, (c) Chota Imambada, and (d) Solani Aqueduct (Asia's 1st Aqueduct).



Fig. (a) Shows the interface for defect detection in heritage structures, (b) Tunganath Temple (the world's Highest Siva Temple), and (c) analysis of the Tunganath Temple.

The Center also developed UAV assisted framework for cost-effective digital recreation along with the methodology for automated point cloud data processing technique. The Burials of Sinauli were investigated using this technique.



Fig. Assessment of Burials of Sinauli in non-destructive manner in collaboration with ASI.

2. **Digital Poompuhar:** The project represents a major milestone in underwater heritage research and digital archaeology in India. It provides the first scientifically validated, integrated life-history model of Poompuhar and significantly enhances understanding of early maritime civilizations, coastal dynamics, and heritage preservation. The findings open new avenues for advanced offshore exploration, refined dating, 3D digital reconstructions, and global comparative studies of ancient port cities. The project involved collaboration among 12 national institutions, coordinated through a centralized framework to achieve the following objectives:
- Discovery of an early establishment (Poompuhar-1) located 35–45 km offshore, dating back 12,000–15,000 years BP, making it one of the oldest known port cities globally.
  - Identification of seven phases (P1–P7) of Poompuhar, indicating multiple relocations driven by marine transgressions, regressions, tectonic activity, tsunamis, floods, and Cauvery River migration.
  - Detection of extensive submerged man-made maritime structures, including harbours, dockyards, lighthouse/watch-tower structures, settlements, and cairn complexes.
  - Establishment of a strong linkage between sea-level fluctuations, tectonic subsidence, and geo-hazards in the extinction of successive Poompuhar phases.
3. A biochar-based hybrid adsorbent for heavy metal removal and its subsequent utilization as cheaper electrodes for energy storage devices. IIT-ISM Dhanbad developed a biochar derived from animal waste for synthesizing porous carbon that demonstrated the removal of 90% Cr (VI) from water within 20 minutes. It also achieved a maximum adsorption capacity of 219 mg/g at 45°C. Using the electrodes, the supercapacitor was developed using Cr-saturated adsorbents, which were tested with a 1.5V and 4.5V voltage window and showed 84% capacitance retention after 10,000 cycles.



**Fig.** (a) Cell components, (b) Parallel arrangement of cells to give 1.5 V device, (c) Fabricated 1.5 V device, (d) Series combination of 1.5 V devices to obtain 4.5 V device, and (e) Powering a LED light using the developed device.

4. Bio-fortification of millet-based products with microbially synthesized vitamin B<sub>12</sub>. The Study focuses on an essential nutrient, vitamin B<sub>12</sub>, which is vital for humans and other animals as it plays a key role in DNA synthesis, red blood cell production, and brain function. Vitamin B<sub>12</sub> is produced industrially through microbial fermentation and is commercially available as a dietary supplement or fortifier. In this study, the standardization of surface coating parameters for millet flakes with spray-dried vitamin B<sub>12</sub>-rich fortificant was achieved to develop ready-to-eat vitamin B<sub>12</sub> fortified millet (VB<sub>12</sub>fm) flakes.



Fig. Process flow chart for the Vitamin B<sub>12</sub> fortified millet products and bioavailability analysis

5. **Development of Micronutrient Enriched Millet-Based Functional Food Using 3D Food Printing Technology:** Millets and sprouted millets exhibited distinct printability characteristics, with improved structural integrity and bioavailability when enriched with spinach powder. Bioavailability studies showed increased antioxidant activity in millet-based printed foods due to spinach powder incorporation. Millet-based batter formulation was optimized, demonstrating non-Newtonian shear-thinning behavior for better extrusion and shape retention. Higher spinach powder concentration enhanced viscosity and rheological properties, improving dough elasticity and printability. Millet-based batter with spinach showed better printability, bioavailability, and rheological properties.

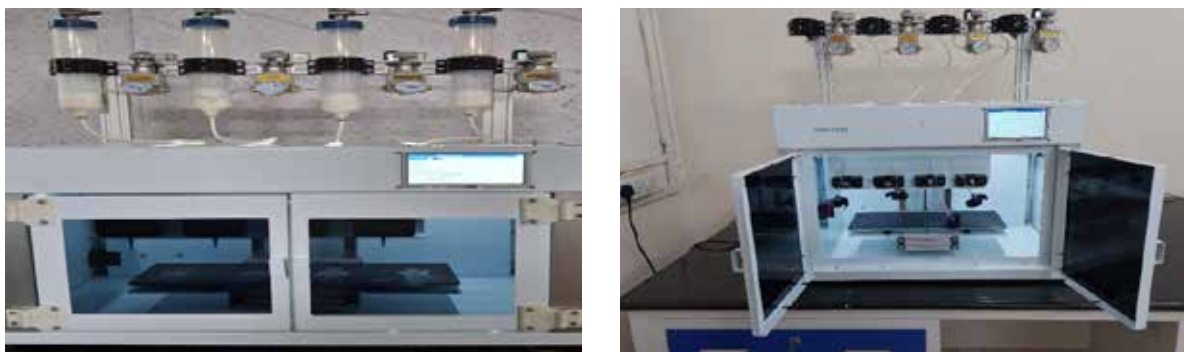


Fig. (a) Interior View and (b) Exterior view of a continuous 3D food printer

## 12 Exhibition & Fairs

The aim of Exhibition Cell is to organize exhibitions to create awareness among students, scholars and general public on various Government policies, schemes, scientific & milestones in the field of Science & Technology. The Exhibition Cell in science exhibitions at National and International level. In addition, Exhibition Cell has ensures to coordinate the work of participation of Department of Science & Technology along with its organizations {Autonomous Institutes/Subordinate Offices/Professional Bodies} in science exhibitions organized in different parts of the country.

The activities of Exhibition Cell, DST during F.Y. 2025-26 are as under:

- i. Participated in the India International Trade Fair – Year 2025
  - ii. Participated in the 32nd Convergence India Expo Year 2025.
- **Instrumental in organizing the 11th edition of India International Science Festival (IISF)- 2025 Panchkula, Haryana during 06 - 09 December, 2025.** The mission of IISF '2025 – “*Vigyan Se Samruddhi: for Aatmanirbhar Bharat*” was to celebrate and advance the spirit of science-led growth for a self-reliant and prosperous India. Rooted in the vision of “*Innovation. Aatmanirbharta. India for Global Good*” ,IISF' 2025 aimed to bring together scientists, innovators, educators, students, industry leaders, Science Communicators, and policymakers on one platform to promote collaboration, creativity, and knowledge exchange.
  - **Organized Emerging Science, Technology and Innovation Conclave (ESTIC)-2025 held during 03 – 05 November, 2025 at Bharat Mandapam, New Delhi,** which brought together global experts, policymakers, academia, industry leaders, and innovators for high- level discussions, collaborations, and showcasing of frontier research and disruptive technologies across 11 key thematic areas.

## NATIONAL MISSION ON INTERDISCIPLINARY CYBER-PHYSICAL SYSTEMS (NM-ICPS)

The Union Cabinet approved the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) in December 2018 with a total outlay of ₹ 3660 Crores for a period of five years which was further extended for four years, i.e. up to December, 2027. The NM-ICPS scheme is being implemented by the Department of Science and Technology (DST). The Mission aims at development of technology platforms to carry out R&D, Translational Research, Product Development, Incubating & Supporting Start-ups as well as Commercialization.

Under this Mission, 25 Technology Innovation Hubs (TIHs) have been established in reputed academic institutes (referred as Host Institutes) across the country (Demographic Map is required, locating TIHs). Each hub is a Section-8 Company, an independent entity within the Host Institute and has been assigned a Technology Vertical in the areas of advanced technologies such as Artificial Intelligence and Machine Learning (AI/M), Technologies for IoT & IoE, Robotics & AI Systems, Cyber Security, Quantum technologies etc. The Mission is being implemented with TIHs undertaking activities under the following four major categories i.e.: (1) Technology Development (2) Human Resource & Skill Development (3) Innovation, Entrepreneurship & startup Ecosystem and, (4) International Collaborations. Recently, four of these TIHs at IIT Kanpur, IISc Bangalore, IIT (ISM) Dhanbad and IIT Indore, have been upgraded to Technology Translation Research Parks (TTRPs), with an aim to significantly scale the translational research, commercialization and industry engagement.

Few major achievements and technologies developed by these TIHs are as under:

### 1 Sovereign Multilingual AI and Language Technology Project - BharatGen: A Suite of Generative AI Technologies for India

BharatGen is India's sovereign, multilingual, and multimodal Generative AI initiative aimed at building inclusive and context-aware AI systems across 22+ Indian languages. It integrates text, speech, and vision-based document understanding within a unified framework to address real-world Indian use cases. The initiative is supported under NM-ICPS, with funding of ₹ 235 crores. The project is being implemented through a consortium led by the TIH Foundation for IoT and IoE, established at IIT Bombay and includes premier academic institutions as partners, namely IIT Bombay, IIIT Hyderabad, IIT Mandi, IIT Kanpur, IIM Indore, IIT Hyderabad and IIT Madras respectively.

- Salient features of **BharatGen** are as follows:
  - **PARAM-1**: A 2.9B parameter bilingual (English–Hindi) foundational text model trained on 7.5T tokens with 33.4% Indian data, including domain variants for agriculture, finance, and healthcare.
  - **Shrutam**: A 30M/120M parameter Automatic Speech Recognition (ASR) model enabling accurate speech-to-text for Indic languages.
  - **Sooktam**: A 150M parameter Text-to-Speech (TTS) model supporting natural speech synthesis in nine Indian languages.
  - **Patram**: India’s first 7B parameter vision-language document model trained on 2.5B tokens for multilingual, multi-domain document understanding and question answering.
- **Bharat Data Sagar (BDS)**: Bharat Data Sagar is a strategic vertical of BharatGen focused on data and model sovereignty, positioning India as a global data powerhouse. It aims to transition India from an AI IP consumer to a major IP generator by creating large-scale, India-centric, ethically sourced multilingual and multimodal datasets. Under BDS, benchmarks such as **BhashaBench-Legal**, **BhashaBench-Finance**, and **BhashaBench-Krishi** have been established, and over 12,000 hours of transcribed audio data across 18 Indian languages has already been collected.
- **Applications and Impact**: BharatGen has demonstrated strong real-world impact through proof-of-concept applications such as **Krishi Sathi**, a voice-enabled WhatsApp advisory service for farmers; **e-VikrAI**, which auto-generates MSME product catalog details from a single image; and **Docbodh**, a document question-answering system powered by the Patram model. These applications showcase citizen-centric AI that empowers agriculture, MSMEs, governance, and enterprise workflows.

**Industry and Ecosystem Collaboration**: The initiative is being strengthened through deep industry and government collaborations, including partnerships with IBM, Zoho, NASSCOM, central ministries such as Water and Sanitation (WASH), and State Governments like Government of Maharashtra.

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## 2 Technology Innovation in Exploration & Mining Foundation (TEXMiN) at IIT (ISM) Dhanbad.

**Technology Vertical: Mining (Exploration to Beneficiation of Minerals)**



Fig. BharatGen – its core technologies and models

- The TIH has developed “AZ-MIN5.0 Advanced Electronic Prototyping Development Board”, a rugged, high-performance platform built around a powerful STMicroelectronics 32-bit (STM32) microcontroller, offering robust computational capability and design flexibility for reliable operation, rapid prototyping, and deployment in harsh, mission-critical environments across mining, robotics, and IoT applications. It is fully compliant with Electromagnetic Compatibility (EMC), Electromagnetic Interference (EMI), and Electromagnetic Susceptibility (EMS) standards, ensuring stable and interference-free performance in demanding industrial settings, and has been successfully tested and validated at Society for Applied Microwave Electronics Engineering & Research (SAMEER), Kolkata, and Council of Scientific & Industrial Research (CSIR) – Central Institute of Mining and Fuel Research (CIMFR), Dhanbad.
- The TIH has also developed “**Non-Explosive, High-Voltage Electric Spark Ignition (ESI) System for Non-Electric Detonator Initiation**”, which is an advanced, battery-powered initiation solution designed to enhance safety, reliability, and precision in blasting operations. The system generates a controlled high-voltage pulse to charge and initiate the Down-Range Initiator (DRI), which is connected to the power pack through a core blasting cable with resistance of less than 60 ohms, ensuring



Fig. AZ-MIN5.0 Advanced Electronic Prototyping Development Board



Fig. Non-Explosive, High-Voltage Electric Spark Ignition (ESI) system

efficient energy transferThe system has been successfully tested and validated at CSIR–CIMFR, Dhanbad.

### 3 IHUB NTIHAC Foundation (C3iHub) at IIT Kanpur

#### Technology Vertical: *Cyber Security*

The TIH has developed “**Blockchain-based Agriculture Seed Licensing System**”, a tamper-proof and transparent agriculture seed licensing system based on blockchain technology that ensures accountability across the seed supply chain by securely issuing and verifying licenses using Hyperledger Besu. After Integration with the Raj Kisan portal through APIs, the platform enables automated license creation, renewal, and verification while maintaining an immutable ledger that guarantees data integrity and real-time auditability.

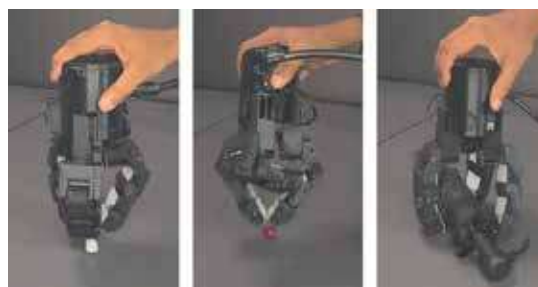


**Fig.** Blockchain-based Agriculture Seed Licensing System

### 4 I-HUB for Robotics and Autonomous Systems Innovation Foundation (ARTPARK) at IISc Bangalore

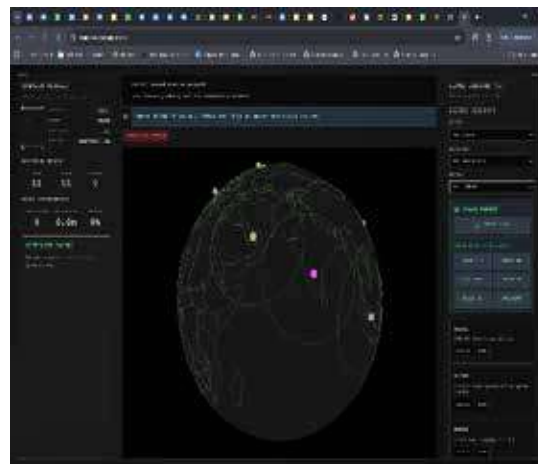
#### Technology Vertical: *Robotics & Autonomous Systems*

- **DexSent Robotics**, a startup supported by the TIH has developed an integrated perception–action framework for adaptive robotic manipulation that tightly couples vision intelligence for real-time scene understanding, dexterous manipulation for compliant and adaptive grasping using advanced end effectors, and sentient control for continuous decision-making. By closing the perception–decision–action loop, DexSent enables robots to adapt their behavior during task execution, allowing robust manipulation across variability without reliance on task-specific tooling. The technology has progressed beyond the lab, with successful initiation and execution of active pilot engagements with Defense Research and Development Organization (DRDO), ongoing technical collaborations with leading robot Original Equipment Manufacturer (OEMs) to support system integration and deployment, and the development of functional end-to-end prototypes demonstrating closed-loop vision-guided manipulation in dynamic environments.



**Fig.** Dexsent’s dextrous, adaptive (hand-like) gripper

- Qosmic**, a startup supported by the TIH, is building high-speed optical ground station networks that enable satellite-to-ground data transmission exceeding 10 Gbps—nearly 100 times faster than traditional RF-based systems. By addressing the critical bandwidth bottleneck that causes satellites to lose 50–70% of collected data due to RF limitations, Qosmic delivers secure, license-free optical connectivity through a pay-per-bit model at nearly one-third the cost of RF alternatives. Operating from strategically located ground stations with high network availability, the company serves Earth observation constellations, defense agencies, and space station operators.. The startup has raised significant investment from reputed international venture capital firms, and is deploying its MVP optical ground station at the IISc Challakere Campus, has demonstrated a 10+ km free-space optical link matching DRDO records at TRL 6.



**Fig.** Global image of optical ground stations for satellite communications. Qosmic's is the one shown in India

## 5 IIT I Drishti CPS Foundation at IIT Indore

### Technology Vertical: *Digital Healthcare*

- One of the major technologies developed by the TIH, **CharakDT – Unified Human Digital Twin Platform**, is an integrated human digital twin platform designed to enhance healthcare delivery through personalized, predictive, and preventive support. It builds virtual physiological models using clinical knowledge, multi-modal health data, and real-time analytics to simulate organ behavior and disease progression. System-agnostic and secure, CharakDT integrates AI-driven decision support with traditional medical knowledge, tackling India's challenges of data fragmentation and diverse practices while extending access to remote communities.
- Vigorus AI**, a startup supported by the TIH, has developed "**Chikitsa - an AI-enabled EMR platform**" integrated with CharakDT. It streamlines hospital workflows by digitizing records, managing appointments, billing, e-prescriptions, and enabling speech-to-text documentation. Features include automated claims, handwriting recognition, and blockchain-secured health records. This



**Fig.** CharakDT – Unified Human Digital Twin Platform digital interface

multilingual platform is compliant to Health Insurance Portability and Accountability Act (HIPAA), and ABHA-approved. Chikitsa consolidates data from prescriptions, diagnostics, and EMRs for unified access.

## 6 IIT Guwahati Technology Innovation and Development Foundation at IIT Guwahati

### Technology Vertical: *Technologies for Underwater Exploration*

The TIH has started “**India’s first Underwater Welding Certification Programme**”, marking a national milestone in structured, industry-certified underwater skill development. The programme has been designed to meet global offshore and marine infrastructure standards, combining classroom instruction, simulator-based training, and real underwater welding practice, and has been developed in collaboration with industry partners and the Indian Register of Shipping (IRS), Mumbai. The programme addresses India’s critical shortage of certified underwater welders for ports, offshore energy, ship repair, and underwater infrastructure projects, while creating a formal skill pipeline for divers and technicians from coastal and riverine regions.



Fig. Underwater welding skill development

## 7 IIIT-H Data I-Hub Foundation at IIIT Hyderabad

### Technology Vertical: *Data Banks & Data Services, Data Analysis*

VahanEye, a startup supported by the hub has developed an “**AI-powered Automatic Number Plate Recognition (ANPR) system**” for highway and access-point surveillance, enabling real-time vehicle identification using high-resolution IP cameras and edge-based AI. It accurately detects and reads Indian license plates under diverse traffic and environmental conditions while performing on-device processing to reduce network dependency. The system supports live monitoring, structured data storage, and whitelist-based identification.



Fig. Digital interface of AI-powered Automatic Number Plate Recognition (ANPR) system

## 8 Divyasampark iHub Roorkee for Devices Material and Technology Foundation at IIT Roorkee

### Technology Vertical: *Device Technology and Materials*

**Calbots - Magnetic Nanobots** from Theranutilus Pvt. Ltd, a DeepTech healthcare startup supported by the hub is focused on “**translating nanorobotics from laboratory research to clinical applications**”. The company specializes in developing advanced equipment for the fabrication of magnetically propelled nanorobots designed for therapeutic use. These nanoscale machines are engineered to perform highly precise functions at the cellular level, including targeted drug delivery, biofilm sterilization, dental applications, and cancer theragnostic.

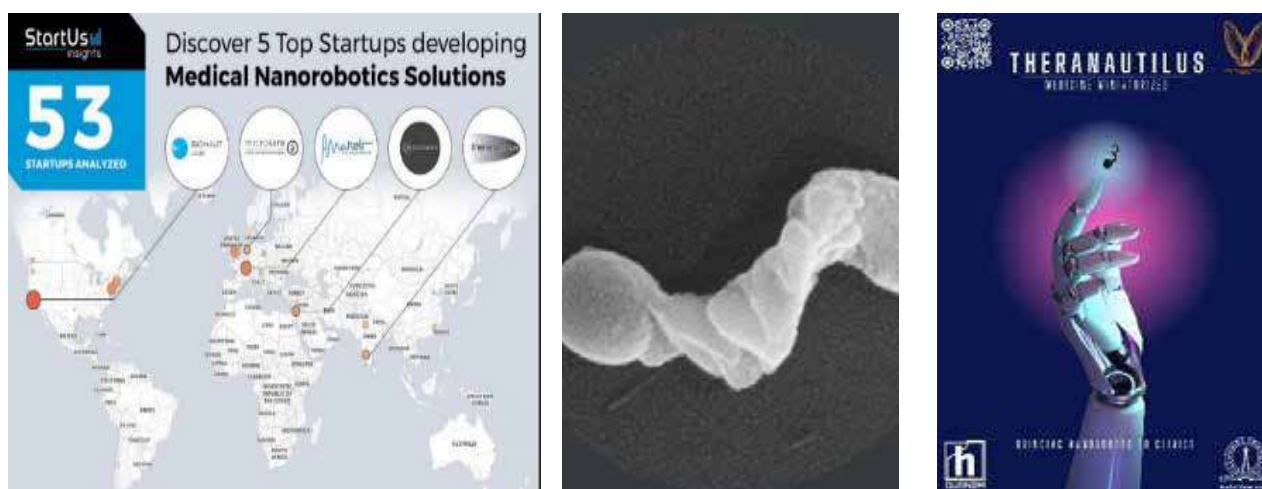


Fig. Magnetically propelled nanorobots for therapeutic use

## 9 TIH Foundation for IoT and IoE at IIT Bombay

### Technology Vertical: *Technologies for Internet of Things & Internet of Everything*

Agri-IoT solutions Sambhav and iSARATHI, developed by the TIH, are enabling precision farming through real-time soil and weather monitoring, AI-based advisories, and drone imaging, and have begun making a significant impact in the market. Specifically, organizations like Jain Irrigation Ltd. are validating the use of IoT sensor-based fertilization and irrigation advisories and collaborating on their development for few crops, including bananas. Dhaksha Drones (a division of Coromandel Fertilizers Ltd.) has partnered within the TIH to leverage edge computing capabilities on the drone to identify areas in the field that require pesticide / insecticide interventions.



Fig. Field calibration at Jain irrigation - Cotton Crop Disease Detection: (a) Healthy, (b) Fusarium Wilt, (c) Army Worm

## 10 BITS BioCYTiH Foundation at BITS Pilani

### Technology Vertical: *Bio-CPS*

- The TIH has developed a rapid, ultra-sensitive technology for the detection and analysis of **"Aflatoxin M1 (AFM1)"** in milk and milk products, designed for field portability and IoT integration to enable real-time monitoring across the dairy supply chain. The system delivers laboratory-level sensitivity within minutes, supporting on-site screening at farms, collection centers, and processing facilities. By providing early and accurate aflatoxin alerts, it enhances milk safety, reduces public health risks, and prevents contaminated batches from reaching consumers.
- The TIH is also developing **"Mobile/Web and AR-VR-based Cognition Tracking, Analysis, and Rehabilitation solutions"** for both healthy and cognitively impaired individuals. The project focuses on identifying and analyzing factors that influence memory loss and cognitive decline. A cognition tracking system is being designed to monitor patients' cognitive health over time. Additionally, the project pilots virtual reality (VR)-based cognitive assessment and rehabilitation protocols at National Institute of Mental Health and Neurosciences (NIMHANS), providing immersive and engaging interventions for patients. By combining advanced monitoring, VR technology, and clinical evaluation, the project seeks to enable timely diagnosis, personalized rehabilitation, and improved cognitive health outcomes for individuals with impairment.

## 11 I-Hub Quantum Technology Foundation at IISER Pune

### Technology Vertical: *Quantum Technologies*

- **QNu Labs**, a startup supported by TIH, has successfully demonstrated “**India’s first 500 km Quantum Key Distribution (QKD) network over existing optical fiber infrastructure**”, a landmark achievement that positions India among global leaders in quantum-secure communications. Executed in collaboration with the Indian Army’s Southern Command Signals, the demonstration used a trusted-node architecture to enable secure key exchange across long distances and stands as the longest quantum communication network outside China, achieved with just six nodes, highlighting major gains in cost efficiency and system performance.
- **QpiAI**, a startup supported by the TIH, has developed a “**Scalable superconducting qubit-based quantum computer, advancing from an 8-qubit to a 64-qubit processor**” using proprietary fabrication and flip-chip integration technologies. Its end-to-end platform spans quantum chip design, superconducting fabrication, Josephson junction processes, qubit characterization, and high-speed control and readout electronics. Key innovations include in-house processor fabrication and a flip-chip indium bump-bonding architecture that improves coherence and scalability.

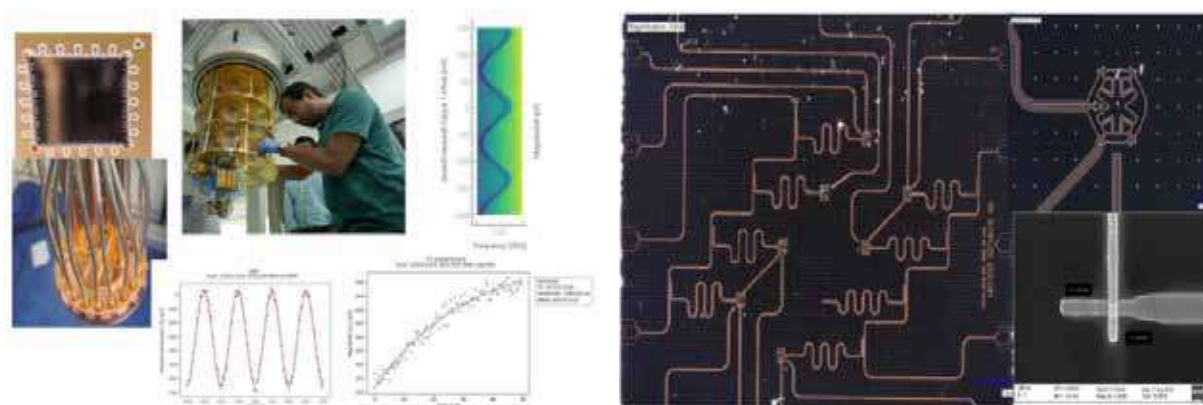


Fig. Quantum Key Distribution (QKD) network

## 12 IIT Kharagpur AI4ICPS I-Hub Foundation at IIT Kharagpur

### Technology Vertical: *Artificial Intelligence and Machine Learning*

**EdgeForce Solutions Pvt. Ltd**, a startup supported by the TIH has developed an “**Edge-capable predictive maintenance platform for condition-based monitoring, analytics, designed to operate reliably in harsh and remote environments with minimal connectivity**”. The solution combines rugged sensor suites, edge telemetry, and AI-

driven anomaly detection to monitor equipment health, predict failures, and trigger maintenance workflows, with on-device inference and adaptive models that improve performance using operational data. Engineered for unmanned systems, defence platforms, and industrial installations, its modular hardware and software architecture enables rapid integration across applications such as naval vessels, remote telemetry sites, and high-altitude assets.



Fig. Edge-capable predictive maintenance platform

### 13 I-DAPT-HUB Foundation at IIT BHU

#### Technology Vertical: *Data Analytics & Predictive Technologies*

**eVerse AI**, an agritech startup supported by the TIH offers “**Intelligent farm management solutions**”, including Connected Cow for health monitoring and Green Cow methane measurement devices, aimed at increasing farmer income and profitability while reducing environmental impact. The company is operational in India and the US and has begun generating revenues exceeding ₹10 crore. eVerse AI has received the Maharashtra Methane Mission (M3) project, established strategic partnerships with Banas Dairy, Asia’s largest milk producer cooperative, and other ecosystem players, and has impacted over 5 lakh farmers and more than 20 lakh animals.



Fig. eVerse AI - agritech startup

### 14 IHUB DRISHTI FOUNDATION at IIT Jodhpur

#### Technology Vertical: *Computer Vision, Augmented and virtual reality*

The TIH has developed “**TrustMe - Explainable Adversarial Attack Detection and Mitigation for Object Recognition Algorithm**”, a system to detect and identify the source of adversarial attacks on AI object recognition models. A key capability



Fig. System to detect and identify the source of adversarial attacks

is its ability to distinguish between deliberate, malicious manipulations and unintentional, natural image noise. The detector operates as a “black-box” system, i.e. it learns the overall data distribution rather than specific image labels, making it highly adaptable and effective for applications like face recognition.

## 15 IIT Mandi IHub and HCI Foundation at IIT Mandi

### Technology Vertical: Human Computer Interaction

- The **Multimodal AI technology** developed by the TIH focuses on quality management in process manufacturing, particularly the technical textile industry, which is rapidly expanding into advanced applications across construction, healthcare, automotive, and defence. The project implements an AI-powered yarn inspection system in collaboration with two textile companies, integrating seamlessly into existing production workflows. It addresses automated yarn quality inspection using high-speed vision sensors and AI-based defect detection, alongside predictive maintenance of yarn machines through sound and vibration analysis to anticipate faults early.
- “**Altersage Innovations**”, a startup supported by the TIH has developed “**CocoBot Gen2**” - the world’s first, fastest, and miniature robotic solution for coconut harvesting, designed to address labour shortages, safety risks, and low productivity associated with manual harvesting of crops such as coconut, and dates from tall trees. The robot is compact, portable, and highly efficient which can climb coconut trees and harvest coconuts with high precision, significantly reducing dependence on skilled human climbers while laying the foundation for future human–robot interaction through multimodal capabilities.



Fig. CocoBot Gen2



Fig. Multimodal AI technology for process manufacturing

## 16 NMICPS Technology Innovation Hub on Autonomous Navigation Foundation (TiHAN) at IIT Hyderabad

Technology Vertical: *Autonomous Navigation and Data Acquisition systems (UAV, RoV, etc)*

- The TIH has developed **Autonomous Campus Shuttle** which is an end-to-end autonomous navigation stack developed for electric buggies, carts, and campus shuttles, enabling safe and reliable self-driving operations in structured environments such as campuses, industrial zones, and smart cities. The shuttle delivers full self-driving capability on designated routes with obstacle detection and path planning, real-time GPS tracking via a mobile application, and automated audio announcements at all stops. The TiHAN Autonomous Campus Shuttle has been successfully deployed at IIT Hyderabad campus, the Andhra Pradesh Secretariat, and IT Hills, Visakhapatnam.
- TIH has also developed ‘**Ti-KALA Drone**’, which is an advanced autonomous drone payload delivery system designed for defence, disaster relief, and logistics applications, enabling precise, reliable, and long-range payload deployment with minimal human intervention. The system integrates a high-resolution onboard camera, real-time image processing, AI-driven visual target recognition, and a custom payload release mechanism that supports multiple payload types and ensures accurate delivery without relying solely on GPS coordinates. It was successfully tested at the IITH-TiHAN testbed with payload drops of up to 5 kg over ranges exceeding 10 km.



Fig. Autonomous Campus Shuttle



Fig. Ti-KALA Drone

## 17 IIT Ropar Technology and Innovation Foundation at IIT Ropar

### Technology Vertical: *Technologies for Agriculture & Water*

- **Canectar Foods Private Limited**, a startup supported by the TIH has developed “**CaneBOT**”, which is a fully automated sugarcane juice vending machine, offering a robotic, contactless, and hygienic solution that delivers fresh juice in under 60 seconds. CaneBOT integrates mechatronics, IoT, and cloud-based systems for real-time monitoring, remote operations, analytics, and predictive maintenance, with plans to add AI/ML capabilities for demand forecasting and dynamic pricing. Backed by seven

patents and a modular, scalable design, the platform enables rapid expansion into other fresh beverage categories such as coconut and pomegranate.

- The TIH has also developed “**Chloritron**”, a portable, solar-powered, IoT-based real-time water quality monitoring system designed for continuous 24×7 monitoring of irrigation, drinking, and surface water sources, with a Technology Readiness Level of 8–9. Built on a modular, low-power architecture for off-grid operation, the system measures critical parameters including pH, turbidity, temperature, conductivity, dissolved oxygen, Chemical Oxygen Demand (COD), chlorine, and selected heavy metals using self-cleaning, waterproof IP68 sensors. Chloritron is a field-tested and deployment-ready solution suitable for applications across agriculture, municipal water supply, industry, sewage treatment plants, rivers, and lakes, and is aligned with national water management initiatives .



Fig. Chloritron

## 18 IIT Palakkad Technology IHub Foundation at IIT Palakkad

### Technology Vertical: *Intelligent Collaborative Systems*

Savtoa Software Technologies Private Limited, a startup supported by the TIH has developed “**Autonomous Swarm System**” based on Autonomous Surface Vessel (ASV) for Bathymetry, Hydrography, and silt estimation. This system enables coordinated swarm-based operation of multiple unmanned surface vessels to conduct high-resolution, repeatable surveys of large water bodies with minimal human intervention. By integrating autonomous navigation, distributed task execution, and centralized data aggregation, the system significantly improves the efficiency and frequency of bathymetric mapping, hydrographic surveys, and silt estimation in ports, rivers, reservoirs, and coastal zones. The pilot-stage platform features a modular and scalable architecture, and reduces dependence on manned survey vessels. Field trials are ongoing, with pilot deployments under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) programme Ministry of Housing and Urban Affairs (MoHUA) and MoU with Map My India.

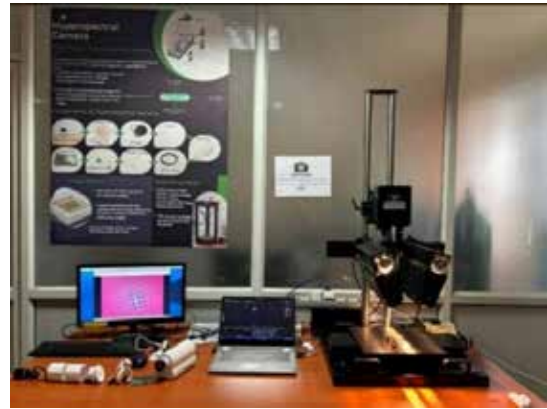


Fig. Autonomous Swarm System

## 19 IIT Tirupati Navavishkar I-Hub Foundation at IIT Tirupati

### Technology Vertical: *Positioning and Precision Technologies*

The Next-Generation **Hyperspectral Camera** developed by the hub for advanced remote sensing is an indigenous, compact, and cost-effective imaging solution capable of capturing detailed scene information across the full spectrum of wavelengths. It integrates a novel compressed sensing approach with multilayer thin-film coating technology to enable precise, full-spectrum sensing while reducing system complexity and cost. This innovation represents a key achievement in hyperspectral instrumentation by combining high-performance spectral capture with a lightweight and efficient design, significantly strengthening India's self-reliance in advanced remote sensing technologies and contributing to sustainable industrial innovation aligned with SDG-9.

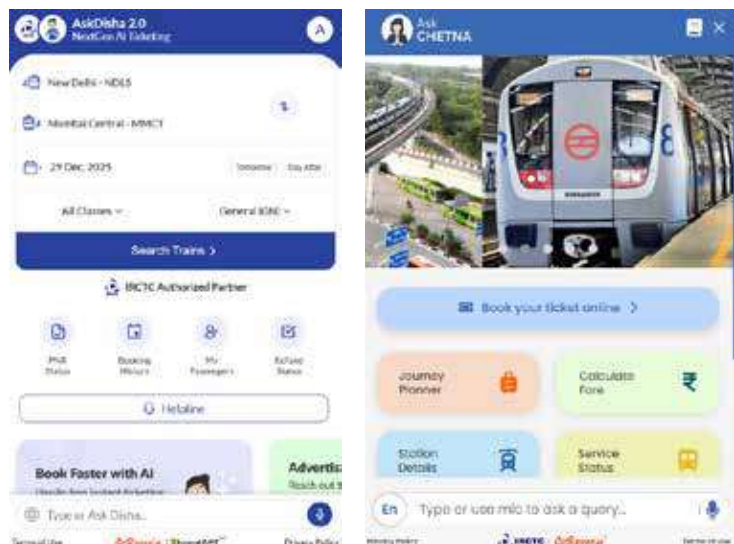


**Fig.** Next-Generation Hyperspectral camera for advanced Remote Sensing

## 20 IHUB Anubhuti-IIITD Foundation at IIIT Delhi

### Technology Vertical: *Cognitive Computing & Social Sensing*

**CoRover Private Limited** (CoRover.ai), a startup supported by the TIH has developed a “Conversational Agentic AI platform enabling the creation of human-centric, multilingual (100+ languages), multimodal (video, voice, text), and multi-channel AI agents, copilots, and assistants” that have impacted over one billion lives globally. With deep expertise in domain-specific and sovereign large language models such as BharatGPT, CoRover is trusted by over 50,000 enterprises, researchers, and developers across sectors, delivering measurable outcomes including up to 10× revenue growth, 70% reduction in support costs, and enhanced customer experience. Its full-stack enterprise AI platform



**Fig.** CoRover.ai - a Conversational Agentic AI platform

integrates seamlessly with existing systems and supports no-code/low-code deployment, enabling rapid automation of pre-sales, sales, and customer support. CoRover's solutions are live across major public and private organizations including Indian Railway Catering and Tourism Corporation (IRCTC), Quality Council of India (QCI), National Payments Corporation of India (NPCI), Paytm, ports, healthcare, and government bodies.

## 21 IITM Pravartak Technologies Foundation at IIT Madras

### Technology Vertical: *Sensors, Networking, Actuators & Control*

- IClassico Sportstech Private Limited**, a startup incubated under the hub, is developing “**AI-driven sports technology solutions for cricket**”, focusing on Decision Review Systems (DRS) and broadcast automation. The startup offers two core products Khel Pro, an on-ground full-stack DRS kit, and Crik.ai, a remote and cost-effective DRS and broadcast workflow platform. Designed for quick deployment and lower operational costs, IClassico is scaling through league and association partnerships while expanding capabilities such as player tracking and advanced graphics.
- Meister-Gen Technologies Private Limited** a startup incubated under the Hub, has developed “Resimeter”, a compact and portable four-point Wenner probe resistivity meter for non-destructive assessment of wet concrete quality, durability, and corrosion risk. Suitable for both field and laboratory use, it provides fast and accurate measurements across a wide resistivity range, supports flexible probe configurations, and is designed for rugged on-site operation with simple controls and wireless data logging. The results correlate with standard durability indicators such as chloride penetration resistance, and the device has been successfully deployed at institutions including NIT Surathkal and NIT Calicut, demonstrating readiness for wider infrastructure applications.



Fig. Resimeter

## 22 IIITB COMET Foundation at IIIT Bangalore

### Technology vertical: *Advanced Communication Systems*

The TIH has developed “**5G-Advanced ORAN Massive MIMO Base Station – Radio Unit (RU)**”,

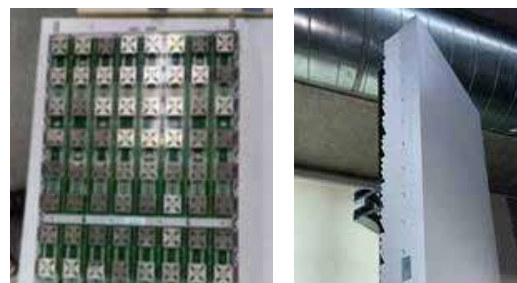


Fig. 5G-Advanced ORAN Massive MIMO Base Station – Radio Unit (RU)

which is an indigenously built 32TR (transmit-receiver) radio unit (RU) for a massive Multiple-Input Multiple-Output (MIMO) base station compliant to 3GPP and Open Radio Access Network (ORAN) standards, capable of providing uniformly good service to multiple users simultaneously. WiSig Networks Pvt. Ltd. has licensed the IP of the technology from IITB COMET Foundation.

## 23 IIT Bhilai Innovation and Technology Foundation at IIT Bhilai

### Technology Vertical: *Technologies for financial sector (Fintech)*

The TIH has developed a “**Digital Vidya Samiksha Kendra (VSK)**” in Chhattisgarh, which is serving as a centralized platform to monitor and strengthen the state’s school education system. Using AI-driven analytics, *Vidya Samiksha Kendra (VSK)* enables near-accurate estimation of beneficiaries through data on attendance, mid-day meals, uniforms, and textbook requirements, supporting informed decision-making, efficient resource and budget planning, targeted interventions, and continuous monitoring. The system has enhanced inclusion and tracking of 7.5 lakh students (out of 50+ lakh), achieved over 50% improvement in live tracking in remote districts such as Dantewada, Bijapur, and Sukma. In 2025, VSK implemented live tracking for free textbook distribution, enabling the monitoring of nearly 2.5 crore books at a cost of just one paise per book, and has been recognised with the Chief Minister’s Excellence Award for e-Governance, Chhattisgarh 2025.



Fig. Digital Vidya Samiksha Kendra (VSK) in Chhattisgarh

## 24 I-Hub Foundation for Cobotics (IHFC) at IIT Delhi

### Technology Vertical: *Cobotics*

- The TIH has supported a healthcare-focused robotics startup ‘**ViTachyon Robotics**’ which is a pioneering tele-robotic ultrasound solution that brings in expert imaging services to underserved locations. Leveraging their proprietary force-feedback control algorithms and a lightweight software suite, they transform standard collaborative robots into remotely operated ultrasound



Fig. ViTachyon Robotics

assistants, enabling radiologists at any remote location to perform scans in real time over any network.

- The TIH has also developed a Computer Numerical Control (CNC) technology-based solution “**Automated Bending of Orthopedic Plates**” that pre-bends plates with high accuracy, reducing operative time and eliminating manual bending during surgery. It lowers skill dependency, improves consistency, and enhances surgical efficiency to meet



Fig. Automated Bending of Orthopedic Plates

growing orthopedic care demands in India. With a commercial-ready prototype and partnerships with Jajal Medical Services Pvt. Ltd. and TCS, the innovation supports cost reduction, accessibility, and growth of the indigenous medical device ecosystem.

## 25 IIT PATNA VISHLESAN I-HUB FOUNDATION at IIT Patna

### Technology Vertical: *Speech, Video & Text Analytics*

- The TIH has developed **VisMaBodha**, a multipurpose Mini-Center of Excellence (CoE) established entirely through internal revenue and industry partnership. A key highlight of this facility is the deployment of high-TRL IoT and Embedded Electronic Kits and production of in-house hardware. This collaboration successfully leveraged shared engineering resources and expert consulting that now serves as the foundation for specialized training in AI, ML, and IoT
- The TIH has developed **SIA (Social Impact Assessment)** in association with **SCOGO Networks**, which has achieved a landmark milestone in ‘Viksit Bharat’ job creation. “SIA”, a pioneering multilingual AI agent supporting 50 languages, has successfully bridged linguistic



Fig. VisMaBodha - multipurpose Mini-Center of Excellence (CoE)

barriers for field technicians, resulting in the creation of 18,067 skilled jobs to date, ensuring long-term financial security for India’s grassroots telecom workforce.



Fig. SIA Platform

## 26 IDEAS - Institute of Data Engineering, Analytics and Science Foundation at ISI Kolkata (IDEAS)

**Technology Vertical:** *Data Science, Big Data Analytics and Data curation etc.*

IDEAS focuses on developing integrated products that combine image, video, sensor, audio, text, and other multimodal data within a unified analytical framework, with applications spanning agriculture, ecology, defence, and healthcare. A key technology that reached significant maturity recently is ‘**SPiDR (Smart Prediction with Infrared Detection of Residual Cancer)**’, a fully functional proof-of-concept intraoperative device that uses active thermal imaging and AI-driven analysis to detect residual cancer tissue in real time during surgery. Successfully deployed and validated in live breast cancer surgeries at Sagore Dutta Medical College, Kolkata, SPiDR integrates infrared heating, high-resolution thermal and visual cameras, and proprietary AI algorithms to generate intuitive, color-coded malignancy risk maps within existing operating room workflows.



Fig. Smart Prediction with Infrared Detection of Residual Cancer – SpiDR

## NATIONAL QUANTUM MISSION (NQM)

The Union Cabinet, approved the National Quantum Mission (NQM) on 19<sup>th</sup> April 2023 at a total cost of ₹ 6003.65/- crore for a period of eight years, aiming to seed, nurture and scale up scientific and industrial R&D and create a vibrant & innovative ecosystem in Quantum Technology (QT). This will accelerate QT-led economic growth, nurture the country's ecosystem, and make India one of the leading nations in the development of Quantum Technologies & Applications (QTA).

The National Quantum Mission aims to develop intermediate-scale quantum computers with 50–1000 physical qubits across platforms such as superconducting and photonic technologies, alongside secure quantum communication capabilities including satellite-based links, long-distance inter-city Quantum Key Distribution (QKD), and multi-node quantum networks with quantum memories. The Mission also focuses on advancing quantum sensing and metrology through high-sensitivity magnetometers and atomic clocks, while supporting the development of quantum materials, devices, and key components such as single-photon and entangled-photon sources for applications in communication, sensing, and precision measurements.

Four Thematic Hubs have been established under NQM in September 2024. These hubs focus on key areas: Quantum Computing at the Indian Institute of Science, Bengaluru, Quantum Communication at the Indian Institute of Technology Madras in association with C-DoT, Quantum Sensing & Metrology at the Indian Institute of Technology Bombay, and Quantum Materials & Devices at the Indian Institute of Technology Delhi.

These T-Hubs comprises of 14 Technical Groups having 17 Project Teams bringing together a total of 152 researchers from 43 Institutions across 17 states and 2 UTs. This initiative reflects the nation's collective ambition to lead in the rapidly evolving field of quantum technologies.

All four Hubs are now fully functional, driving technology development, nurturing human capital, promoting entrepreneurship, strengthening Industry partnership and advancing international collaborations.

### 1 Establishment of Fabrication and Central Facilities

Under the NQM, state-of-the-art Fabrication and Centralized Facilities are being established at premier institutions— IIT Bombay, IISc Bengaluru, IIT Kanpur and IIT Delhi to create world-class quantum fabrication and device development capabilities within the country. These facilities will enable researchers and startups to develop indigenous prototype quantum processors, sensors, materials, and devices, while also training the nation's human resources

in quantum technology hardware, device fabrication, and system integration.

- **The Quantum Computing fabrication facilities at IISc Bengaluru & IIT Bombay**, will enable fabrication of quantum computing chips based on superconducting, photonic, spin qubits; which are central to the development of scalable quantum qubit architectures.
- **The Quantum Sensing & Metrology facilities at IIT Bombay & IIT Kanpur**, will accelerate breakthroughs in quantum sensing such as advanced quantum sensor platforms for tangible societal and strategic impact.
- **The Quantum Materials & Devices fabrication facility at IIT Delhi**, will drive indigenous quantum materials and device fabrication for scaling up various quantum technologies.

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## 2 Startup Support in Quantum Technologies

The NQM has actively engaged with startups to foster innovation and accelerate the development of quantum technologies in India.

- NQM has formulated exclusive guidelines to effectively onboard and support startups, as quantum technologies are still at a nascent stage and require substantial investment.
- Eight promising startups have already been supported under NQM.
- A rolling Call for Startups has been launched in July 2025 to provide continuous support to early-stage ventures across all four quantum verticals including quantum computing, quantum communication, quantum sensing & metrology and quantum materials & devices.

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## 3 Capacity Building

To expedite the Human Resource Development under the four T-Hubs, it's imperative to focus on capacity building, targeting a diverse range of individuals including students, undergraduates, postgraduates, doctoral candidates, post-doctoral researchers, as well as skilled and semi-skilled manpower:

- To strengthen quantum education and build a skilled workforce, UG Minor program in December 2024 and M.Tech. Programme in Quantum Technologies in August 2025 have been launched in collaboration with AICTE.
- DST has also initiated quantum awareness programmes for researchers and faculty.
- Complementing these efforts, course books, lecture series, and teaching laboratories are being developed to ensure high-quality and accessible education in quantum science and engineering.

- A dedicated call on Undergraduate Teaching Laboratories in Quantum Technologies has also been launched in July 2025 to foster hands-on learning among young talent.
- Together, these initiatives aim to bridge research outputs with industry needs while cultivating a future-ready quantum workforce for India.

#### 4 Major Accomplishments

- Qnu Labs Pvt. Ltd. has developed 500 km Quantum Key Distribution (QKD) network that detects eavesdropping and ensures secure encryption key distribution to protect confidential data. (Fig.)



Fig. QKD Armos 500 Km (Qnu Labs Pvt Ltd.)

- QpiAI created a 64-qubit scalable, fault-tolerant Quantum Processor Unit (QPU) to achieve quantum advantage in real-world applications. (Fig.)

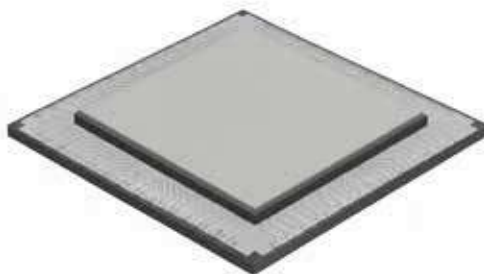


Fig. QpiAI Proprietary superconducting flip chip Integrated Technology

- PQuest Group under the IIT Bombay's Quantum Sensing & Metrology T-Hub launched India's first indigenous Quantum Diamond Microscope (QDM) for advanced magnetic field imaging. (Fig.)

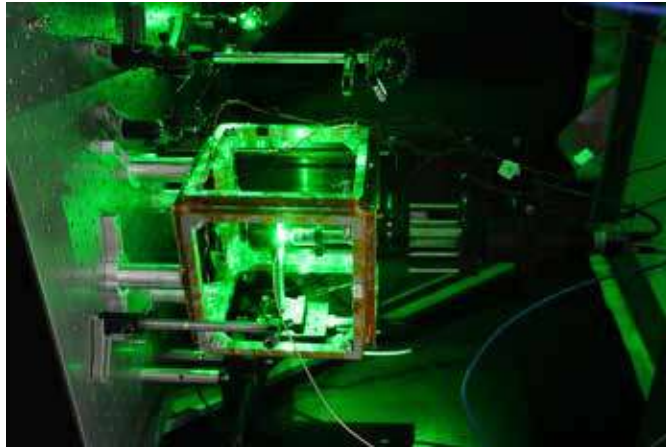


Fig. Quantum Diamond Microscope (PQuest Group)

- Prenishq, an NQM-supported startup, developed a high-precision diode laser with superior beam quality and stability for quantum communication and computing. (Fig 5.4)



Fig. High precision Diode Laser (Prenishq Pvt. Ltd.)

## AUTONOMOUS INSTITUTIONS (AIs)

The Department of Science & Technology (DST) supports a network of Autonomous Institutions that function as centres of excellence in frontier science, technology development, and science policy support. These include research & development institutes, science service or specialized knowledge organizations, and professional bodies/academies. These institutions—ranging from national laboratories and advanced research centres to mission-oriented agencies—enjoy functional autonomy while aligning with national priorities. They play a critical role in cutting-edge research, technology incubation, capacity building, and scientific advisory services, often acting as bridges between academia, industry, and government. These AIs are geographically spread across India, reflecting DST's pan-national footprint in advancing research, innovation, and science policy support across regions. Together, DST's Autonomous Institutions strengthen the national science and innovation ecosystem by promoting frontier research, enabling technology diffusion, and nurturing scientific communities across the country.

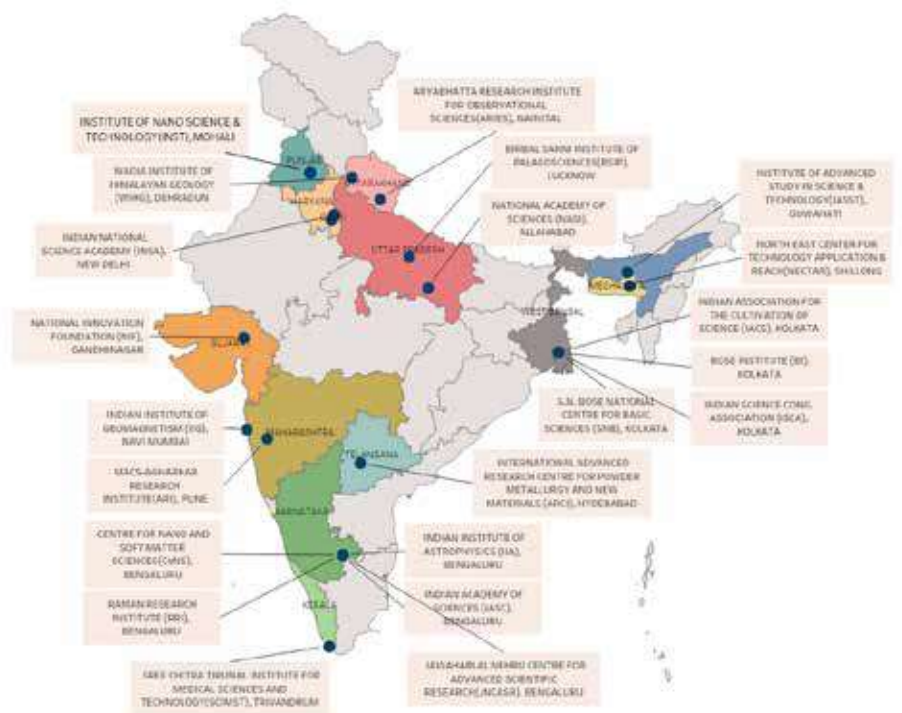


Fig. DST's Autonomous Institutions

Accomplishments of Individual Autonomous Institutions (AI's) are listed below:

## 1 Agharkar Research Institute (ARI), Pune

The Agharkar Research Institute (ARI) has research focus on Biodiversity & Palaeobiology, Bioenergy, Bioprospecting, Developmental Biology, Genetics & Plant Breeding, Nano bioscience. ARI has made significant strides in various research and societal outreach domains. A summary of the major accomplishments of ARI Pune during Year 2025-26 is given below:

- ARI enhanced India's biodiversity knowledge by documenting new species from the Western Ghats, advancing palaeobiological studies of the Deccan fossil records, and expanding DNA barcoding for the conservation of endangered species. A significant contribution was the discovery of two new fungal species in the *Aspergillus* section *Nigri*—*Aspergillus dhakephalkarii* and *Aspergillus patriciawiltshireae*—characterized through detailed morphological and molecular analyses. This finding enriches global fungal taxonomy and holds potential applications in agriculture, food safety, medicine, and industrial biotechnology, particularly in mycotoxin management and enzyme production.

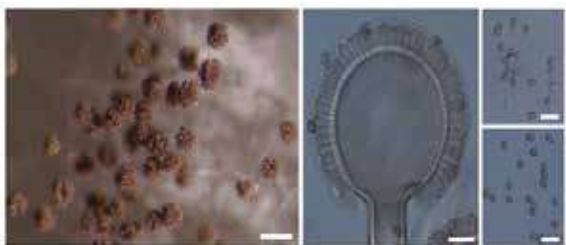


Fig 1 : *Aspergillus dhakephalkarii*



Fig 2 : *Aspergillus patriciawiltshireae*

- ARI undertook extensive exploration and conservation of fungal and lichen biodiversity, leading to major taxonomic advances. Several novel fungi were discovered and described, including *Waitea lakhanpalii*, *Alanomyces indica*, *Pseudocercospora trifoliorum*, *Scolecobasidium laurentii*, *Syncephalastrum bagoolii*, *Conidiobolus srinivasanii*, and multiple new taxa within *Mycosphaerellaceae*, *Pleosporales*, *Mucorales*, and *Aspergillus* sect. *Nigri*, along with the establishment of new genera such as *Marcstadlera* and *Neoclypeosphaerella*. New records and pathogenic reports, including *Mariannaea camelliae*, *Colletotrichum nymphaeae* on strawberry, and *Lasiodiplodia theobromae* on bitter melon, along with metagenomic and endophytic studies, strengthened biodiversity inventories, expanded national fungal collections, and generated knowledge relevant to conservation, agriculture, and biotechnological applications.
- ARI's Bioprospecting Group combined traditional knowledge of *Crataeva nurvala* (Varuna) with systematic screening of microbial metabolites and launched a project sponsored by

the RGSTC to explore, isolate, and characterize bioactive compounds from regionally important medicinal plants. This work bridges Ayurvedic and folkloric knowledge with modern scientific approaches, promoting the sustainable use of biodiversity and contributing to ARI's translational research pipeline by identifying natural compounds with promising antimicrobial and therapeutic potential.

- The bioenergy group of ARI demonstrated pilot-scale microbial hydrogen production from agricultural residues, such as paddy straw and wheat stubble, using specialized anaerobic consortia and a two-stage dark fermentation–biomethanation process developed in collaboration with Sentient Labs (KPIT Technologies). These efforts improved waste-to-energy conversion efficiency, generated hydrogen, methane, and organic fertilizer, reduced emissions from residue burning, and reinforced ARI's contribution to the circular bioeconomy and India's net-zero goals.
- The Genetics and Plant Breeding Group at ARI has advanced agricultural biotechnology through the development and evaluation of stress-tolerant wheat and soybean varieties. The institute made some recent varietal releases, including the high-yielding soybean MACS 1520 and the climate-resilient MACS 1460. Multi-location trials and seed multiplication were continued to support wider adoption in peninsular India. Field trials of microbial-based biofertilizers and biopesticides promoted sustainable pest management and soil health. These efforts, aligned with ICAR's AICRP on Wheat and Soybean, contributed to national goals of food security and climate resilience.
- The Developmental Biology Group studies in *Drosophila* addressed autophagy, nervous system function, stem cell regulation, endo-lysosomal pathways, blood–brain barrier formation, and lysosome diversity, with relevance to cancer, neurodegeneration, and ageing. A major achievement was the demonstration of a non-cell-autonomous role of autophagy in somatic niche cap cells for long-term maintenance of germline stem cells via BMP–pMad signaling, preventing age-related niche apoptosis. The group's work resulted in high-impact publications in journals.

## 2 Aryabhata Research Institute of Observational Sciences (ARIES), Nainital

Aryabhata Research Institute of Observational Sciences (ARIES) is a specialised research institute in Astronomy & Astrophysics and Atmospheric Sciences. There are three divisions in ARIES. The Astronomy division specialises primarily in observational and theoretical research of the Sun and solar system objects, galactic and extragalactic celestial sources. The Atmospheric Sciences division specialises in studying and understanding the physical, chemical, and dynamical processes governing the Earth's atmosphere, with specific attention on air pollution and climate change studies. The engineering division caters to the design, development, maintenance and upgradation of the instruments and support facilities. It

supports maintenance of the ARIES infrastructure with primary focus on astronomical telescopes and back-end instruments. Below is a summary of the major accomplishments during 2025-26:

- AI techniques were used on the ILMT data to reveal thousands of transient sources, including 16 rare supernova-like extragalactic transients. A new study has pulled back the curtain on the chaotic early lives of young stars, revealing that stellar infancy is far more turbulent and variable than previously thought; Observations from Indian telescopes revealed that star formation activities were triggered around an expanding molecular bubble; Thousands of open clusters in our Milky Way Galaxy were traced to show that the interstellar dust is not evenly distributed in the galactic disk; A comprehensive study of contact binary stars indicated star spots and magnetic activity; The first high-resolution observations in the Central Himalayas were used in revealing the complex greenhouse gas dynamics and highlighting the influence of emissions from both local and upwind sources; Improved prediction of the Indian monsoon and better assessment of air quality over South Asia are now becoming possible with new insights into the hidden patterns of airflow over the Himalayas as found by a new study.
- An international team lead by ARIES scientists shed light on the X-ray secrets of High-Energy Blazars by detecting rare signatures from their jets. Two supermassive black holes were spotted in orbit circling around each other by an international team involving ARIES scientists in radio.
- The scientists of ARIES had the following significant achievements also: Uncovering a way to reconstruct the Sun's past polar magnetic behaviour stretching over a century by digging into historical solar images taken at the Kodaikanal Solar Observatory (KoSO); Study of the radiative effects and climate implications of water vapour and aerosols over the Indo-Gangetic Plain. The study revealed that the water vapour contributes more to the atmospheric heating than the aerosols.
- To honour ARIES's contributions in the field of science, the Department of Posts, Government of India, released a special commemorative cover on 11<sup>th</sup> October, 2025. The cover symbolizes the international projects housed at ARIES's Manora Peak and Devasthal campuses.

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### 3 Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow

Research activities at BSIP involve a multidisciplinary approach which includes a variety of biotic and abiotic proxies, for a holistic understanding of the evolution of floras, faunas, climate and ecosystems at different temporal and spatial scales through time. Some major highlights of research work & other activities during 2025-26 at BSIP are given below.

- BSIP scientists identified evidence of Permian (~290 Ma) wildfires in the Godavari

Basin using palynofacies, geochemical, and spectroscopic analyses, revealing how palaeofires, sea-level changes, and charcoal preservation shaped past environments and carbon storage.

- A well-preserved early Miocene bamboo fossil from Neyveli, India, exhibiting rare features like nodal buds and swollen nodes, represents the earliest bamboo fossil from southern India. This discovery provides key insights into bamboo morphological evolution, supports a Gondwanan origin of Asian bamboos, and indicates warm, humid ancient climates.
- BSIP scientists showed that travertine deposits at Ladakh's Puga hot springs can trap and preserve prebiotic organic molecules, highlighting  $\text{CaCO}_3$  as a natural template for origin-of-life chemistry and aiding biosignature detection for planetary exploration.
- BSIP researchers reconstructed Sri Lankan genetic history, revealing links to mainland India over the past 4–5 millennia, and showed dynamic admixture over ~1300 years at the northern Himalayan frontier, reshaping high-altitude population history. BSIP researchers also reconstructed a middle Eocene (~41.6–40.8 Ma) tropical ecosystem from Harudi Formation amber, revealing high arthropod and palynomorph diversity under warm, humid conditions and supporting the ESAT (energy-stability-area-time) model of deep-time biodiversity and climate–ecosystem links.
- BSIP is hosting '**PRITHVI – The Palaeoscience Film Festival of India**', in 2026 which is an annual national initiative aimed at promoting and inculcating science communicators and science filmmakers in the domains of Palaeosciences, Geology, Botany, Climate & Earth Sciences, Geo Heritage, and Geo Tourism.

#### 4 Bose Institute (BI), Kolkata

Bose Institute (BI), Kolkata is engaged in frontier research across diverse domains of basic sciences, while simultaneously advancing the fundamental knowledge-base and translating it towards addressing critical national challenges. The Institute undertakes focused research initiatives in priority areas such as healthcare, food security, environmental sustainability, and climate change mitigation. The major highlights during Year 2025-26 are given below.

- Scientists of Bose Institute found a novel way to tune the optoelectronic properties of  $\text{MoSe}_2$ . By inserting manganese (Mn) atoms between the atomic layers—a process called intercalation—they have successfully engineered the material's band structure and light emission properties. The added Mn donates electrons to the conduction band of  $\text{MoSe}_2$ , inducing a Burstein–Moss shift in the band gap. These Mn-treated samples also show a broad range of light emission due to the combined effects of the host material and the Mn atoms. The results provide new insights into how adding atoms between layers can control material properties, opening possibilities for future light-based and electronic technologies.

- Scientists at Bose Institute have developed a novel method to study radiation effects on GEM detectors vital for high-energy physics and medical imaging. This achievement marks a significant step forward in strengthening India's contribution to the FAIR project, Germany.
- Scientists of Bose Institute have invented a New CRISPR Technology that helps plants to outsmart heat and disease. CRISPR tools usually work like scissors that cut DNA to create lasting changes. However, scientists of Bose Institute have developed a modified version that does not cut DNA. Instead, it acts like a switch that can turn genes on or off. The switch stays off until the plant experiences stress.
- Research finding overturns a 50-year-old paradigm in molecular biology and offers new insights into bacterial transcription mechanisms with far-reaching implications for understanding gene regulation and antibiotic development.
- Researchers at the Bose Institute, Kolkata, have shown that bacteria living inside freshwater sponges (*Ephydatia meyeri*) can act as real-time indicators of toxic metal pollution in the Indian Sundarbans. It was found that sponges from polluted sites contained higher concentrations of metals and distinct bacterial communities compared to cleaner waters. Certain bacterial species such as *Pseudomonas*, *Bacillus*, *Micrococcus*, *Streptomyces*, and *Arthrobacter* were linked with specific metal accumulations, suggesting their role in detoxification and metal sequestration. The study highlights the sponge–bacteria partnership as a potential eco-friendly biosensor and bioremediation tool for monitoring aquatic pollution.
- Scientists of Bose Institute have proposed a novel mechanism to test whether gravity acts as a quantum entity when measured. This study is a substantial step towards verifying whether gravity is quantum.

The 03-million-dollar Breakthrough Prize in Fundamental Physics 2025 has been awarded to researchers from over 70 countries representing CERN's Large Hadron Collider (LHC) collaborations — ATLAS, CMS, ALICE, and LHCb. Scientists from the High Energy Physics Group of Bose Institute share this honour as part of the ALICE Collaboration, contributing significantly to detector hardware development, simulation, physics analysis, data-taking, and experiment operations.

## 5 Centre for Nano and Soft Matter Sciences (CeNS), Bangalore

Centre for Nano and Soft Matter Sciences (CeNS) carries out research in the area of Nanomaterials and Composites, 2D materials, Soft-materials, Soft-nano composites, Supramolecular polymers, Surfaces and interfaces, Halide perovskites, Sensors, Photovoltaic materials, Electrocatalysts, Energy storage devices, Memristors, Electro-optical devices, Electrochromic devices, Smart windows and displays. The major activities of CeNS during Year 2025-26 are given below.

- An externally tunable near-infrared modulation device was fabricated by incorporating the two-dimensional material hexagonal boron nitride (h BN) into a polymer liquid crystal matrix.
- A multiplexed few-layer graphene (FLG) transistor array integrated with machine learning was demonstrated for real time detection of traumatic brain injury (TBI) biomarkers—Glial Fibrillary Acidic Protein (GFAP) and S100 calcium binding protein B (S100B). This supports POC diagnostics for emergency and defence medicine.
- A fluorescent gadolinium-based metal–organic framework, Gd (DAB), was developed as a turn-off photoluminescent sensor for nitroaromatic explosives which is critical for national security and environmental monitoring.
- An NiO/NdNiO<sub>3</sub>-based sensor demonstrated superior SO<sub>2</sub> detection at 140 °C, with a response range from 450 ppb to 200 ppm and an impressive detection limit (320 ppb), presenting a promising avenue for applications in industrial and environmental monitoring.
- A cost effective CoMnNi alloy demonstrated excellent water electrolysis performance in alkaline media with remarkable stability, sustaining 100 h of operation at 100 mA cm<sup>-2</sup> and also under harsh conditions, including 6 M KOH and alkaline seawater. This can contribute to the National Green Hydrogen Mission.
- An innovative piezoelectric device composed of tungsten trioxide (WO<sub>3</sub>) polyvinylidene fluoride (PVDF) nanocomposite showcases a promising route toward highly efficient, flexible, and wearable energy-harvesting devices with real-time biomedical applications. The fabricated prototype demonstrated an output voltage of 107 V under biomechanical force ranging from 10 to 11 N, achieving a maximum power density of 377.46 μW/cm<sup>2</sup> at 1 MΩ resistance.
- A flexible AAIB was developed using copper hexacyanoferrate (CuHCFe) intercalated with Al<sup>-</sup> ions and MoO<sub>3</sub> anode, which offers a safe, cost-effective, and eco-friendly alternative to Li-ion batteries, ideal for flexible electronics and grid storage. This innovative flexible battery delivers high performance with 66.84 mAh g<sup>-1</sup> at 0.5 A g<sup>-1</sup> capacity, durability of 96.77% efficiency after 150 cycles and exceptional flexibility, retaining nearly 80% capacity even when bent completely.
- A facile colloidal technique for the growth of core shell heterostructures for inorganic halide perovskites, lead-free Cs<sub>2</sub>NaInCl<sub>6</sub> shell on the surface of Cs<sub>2</sub>AgBiCl<sub>6</sub> cubic NCs has been developed with ten-fold enhancement in photoluminescence quantum yield.

## 6 Indian Association for the Cultivation of Science (IACS), Kolkata

Indian Association for the Cultivation of Science (IACS) carries out cutting-edge research

in various field of Theoretical Sciences, Molecular Sciences, Materials Sciences, Biological Sciences, and Mathematical and Computational Sciences. The major activities of IACS Kolkata during 2025-26 are given below.

- The phenomenon of Dynamical Freezing has been discovered, providing a mechanism that can help stabilize a quantum system—such as a quantum device composed of interacting qubits—against decoherence. In a work titled Stabilizing quantum many-body scars, a route has been proposed to stabilize quantum states with nontrivial entanglement patterns in experimental settings and such states are important for quantum computation.
- Electron–magnon coupling has been demonstrated in few-layer graphene/FePS<sub>3</sub> heterostructures, accompanied by the observation of negative magnetoresistance and magnon softening. Power-law divergence of critical fluctuations has been observed in charge-density-wave (CDW) transitions in quasi-one-dimensional CDW systems.
- It has been shown for the first time that black holes can be deformed by dynamical tidal fields, and the resulting impact on gravitational waveforms has been illustrated.
- In Mathematics, the proof for the Bedford conjecture, which has been an open problem for last 30 years was successfully provided by a faculty of IACS as a joint author. Also, Deep learning-based method to combine genetic profile and histopathological slides to detect the gradation and estimate the survival risk in cancer patients were developed.
- An Ultrafast laser spectroscopy facility was established in the eastern region and carried out photophysical process of nanomaterials. A battery development lab has been established where the mechanistic and degradation studies of battery electrodes and electrolytes using in-situ and ex-situ spectroscopic and diffraction methods are carried out.

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## 7 Institute of Nano Science and Technology (INST), Mohali

Research activities at Institute of Nano Science and Technology (INST) encompass physics, chemistry, biology, and interdisciplinary sciences addressing problems in the field of energy, environment, quantum materials, nano-devices, and chemical biology. Institute has set a unique mission to work at the forefront of fundamental science together with the development of technologies to address problems of national and global priorities. The major activities during 2025-26 are given below.

- INST's researchers showed a new path involving nanoparticles integrating a polyphenol with antioxidant properties found in green tea, neurotransmitter, and amino acid has the potential to treat Alzheimer's Disease (AD) by changing the path of the progression of the disease, slowing it, improving memory, and supporting thinking skills.

- INST's researchers have recently reported on cholesterol-based nanomaterials as promising platforms for future quantum technologies and spintronic applications. These findings have been highlighted by several prominent national media and newspapers.
- Researchers of INST discovered a new semiconductor property of a known self-assembling bacterial shell protein that could pave the way for safe, environment friendly electronics—from mobile phones and smart watches to medical instruments and environmental sensors.
- It was demonstrated that nano plastics derived from single-use PET bottles adversely affect gut microbiota and human cells, providing the first direct evidence of their disruption of key biological systems essential for human health.
- In a ground breaking twist in cancer research, scientists have discovered that certain bacteria living in our gut can dramatically enhance the potency of common chemotherapy drugs and explored whether *E. coli* could enhance the bioactivity of conventional drugs not originally designed for CRC.
- Researchers of INST have developed a novel one-step colloidal synthesis method for nanoparticles with a unique shell structure with nano-cup morphology that is partly covered with polyethylene glycol (PEG) that can help with photothermal therapy (PTT) to treat cancer.
- A team of researchers from INST have designed a 3D-printed scaffold made from biodegradable polylactic acid (PLA), which is known for piezo-photocatalytic properties, acts as water filter that not only traps pollutants but also destroys them, using sunlight, gentle vibrations, and a slight help from artificial intelligence (AI).
- Scientists of INST, Mohali, grew  $\text{CuWO}_4$  (Copper tungsten oxide) nano-particles precursor over  $\text{Cu}(\text{OH})_2$  (Copper hydroxide) and fabricated  $\text{CuWO}_4$ -CuO hetero-structure and studied its physical and electrochemical properties. They examined the Gibbs free energy profile for proton adsorption of different regions and found that near the depletion region and along the interface, the proton adsorption energy shows contrasting behaviour as compared with bulk area. This induces a gradient in Gibbs free energy across and near the depletion region, thereby promoting an improved hydrogen adsorption and desorption.
- Researchers of INST have developed a triboelectric nanogenerator (TENG) wherein flexible single crystals of an organic compound was used as the main component for the fabrication of a self-powered tactile sensor which was used to monitor finger joint movements. This has significant importance particularly in biomedical and robotic system development & could pave the way for their utilization as biomedical wearable devices.

- An AI tool named Spextra.AI was developed that is first of its kind to train Raman spectra of disease biomarkers for intelligent detection and diagnostics. Researchers also developed a non-enzymatic/metal-free small fluorescence probe for total cholesterol detection blood serum samples in collaboration with doctors from PGI, Chandigarh.

Flexible hybrid supercapacitor has been designed and working prototype has been demonstrated with high Energy density of 217 Wh/Kg and high stability of 1 lakh cycle with 98% capacitive retention. The prototype device is working under a wide potential window of 3.5 volt and wide temperature window of -25°C to +60°C

## 8 Institute of Advanced Study in Science and Technology (IASST), Guwahati

The area of focus of Institute of Advanced Study in Science & Technology (IASST) is Basic and Applied Plasma Physics, Advanced Material Sciences, Mathematical and Computational Sciences, Traditional and Modern Drug Discovery and Disease Diagnosis, Biodiversity and Ecosystem Research, and Interdisciplinary Research. The major activities during 2025-26 are given below.

- Analysis of venom proteome composition of Indian Black Scorpion (*Heterometrus bengalensis*), Popes's Pit Viper (*Trimeresurus popeiorum*), Red-tailed Pit Viper (*Trimeresurus erythrurus*) venom from North east India and demonstration of poor neutralisation of lethality and toxicity of commercial antivenom were carried out. Smartphone-based digital imaging process for the diagnosis of Indian Big Four snake venom was developed.
- Optimization of production of biosurfactant produced by probiotic bacterium *Lactobacillus plantarum* JBC5 in a unique medium was done with its assessment for industrial applications.
- Gd-doped  $\text{CoCr}_2\text{O}_4$  nanoparticles have been developed by incorporating Gd ions, tuning their microstructural, magnetic, electronic, and optical properties for potential use in magnetic hyperthermia applications.
- Developed a Surface-Modified Graphitic Carbon Nitride as a Lubricant Additive in Bio-Based Oil. A clay-based  $\text{ZnO-TiO}_2$ -Sepiolite (ZTS) nanocomposite showed  $\text{CO}_2$  adsorption of 19.23  $\text{cm}^3/\text{g}$  at 288K and nearly 100% removal of textile pollutants from water, highlighting its cost-effectiveness and sustainability.
- Cross-linked starch-gold nanocomposite films demonstrate enhanced flexibility with an elongation of 130%. Stability analysis and water vapor permeability tests were conducted that indicate lower permeability, suggesting potential applications in biodegradable packaging and coatings.

- It was reported that *Leuconostoc mesenteroides* strain SB1075 enhances the flavor, texture, and nutritional profile of soy yogurt, significantly extending its shelf life and improving dairy alternatives in safety and longevity.
- A cost-effective nano system comprising cobalt nanoparticles over SnS<sub>2</sub>/SnO<sub>2</sub> is used for overall water splitting with excellent H<sub>2</sub> yield.
- A layered LDH system is used for electrocatalytic O<sub>2</sub> evolution with immense practical use in alkaline water electrolyzers with 66 times increased activity-to-price efficiency compared to traditional RuO<sub>2</sub> catalysts.
- A time-domain model has been developed for studying the interactions of acoustic-gravity waves and wave-seabed, revealing transient wave evolution, interfacial coupling, seabed-induced energy dissipation, higher-mode wave responses, and applications to long-range Indian summer monsoon rainfall prediction using deep learning.
- Cold atmospheric plasma (CAP) has been used as a tool to increase the β-sheet content in CAP-treated glycosylated BSA compared to native forms. These findings provide insights into CAP's potential applications in biomaterials, disease mechanisms, and protein engineering.
- A nitro-substituted organoselenium compound inhibits the growth, invasiveness, and metastasis of breast cancer cells while enhancing survival rates in preclinical mouse models.
- Enhanced visible-light-driven photodegradation of total petroleum hydrocarbons was developed applying biogenic trimetallic nanocomposite. Flexible and transparent PVA-PEG composite film having a high dielectric constant was fabricated.
- Cobalt ion-incorporated nanocrystalline spinel cubic zinc ferrite was developed for targeted magnetic hyperthermia and sensing applications.
- Method of development of preparation of Jackfruit-enriched *Kombucha* by IASST, marked a key translational outcome highlighting its strong potential for commercialization and value addition of locally available fruits and vegetables.

## 9 Indian Institute of Astrophysics (IIA), Bangalore

Indian Institute of Astrophysics (IIA) is a specialized R&D institute in the field of Astronomy, Astrophysics, and Astronomy Instrumentation. Major achievements of the institute during 2025-26 are given below.

- In a major advancement in computational astrophysics, a team including scientists from IIA have developed a method to compute more realistic properties of stellar atmospheres. The method opens the door to more realistic simulations of stellar spectra — the primary

tool astronomers use to decode the physical conditions in stars, circumstellar disks, and interstellar clouds.

- A peculiar star named A980 that is 25800 light years away was recently discovered. A closer look into this star by astronomers from IIA using the Hanle Echelle Spectrograph on the Himalayan Chandra Telescope in Ladakh showed something strange that has rewritten the known facts about stellar chemistry. Researchers of IIA have uncovered a cosmic twist that this mysterious star which belongs to a rare class called Extreme Helium (EHe) stars, carries surprisingly high amount of Germanium—a metallic element never before observed in this type of star.
- Astronomers have found an explanation for the strange deficiency of dark matter, a critical component of galaxy formation, in the galaxy NGC 1052-DF2, 62 million light years away that has so far remained as a puzzle. A work by researchers of IIA traces the reason behind this. The research shows that the estimation of the dark matter halo is critically dependent on the shape and structure of the dark matter halo, a huge invisible cocoon of dark matter, which gravitationally affects the dynamics of the stars and anisotropy or direction of the stellar velocity dispersion.
- A new study carried out by researchers of IIA has accurately estimated the abundance of Helium in our Sun for the first time. This could be a major step in assessing the opacity of the Sun's photosphere. Another study led by IIA used calcium K line spectroscopic data of 11 years (2015-2025) from the Kodaikanal Solar Observatory which recently celebrated its 125th anniversary to map how the Sun's magnetic activity varied with latitude.
- Supermassive black holes at the centres of galaxies are known to drive outflows of gas, and astronomers have long studied how feedback processes from these outflows can in turn determine the evolution of these galaxies. However, a key puzzle has been to understand the relative influence of this gas outflow versus radiation from the central regions on the behaviour and evolution of the host galaxy. A new study IIA has uncovered key insights into these powerful forces shaping our Universe. Their study reveals that both the intense radiation from around the black holes, as well as the high-speed jets they emit, can work together to eject gas from the centres of galaxies, potentially shutting down star formation in their central regions and regulating galactic growth.
- A new study by IIA has traced a link between Lithium-rich red giant stars and their enhanced Helium abundance, using data from the Himalayan Chandra Telescope and other archival data. In this study, researchers have measured the Hydrogen abundance, and any departure from its standard value, by comparing the magnesium abundances derived from its atomic versus molecular spectral lines. This departure in hydrogen abundance was then translated to the corresponding helium abundance using the model

atmospheres computed for differing values of hydrogen to helium ratio (He/H ratio). This method was also effectively used by the team for determining the Helium abundance of the Sun in an earlier work.

- Scientists have long believed that just like dust particles dancing in a ray of light, tiny cosmic particles floating between stars in the Milky Way act as storytellers of the universe. A team of astronomers led by IIA and their collaborators has made a breakthrough in understanding how these dust grains behave. They have uncovered the strongest observational evidence yet of how these interstellar dust grains align themselves with magnetic fields in our Galaxy. Their work provides the strongest observational evidence yet for the long-theorized ways in which dust aligns itself with magnetic fields in our Galaxy. The study found observational evidence for three different alignment mechanisms acting in a single cosmic cloud namely RAT-A, RAT-D and M-RAT.
- On the day of the total lunar eclipse on 7<sup>th</sup> September 2025, broad organisational platforms were created for Karnataka and Tamil Nadu, 50000 posters in Tamil were printed and distributed, training workshops were organised, more than 25 schools were visited for awareness programs, multi-lingual information were created, press conferences were organised, and the eclipse was live streamed publicly.
- 25<sup>th</sup> September 2025 was marked 25 years of operation of the Himalayan Chandra Telescope at Hanle, Ladakh. 30<sup>th</sup> November 2025 marked 10 years of operation of the UltraViolet Imaging Telescope on board AstroSat, along with the Payloads Operations Centre at IIA.

The Hon'ble Union Minister of Finance and Corporate Affairs, visited the Indian Astronomical Observatory (IAO) and Hanle Dark Sky Reserve (HDSR) at Hanle, and the proposed site of the National Large Solar Telescope (NLST) in Merak during June 16-17, 2025. She laid the foundation stone for the Mini Planetarium and Astro Globe at HDSR on 16<sup>th</sup> June, at Ladakh

- IIA is the Indian nodal agency in the Thirty Meter Telescope (TMT) international project. In this regard, 18 sets of prototype P3e Actuators were successfully fabricated and shipped to the Observatory in USA and testing is ongoing. Glass edge sensor block machining has been perfected. A chromium-gold coating method was developed by India TMT Coordination Office. SSA Module Assembly Test Tool was delivered to IIA and all 10PQP SSAs passed the test. Production Qualification Phase Segment Support Assemblies (SSA) were completed and delivered to ITCC. SSA Module Assembly Test Tool was designed, fabricated, and delivered, and all 10 SSAs passed the test.
- The COSMOS-Mysuru planetarium project is ongoing. The civil engineering and MEP works were continued, focusing on getting the sky theatre ready for equipment installation.

## 6.10 Indian Institute of Geomagnetism (IIG), Mumbai

Indian Institute of Geomagnetism (IIG) is a specialized research institute under DST which work in Geomagnetism and allied fields. Major achievements of IIG during 2025-26 are given below.

- IIG scientists have revealed the causes for the strongest geomagnetic storm of the past three decades, which occurred on May 10 – 11, 2024. The storm was driven by a sequence of six Earth-directed coronal mass ejections (CMEs) from the Sun, which interacted with each other, and a cannibal CME has impinged on the Earth's magnetosphere around 1700 UT on 10<sup>th</sup> May 2024. IIG scientists investigated the multifaceted impacts of this event on the near-Earth space environment. The widespread effects of the event, spanning from the outer magnetosphere to the lower atmospheric regions, underscores the vulnerability of ground- and space-based technological systems to extreme space weather hazards.
- A team of IIG scientists have investigated different plasma waves that play a role in particle transport and acceleration in Earth's magnetosphere. This includes lower hybrid drift waves, electromagnetic ion cyclotron waves, magnetosonic waves. Furthermore, the IIG team has studied the plasma processes in Martian magnetosphere and ionosphere. This includes the first evidence of plasma waves in the Martian magnetosphere. The novel method and tool to identify solitary waves in the Martian magnetosphere have been developed. The team has also reported unique observations of the double layers, magnetosonic waves, and provided the theoretical models to understand their generation mechanisms. Furthermore, the spatial scales of electron density fluctuations, which are crucial for understanding their impact on the radio wave propagation in the Martian ionosphere have been obtained. The team has also investigated the ultra-relativistic charged particle dynamics in Jupiter's radiation belts and found a new proxy useful for predicting the adiabatic and non-adiabatic regimes of the trapped charged particles, leading to a better understanding of Jupiter's radiation belts.
- The impact of solar variability on the mean horizontal winds at the mesosphere and lower thermosphere region is investigated using MF Radar data from two stations in India, Kolhapur (16.7°N, 74.2°E) and Tirunelveli (8.7°N, 77.8°E), for durations 2015-2025 and 1993-2011, respectively. It is found that the meridional wind component's annual oscillation strength decreases during the ascending phase and maximum, while it increases during the descending phase and minima of solar cycles 22 to 24. Furthermore, the effect of solar variations on the atmospheric tide is investigated using temperature data from the Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) instrument, which is one of the primary scientific payloads aboard the Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED) satellite.

- IIG scientists have explored the convective generation of volcano-induced Atmospheric Gravity Waves (AGWs) using the multisensory observations, after the January 15, 2022 Hunga Tonga-Hunga Ha'apai, April 11, 2021 La Soufriere, and February 13, 2014 Kelud eruptions, strengthening the existing understanding of lithosphere-atmosphere coupling through wave-dynamic pathways. A comparative assessment of Rayleigh seismic waves and associated ionospheric perturbations during the Mw 9.1 Tohoku-Oki earthquake of March 11, 2011, over the Japan, revealed that low-frequency Rayleigh waves are particularly effective in coupling with ionosphere, thereby producing more prominent signatures.
- Geophysical Studies over North-East India and Deccan Traps was formulated by IIG to understand the structure, tectonics and geodynamics of North-East India with special emphasis on Kopili fault and the western continental margin and coastal regions of the Deccan Volcanic Province. Geophysical surveys including ground magnetic (coastal DVP & adjoining areas of Kopilli fault) and Electrical Resistivity Tomography (Kopilli Fault area) were carried out in addition to data retrieval from broadband seismometers placed at several locations in North-East India; Utilising data from CHAMP and Swarm Satellite Constellation, a Lithospheric Magnetic Anomaly Model was generated over the Indian sub-continent and adjoining oceans; A comparative study based on magnetic proxies undertaken before and during Mahakumbh-2025 in Prayagraj and adjoining regions helped in assessing pollution levels before and during the event.
- Analysis of aeromagnetic data in the western continental shelf (16 to 17 N) helped in mapping of shallow and deep lineaments, some of which are relicts of India-Madagascar separation. The magnetic sources mapped up to 60m isobath are interpreted to reflect the signature of Deccan Traps in the continental shelf. The interseismic strain rate and fault coupling ratio at the Main Himalayan Thrust beneath the central Himalayas (Himachal-Garhwal-Kumaon) were analysed using 40 new GPS data (2003-2016) along with published data. The study's interseismic coupling model shows no low coupling zones, contradicting previous studies, likely due to the better GPS data coverage. The geodetic moment rate indicates an earthquake potential of  $M_w > 8.7$  for this region.

## 11 International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) is focused in research related to Materials and Devices for Energy Storage, Solar Energy Materials, Nanomaterials, Engineered Coatings, Ceramic Processing, Laser Processing of Materials, Fuel Cells, Carbon Materials, Additive Manufacturing and Advanced Powder Metallurgy.

- Powder as well as high-performance thermal barrier coatings (TBCs) were developed by ARCI for scramjet combustor engines. These TBCs enabled stable combustion and effective thermal management under high temperature. The new TBC contributed to required temperature drop during 120 seconds ground test as part of the development of scramjet technologies by DRDO. The test was successful with stable combustion, improved performance control and robust thermal management-marking a major step toward next-generation self-deterrent systems.
- Pulse electro-deposited Ni-W and HVAF sprayed WC-Co coatings of 50-micron meter thickness were deposited on water jet piston rods and supplied to M/s Larsen & Toubro (L&T) Limited for finishing and field testing. The finished components succeeded in the leak testing and were eventually deployed in the water jet boat for field testing.
- Designed, developed a 1kW alkaline electrolyzer for Hydrogen production using cost-effective Indigenous electrodes replacing Ni electrodes. This was demonstrated to run a Hydrogen gas stove (provided by M/s Vision Mechatronics). Demonstration of PEM fuel cell as a backup power supply for Airtel telecom tower was carried out successfully at Pune.
- For the first time a heavy water pump shaft in nuclear power plant was coated with carbide powders at ARCI using detonation spray coating technology and supplied to industry for field tests.
- Development of NVP cathode material for sodium ion batteries by solid state process and 1Kg of the material was supplied to Watthour company for field trials and validation. LFP-LTO fast charging cells (18650) were made and supplied to M/s MagicMyna for demonstration in drones. IITD- ARCI validated the carbon and LTO developed by IIT Delhi at cell level with the fabrication of 18650 cells. Successfully fabricated & validated pouch cells using M/s Cancri's carbon produced from Bio-waste.
- ARCI has been selected as an e-node for ANRF MAHA EV Mission and will work as lead institute, with several academic and industry partners such as IIITDM Kancheepuram, IIT Hyderabad, NIT Warangal, IIT Guwahati, IIT Bhilai, IIT Tirupati, ICT Hyderabad, Tata Motors, Amara Raja Advanced Cell Technologies, ALTMIN Pvt. Ltd., Himadri Chemicals Ltd., and Innovative Filtrex for Development and demonstration of materials and fabrication technologies for tropical batteries.
- ARCI has established a facility for producing NIB magnets adopting a novel process called the New Press Less Process (NPLP) technology for the manufacture of near-net shaped rare earth magnets.
- ARCI in collaboration with DRDO and ISRO has established a Low Expansion Glass-Ceramic (LEGC) process line to fabricate lithium aluminosilicate based low expansion glass-ceramics by melt quenching process. These materials are of critical importance for

strategic applications such as inertial navigation systems, precision optical components, and satellite mirrors. ARCI has been successful in indigenizing LEGC at par with imported substitute.

- The development of an indigenous Anode-Supported Solid Oxide Fuel Cell (SOFC) and Solid Oxide Electrolysis Cell (SOEC) technology in India is still at a nascent stage. ARCI has established the pilot scale facility (SOFC technology to TRL-7) and is optimizing the processing steps for enhanced production rates and lowering cost of components and stacks. ARCI is in the process of fabricating Made in India 10 kW SOFC stacks and systems jointly with the consortium partners.
- Efficient Phase Change Material (PCM) composites were developed at lab-scale, showcasing improved thermal conductivity, mechanical strength, long-term stability, and cyclability.

## 12 Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore

JNCASR is focused on research in the areas of Chemistry and Physics of Materials, Engineering Mechanics, Evolutionary and Organismal Biology, Geodynamics, Molecular Biology and Genetics, Neuroscience, Theoretical Sciences, New Chemistry, and Chemical Biology. Some research breakthrough during 2025-26 is given below:

- Defect-free metal/semiconductor superlattices with engineered interfaces was developed that enable highly efficient electron transport and quantum-enabled heat-to-power conversion, paving the way for energy-efficient electronics and sustainable technologies.
- JNCASR has enabled the incubation and scientific advancement of modular nuclear fusion reactors, positioning India to lead in next-generation clean and transformative energy production.
- A metal-free donor–acceptor covalent-organic framework was created for piezocatalytic water splitting, breaking dependence on heavy and transition metals while improving efficiency and sustainability of hydrogen production.
- An NASICON-based sodium-ion battery that charges to 80% in six minutes and retains over 80% capacity after 3,000 cycles was developed, marking a major advancement towards energy independence and Atmanirbhar Bharat goals.
- Scientists of JNCASR demonstrated a glucose-derived nanosphere-based delivery of an epigenetic activator that restores neuronal function, learning, and memory in autistic models, establishing the first direct link between histone acetylation and autism and opening new treatment avenues. Another research identified miR-7a as a key regulator of neuroinflammation and ferroptosis through Klf4 suppression and proposed an RNA-

based therapeutic strategy using miR-7a and Honokiol for effective Alzheimer's disease management.

- Oral cancer-driving gene mutations in women patients from southern India was identified, providing critical genetic clues to address India's high oral cancer burden linked to tobacco-infused betel quid and gutka consumption, particularly among women in southern and northeastern regions.
- JNCASR was ranked 44<sup>th</sup> under the Research Institutions category in the National Institutional Ranking Framework (NIRF) 2025 released by the Ministry of Education, Government of India. With the joining of 105 students in August 2025, the current student strength is 440. A total 71 degrees were conferred to students across various degree and diploma programmes.
- Nature Index Institution Tables 2025, which covers the period between 1<sup>st</sup> August 2024 and 31<sup>st</sup> July 2025, ranked JNCASR among the top academic institutions in the country. The Centre secured 17<sup>th</sup> rank across all categories of institutions, 14<sup>th</sup> across all subjects, 9<sup>th</sup> in Biological Sciences, 11<sup>th</sup> in Physical Sciences, and 12<sup>th</sup> in Chemistry.

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### 13 Raman Research Institute (RRI), Bangalore

Indian Science Nobel Laureate Professor C. V. Raman founded the Raman Research Institute (RRI) in 1948. The research at the Institute is in frontier themes under Astronomy and Astrophysics, Light and Matter Physics, Soft Condensed Matter and Theoretical Physics. The Institute's Electronics Engineering Group and Mechanical Engineering Services have built world-class instruments and telescopes in India and around the world. Major highlights during the period in question are given below.

- Shaped Antenna measurement of the background Radio Spectrum (SARAS) is an indigenous correlation spectrometer designed for precision measurements of the cosmic radio background and faint features in the sky spectrum at long wavelengths arising from redshifted 21-cm from gas in the reionization epoch. The SARAS 3 model, the third-generation antenna, was deployed in remote, radio-quiet regions of the Andaman Islands, where it collected 30 hours of data which RRI researchers are currently analysing. Current efforts are towards winter deployment in the Arctic. Complementing the ground-based observations, Probing Reionization of the Universe using Signal from Hydrogen (PRATUSH) will be its extension in space. PRATUSH will orbit the moon, leveraging its pristine far side. It aims to study when and how the first stars formed in our Universe. During the past year, researchers at RRI built a laboratory model of PRATUSH which houses a compact single-board computer built around a raspberry pi – a necessary innovation considering the stringent constraints in size, weight, power usage for a flight model. Under an MoU with Space Applications Centre (ISRO), the researchers are working towards the development of a space-hardened version.

- A new study from researchers at the Raman Research Institute (RRI) and collaborators reveals that the intraparticle form of entanglement (that involves links within a single particle), a less-known form of quantum entanglement, is not only more robust in the face of noise, but can also emerge from noise itself. This study opens up new avenues for further research and innovation in the topical area of quantum technologies.
- Using Raman-Driven Spin Noise Spectroscopy researchers at RRI have developed quantum sensing of magnetic fields at unprecedented sensitivities using neutral atoms at room temperatures with obvious applications in situations requiring precise measurement of weak magnetic fields. uncovered novel quantum physics of laser-cooled atoms at ultracold temperatures using an apparatus built in-house.
- RRI researchers designed a low-cost, high-throughput amplifier in-house to detect cell volume, mechanical, and physiological changes in red blood corpuscles of patients suffering from Sickle Cell Disease. Their cost-effective and portable method could be used for mass screening of the disease across our country, including the rural areas, aligning with the goals set by the National Sickle Cell Anaemia Elimination Mission. Another indigenous development at RRI was a novel dual-trap optical tweezers, which utilize laser light scattered back by the sample to detect the position of the trapped particle, rather than relying on light that passes through the trapped particles. A patent has been filed for the same.
- Researchers at RRI developed a new technique to study adsorption at unprecedented timescales by tracking changes in electrical charge on the adsorbent, rather than relying on changes in mass or volume. Such an understanding of adsorption dynamics at small spatial and temporal scales can help industries to gain precise control over the adsorption process, especially in charged materials.
- Theoretical physicists at RRI discovered a new method for detecting a property of topological space known as topological invariant in quantum materials, that remains unchanged under continuous deformations or transformations.
- Research at RRI has uncovered an exciting use for the otherwise discarded leaves of teak tree. The teak leaves exhibited nonlinear optical properties that could be employed for optical limiting applications. This research opens new possibilities for the manufacture of modern, eco-friendly laser protective equipment, such as safety goggles, shields for optical sensors, and laser-resistant coatings.
- Scientists at RRI leveraged the coffee-stain effect to detect toxins in food at the trillionth level, and have developed a novel method to investigate how fluids formed by surfactant or soap molecules behave up close, at the level of a single moving object.
- Researchers in Astronomy at RRI decoded the secret of how ultra-thin galaxies manage to stay razor-slim due to dark matter dominance. In another study, researchers have

shown how contributions from matter in the intergalactic medium may be affecting measurements of the diffuse envelope surrounding a galaxy.

## 14 Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Trivandrum

Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST) has been actively contributing to biomedical technology development and its translation, Biomaterials Research and Development, Biomedical Device Development, Technology Transfer and Industrial Partnerships, Quality Management Systems, Testing and Technical Services, Advanced Patient Care in Clinical Super-specialties in Cardiac and Neuro Sciences along with Human Resource Development in the above said areas and Public Health.

- The Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum has organized the exhibition on “Innovation for Self-Reliance – Accelerating Healthcare with Indigenous Medical Device Development – *The Sree Chitra Contributions*”, at the Indian National Science Academy Auditorium, Bahadur Shah Zafar Marg, New Delhi on 3<sup>rd</sup> October 2025. The exhibition is intended to showcase the technologies transferred by SCTIMST Team to Industry for commercialization in the recent years. The event was inaugurated by the Hon’ble Union Minister of State (Independent Charge) for Science and Technology, Government of India and was attended by many notable dignitaries including senior faculty and scientists of SCTIMST, and industry partners, along with the officials of WHO, DST, ICMR and INSA.
- Secretary, Department of Space & Chairman ISRO, Government of India has inaugurated “Centre for Space Medicine and Research”, “Simulation and Skills Lab Facility” and launched “Post Doctoral Fellowship Course on Bioastronautics” on 26<sup>th</sup> November, 2025 at SCTIMST. The Simulation and Skills Lab Facility is a part of new initiatives in the areas of biomedical research and clinical training. The Trans Lab Animal Facility will be a research facility under the Simulation and Skills Lab for housing animal models selected for cancer and diabetic research, as well as for conducting procedures. The terminology “Bioastronautics” encompasses biological, behavioural and medical aspects governing humans and other living organisms in a space flight environment; and includes design of payloads, spacecraft habitats, and life support systems. With a view to develop human resources on this specialized area, which is not so familiar in our country, SCTIMST have decided to launch Post Doctoral Fellowship Course on Bioastronautics.
- The following license agreements were signed as part of the Technology Transfer during the period: Deep Brain stimulator with Shree Pacetronix Ltd, MP; Intracranial electrode with Synapticore Technology Pvt Ltd, Delhi; Isolation and purification of Plasma proteins - Fibrinogen, Thrombin, Intravenous Immunoglobulin, Albumin with Synapticore Technology Pvt Ltd, Delhi; Chitosan based antioxidant polymeric dressings for in situ

application of antibiotic drugs for chronic non healing wounds with Vranova Biotech Pvt Ltd, Mumbai; Box – tunnel system with secured gates for mice transfer and enrichment with Citizen industries, Gujarat; Surgical bioprosthesis heart valve (bovine pericardium based) with BL Lifesciences Pvt Ltd.

- Two products were launched commercially: Drug-Eluting Bioceramics Beads for Osteomyelitis in Bone – “BONYX” and Drug-Eluting Bioactive Cement for Osteomyelitis in Bone – “CASPRO” both manufactured by M/s. Onyx Medicals Pvt. Ltd., Meerut.
- AMRIT pharmacy of SCTIMST for dispensing consumables through a government procurement agency was inaugurated on 15<sup>th</sup> Nov 2025. During the event held in Delhi, the Hon’ble Union Health Minister inaugurated *10 new AMRIT outlets across the country* including that in SCTIMST. Starting of umbilical cord biobank was done and further expansion of cardiology biobank (now housing 4000 samples) was done.

## 15 S.N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata

S.N. Bose National Centre for Basic Sciences (SNBNCBS) is focused on the following research areas: Quantum Materials and Devices; Quantum information and communication; Computational Study of Materials, Machine learning; Observational Astrophysics; Quantum field theory, Statistical Physics and Non-Linear Dynamics. Some highlights of research/activities during 2025-26 are presented below.

- Scientists of SNBNCBS developed a photosensitive triboelectric nanogenerator based on semiconducting transition metal dichalcogenides, which is useful for harvesting mechanical and solar energy. The tribo-voltage and tribo-current variations are independent of impact frequency (0.1-5 Hz) at low frequencies, making them suitable for harvesting energy from irregular sources. There is a large impact range coverage (0.01-100 N). It is useful for real-time monitoring in both dark and illuminated conditions (with repeated on-off cycles) without requiring an additional power supply.
- Researchers at SNBNCBS designed and developed a Self-Powered, Flexible Triboelectric Nanogenerator for Real-Time Monitoring of Internal Pressure Distribution Inside a Prosthetic Socket: A new, large-area triboelectric nanogenerator that uses flexible and biocompatible polymers has been fabricated. It offers an enhanced signal compared to existing ones. Performance testing of the sensor system and patent filing are in progress.
- A new organic material has been synthesized that can produce H<sub>2</sub>O<sub>2</sub> from water splitting under ambient conditions and sunlight. The process of scaling up and filing a patent is underway.

- AI-Based Cancer Stem Cell (CSC) Profiler and Neoplasm Deconvoluter is an artificial intelligence software that uses a digital cytometric approach to quantify and identify CSCs with 98.7% accuracy, as demonstrated by experimental results, from bulk RNAseq biopsy data. The patent filing and field trial are in progress.
- Synthesis of n-type In:CdSe NPLs for Optoelectronic Applications is one of the first reports on emissive n-type doped semiconductor nanocrystals with a new synthesis method. This material shows potential for mid-infrared sensing applications. It demonstrates resistive switching (RS) behavior, which could be useful for resistive random-access memory (ReRAM) applications.
- Synthesis and Fabrication of a 2D Perovskite Material-Based Non-Volatile, Stable Memory Device was carried out. The active material is sandwiched between two cross-wire electrodes made of indium tin oxide (ITO) and gold (Au), and the device exhibits switching from a low-conducting state to a high-conducting state at a very low voltage of +0.58 V. It is highly reproducible and remains stable for over 20 days.
- A new layered 2D Van der Waals material was synthesized and characterized, and then used to design a three-electrode hydrogen evolution reaction (HER) protocol. This fabricated three-electrode cell can produce hydrogen from acidic electrolyte solutions. The process is being scaled up for commercial viability.
- The Centre has set up an Astronomical Observatory site at Panchet hilltop, Purulia, which is the first one of its kind in the Eastern India. Additionally, a Diploma Course on Observational Astronomy and hands-on sky watching session has been initiated in collaboration with Sidho-Kanho-Birsha University (SKBU), Purulia.



## 16 Wadia Institute of Himalayan Geology (WIHG), Dehradun

Wadia Institute of Himalayan Geology (WIHG) is dedicated to carrying out fundamental and applied research to understand the surface and subsurface processes of the Himalayan Orogeny. This is achieved through various Geoscience disciplines such as structural geology,

geophysics, seismology, petrology, sedimentology, biostratigraphy, earthquake geology, engineering geology, hydrology, river science, glaciology, and AI/ML. The research aims to characterize the geodynamics of Himalayan orogeny, geo-hazards (earthquakes, landslides, glacial hazards, avalanches, and flash floods), geo-resources (hydrocarbons, minerals, geothermal resources, and cold springs), glacial dynamics, biotic evolution, and the interplay between climate and tectonics. Major research activities by scientists of WIHG during 2025-26 are given below:

- U–Pb zircon Geochronological age investigation of the Bandal Granitoids Complex along the northern Indian margin were carried out. Zircon features indicate igneous origin, subduction–accretion tectonics, later crustal extension (~1.80 Ga), and links to Columbia supercontinent assembly.
- Holocene flood deposits were analyzed using petrography, zircon U–Pb dating, and Sr–Nd isotopes to determine provenance. Sr–Nd isotopes from an 8,000-year Teesta megafan core reveal rapid aggradation and variable signatures, since the mid-Holocene, driven by exhumation, precipitation, and weathering.
- Study in the Lohit and Dibang Valley, NE India suggests that uplift of the Easternmost Trans-Himalaya started prior to the India-Asia collision (i.e. 55 Ma). New hypothesis of Zircon Fission Track Data suggests that the doming process of the Tso Moriri Dom is inactive in the NW Trans-Himalaya since ~35 Ma.
- Conducted Petrography, Mineral chemistry and geochronology work of monazite in Greater Himalayan Sequence, Dhauliganga valley, Garhwal Himalaya. Geodynamic evolution of the Greater Himalaya Sequence from Bhagirathi valley, Garhwal Himalaya elucidated through quartz crystallographic analysis.
- Evidences of volcanic-arc related tectonic setting during Neoproterozoic at the northern proto-Indian continental margin were identified. Geochemical and petrological characteristics of Tertiary Himalayan and Gondwana coal deposit sequences show evidence of paleo-depositional and maturation evolution were identified.
- The oldest continental record of sub-millennium scale ISM variability using speleothem was developed. CO<sub>2</sub> in atmosphere and sea ice cover indicates ISM changes of 309-260 kyr BP.
- Substantial carbon sink in 61-million-year-old talus breccias from the Mid-Atlantic Ridge was measured. These breccias are having ~40 times more seawater-derived CO<sub>2</sub> (7.5 w.%).
- Regional static Gravitational Potential Energy (GPE), crustal thickness and Earth Gravity in the NW Himalaya indicate high topography of GPE compared to the lithospheric GPE.

- Multivariate study for landslides in Kumaun Himalaya and InSAR analysis for Joshimath, Halang and Kalpeswar was performed. Early landslide monitoring of the Kondoi village, Chakrata block, through in-situ sensors and remote sensing were carried out.
- Hydro-meteorological monitoring networks were established in the Nubra Basin by installing 3 Automatic Weather Stations (AWS) and 3 Automatic Water Level Recorders (AWLRs), and in the Dhauliganga Basin glaciological studies by installing 2 AWS and 1 AWLR.
- Satellite imagery (1969-2022) suggests receding of geothermal hot spring near Chongmulung Glacier (~4980 m asl) terminus, Karakoram by 478m (9.0 m/y) with pronounced thinning.
- Accomplished anthropogenic and climatic drivers of hydro-environmental change in urban freshwater wetlands of Doon-Valley, Uttarakhand, for sustainable management and planning. A total of 426 glacial lakes with a surface area greater than 1,000 m<sup>2</sup> were mapped in Uttarakhand. Investigated the Dharali event occurred on 5<sup>th</sup> August 2025 at Uttarakhand using an integrated approach of field investigations, satellite-imaginary, and geomorphological assessment.
- An unassembled gravity data processing code for LG-1 Galileo gravity meter data has been developed and the first version is implemented for the use. A Laser Water Isotope Analyzer was successfully installed by WIHG to strengthen isotope research.

### 17 North East Centre for Technology Application and Reach (NECTAR), Shillong

North East Centre for Technology Application and Reach (NECTAR) is a S&T service organization mainly working for the development of North East India. The major area of focus of NECTAR include - Agriculture & Food Processing; Bamboo and allied Technologies; Communication and IT technologies; Geospatial and Drone technology Application; Livelihood Generation & Value addition of Natural Resources; Training & Skill Development; Health-related Technology and outreach activities; Organization of S&T Innovation & Entrepreneurship based Conclaves, Conferences and Workshops etc.

- Implementation of NECTAR Honey Mission is ongoing. The project includes establishment of Honey Processing Unit of 1000 MT capacity, establishment of Packaging, storages, cold storage, etc. for Honey & other beehive products, establishment of Honey & other beehive products collection, trading centre, branding centre, marketing centre, etc. The project is in collaboration with the Rajiv Gandhi University where the supply of various items such as bee boxes with colonies and related accessories to set up the bee breeding centre is in progress. To set up the honey testing laboratory, various scientific equipment to facilitate the honey analysis is also in process.

- The NECTAR-led implementation of the **PM Vishwakarma Scheme** in Shillong has successfully empowered local artisans by providing comprehensive technical, practical, and entrepreneurial training designed to foster self-employment and sustainable livelihoods. The initiative saw high engagement through two specialized programs: an initial session for “Assistant Barber-Salon Services” held in late August 2025 for 32 participants, and a “Washerman (Dhobi)” program in December 2025 tailored for 28 female candidates. Both training cycles integrated core trade skills—such as barbering techniques or advanced fabric care and hygiene—with essential business modules covering financial literacy and self-employment strategies. The project has effectively bridged the gap between traditional craftsmanship and modern entrepreneurial requirements, equipping beneficiaries with the confidence and expertise needed to thrive in the local economy.
- More than 78 drone pilots were certified from NECTAR’s Remote Pilot Training Organisation (RPTO) and issued DGCA-compliant Remote Pilot License, enabled a strong pool of skilled drone professionals to meet the rapidly growing national demand of pilots.
- Over 230 students including faculty members from various colleges/universities spanning across 07 North Eastern states have been trained under the 10 days training called ‘Mobile Campus Training on Remote Sensing & GIS’. The initiative, majorly includes hands on practical case study-based training, significantly contributes to building a skilled geospatial workforce in the region aligned with national and regional development priorities.
- More than 1,500 school students undergone awareness workshops program on drone technology through interactive sessions and live demonstrations. The initiative is focused to ignite young minds and encouraging students to explore future opportunities on drone and geospatial technology ecosystem. More than 2500 trees were drone mapped and out of which about 200 trees were treated through drone spraying to mitigate the fungal disease, affecting severely, in Areca Nut plants in rural villages of West Garo hill district, Meghalaya.
- As part of the CSS “Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)” NECTAR has successfully incorporated 21 FPOs across 21 blocks in 7 districts of Arunachal Pradesh. A total of 4628 farmers has been registered, with each FPO comprising at least 100 members, and efforts to recruit new members are ongoing. Each FPO has appointed a CEO and an accountant, established physical offices with necessary facilities, and completed at least two rounds of capacity-building training. In addition, training on crop cultivation and value addition has been provided, and new products like pickles have been launched by the FPCs. The FPCs have also secured and are currently being assisted for availing the equity grant exceeding ₹ 65 lakhs in the first and second stages, supporting their growth and sustainability.

- With the collaboration of the CSIR-CFTRI, Mysuru a Mobile Processing Unit (MPU) has been developed which is a multi-optional technology intervention for the processing of fruits and vegetables enabling doorstep “processing on wheels”. This is a concept to cater to the needs of farmers in rural areas and to serve as a demonstration centre for food processing. MPU carries micro/small fully equipped processing equipment for processing of the farm produce such as pulper, juice extractor, miller, steam generator, slicer, double jacketed vessel, packaging machine, washer, etc. The kind of products that can be manufactured include beverages, jam, jelly, pickles, dried fruits, powdered spices, slices of various spices and so on.
- As part of the **PM-DevINE Project** aimed at “Promoting Organic Cultivation in the North Eastern Region (NER)”, significant progress has been achieved across all participating states in farmer training and capacity building. During this period more than 5,000 farmers have been trained in organic farming practices. To support on-farm bio-input production, 235 organic demonstration farm labs have been established. The supply of organic seeds and planting materials has been completed in all clusters, and market linkages were successfully facilitated for Muga cocoons in West Garo Hills district of Meghalaya and pumpkin in Wokha district of Nagaland. A robust Management Information System (MIS) portal has been developed, with detailed records of nearly 15,000 farmers now available on the dashboard. More than 12,000 agricultural farm boundaries have been mapped, benefiting over 6,000 registered farmers. Periodic crop monitoring has been carried out using high-resolution drone mapping, complemented by the establishment of IoT sensor networks for continuous monitoring of weather parameters and their impact on crop health. More than 18,000 out of 25,000 farmer plots have been registered on the PGS-India portal for organic certification.

Additionally, 280 local groups have received PGS-Scope-1 certification, signifying the transition of their farms from inorganic to organic practices—one of the major success indicators of the project. Awareness programmes for the establishment of Community Seed Banks were conducted in 20 clusters across Assam, Meghalaya, and Nagaland in collaboration with ICAR-NBPGR, and these seed banks are expected to become operational soon. Soil Organic Carbon detection kits were distributed to 447 farmers, who were also trained in their in-situ use and in bio-input dose recommendations. The initiative is expected to benefit more farmers in the coming period. Planning for long-term sustainability is underway through the establishment of organic outlets and improved market access for farmers. Drone data simulation has been completed in selected districts of Assam, Meghalaya, Nagaland, and Arunachal Pradesh.

- The STEM Education Hub, a collaborative initiative between NECTAR, the Smart Village Movement (SVM), and IISER Pune, marks a transformative effort to advance experiential learning in Meghalaya by establishing a state-of-the-art laboratory at the NECTAR Headquarters in Shillong. Aiming to reach approximately 100 schools, the hub

provides students and teachers with year-round access to high-tech disciplines such as electronics, robotics, 3D printing, drones, and virtual reality through a self-sustainable model funded by minimal participation fees. The project focuses on empowering educators with specialized curricula, fostering curiosity through a visually engaging lab environment, and securing administrative support to ensure long-term community engagement. The initiative's impact was recently highlighted by the STEM Fusion workshop on August 18, 2025, where over 400 students and 80 teachers showcased 95 innovative projects to distinguished leaders, including the Hon'ble Chief Minister of Meghalaya, successfully bridging the gap between academic theory and hands-on experience in technological innovation in the region.

- NECTAR's saffron cultivation initiative has successfully introduced saffron farming in non-traditional areas of Northeast India, including Arunachal Pradesh, Meghalaya, Sikkim, and Mizoram. Through scientific training and collaboration, over 80 farmers have been empowered to diversify crops and improve incomes, particularly in regions like Menchukha and Yuksom. This project expands its scope to include Nagaland and Manipur, in addition to the previously covered states. Work order for procurement of 77.50 quintal of saffron corms was issued and part distribution and cultivation are being taken up at Tawang and Menchuka of Arunachal Pradesh and Thangsning village, East Khasi Hills Meghalaya, benefitting about 55 farmers in these locations. Over the next two years, the initiative aims to bring approximately 20 acres under saffron cultivation and benefit around 500 farmers across the North East region.
- The project "*Assistance of Quality Fodder Seed Production under the National Livestock Mission*" supported by the Ministry of Fisheries, Animal Husbandry and Dairying, is being implemented in Manipur in collaboration with the Central Agricultural University (CAU), Imphal. The initiative focuses on enhancing livestock productivity through the production of quality fodder seeds and promoting sustainable agricultural practices. A total of 30 farmers were engaged in the production of fodder maize (Var. J-1006), cowpea (Var. CL-367), and Bajra Napier Hybrid (Co-4 and Co-5). Regular field visits, training, and technical support were provided to ensure quality seed production.
- Six Common Facility Centers (CFCs) established at Boko (Assam), Chümoukedima (Nagaland), Serchhip (Mizoram), Agartala (Tripura), East Siang (Arunachal Pradesh), and Umsiang (Meghalaya) under PM-DevINE Banana Pseudostem project for producing fibre, liquid biofertilizer, vermicompost, and value-added products such as paper, yarn, vegan leather and bakery items.

## 18 National Innovation Foundation (NIF), Ahmedabad

National Innovation Foundation (NIF) is another S&T service organization and the areas of focus of NIF are mainly the Incubation and promotion of technological grassroots innovations

including those which stems from children creativity and to add value to India's outstanding traditional knowledge base. This is accomplished by providing an end-to-end support to innovators encompassing scouting, validation, value addition, product development, Intellectual Property Rights (IPR) protection, recognition to the innovators and dissemination of technologies through social and commercial channels.

- The Fourteenth National Biennial Competition for unaided grassroots innovations and outstanding traditional knowledge had concluded on March 31, 2025 and over 23,000 entries from grassroots innovators and traditional knowledge holders were received from 35 states and union territories of the country. The fifteenth National Biennial campaign has started on April 1, 2025 and will be accepting entries up to March 31, 2027. So far, more than 4000 entries from grassroots innovators and traditional knowledge holders have been received.
- Development of improved prototypes of 10 technologies were conducted in the fab lab viz. Rollator / mobility aid for children suffering from cerebral palsy, Manual paddy transplanter, Tamarind deseeding machine, Seed tape making machine, Bamboo fork making machine, Seabuck thorn harvester, Sugam walker, Improved Lawnmower, Plant typing device, Combi tillage implement, Sewage cleaning tool, Bamboo basket weaving machine, Secateurs pruning tool and LPG cylinder cap opener.
- A total of 7 farmer plant varieties were evaluated at Agricultural Universities and ICAR institutions viz, URGA 2019, URGA 2020 and Parvati Sut 27 (rice), DR-1, Gauri Bajra (pearl millet), MM 20 (Betel vine) and RTB 16 (mustard). Bio-efficacy evaluation of eight herbal leads against apple scab and brinjal insect pests were undertaken. Clinical evidence for outstanding traditional knowledge practices in management of Osteoporosis (Postmenopausal women) and adiposopathy were illustrated. NIF had pivoted a technology development activity based on community knowledge in control of subclinical mastitis condition among dairy animals.
- A total of 17 patents in the name of grassroots innovators and outstanding traditional knowledge holders were granted. Protection of Plant Varieties and Farmer Rights Act [PPVFRA] registrations of Seven farmer plant varieties were granted and one design registration was granted. In addition, 53 new patent applications were filed and 06 new applications were filed towards seeking registration of farmers' plant varieties. A total of 03 trademark registrations were filed along with filing of 02 design registration.
- NIF has entered into technology transfer agreement for three herbal veterinary technologies with Rakesh Health Care India Limited, Gandhinagar a leading enterprise engaged in manufacturing and marketing of herbal products for animal health care and productivity. These technologies include medicine in treatment of tick infestation, placental retention and for enhancing milk yield. A collaboration was established with B Naik Uprising Agro Industry Pvt. Ltd., (BNUAI) for the commercialization of walnut

peeling machine, a technology developed by the grassroots innovator of Anantnag district of J&K. A marketing agreement was signed for the sale and distribution of the technology across Jammu & Kashmir.

- NIF proactively identifies local and regional technological challenges and strategically match-makes them with grassroot innovations for possible social diffusion. In 2025, NIF significantly scaled up its efforts: it facilitated fifty-seven training programs on fifteen diverse grassroots innovations (like cotton-wick making machines, sal-leaf plate and bowl making machine, banana fiber products training, etc.) across eighteen districts in nine states, primarily focused on expanding economic prospects for rural and tribal populations.
- NIF's Herbal Analytical Laboratory (HAL) was inaugurated on July 12, 2025, which will help to validate herbal practices thereby strengthening validation chain for indigenous knowledge system.
- NIF in collaboration with the Academy of Scientific and Innovative Research (AcSIR) had initiated doctoral research programs under I-PhD fellowship, focusing on problem statements derived from NIF supported technologies.
- NIF's grassroots innovator, Shri Godasu Narsimha, received a Gold Medal for his innovation for Hyacinth Removal Machine in the category of New Technologies at the 38<sup>th</sup> International Exhibition of Inventions, New Technologies, and Industrial Design, held during Invention Week 2025 (September 02-09, 2025), organized by the Belgrade Inventors Association, Serbia.
- NIF has launched a bilingual bi-monthly newsletter '*Innovation Frontline*' published in English and Hindi, marking a significant step in strengthening the communication and outreach efforts of the NIF. The newsletter aims to showcase the journey of grassroots innovators, highlight institutional initiatives, and provide insights into the evolving landscape of inclusive innovation.

## 19 Indian National Science Academy (INSA), New Delhi

Indian National Science Academy (INSA) is one of the renowned science academies in India which is mainly engaged in recognition of scientific talent, promotion of science and outreach programmes.

- The Academy elected 78 Fellows and 12 Foreign Fellows during the year 2025-26. 20 young researchers were selected by the Academy for the INSA Young Associates for the year 2025. 21 young researchers were selected by the Academy for the INSA Associate Fellows for the year 2025. 09 INSA Distinguished Lecture-1 Fellows and 09 INSA Distinguished Lecture-2 Fellows were selected for the year 2025.

- 03 Award Lectures were delivered. 01 Presidential Lecture, Lectures/presentation by 06 INSA Past-Presidents, 09 INSA Distinguished Lecture-1 Fellows and 09 INSA Distinguished Lecture-2 Fellows, 60 New Fellows, 06 New Foreign Fellow, 17 INSA Young Associates, 16 INSA Associate Fellows, 01 INSA Overseas Chair, 01 INYAS Chair and 26 INSA Women Associates were delivered during “*Celebration of Science Week at Delhi-2025*” & 91<sup>st</sup> Anniversary General Meeting (2025) held at various institutes and universities of Delhi/NCR during 2-5 December, 2025.
- The Academy nominated Former Secretary, Ministry of Earth Sciences, to the S20 Inception Meeting held in Pretoria, South Africa (25–27 February 2025), hosted by the Academy of Science of South Africa (ASSAf) under the theme “*Climate Change and Well-being*”. INSA S20 Expert Committee members participated in the S20 Webinar on 27 August 2025, contributing inputs to the draft S20 Communiqué. The final S20 Summit was convened online on 23 September 2025, hosted by ASSAf, culminating in the adoption of the S20 Statement, with active participation by INSA.
- INSA nominees were elected to AASSA Special Committees (2025–2027). Representative of INSA delivered a talk on women in science in India at the 3rd AASSA-WISE Symposium. INSA nominated several Fellows to IAP leadership bodies. Persons nominated by INSA attended the BRICS Forum Summit held in Rio de Janeiro, Brazil (24–25 June 2025).
- The 6th Yusuf Hamied INSA–Royal Society Bilateral Workshop was held at IIT Delhi during 25–26 November 2025, focusing on (i) *Secondary Health Prevention* and (ii) *Sustainability in the Digital and Cyber World*. A policy dialogue on “Towards a Responsible Digital Future” was held on 27 November 2025. The workshop involved 20 delegates from the Royal Society, UK, and 18 Indian experts.
- INSA coordinated a merged session on “Responsible and Sustainable AI for Society” at the IAP Triennial Conference and General Assembly (8–11 December 2025, Cairo, Egypt), in collaboration with academies from Australia, South Africa, Germany, and TWAS.
- Under the INSA Visiting Scientist Programme, 74 Scientists were awarded Visiting Fellowships to conduct collaborative research and training in India. Under the INSA scheme for Partial Financial Assistance for holding National/International Conference/Seminars in India, 22 scientists were provided partial funding. Under the Academy’s History of Science programme, 22 projects were funded for research in various areas of the history of science, including mathematics & astronomy, metals & metallurgy, alchemy & medicine, epigraphy & archaeology, etc. 05 INSA Distinguished Professors, 45 Senior Scientists, and 20 Honorary Scientists were provided with funding support for research. 10 Indian scientists were supported by the Academy to attend the ISC (International Science Council) sponsored conferences abroad. 30 Indian scientists were supported

by the Academy for attending the Non-ISC (International Science Council) sponsored conferences abroad.

- Indian National Science Academy (INSA) and National Centre for Good Governance (NCGG) jointly organized two Leadership Development Programs in Science & Technology (INSA-NCGG LEADS 2025) during April 09-15 and September 01-06, 2025 at INSA, New Delhi.
- Three quarterly Journals, Proceedings of the Indian National Science Academy (PINSAs), Indian Journal of Pure and Applied Mathematics (IJPAM), and Indian Journal of History of Science (IJHS) were published. Two INSA Newsletters (April -June and July-September 2025) were also Published.

## 20 National Academy of Sciences (NASI), Allahabad

The National Academy of Sciences, India (NASI), has a mandate in advancing science and technology and promoting its application for national development and human welfare. Over the years, the Academy has provided a platform for scientists to share knowledge, deliberate on emerging challenges, and contribute to policy and public understanding of science. Major activities of NASI during the Year 2025-26 are given below:

- The Academy awards its prestigious Fellowship/Membership to some of the distinguished scientists all across the country and abroad to recognize their outstanding scientific contributions. A Total of 144 scientists (84 Fellows and 60 Members) working in different areas of Science & Technology were selected. Eight Foreign Fellowships were also awarded to the scientists (in the year 2025) who are working in different countries and have collaborated with the scientists from India.
- NASI organizes awareness/training programmes for the welfare of rural people especially for women. In the year 2025-26, NASI organized a few awareness programmes for the people of the rural area around Prayagraj. It opened opportunity for the rural people to interact with the experts/ scientists for their local problems which were addressed by the experts.
- Science Communication is an essential component of NASI's mandate (Science & Society). Under the Science-Society Programme, the Academy, in collaboration with its 20 Local Chapters, organized numerous Scientific Awareness Programmes across the country. These outreach activities focused on key societal issues such as Health and Hygiene, Nutrition, Safe Drinking Water, Sanitation, and Entrepreneurship Development, among others. The activities include Children Science Meet, Teachers' Training Workshops, Vigyan & Health Chaupals and Seminars focusing on scientific awareness, skill development and capacity building. NASI intensified its efforts in bridging the gap between science and society through a wide range of science communication initiatives.

- NASI, together with other two Science Academies, viz. Indian National Science Academy (INSA), New Delhi and Indian Academy of Sciences (IASc), Bangalore jointly sponsors Summer Research Fellowship under the joint Science Education Panel.
- To promote scientific activities in the country, the Academy has established Chairs, Senior Scientist and Honorary Scientist Positions to enable NASI Fellows to remain active in academic work and continue contributing to society, even after retirement. This represents an acknowledgement of excellence and dedication to advancing knowledge in various fields. Associating with leading institutions and universities across India, the recipients can continue to inspire and mentor the next generation of researchers while making significant contributions to the scientific community. To promote excellence in research, the academy honours its Fellows and invites them to deliver endowed lectures, established in memory of distinguished individuals. This year 15 Scientists/Researchers were selected to deliver such Lectures in different areas of Science & Technology.
- The Annual Session is one of NASI's most significant events, held at different academic institutions across the country. It brings together leading scientists, policy experts, industry professionals, educators, and students to discuss current scientific challenges and emerging opportunities. The 95<sup>th</sup> Annual Session of NASI was held during December 08–10, 2025 at IIT Guwahati, reinforcing NASI's commitment to pan-India scientific engagement and interdisciplinary collaboration. A thematic Symposium on “Healthy Brain, Mind and Cognition: From Computers to Clinics” was organized alongside the Session. The symposium focused on wide range of cutting-edge research and translational approaches focusing on brain networks, cognition, neurological & psychiatric disorders, therapeutics, physical systems and computational models. The expert speakers that work in these domains (neuroscientists, engineers, clinicians & entrepreneurs) contributed to rich interdisciplinary deliberations. The plenary lectures by eminent leaders provided strategic perspectives on the role of academia in realizing the vision of a Viksit Bharat. The convergence of neuroscience and next-generation artificial intelligence, and emerging directions shaping the future of health and healthcare.
- NASI Library has already been digitized and its services have been enhanced through subscribing more books every year. The library having a conducive environment is connected to National Knowledge Network (NKN). NASI published the internationally recognized Research Journals in collaboration with Springer Nature: National Academy Science Letters in VI parts (IF-1.3); Proceedings of NASI, Sec. A in IV parts (IF-1.2); Proceedings of NASI Sec. B in IV parts (Cite Score-2.4).

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## 21 Indian Academy of Sciences (IASc), Bangalore

The Indian Academy of Sciences was founded by Nobel Laureate Sir C. V. Raman. The Academy aims at promoting the progress and upholding the cause of science in pure and

applied branches. Since its inception in 1934, the Academy has played a pivotal role in advancing science in India through a wide range of scholarly and academic activities. It is the country's largest scientific society publisher, producing eleven leading journals across major disciplines, along with special topical publications. Major activities of IASc during 2025-26 are given below:

- The Academy publishes **11 reputed international scholarly journals** (including one online journal) covering all major disciplines in science and engineering, featuring high-quality contributions from scientists in India and abroad. Ten of these journals are co-published with **Springer/Springer Nature**, ensuring worldwide visibility through the **SpringerLink** platform, while the complete journal content is also freely accessible on the IASc website in line with the Academy's open-science commitment. During the reporting period, the Academy published **1,347 peer-reviewed articles** across its journals, further strengthening its role as a leading scientific publisher in the country. Increased global visibility led to higher submissions, and the journals collectively recorded around **38.64 lakh downloads** during the year 2025. In addition to regular issues, **seven Special Issues** were published up to **30 November 2025**, focusing on themes of contemporary scientific importance.
- The **Summer Research Fellowship Programme (SRFP-2025)** is a flagship science education initiative jointly conducted by the National Science Academies INSA & NASI, with **IASc coordinating and implementing the programme**. Initiated in **1995**, and significantly expanded after the participation of INSA and NASI in **2007**, the programme has grown into one of the Academy's major activities, now in its nineteenth year. Under the **Summer Research Fellowship Programme (SRFP-2025)**, **1,564 students and teachers** undertook two-month research fellowships under the mentorship of Fellows and other scientists at **273 research institutions** nationwide. Complementing this, the **Focus Area Science Technology–Summer Fellowship (FAST-SF-2025) Programme** supported **103 students and teachers**, who carried out fellowship work at **68 research institutions**, further expanding access to hands-on research training.
- The Academy also pursued capacity building through the organization of **six lecture workshops and one refresher course** on diverse scientific themes. The Academy organized regular **scientific meetings, symposia, and public lectures** to facilitate exchange of scientific knowledge and dissemination of new developments.
- The academy annually elects distinguished scientists of the country, Honorary Fellows working in institutions outside India, who are distinguished for their contributions to science and engineering. During 2025, the Academy elected 28 distinguished scientists of the country as its Fellows and two honorary Fellows.
- The Associateship programme was introduced in 1983 to identify and encourage promising young scientists. The Associateship is tenable for a minimum period of 3

years or a maximum period of 6 years. The Academy during 2025 selected 22 young scientists.

- The Academy arranges 2 to 3-day Lecture Workshops on carefully chosen topics in Physics, Mathematics, Chemistry and Life Sciences for local students and teachers at selected college and university departments. During 2025-26, Six lecture Workshops in different parts of the country were organized. Apart from this, the Refresher Course for Teachers on “Evolutionary Ecology of Plant and Animal Adaptation” and summer school programmes for the students pursuing Ph.D. in the area of Basic Sciences were conducted.
- Under an on-going initiative of the Academy termed the Repository of Publications of Fellows, research and review papers published by Fellows in peer-reviewed journals were curated. The total number of metadata articles stands at 129533.

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## **22 Indian Science Congress Association (ISCA), Kolkata**

Indian Science Congress Association is one of the oldest organizations established in 1914 to advance and promote the Science in India. During 2025-26, the ISCA participated in different programmes like Raj Bhasha programmes, Mission Karmyogi, vigilance awareness week etc.

## ANUSANDHAN NATIONAL RESEARCH FOUNDATION (ANRF)

Anusandhan National Research Foundation (ANRF) - established through an Act of Parliament: ANRF Act, 2023, in February 2024, to provide high-level strategic directions for research, innovation, and entrepreneurship to achieve global scientific and technological excellence in the fields of natural sciences, including mathematical sciences, engineering and technology, environmental and earth sciences, health and agriculture, and scientific and technological interfaces of humanities and social sciences. ANRF has been established to promote research and development and foster a culture of research and innovation throughout India's Universities, Colleges, Research Institutions, and R&D laboratories. ANRF acts as an apex body to provide high-level strategic direction of scientific research in the country as per recommendations of the National Education Policy (NEP). ANRF forges collaborations among the industry, academia, and government departments and research institutions.

### 1 Major accomplishments:

- 1.1 ANRF has initiated the program, **Prime Minister's Early Career Research Grant (PM ECRG)** to assist young researchers to initiate their research career in a new institution with a flexible budget and progressive initiatives for ease of doing research. By supporting early-career scientists, the PMECRG will play a pivotal role in advancing scientific research, enabling recipients to undertake independent and impactful research. The first call for proposals was catered under this scheme and received 6930 proposals from the young investigators. As per the program eligibility guidelines, 718 potential projects were selected based on the recommendation of the Expert committee.
- 1.2 New program **Partnerships for Accelerated Innovation and Research (PAIR)** has been launched as Hub and Spoke model. PAIR program is to boost the overall research capacity of higher education institutions such as state universities and other academic institutions where research capability is at nascent stage. In the PAIR initiative, the HUB will play an important role in anchoring, mentoring and also taking responsibility to guide the spoke institutions in various R&D-related activities. The program allows the partnering institutions to build collaborative networks, enhance research capacities, and to strengthen the personnel capabilities for a robust and inclusive research culture. One call for proposals was solicited (14.11.2024-

10.02.2025) and received 30 proposals from eligible institutions and universities for HUB selection and a total of 166 institutions participated as potential spokes. In the reporting period 7 HUB institutions and 45 spoke Institutions were selected under this program for category A. In addition, to recognize the commitment and efforts, ANRF supported 11 more HUB institutions with 61 Spoke Institutions under category B with a limited budget to enable collaborations and capacity building for a year.

- 1.3 Assistance to Professional Bodies & Seminars/Symposia:** The programme extends partial support on selective basis for organizing seminar/symposia/training program/workshop/conferences at national as well as international level. The support is provided to academic institutions, research laboratories, professional bodies and other non-profit organizations engaged in promoting scientific research. In the reporting period under Seminar/symposia scheme, 911 events were recommended for financial support across the country in various fields of Science and Technology.
- 1.4 International Travel Support (ITS) Scheme** provides an opportunity to emerging and eminent scientist to present the original research findings in the international events held abroad. In the reporting period, a total of 1551 participants were supported under the scheme.
- 1.5 Inclusivity Research Grant (IRG)** is to facilitate equal participation of researchers from all sectors of society, ANRF initiated this scheme to support researchers belonging to the Scheduled Caste /Scheduled Tribe to undertake research in frontier areas of science and engineering including multidisciplinary fields. One call for proposal was solicited (04.11.2024-09.12.2024) in which 1754 proposals were received. 163 new projects were sanctioned in the reporting period.
- 1.6 J.C. Bose Grant (JBG)** is launched to recognize the outstanding performances and contributions of active, senior Indian scientists and engineers. The JBG grant is formulated to support senior level scientists who have demonstrated exceptional achievements, recognized by their publications, patents, technology transfer, awards and grants, etc across various domains of science and technology including agriculture, medicine, as well as humanities and social sciences at the interfaces of S&T. The first call for proposals was solicited (11.02.2025 - 04.04.2025) and received 460 proposals. A total of 50 proposals out of 460 proposals have been sanctioned.
- 1.7 Ramanujan Fellowship** offers support to brilliant Indian scientists and engineers returning from all over the world to pursue their research career in India. This fellowship supports young researchers below the age of 40 years with a proven outstanding track record. The Ramanujan Fellows can work in any of the scientific institutions and universities across the country. A total of 763 nominations were received out of which 109 nominations have been recommended.

- 1.8 National Postdoctoral Fellowship (NPDF)** programme is designed to support and foster highly potential young researchers in leading research labs with accomplished mentors. In the reporting period, a total of 658 NPDF fellowships were awarded.
- 1.9 National Science Chair (NSC)** intends to recognize distinguished Indian superannuated scientists for their outstanding contributions in the areas of Science, Technology, Engineering and Mathematics (STEM) to promote excellence and growth in R&D. The NSC is provided in two modes, Mode 1: Scientific Excellence, the objective of which is to extend continuance of support for excellence in R&D activities and Mode 2: Science Leadership which is aimed towards recognition of thoughtful leadership displayed by the awardee in his/her professional career. In the reporting period, 12 National Science Chairships have been recommended.
- 1.10** Anusandhan National Research Foundation (ANRF) announces call for proposals for the new program **PM Professorship**, to utilize the expertise of superannuated scientists and faculty from reputed academic institutions, research laboratories and industry, who are willing to serve in the state universities where research is still at nascent stage. Prime Minister Professorship is expected to mentor faculty and students of less endowed institutions to improve/raise their research eco-system to a world class standard. In the reporting period, 21 PM Professorships were recommended out of 311 applications received.
- 1.11** Anusandhan National Research Foundation (ANRF) announces call for proposals for the new program **Advanced Research Grant (ARG)** which is a competitive program providing financial assistance to researchers and scientists in academic institutions, National Research Laboratories, and other DSIR-SIRO recognised research organisations eligible to receive grants-in-aid from Government of India (GoI) to carry out high-impact fundamental or basic research (Technology Readiness Level (TRL 1-3) and applied research (TRL 4-6) in frontier areas of science and technology. This program encourages participation from emerging, mid-career, as well as established researchers, offering funding opportunities for individual and collaborative projects. A total of 15,700 proposals (12600 proposals in ARG Core, and over 3100 in ARG MATRICS) have been received in core ARG and MARTIX ARG respectively.
- 1.12 Mission for Advancement in High-impact Areas (MAHA) Scheme**
- Mission for Advancement in High-impact Areas (MAHA) EV mission is to address priority driven, solution-focused research in mission-mode to address scientific challenges and advance the frontiers of technology in key scientific areas.
- 1.12.1 MAHA-EV Mission :** ANRF identified Electric Vehicle (EV) mobility as the first priority area of focus in this mission program and call for proposals were made (04.11.2024-09.12.2024) focusing on three strategically defined technological

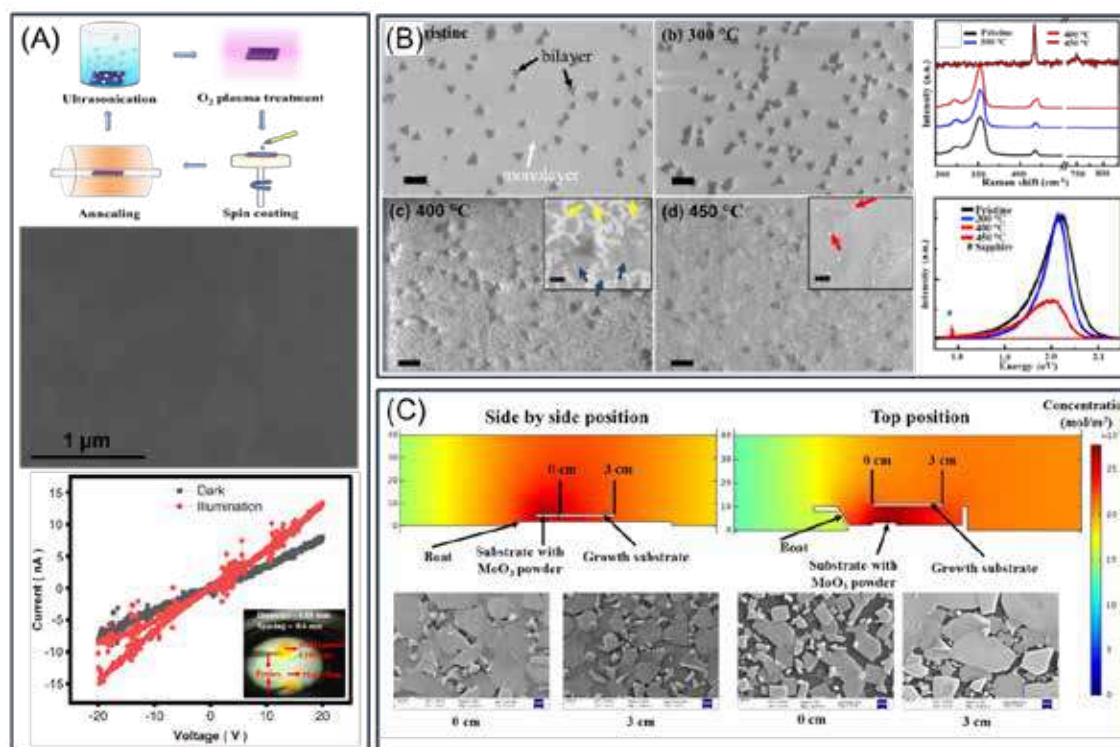
verticals (TV) such as Tropical EV battery and Battery cells (TV-I), Power Electronics, Machines and Drives (PEMD-TV-II) and EV Charging Infrastructure (TV-III). The call generated wide enthusiasm among all the stakeholders and received 227 proposals in consortium mode involving academic institutions, R&D institutions and industries. Under this call for proposals seven high-impact projects (e-Nodes) were selected for support under the MAHA-EV mission.

- 1.12.2 2D Material Research Fab and Innovation Hub (2D Innovation Hub):** To foster and nurture scientific and industrial R&D in 2D materials-based technologies, establishing an innovative ecosystem in India that drives research and development, commercialization, and deployment of indigenous technologies for various applications/sectors, 2D Material Research Fab and Innovation Hub (2D Innovation Hub) was launched. A total of 40 proposals have been received in the first call.
- 1.12.3 Convergence Research Centres of Excellence (CoE): Bridging Social Sciences, Humanities, Science & Technology:** Anusandhan National Research Foundation (ANRF) aims to establish “convergence” research Centres of Excellence (CoEs) to undertake cutting edge, innovative and impactful research at the interface of Science, Technology, Humanities, Social Sciences and Society. These Centres will address complex societal challenges that require integrated perspectives from both technical and social sciences/humanities domains. A total of 945 proposals were received in the first call.
- 1.12.4 MAHA MedTech Mission:** The primary focus of the mission will be supporting the development and commercialization of high-quality, affordable, and innovative medical technologies. Additionally, efforts will be directed towards fostering indigenous development of high priority, high-cost, imported medical technologies to promote self-reliance and adaptation for Indian population (for low-resource settings). Further, the mission may strengthen the existing infrastructure for medical device development at the government supported Institutions/ CoEs as special funds in case some technologies are ready for mass production. A total of 1177 proposals have been received in the first call.
- 1.12.5 ANRF MISSION AI for Science and Engineering (AI-SE):** Anusandhan National Research Foundation (ANRF) has launched a flagship initiative under ANRF MAHA Artificial Intelligence for Science & Engineering (AI-SE) to embed AI as a core enabler of India’s scientific and engineering ecosystem by advancing foundational AI methods, domain-specific models, and national-scale infrastructure for accelerated discovery and innovation. A total of 1864 proposals have been received in the first call.

## 2 Research highlights of a few sanctioned projects:

### 2.1 Synthesis of layered transition metal oxides for optoelectronic applications, (Indian Institute of Technology 'Bombay' (IIT Bombay))

This research was aimed at synthesizing air-stable layered transition metal oxides by three different routes. PIs group has developed a reliable liquid precursor synthesis method (Fig.), where minimal thermal exposure of 30 s was used to convert Mo precursor, like ammonium molybdate tetrahydrate dissolved in ethylene glycol was spin-coated and converted to  $\alpha$ - $\text{MoO}_3$  in oxygen flow. Optoelectronic application, like photo response, of these materials are being investigated now. Microstructure of these films can be readily tuned by changing precursor concentration spin speed. They also investigated conversion of wafer scale  $\text{WS}_2$  films to obtain  $\text{WO}_3$  (Fig.) by annealing in air, oxygen and argon. Conversion was not achieved; the thermal stability of these films was however ascertained. Powder vaporization is another reliable method of synthesizing  $\text{MoO}_3$ . Preliminary growth in reducing environment resulted in  $\text{MoO}_2$  (Fig.).



**Fig.** (A) Summarizes the solution precursor synthesis process and the coalesced films produced by the method. Preliminary photo-response was observed in these films. (B) Thermal annealing of  $\text{WS}_2$  to convert it to oxide was attempted, and significant film degradation was observed in SEM, Raman, and PL. (C) Summarizes the formation of  $\text{MoO}_2$  in powder-source chemical vapor deposition process when the substrate geometry is varied.

## 2.2 Transformation of Abundant Clays to Transparent and Flexible Composite Solid Electrolytes for Rechargeable Na Batteries (Indian Institute of Science Education and Research, Tirupati (IISER' Tirupati)).

Rechargeable Batteries using alkali metal anodes are important as a transformative energy storage technology. However, scanty resources of Lithium and safety issues related to explosion, dendritic growth, limited cycle life, and capacity fading in liquid electrolytes have pushed the research focus towards the realm of abundant alkali and alkaline earth. PI's group has developed a flexible, solid-polymer-composite electrolyte with not only the enhanced sodium ion transport but excellent flame retarding and mechanical properties also, based on cellulose nanocrystals (CNC) and clay, which can be mass-produced at room temperature. From a critical analysis of the preliminary results using various compositions and optimized architecture of the composite electrolyte, an ionic conductivity of the order of  $10^{-4}$  S  $\text{cm}^{-1}$  at 50 °C is obtained. The electrochemical response after coupling with a Na metal anode indicates potential applications in all-solid-state batteries, opening a game-changing perspectives for fabricating flexible power sources from abundant resources (Fig.).

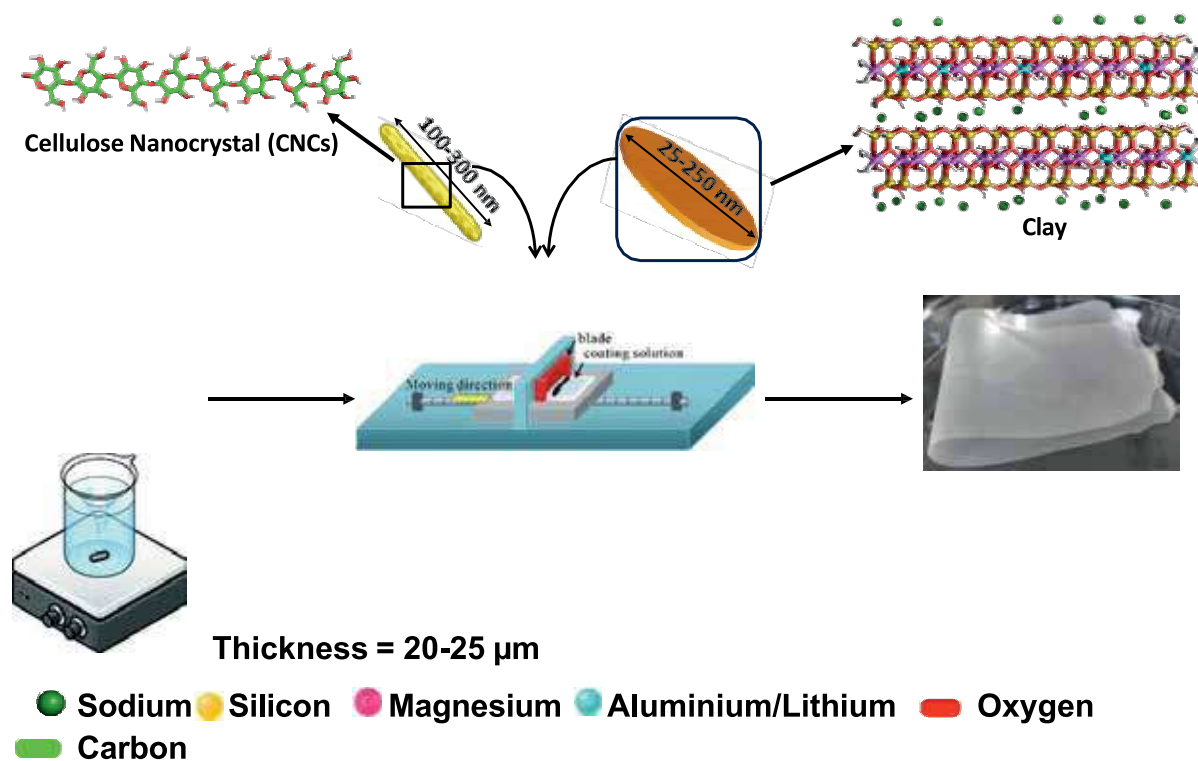


Fig. Illustration of free-standing, thin, flexible, and transparent composite polymer electrolytes preparation for Na Batteries.

## TECHNOLOGY DEVELOPMENT BOARD (TDB)

Technology Development Board (TDB) is a statutory body constituted through Technology Development Board Act, 1995, under Department of Science & Technology. The Board has a mandate to provide financial assistance to the industrial concerns and other agencies attempting development and commercial application of indigenous technology or adapting imported technology for wider domestic application.

In pursuance to its mandate, TDB accepts applications for financial assistance throughout the year from all sectors of economy such as Health & Medical, Engineering, IT, Chemical Agriculture, Telecommunications, Road Transport, Energy & Waste Utilization, Electronics, Defence, Civil Aviation, Textile etc.

### 1 Agreements signed during 2025-26

During the year 2025-26, TDB signed seventeen (17) National Agreements and seven (07) International Bilateral Projects for providing financial support to projects addressing various industrial concerns. The details of agreements are as under: -

#### 1.1 National Agreements

##### 1.1.1 M/s Dvipa Defence India Private Limited, Siddipet (Telangana)

TDB signed an agreement dated 16 April 2025 to provide financial support for the project entitled “*Development and Commercialization of 7.62 × 51 mm Assault Rifle*”, under Defence & Civil Aviation sector. TDB agreed to provide financial assistance of ₹ 18.00 crore out of the total project cost of ₹ 36.02 crore.

##### 1.1.2 M/s Urban Air Labs Private Limited, Gurugram (Haryana)

TDB signed an agreement dated 23<sup>rd</sup> April 2025 to provide financial support for the project entitled “*Development and Commercialization of a Made-in-India Efficient Wall-Mounted Air-Purification System for Indoor Premises*”, under the Engineering sector. TDB agreed to provide financial assistance of ₹ 1.40 crore out of the total project cost of ₹ 3.00 crore.

##### 1.1.3 M/s S3V Vascular Technologies Ltd., Mysuru (Karnataka)

TDB signed an agreement dated 29<sup>th</sup> May 2025 to provide financial support for the project entitled “*Integrated Manufacturing of Mechanical Thrombectomy Kit for Treatment of Acute*”

*Ischemic Stroke*", under Health & Medical sector. TDB agreed to provide financial assistance of ₹ 83.53 crore out of the total project cost of ₹ 208.31 crore.

**1.1.4 M/s Clearsynth Labs Ltd., Mumbai (Maharashtra)**

TDB signed an agreement dated 30<sup>th</sup> May 2025 to provide financial support for the project entitled "*Setting-up of Manufacturing Plant for Commercial Scale Production of Deuterated Products*", under Chemical sector. TDB agreed to provide financial assistance of ₹ 19.95 crore out of the total project cost of ₹ 45.18 crore.

**1.1.5 M/s Nitika Pharmaceuticals Specialities Private Limited, Nagpur (Maharashtra)**

TDB signed an agreement dated 30<sup>th</sup> May 2025 to provide financial support for the project entitled "*Manufacture of Complex Excipient*", under Health & Medical sector. TDB agreed to provide financial assistance of ₹ 82.61 crore out of the total project cost of ₹ 208.03 crore.

**1.1.6 M/s Meta Tattva Systems Pvt. Ltd., New Delhi**

TDB signed an agreement dated 30<sup>th</sup> May 2025 to provide financial support for the project entitled "*Industrial Meta Tattva Facility for the Fabrication of Multi-Spectral Camouflage Material and Shelters*", under Defence & Civil Aviation sector. TDB agreed to provide financial assistance of ₹ 3.49 crore out of the total project cost of ₹ 4.99 crore.

**1.1.7 M/s BatX Energies Pvt. Ltd., Gurugram (Haryana)**

TDB signed an agreement dated 2<sup>nd</sup> June 2025 to provide financial support for the project entitled "*Recycling Technologies for Generation of Battery Grade Materials and Value Addition through Closed Loop*", under Energy & Waste Utilization sector. TDB agreed to provide financial assistance of ₹ 10.00 crore out of the total project cost of ₹ 43.94 crore.

**1.1.8 M/s Autocracy Machinery Pvt. Ltd., Hyderabad (Telangana)**

TDB signed an agreement dated 23.12.2025 to provide financial support for the project entitled "*Commercialization of State-of-the-Art Trencher Technology*", under Engineering sector. TDB agreed to provide financial assistance of ₹ 19.50 crore out of the total project cost of ₹ 50.00 crore.

**1.1.9 M/s Edall Systems and Services Pvt. Ltd., Bengaluru (Karnataka)**

TDB signed an agreement dated 18<sup>th</sup> July 2025 to provide financial support for the project entitled "*Commercialization of White Hawk Drone*", under Engineering sector. TDB agreed to provide financial assistance of ₹ 4.58 crore out of the total project cost of ₹ 10.89 crore.

#### 1.1.10 M/s EGEE Pallet Pvt. Ltd., Hyderabad (Telangana)

TDB signed an agreement dated 24<sup>th</sup> July 2025 to provide financial support for the project entitled “*Business Proposal for Commercial Application of Products made from Wood and Plastic Waste*”, under Energy & Waste Utilization sector. TDB agreed to provide financial assistance of ₹ 2.90 crore out of the total project cost of ₹ 5.81 crore.

#### 1.1.11 M/s Primary Healthtech Pvt. Ltd., New Delhi

TDB signed an agreement dated 11<sup>th</sup> August 2025 to provide financial support for the project entitled “*IoT-Enabled Point-of-Care Blood Testing Device for Affordable and Accessible Healthcare Powered by AI/ML Algorithms*”, under Health & Medical sector. TDB agreed to provide financial assistance of ₹ 4.00 crore out of the total project cost of ₹ 11.17 crore.

#### 1.1.12 M/s Aodh Lifesciences Private Limited, Hyderabad (Telangana)

TDB signed an agreement dated 10<sup>th</sup> September 2025 to provide financial support for the project entitled “*Antibiotic Nebulization Suspension for Pneumonia and Antimicrobial Resistance*”, under Health & Medical sector. TDB agreed to provide financial assistance of ₹ 19.50 crore out of the total project cost of ₹ 40.98 crore.

#### 1.1.13 M/s Raptee Energy Pvt. Ltd., Chennai (Tamil Nadu)

TDB signed an agreement dated 16<sup>th</sup> September 2025 to provide financial support for the project entitled “*T30 High Voltage Electric Motorcycle*”, under Energy & Waste Utilization sector. TDB agreed to provide financial assistance of ₹ 18.95 crore out of the total project cost of ₹ 37.90 crore.

#### 1.1.14 M/s Westech Power Management Pvt. Ltd., Pune (Maharashtra)

TDB signed an agreement dated 30<sup>th</sup> October 2025 to provide financial support for the project entitled “*Development of Mobile High-Power Containerised Supercapacitor Energy Storage System for Critical Industrial and Defence Applications*”, under Energy & Waste Utilization sector. TDB agreed to provide financial assistance of ₹ 4.05 crore out of the total project cost of ₹ 14.74 crore.

#### 1.1.15 M/s Techinvention Lifecare Limited, Mumbai (Maharashtra)

TDB signed an agreement dated 20<sup>th</sup> November 2025 to provide financial support for the project entitled “*GMP Vaccine Manufacturing Facility to Produce Pneumococcal Conjugate Vaccine (16-Valent)*”, under Health & Medical sector. TDB agreed to provide financial assistance of ₹ 19.50 crore out of the total project cost of ₹101.00 crore.

### 1.1.16 M/s Electrowaves Electronics Pvt. Ltd., Parwanoo (Himachal Pradesh)

TDB signed an agreement dated 26th November 2025 to provide financial support for the project entitled “Commercialisation of Indigenously Designed, Developed and Manufactured EV Chargers”, under Energy & Waste Utilization sector. TDB has agreed to provide financial assistance of ₹ 4.10 crore out of the total project cost of ₹ 11.85 crore.

### 1.1.17 M/s Ramuka Global Pvt. Ltd., Vishakhapatnam (Andhra Pradesh)

TDB signed an agreement dated 20<sup>th</sup> January, 2026 to provide financial support for the project entitled “Production of ECOFIX- a ready-to-use pothole mix using iron & steel slag aggregates”, developed by CSIR–Central Road Research Institute (CRRI), New Delhi. The agreement signing ceremony was held at National Media Centre, New Delhi, in presence of the Hon’ble Minister of Science & Technology, officials from Department of Science & Technology, CSIR Headquarters, CSIR–CRRI, Technology Development Board and industry representatives. TDB agreed to provide financial assistance of ₹ 95.79 crore out of the total project cost of ₹ 191.58 crore.



Fig. Agreement signing ceremony held at the National Media Centre, New Delhi

## 1.2 International Agreements

### 1.2.1 M/s Kapih Deep-Tech Private Limited, Pune (Maharashtra)

TDB signed an agreement dated 3<sup>rd</sup> September 2025 to provide financial support for the project entitled “Adaptive Digital Twin Framework for Urban Water Distribution Systems: A Conceptual Implementation Strategy for Indian Infrastructure”, under Information Technology

sector. The project is being implemented in collaboration with an international partner from Israel. TDB agreed to provide financial assistance of ₹ 4.08 crore out of the total project cost of ₹ 5.82 crore.

#### 1.2.2 M/s Aurigene Oncology Limited, Bengaluru (Karnataka)

TDB has signed an agreement dated 18<sup>th</sup> September 2025 to provide financial support for the project titled “*Novel Cell and Gene Therapy for the Treatment of Colorectal Cancer*”, under Health & Medical sector. The project is being undertaken in collaboration with an international partner from Israel. TDB agreed to provide financial assistance of ₹ 10.39 crore out of the total project cost of ₹ 20.78 crore, as per the agreement.

#### 1.2.3 M/s Big Bang Boom Solutions Private Limited, Chennai (Tamil Nadu)

TDB signed an agreement dated 16 October 2025 to provide financial support for the project entitled “*Rugged Autonomous Drone for Hazardous Indoor and GPS-Denied Environments – Industrial Inspection Drone*”, under Aerospace sector. The project is being implemented in collaboration with an international partner from Israel. TDB agreed to provide financial assistance of ₹ 10.65 crore out of the total project cost of ₹ 21.30 crore.

#### 1.2.4 M/s Arthro Biotech Private Limited, Hyderabad (Telangana)

TDB signed an agreement dated 16 October 2025 to provide financial support for the project entitled “*AMPlified Larvae – Next-Generation Insect Biotechnology for Antibiotic-Free Animal Health*”, under Health & Medical sector. The project is being implemented in collaboration with an international partner from Israel. TDB agreed to provide financial assistance of ₹ 2.80 crore out of the total project cost of ₹ 4.00 crore.

#### 1.2.5 M/s NOPO Nanotechnologies India Pvt Ltd., Bengaluru (Karnataka)

TDB signed an agreement dated 17 December, 2025 to provide financial support for the project entitled “*I4F Feasibility Study: Feasibility Study of HiPCO SWCNT Integration in Sodium-Ion Batteries*”, under Health & Medical sector. The project is being implemented in collaboration with an international partner from Israel. TDB agreed to provide financial assistance of ₹ 0.42 crore out of the total project cost of ₹ 0.83 crore.

#### 1.2.6 M/s Vijai Marine Services Pvt Ltd, Goa

TDB signed an agreement dated 30<sup>th</sup> December, 2025 to provide financial support for the project entitled “*The Smart Sea Project by VACE*”, under the Health & Medical sector. The project is being implemented in collaboration with an international partner from Canada. TDB agreed to provide financial assistance of ₹ 1.5 crore out of the total project cost of ₹ 3.00 crore.

### 1.2.7 M/s Drstore Healthcare Service India Pvt. Ltd., Maharashtra

TDB signed an agreement dated 19<sup>th</sup> January, 2026 to provide financial support for the project entitled “*Multivital Continuous Glucose Monitoring (CGM) Device with Cardiovascular Biomarkers for Early Detection of Heart Conditions alongside Diabetes Monitoring*”, under Health & Medical sector. The project is being implemented in collaboration with an international partner from Canada. TDB agreed to provide financial assistance of ₹ 1.5 crore out of the total project cost of ₹ 3.67 crore.

## 2 Call for Proposals (CFP)

### 2.1 National

#### 2.1.1 Strengthening India's Electronic & Telecom Technology Development Ecosystem

This call for proposals envisaged to encourage commercial application of indigenously developed technologies in the field of advanced Electronic Device/Equipment manufacturing and Telecommunication sector including optical communication and to support them to commission their technologies for wider application besides adapting imported technologies for wider domestic applications in related areas.

#### 2.1.2 Empowering Indigenous Technologies for Sustainable Semiconductor Supply Chain

Aligning with the national requirement and focus in the semiconductor sector, Technology Development Board (TDB) issued a ‘*Call for Proposal*’, inviting applications from Indian companies having innovative/indigenous technologies at commercialization stage in this emerging sector. The call included companies with innovative / indigenous technologies for gases, chemicals, polymers, metals, ceramics, wafers, equipment, instruments, Artificial Intelligence (AI) driven Electronic Design Automation (EDA) tools etc. required for the functioning of semiconductor industry.

#### 2.1.3 Metals and Ceramics 3-D Printing Industry and Its Ecosystem Enabler Technologies

Aligning with the national requirement and focus in Metal and Ceramic Additive Manufacturing sector, Technology Development Board (TDB) issue a ‘*Call for Proposal*’, inviting applications from Indian companies having innovative/indigenous technologies at commercialization stage in this emerging sector. This call aimed to promote growth of Metal and Ceramic 3-D printing ecosystem in India, which could support India's manufacturing sector from medical implants to defence and aerospace parts.

Some examples of the products (but not limited to) TDB intended to support are as follows:

- Innovative Metal/ceramic 3D printed products
- Metal/ceramic 3D printer and parts
- Metal/ceramic feed-stock for 3D printer (raw materials)
- Binders/additives used for feed-stock preparation etc.
- Any other material required for Metal and/or Ceramic Additive Manufacturing industry.

## 2.2 International

### 2.2.1 India-Canada Collaborative Industrial Research & Development Programme– Request for Proposal (RFP) '2025

The collaboration aimed to promote projects that were innovative and reflected consumer demands, so that they were market-oriented at the same time focused on creating a new product or process that would eventually lead to commercialization. This RFP '2025 was for applied R&D projects in the following areas:

- Advanced manufacturing
- Clean technologies and green technologies
- Digital technologies
- Health and bio-sciences
- Food and agriculture technologies
- Smart infrastructure

### 2.2.2 India-Sweden Collaborative Industrial Research & Development Programme – Request for Proposal (RFP) '2025

The Collaboration aimed to drive innovation to develop new innovative technologies, processes and advanced to technology-based services related to the green transition in the steel and cement industries, which would in subsequent stages, generate sustainable solution for society coupled with market potential.

### 2.2.3 Israel – India (I4F) Strategic Call for Proposals (CFP 15)

TDB Launched a Strategic Call for Proposal (CFP) – 15 for the India-Israel Industrial R&D and Technological Innovation Fund (I4F) under the multidisciplinary area : “**SMART MOBILITY**”.

Smart Mobility, included (but not limited to) the following sub-sectors:

- Autonomous Mobility
- Maritime Mobility
- Railroad Technology
- Smart Aviation
- Public Transit Technology & Traffic Management
- Electric Vehicles & Battery Tech

#### 2.2.4 Israel – India (I4F) Normal Call for Proposals (CFP 14)

The Call for proposals invited joint Industrial R&D projects between companies from India and Israel, which would lead to successful commercialization and benefit for both countries. The relevant technology sectors (but not limited to) under CFP 14 were: Biotech, space, robotics, Agri-tech, smart transportation, smart cities, Climate-tech, Industry 4.0, care for the disabled, etc.

### 3 National Technology Day, 2025





Fig. Glimpses of National Technology Day Celebration '2025

The Technology Development Board (TDB), Department of Science & Technology (DST), Government of India, celebrated National Technology Day' 2025 under the theme "**YANTRA – Yugantar for Advancing New Technology, Research & Acceleration**", 11<sup>th</sup> May, 2025 at Dr. Ambedkar International Centre, New Delhi.

The theme reflected India's accelerating technological transformation in alignment with the National vision of a **Viksit Bharat by Year' 2047**. The event was graced by Dr. Jitendra Singh, Hon'ble Union Minister of State (Independent Charge), Ministry of Science & Technology and Earth Sciences, as Chief Guest, who delivered the keynote address highlighting India's strides in deep-tech innovation, scientific entrepreneurship and technology-enabled governance. The Hon'ble Minister also interacted with selected start-ups, reaffirming the Government's commitment to supporting indigenous enterprises working in frontier technology domains.

#### 4 Appointment of TDB as Second Level Fund Manager under RDIF

TDB has been appointed as a Second-Level Fund Manager (SLFM) under the Research Development and Innovation Fund (RDIF) Scheme. This nomination recognises TDB's three decades of experience in financing, nurturing and de-risking indigenously developed technologies, particularly at critical scale-up and commercialisation stages.

## STRENGTHENING SURVEY AND MAPPING ACTIVITY

### 1 Survey of India (Sol)

The Government of India notified the National Geospatial Policy (NGP) on 28<sup>th</sup> December, 2022, with the vision of positioning India as a global leader in the Geospatial sector. Survey of India (Sol) has been designated as the overarching nodal agency for geospatial data and is entrusted with generation, maintenance, and updation of the following fundamental data themes: a) **Geodetic Reference Frame**; b) **Ortho-imagery**; **Elevation (Digital Elevation Model – DEM)**; c) **Functional Areas (Administrative Boundaries)** and d) **Geographical Names (Toponymy)**.

#### 1.1 Fundamental Data Themes:

##### a. Geodetic Reference Frame

##### (i) Continuously Operating Reference Station (CORS) Network:

Survey of India has undertaken the modernization of the national Geodetic Reference Frame through the establishment of a nationwide network of Continuously Operating Reference Stations (CORS). A total of 1,045 CORS stations has been established across the country at an average spacing of approximately 60–90 km, ensuring uniform and comprehensive coverage. The CORS network provides positioning services on a 24×7, 365-days basis and is accessible through a dedicated online CORS portal. As on date, a total of 17,323 users have been registered on the CORS Portal for availing various CORS-based services. The link to access the CORS Portal are <https://cors.surveyofindia.gov.in/>

- The CORS data are also accessed and downloaded by a wide range of users, including Government organizations, private sector entities, research and academic institutions, for training, research, and other geospatial applications.

## Usage Details by User Type (In Hours)...

User Types	RTK Region 1	RTK Region 2	RTK Total	RDS Region 1	RDS Region 2	RDS Total	Grand Total
Other Government Users	121491	847915	969406	780558	444202	1224760	2194166
Private Users	162843	192272	355115	211786	371089	582875	937990
Research and Academic Users	5833	7992	13825	6249102	7854001	14103103	14116928
Survey of India	24012	19382	43394	475231	1605028	2080259	2123653
Training and Maintenance	2093	47777	49870	62152	91336	153488	203358
<b>Grand Total</b>	<b>316272</b>	<b>1115338</b>	<b>1431610</b>	<b>7778829</b>	<b>10365656</b>	<b>18144485</b>	<b>19576095</b>

**(ii) Geoid Model Development:**

Survey of India is undertaking the development of a National Geoid Model covering the entire country. The model is intended to establish an accurate relationship between the Geoid and the WGS-84 Ellipsoid, thereby enabling direct conversion of heights obtained from satellite-based technologies, including GNSS and satellite imagery, into orthometric heights with the requisite precision. In support of this effort, gravity observations are being carried out at approximately 36,000 stations across the country, with an average spacing of about 10 km.

**(iii) Geodetic Asset Register (GAR) and Geodetic Asset Map (GAM):**

A Geodetic Reference Frame provides a stable, accurate, and precise coordinate system for defining positions on the Earth's surface. It forms the fundamental basis for mapping, navigation, and a wide range of geospatial applications. The reference frame is realized through an integrated network of physical monuments and sensing systems, collectively referred to as **Geodetic Assets**. These assets are critical not only for surveying and map production but also for supporting national priorities, including engineering and infrastructure development, disaster management, land-use planning, environmental monitoring, and scientific research.

The national geodetic infrastructure comprises a comprehensive suite of assets, including:

- Ground Control Points (GCPs)
- Continuously Operating Reference Stations (CORS)
- High-precision Levelling Benchmarks
- Gravity Reference Stations

- Magnetic Repeat Stations
- Tidal Observatories

To ensure effective management, monitoring, and optimal utilization of this critical infrastructure, a **Geodetic Asset Register (GAR)** has been developed. The Register serves as a centralized digital repository of all national geodetic assets and contains comprehensive information pertaining to their location, technical specifications, operational status, and associated reference values.



Fig. Hon'ble Chief Minister of Goa receiving the Geodetic Asset Register (GAR) and Geodetic Assets Map from the Survey of India.

**Geodetic Asset Map (GAM):** As the National Mapping Agency of India and the custodian of the country's geodetic assets, the Survey of India is preparing **State/ UT-wise Geodetic Asset Maps (GAMs)**. Each GAM provides a comprehensive representation of all geodetic assets located within the respective State or Union Territory. To date, GAMs for 26 States/UTs have been published.

**(iv) Geodetic Publications:**

Indian Tide Table-2026 & Hugli River Tide Table -2026 have been published.

**b. Ortho-imagery; Elevation (Digital Elevation Model – DEM)**

**(i) SVAMITVA:**

**SVAMITVA Scheme (Survey of Villages and Mapping with Improvised Technology in Village Areas):** Government of India launched the SVAMITVA Scheme on 24<sup>th</sup> April 2020 with the objective of surveying land parcels in rural inhabited (Abadi) areas using advanced drone technology to establish clear and accurate ownership records. This Central Sector Scheme is implemented by the Ministry of Panchayati Raj (MoPR), with the Survey of India (Sol) serving as the technology partner. Under the scheme, Sol is deploying a fleet of drones to capture high-resolution imagery (better than 5 cm)

for mapping rural habitations across the country. The SVAMITVA Scheme represents a significant step in strengthening rural property rights and modernizing India's land administration system.

- Objective: Establishment of clear property ownership in rural areas through accurate mapping
- Technology: Drone-based image acquisition and geospatial mapping
- Coverage: Approximately 3,42,746 villages across India
- Progress: As on date, drone surveys have been completed for approximately 3,15,000 villages across the country.

#### **(ii) Large Scale Mapping (LSM):**

Survey of India, in collaboration with the respective State Government authorities, is executing large-scale mapping (LSM) projects using professional survey-grade Unmanned Aerial Vehicles (UAVs)/drones. These projects aim at generation of high-resolution ortho-rectified imagery, digital elevation models (DEMs), and GIS-enabled data. Currently, LSM activities are being carried out in the States/UTs of Haryana, Karnataka, Andhra Pradesh, and Andaman Islands.

#### **(iii) Atal Mission for Rejuvenation and Urban Transformation 2.0 (AMRUT 2.0):**

A Memorandum of Understanding (MoU) was signed between the Survey of India and the Ministry of Housing and Urban Affairs for the execution of drone surveys using professional survey-grade UAVs/drones. The objective of this collaboration is to generate large-scale urban geospatial data for small and medium towns with populations ranging from 50,000 to 99,000, under the AMRUT 2.0 GIS Sub-Scheme.

- Objective: Creation of detailed urban geospatial datasets to support urban planning, infrastructure development, and governance.
- Coverage: Target towns under the AMRUT 2.0 GIS Sub-Scheme.
- Progress: Drone data acquisition covering approximately 14,000 sq. km has been successfully completed
- Technology Used: High-precision survey-grade drones/UAVs

#### **(iv) National Geospatial Knowledge – based land Survey of urban Habitations (NAKSHA):**

The Department of Land Resources has launched the pilot program, “**National Geospatial Knowledge-based Land Survey of Urban Habitations (NAKSHA)**,” aimed at creating accurate and up-to-date land records in urban areas. The program is

designed to empower urban citizens, improve ease of living, and facilitate better urban planning. The one-year pilot is being implemented in 128 cities across the country, with the Survey of India serving as the technical partner under the **Digital India Land Records Modernization Programme (DILRMP)**.

- **Technology Used:**

- High-precision survey-grade drones/UAVs with Nadir camera
- High-precision survey-grade drones/UAVs with 1 Nadir + 4 Oblique cameras
- Multi-angle survey-grade drones/UAVs with 1 Nadir + 4 Oblique cameras integrated with LiDAR sensors

- **Progress:** Data acquisition has been completed for 119 Urban Local Bodies (ULBs), with feature extraction completed for 2D datasets of 100 ULBs and 3D datasets of 45 ULBs, out of the targeted 120 ULBs.

**(v) National Mission for Clean Ganga (NMCG):**

The **National Mission for Clean Ganga (NMCG)** is an integrated conservation initiative and a flagship programme of Government of India, aimed at pollution abatement and the conservation and rejuvenation of the river Ganga. To support the Mission through advanced geospatial technologies, the Survey of India (SoI) has partnered with NMCG to provide GIS-based solutions for effective river basin management. Under this collaboration, the Survey of India has been entrusted with the following key responsibilities:

- Creation of a GIS-ready geospatial database for the Ganga and Hugli River stretches, extending up to 10 km on either side of the riverbanks.
- Generation of High-Resolution Digital Elevation Models (DEMs) at 0.5-meter resolution using LiDAR technology.
- Support in planning and decision-making for Ganga River Basin management, sewerage and waste management, and pollution control.

**c. Functional Areas (Administrative Boundaries)**

**(i) International Boundary:**

- **Seventh Meeting of the India-Nepal Boundary Working Group (BWG)** was held in New Delhi on 28<sup>th</sup> –29<sup>th</sup> July 2025. The Indian delegation was led by Shri Hitesh Kumar S. Makwana, Surveyor General of India (SGI) , Survey of India, while the Nepali delegation was headed by Shri Prakash Joshi, Director General (DG), Survey Department, Government of Nepal. During the meeting, both

sides reviewed the progress made since the sixth BWG meeting. Additionally, the two delegations jointly adopted the “*Updated Modalities for Inspection, Repair & Maintenance of Boundary Pillars along the India-Nepal Boundary*” and agreed to expedite the related work.



**Fig.** Seventh Meeting of the India-Nepal Boundary Working Group (BWG) held in New Delhi on 28–29 July 2025.

- **Joint Technical Level Meeting (JTLM) – India-Bhutan** between the Governments of India and Bhutan was held on 19<sup>th</sup> –20<sup>th</sup> May 2025 in Shillong, organized by the Meghalaya & Arunachal Pradesh Geospatial Directorate, Survey of India. The Indian delegation was led by Sri Rajiv Kumar Srivastava, Director, Meghalaya & Arunachal Pradesh Geo-division, Survey of India, Shillong. The Bhutanese delegation was led by Mr. Sangay Dorji, Director General/Specialist, International Boundaries. The meeting focused on reviewing, discussing, and finalizing the joint work programme for the Indo-Bhutan Boundary Survey.
- **46th Joint Boundary Conference (Mizoram Sector) between India and Bangladesh** was held in Dhaka, Bangladesh, from 09–11 September 2025. The Indian delegation was led by Shri Uday Shankar Prasad, Director, Assam & Nagaland and TMMz GD, Guwahati.
- **Signing of India–Myanmar Boundary Strip Maps:-** Shri Rajiv Kumar Srivastava, Director, and Shri Raman Verma, Officer Surveyor, Meghalaya & Arunachal Pradesh GD, Shillong, participated in the signing of 36 technically finalized Boundary Strip maps of the India–Myanmar Boundary at the Plenipotentiaries level, held in Nay Pyi Taw, Myanmar, on 29 July 2025.
- **14th Secretary Level Meeting (SLM) between India & Bhutan:** Shri Uday Shankar Prasad, Director, Assam & Nagaland and TMMz GD, Guwahati, participated in the **14th Secretary Level Meeting (SLM) between India and Bhutan**, held in Bhutan from 16–17 October 2025.

**(ii) Inter-State Boundary**

- **Inter-State Boundary Survey Between Assam & Meghalaya:** A joint initiative by the State Governments of Assam and Meghalaya, in collaboration with the Survey of India, is being undertaken to conduct an **Inter-State Boundary Survey**. Field survey activities commenced in the Hahim and Gizang regions, with participation from representatives of State Governments, the Survey of India, and media officials. Advanced GNSS technology is being employed to determine precise ground coordinates and ensure accurate boundary delineation.
- **Inter-State Boundary Survey – Uttar Pradesh and Haryana:** The demarcation and relocation of inter-state boundary pillars between Uttar Pradesh and Haryana have been completed and formally handed over to the respective State Governments. The erection of boundary pillars is currently in progress, and simultaneous verification and checking of the erected pillars are being carried out to ensure accuracy and compliance with the approved boundary alignment.

**(iii) Harmonisation of Administrative Boundary Database:**

- **Functional Areas Dataset and Administrative Boundary Database (ABDB):** The Functional Areas dataset comprises administrative boundaries, including International, State, District, Sub-district, and Revenue Village boundaries, as well as other functional units such as Municipal Corporations, Municipalities, Blocks, and Constituencies.

In collaboration with the Office of the Registrar General & Census Commissioner, India (ORGI), the Survey of India has initiated the harmonization of the **Administrative Boundary Database (ABDB)**. To date, up-to-date, discrepancy-free and harmonized boundary data from 16 States and Union Territories have been published and made accessible through the Survey of India's **Online Maps Portal**. (<https://onlinemaps.surveyofindia.gov.in>)

**d. Geographical Names (Toponymy)**

- **Toponymy (Geographical Names/Topographical Names):** The Survey of India has transliterated the Toponymy layer into 22 languages, forming the **Base Geographical Name Database (GNDB)**. A **National Geographical Name Information System (NGNIS)** is being developed, which will be maintained and disseminated by the Survey of India to enable access to all users through a dedicated Geo-portal. Additionally, state maps in regional languages are now available for all States and Union Territories.

## 1.2 Data Dissemination:

- **The Survey of India's Online Maps Portal** (<https://onlinemaps.surveyofindia.gov.in/>) offers a wide range of digital products, including topographical maps in PDF and shapefile formats, as well as other thematic products such as geographical maps, railway maps, political maps, roadmaps, physical maps of India, and several additional products. Government-to-Government (G2G) data is provided free of cost, while access to other users is available at fair and transparent pricing. Some products are freely accessible to all users. Usage Statistics is given below:

S.No.	Category	Paid Products Downloaded	Free Products Downloaded	Users Registered
1	Government	14,319	1,866	1,121
2	Private	2,366	88,408	138,414

**Products Available** include 10 paid and 17 free digital products.

## 1.3 Training & Capacity Building:

The **National Institute for Geo-informatics Science and Technology (NIGST), Hyderabad**, a premier institution, has been at the forefront of training and capacity building in the fields of Surveying & Mapping, Photogrammetry, Geodesy, GIS, and related geospatial disciplines. In addition to training officers and staff of the Survey of India, NIGST provides training to other Government organizations, private individuals, scholars from various Afro-Asian countries, and students from neighbouring developing countries.

To remain current with emerging technologies, NIGST has introduced a range of courses and training programs based on the latest trends in spatial data science, including:

- Modern data acquisition tools such as GNSS, Laser Range Finder, and UAVs/Drones
- Advanced visualization techniques for spatial data interpretation
- Training modules designed to integrate traditional methods with cutting-edge geospatial technologies

During Year' 2025, NIGST conducted regular, advanced, refresher, short-term, and special courses for departmental, extra-departmental, private, and foreign trainees.

Furthermore, the Survey of India has onboarded the course "**Understanding the Administrative Boundary Database**" on the **iGOT Karamyogi** platform to enhance accessibility and training outreach.

The National Institute of Geo-informatics Science & Technology (NIGST), Hyderabad, under the Survey of India, has been awarded the prestigious “UTTAM” level accreditation by the Capacity Building Commission (CBC) under the National Standards for Civil Services Training Institutions (NSCSTI). This recognition underscores NIGST’s commitment to delivering high-quality professional education and training programs in the field of Geospatial Sciences and Technology.

### 1.4 Collaborations:

#### a. Domestic:

- i. The Survey of India has signed a Memorandum of Understanding (MoU) with the Government of Andhra Pradesh’s Survey, Settlements, and Land Records Department for the integration of 70 Continuously Operating Reference Stations (CORS) with the National CORS Network.
- ii. The Survey of India (Sol) and the Institute of Secretariat Training & Management (ISTM) formalized a Memorandum of Understanding (MoU) on 01st April 2025 to collaborate on enhancing public administration and governance. Under the MoU, Sol and ISTM will jointly undertake research projects focused on public policy, governance, and administration. The agreement also facilitates faculty exchanges between the two institutions, promoting the sharing of expertise and the development of mutually beneficial academic and training programs.
- iii. The Survey of India and the Brahmaputra Board signed a Memorandum of Understanding (MoU) on 19th June 2025 at the Brahmaputra Board office in Guwahati. The agreement aims to strengthen cooperation in survey operations and geospatial capacity building across the Brahmaputra and Barak river basins. The collaboration encompasses support for aerial and topographic surveys, high-resolution mapping using drones, GNSS, and LiDAR, as well as the standardization of geospatial data through integration with the Continuously Operating Reference Stations (CORS) network.
- iv. The Survey of India (Sol) has entered into an agreement with C.E. Info Systems Pvt. Ltd. (MapmyIndia) for the development of a state-of-the-art National Geo-Spatial Platform. This platform will serve as a unified digital infrastructure for aggregating, harmonizing, and disseminating authentic and accurate foundational geospatial data and services. It aims to support governance, research, industry, and citizen-centric applications across the country.
- v. The Survey of India (Sol) has signed Memorandum of Understanding (MoUs) with various universities and educational institutions across India to foster collaboration and facilitate activities in technical and geospatial fields. These partnerships focus on sharing ideas, the latest technologies, participation in seminars and workshops, and

providing internships for students pursuing degree courses. The collaborations aims to recognize the strategic importance of geospatial data, services, and technology in promoting knowledge, innovation, and national development.

**Institutions Covered:**

1. Indian Institute of Technology (IIT), Patna
2. Indian Institute of Technology (IIT), Palakkad
3. Indian Institute of Technology (IIT) – Indian School of Mines, Dhanbad
4. National Institute of Technology (NIT), Calicut
5. National Institute of Technology (NIT), Puducherry
6. Christ (Deemed to be University), Bengaluru
7. Central University of Karnataka, Kalaburgi
8. Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai
9. Madhabdev University, Narayanpur, Assam
10. Gujarat Technological University – School of Engineering and Technology, Ahmedabad
11. Indian Institute of Information Technology (IIIT), Vadodara
12. Centre for Environmental Planning and Technology (CEPT) University, Ahmedabad
13. National Council for Vocational Education and Training (NCVET), New Delhi
14. University of Mumbai
15. Andhra University, Visakhapatnam, Andhra Pradesh
16. National Remote Sensing Centre (NRSC), Hyderabad
17. Anna University, Chennai
18. Telangana State Aviation Academy (TSAA), Hyderabad

**b. International:**

- i. The Survey of India, on behalf of the Government of India, has become a participant of the Multilateral Memorandum of Understanding (MMOU) between United Nations Global Geodetic Centre of Excellence (UN-GGCE) and Member State on 'Strengthening the Global Geodesy Supply Chain' on 15<sup>th</sup> December 2025. Survey of India will serve as the Central point for coordinating agencies for participation of other Indian agencies under the MoU.
- ii. A Memorandum of Understanding between the Survey of India (SoI) and Surveying & Mapping Authority (SMA) of the Republic of Slovenia, was signed on 27<sup>th</sup> November

2025 in New Delhi, to exchange experience in relevant areas of activities pertaining to the geo-spatial domain and to strengthen their relationship.



**Fig.** Memorandum of Understanding (MoU) signed between the Survey of India (SoI) and the Surveying & Mapping Authority (SMA), Republic of Slovenia, on 27 November 2025 in New Delhi

### 1.5 Significant achievements in the year :

- i. The Survey of India, represented by Shri Hitesh Kumar S. Makwana, IAS, Surveyor General of India, has been elected as the prestigious role of Co-Chair of the United Nations Committee of Experts on Global Geospatial Information Management – Asia Pacific (UN-GGIM-AP).
- ii. The Surveyor General of India delivered a presentation titled “*Automated Tool for Names Collection: Facilitating Correct Place Names Capturing in Local Vernacular and Overcoming Past Challenges*”, emphasizing the Survey of India’s pivotal role in the nationwide standardization of geographical names during the 2025 Session of the United Nation Group of Experts on Geographical Names (UNGEGN) held in New York, USA from 28<sup>th</sup> April to 02<sup>nd</sup> May 2025.



**Fig.** SGI addressing 2025 Session of the United Nation Group of Experts on Geographical Names (UNGEGN), New York, USA

- iii. **National Workshop on Strengthening the Geospatial Ecosystem: The Survey of India** has organized the **National Workshop on Strengthening the Geospatial Ecosystem** with the theme on “**Geospatial Mission: an Enabler of Viksit Bharat**” on 17<sup>th</sup> December 2025 at **Yashobhoomi, Dwarka, New Delhi**. The workshop was attended by over 400 senior officials from Central and State Governments, industry representatives, academia, and research institutions, while nearly 200 students from IITs, NITs, universities, and private partners joined virtually.

The event was inaugurated by **Dr. Jitendra Singh, Hon’ble Minister of Science and Technology and Minister of Earth Sciences, Government of India**, who highlighted the role of geospatial technologies in nation-building, referencing the **National Geospatial Policy ‘2022** and the **National Geospatial Mission**, **Prof. Abhay Karandikar, Secretary, DST**, emphasized geodetic modernization and interoperability, and **Shri Hitesh Kumar Makwana, IAS, Surveyor General of India**, highlighted Sol’s leadership in modernizing the national geodetic framework and expanding **CORS services**. During the workshop, a **Coffee Table Book** titled “**From Cape Comorin to the Himalayas: Semi quinentennial Commemorative of the Survey of India**”, chronicling the journey of surveying in India from ancient to modern times, was also launched by the Hon’ble Minister.



**Fig.** Dr. Jitendra Singh, Hon’ble Minister of Science and Technology and Minister of Earth Science, Govt. of India inaugurating Coffee Table Book of SOI at National Workshop, New Delhi

The workshop comprised four theme-based sessions, Modernization and Strengthening of National Geodetic Reference Frame; Strengthening of Geospatial Data and Mapping Infrastructure; Role of Standards in Harmonizing Geospatial Frameworks; Keeping Pace with Technological Advancements in Geospatial Fields

## 1.6 Participation in International Forums:

- Shri Dharmendra Kumar Singh, Director, Gujarat Daman & Diu GD, Gandhinagar, and

Ms. Debanjana Gupta, Superintending Surveyor, SGO, participated in the FIG Working Week 2025 & Locate 2025 Conference held in Australia from 6th –10th April 2025.

- Shri Hitesh Kumar S. Makwana, IAS, Surveyor General of India, participated in the Cambridge Conference 2025 in the United Kingdom from 7th –10th April 2025.
- Shri Hitesh Kumar S. Makwana, IAS, Surveyor General of India; Shri Mahesh Ravindranathan, Director, Tamil Nadu, Pondicherry and Andaman & Nicobar Island GD, Chennai; and Shri Tushar Vaish, Superintending Surveyor, NGDR & UGI Directorate, Dehradun, participated in the 2025 Session of the United Nations Group of Experts on Geographical Names (UNGEGN) at the United Nations Headquarters, USA, from 28th April to 2nd May 2025.
- Shri Shailesh Kumar Sinha, Additional Surveyor General, SGO, Dehradun, participated in the World Bank Land Conference held in Washington, DC, USA, from 5th –8th May 2025.
- A delegation of Survey of India officers, led by Shri Hitesh Kumar S. Makwana, IAS, Surveyor General of India; Shri Pankaj Mishra, Deputy Surveyor General, NIGST, Hyderabad; and Shri Pardeep Singh, Deputy Surveyor General (Technical), SGO, Dehradun, attended the Executive Board Meeting of the Regional Committee of the United Nations on Global Geospatial Information Management – Asia and Pacific (UN-GGIM-AP EB Meeting) and Seminar in China from 3rd –5th June 2025.
- Shri Upkar Pathak, Superintending Surveyor, SGO, Dehradun, participated in the Geodesy Capacity Development Workshop for Asia-Pacific on Transitioning to a Modern Geospatial Reference System held in Bangkok, Thailand, from 30th June to 4th July 2025.
- Shri Hitesh Kumar S Makwana, IAS, Surveyor General of India and Shri Pardeep Singh, Deputy Surveyor General (Technical) participated in the “*Fifteen Session of the United Nations Global Geospatial Information Management (UN-GGIM)*” and all side events at the United Nations Headquarters in New York, USA from August 04<sup>th</sup> to 08<sup>th</sup> 2025.
- Shri Hitesh Kumar S Makwana, IAS, Surveyor General of India, Shri Shailesh Kumar Sinha, Additional Surveyor General, SGO and Shri Neeraj Gurjar, Director, G&RB, Dehradun.
- Participated in the ‘Fourteenth Plenary Meeting of the Regional Committee of United Nations Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP) and side events including International Seminar on shaping the future: Geo – Innovation, Geo-solutions in Republic of Korea from 24<sup>th</sup> to 26<sup>th</sup> September, 2025.



**Fig.** 14th Plenary Meeting of the Regional Committee of United Nations Global Geospatial Information Management for Asia and the Pacific (UN-GGIM- AP), Republic of Korea

- The **Survey of India (Sol)** has been actively engaging with international mapping agencies to strengthen cooperation and capacity building in the global geospatial domain. During Year' 2025, Sol conducted virtual meetings with the following international organizations:
  1. Bhutan – National Commission Secretariat
  2. Finland – National Land Survey (NLS)
  3. Netherlands - University of Twente (ITC)
  4. Nigeria – Office of the Surveyor General of the Federation (OSGOF)
  5. Philippines – National Mapping and Resource Information Authority (NAMRIA)
  6. Russian Federation – Rosreestr and Roskadastr
- Shri Ashish Kaushal, Director, Odisha & Chhattisgarh GD, Bhubaneswar, participated in the India-GCC Geospatial and Space Business Summit held in the UAE on 28<sup>th</sup> October 2025.
- Shri Hitesh Kumar S. Makwana, IAS, Surveyor General of India, and Shri Anbumani B, Superintending Surveyor, NIGST, Hyderabad, participated in the 61st Plenary Meeting of ISO/TC 211 – Geographic Information/Geomatics held in Gothenburg, Sweden from 17<sup>th</sup> –21<sup>st</sup> November 2025.

## 2 NATIONAL ATLAS AND THEMATIC MAPPING ORGANISATION (NATMO)

### 2.1 Introduction:

NATMO started its journey in the Year 1956 under various Ministries and at present it is a subordinate office under the administrative control of the Union Ministry of Science and Technology (Department of Science and Technology), Govt. of India. NATMO runs with geographers, geologists, statisticians, mathematicians, professionals of geospatial technology with a sanctioned strength of 467 employees. Main objective of this office is to prepare the research based thematic maps and atlases and disseminate the same to the students, researchers, academicians, planners and policy makers. The first publication of this organization was “*Bharat Rashtriya Atlas*” in Hindi, which was highly appreciated from a wide spectrum of stakeholders. But now with the advancement of technology, NATMO also retracted itself to the digital environment using advanced GIS software and geospatial tools.

### 2.2 Major Activities and Achievements during Year 2025-26

#### a. National Atlas of India

The mandate of this Organization is compile National Atlas volumes, regular revision and updation of these volumes on priority. This Office completed 07 plates (Fig.) digitally and is awaiting their publication.

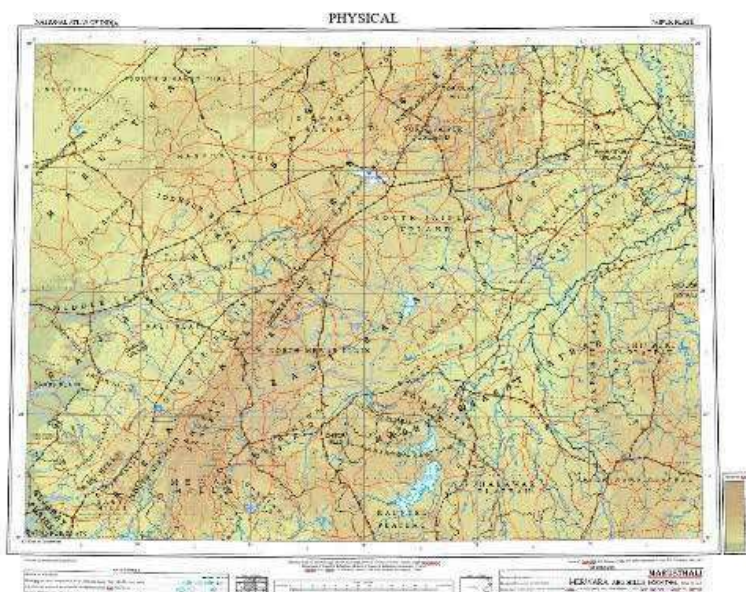


Fig. National Atlas of India: Jaipur Plate

### b. District Planning Map Series:

District Planning Map Series is the sanctioned project of NATMO. It provides at-a-glance view of complete geographical, geological, demographic, cultural information and features along with administrative boundaries of particular district both in physical and digital format. Due to the regular disintegration of districts, the number of districts is increasing. Here, the revision and update of this information is in progress. During the period mentioned, NATMO has published District Planning Map Series for 32 districts, mainly aspirational Districts (Fig.).

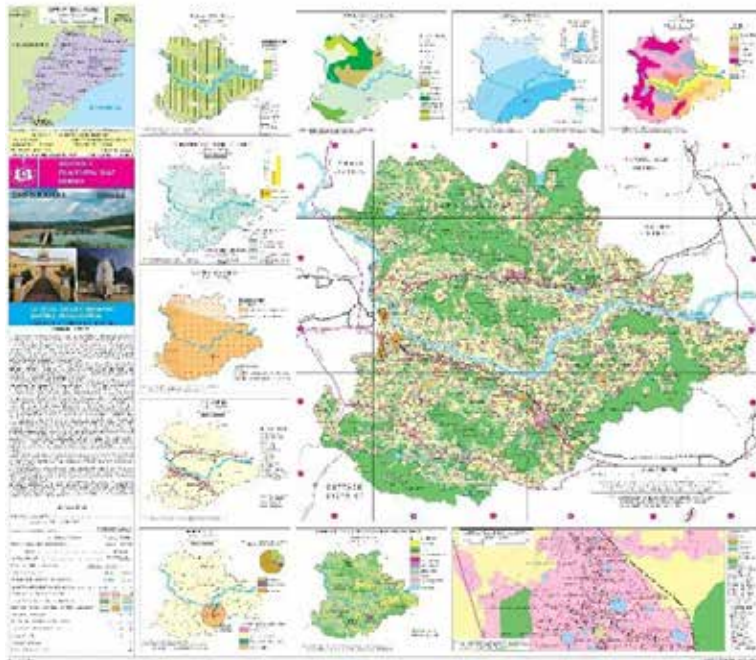


Fig. DPMS of Dhankanal District

### c. Golden Map Service

Basic objective of **Golden Map Service** is to provide web map services to cater to the data requirement for Location Based Services (LBS). On the occasion of Golden Jubilee celebration of NATMO, this project was taken up with a view to map physical connectivity between locations and all utilities spread across the cities and towns of the country. This year NATMO prepared one map under GMS project, i.e., Muzaffarpur.

### d. Atlas Preparation

This year NATMO completed three atlases on Sustainable Development Goals (SDGs) i.e. SDG 1, SDG 2, and SDG 3 respectively which are ready for publication/uploading.

**e. Geoportal**

NATMO has its prestigious geo-portal enterprise named [geoportal.natmo.gov.in](http://geoportal.natmo.gov.in) which is popular as **Manchitran**, which is the product of PM's Digital India initiative. Payment gateway integration is underway to enable online purchase of maps by users. Recently e-office migration is also under process.

**f. Extra-Departmental Projects:**

NATMO is now ready to provide tailored technical support to meet specific needs of Ministries, Departments, and Offices. In this regard, NATMO made a significant strides in building a sustainable and responsive nation in advancing effective, data-driven and spatially- informed governance in collaboration with them. As of late 2025, NATMO's inter-ministerial collaborations show varying levels of progress, with several projects currently awaiting administrative responses. Formal project proposals and Proof of Concepts submitted to different ministries and are waiting for feedback. The first phase of the Community Development (C.D.) Block shapefile project got completed in December 2025 with eleven states and the rest are in progress.

**g. Atlas for Visually Impaired**

One of the unique projects of NATMO is the production of Braille Atlas. This year NATMO completed the Atlas of the States of Karnataka and Tamil Nadu (Fig.). Braille Wall map project for 36 States and Union Territories was taken up. By March, 2026 Braille Wall Maps for the all 36 States/UTs in two themes are scheduled to be completed.



**Fig.** Braille Atlas of Tamil Nadu

**3 Other Services:**

**a. Training and Capacity Building**

From January 2025 till date, NATMO trained their 25 officials on Building Local Resilience in a Changing Climate and GIS Analysis & Applications.

**b. Library and documentation Centre**

NATMO documentation center provided support to researchers and scholars with its rich resources. The library boasts of a vast collection of: 22,216 books, 65,000 maps and topographical sheets.

### c. Exhibitions and Fairs

NATMO participated in different exhibitions throughout India where the students and researchers went to collect required data related to their respective study/research area. Various universities conducted seminars where NATMO provided relevant insights.



**Fig.** Lighting of Lamp at INCA



**Fig.** Inaugural speech of Director, NATMO

This year NATMO organized a major event i.e. 43<sup>rd</sup> International congress of Indian National Cartographic Association (INCA) at Gaya ji, Bihar (Fig.). NATMO officials shared their insights in this conference. Number of delegates from NATMO were 34, of which 08 officials presented their papers in the conference. The other remarkable event was the 46<sup>th</sup> annual conference of Indian Association for the Study of Population (IASP) where NATMO was a co-organizer. Apart from these, there were eleven other exhibitions (Fig.) where NATMO actively participated wherein the students and researchers attend to collect the required data related to their study/research. The professionals get an overview of maps rather than the literature.



**Fig.** Exhibition of NATMO at Bharat Mandapam, Delhi and NEHU,

#### d. Service to Nation

The students from different educational institutions visit NATMO frequently to get exposure on maps and the methodology of production of maps at professional level as well as learning about the modern geo-spatial technologies related to mapping and research.

One digital design team of National e-governance under MEITY organized a workshop which was hosted by NATMO. The new researchers of NATMO received potential insights from the workshop.

### 4 International Events:

- Director, NATMO, Dr. B. K. Singh, participated as a member of the Indian Delegation for 60<sup>th</sup> Plenary meetings of ISO/TC 211 'Geographic Information/Geomatics' held during 19<sup>th</sup> – 23<sup>rd</sup> May, 2025 in Wuhan, China.
- Director, NATMO, Dr. B. K. Singh, Deputed to International Cartographic Conference (ICC 2025) presented the accepted papers and poster presentations, held in Vancouver, BC, Canada, during 17<sup>th</sup> – 22<sup>nd</sup> August, 2025.

### 5 Other Important Events Convened during the Year

- National Flag hoisting on Republic Day and Independence Day at Rashtriya Atlas Bhawan is celebrated with honour.
- This Office tribute its homage to the founder Director Padmabhusan Professor S.P Chatterjee on his birth and death anniversary on 22<sup>nd</sup> and 27<sup>th</sup>, respectively.
- Celebration of Science Day is a major event where the dignitaries across the country delivered their speeches for the enlightenment of the officials.
- National Yoga Day in Year' 2025 was observed.
- NATMO celebrated Hindi Pakhwada from 14<sup>th</sup> -27<sup>th</sup> September 2025 to promote Rajbhasa in working sphere. Competition held during the Pakhwada and the programme concluded with great success.



Fig. Celebration of Hindi Day

- NATMO also takes initiative under Swachha Bhart Abhiyan. Cleaning of NATMO campus is a regular phenomenon (Fig.). This year NATMO organized Poster making competition, Slogan Writing competition and Essay writing competition under the head of “Swachhata Hi Seva”. One special campaign went on 30.09.2025 “*Ek Ped Maa ke naam*” (Fig.).



**Fig.** Swachha NATMO Campus



**Fig.** Ek Ped Maa ke naam

During the year 2025–26, the NATMO continued to play a pivotal role in advancing the nation’s geospatial and cartographic capabilities. With a strong legacy dating back to 1956, NATMO effectively balanced its traditional mandate of atlas compilation with modern digital transformation initiatives. Significant progress was achieved in the revision and digital completion of National Atlas plates, expansion of the District Planning Map Series particularly for aspirational districts and preparation of thematic atlases aligned with the Sustainable Development Goals.

The Organization further strengthened its technological footprint through initiatives such as the Golden Map Service and the Manchitran Geoportal, supporting the Government of India’s Digital India vision and enhancing public access to geospatial information. NATMO’s unique contributions, especially the preparation of Braille Atlases and Braille Wall Maps for visually impaired users, underscored its commitment to inclusivity and social responsibility.

Capacity building, inter-ministerial collaborations, international engagement, and active participation in exhibitions, conferences, and academic forums reinforced NATMO’s national and global standing. Training programmes, library services, and outreach activities continued to support students, researchers, and professionals across the country.

Overall, the achievements of Year 2025-26 reflect NATMO’s sustained efforts towards data-driven governance, technological innovation, inclusive services, and knowledge dissemination. The Organization remains well-positioned to meet emerging geospatial challenges and to contribute meaningfully to national development and policy planning in the years ahead.

## ADMINISTRATION

### 1 General Administration (GA)

- 1.1 In the Year '2025, Department successfully achieved savings of approximately ₹ 57.87 Lakhs in electricity costs through utilization of solar energy generated by rooftop solar power plants.
- 1.2 The Department of Science and Technology (DST) celebrated its **55<sup>th</sup> Foundation Day** on 02<sup>nd</sup> May 2025 at Dr. Ambedkar International Center, New Delhi, marking the occasion with a full-day programme highlighting India's progress and future directions in Science, Technology and Innovation (STI). The event featured distinguished lectures by eminent experts, including talks on digital technology and neurosciences, deep-tech manufacturing, and innovation ecosystems, along with keynote and foundation day addresses by leading thought leaders. The programme was graced by Hon'ble Minister of State (I/C), Dr. Jitendra Singh, as Chief Guest, with Prof. Ajay Kumar Sood, Principal Scientific Adviser (PSA), as Guest of Honour, and participation of senior government officials and stakeholders. The celebrations also included a Director's Conclave, a panel discussion on the deep technology manufacturing ecosystem in India, and an exhibition where all autonomous institutions and divisions of DST showcased their significant achievements of the year through banners and standees, reflecting DST's sustained contributions over 55 years towards strengthening India's science and technology landscape
- 1.3 **Renovation and Upgradation of Guest House Suites:** Renovation and upgradation work of ten (10) suites located on the 1<sup>st</sup> and 3<sup>rd</sup> floors of the DST Guest House at Vigyan Sadan, Sector-10, R.K. Puram, New Delhi were undertaken and completed through the Central Public Works Department (CPWD). The work aimed to enhance functional utility, safety, and comfort of the accommodation facilities. The upgraded suites are intended to facilitate official and personal visits of officers, scientists, and other authorized guests.
- 1.4 **Installation of Rooftop Solar Photovoltaic Plant:** A 30 kWp rooftop solar photovoltaic power plant was installed at Vigyan Sadan Guest House building through CPWD as part of the Department's efforts towards promoting renewable energy and reducing dependence on conventional grid electricity. The installation will contribute to partial fulfilment of the building's energy requirements, support

reduction in electricity expenditure. The system is expected to provide long-term operational benefits while supporting cleaner energy adoption in government infrastructure

**1.5 Finishing and Painting Works of Vigyan Sadan Building:** Finishing works, including painting of the Vigyan Sadan building and construction of parapet wall on the roof, were carried out through CPWD to improve the overall appearance and upkeep of the premises. The works were undertaken to maintain the structural aesthetics, protect building surfaces from environmental wear and tear, and ensure a well-maintained and presentable residential environment for occupants and visitors. These measures contribute to the systematic maintenance of government assets in accordance with prescribed standards.

### 1.6 Disposal of Waste

- The e-waste accumulated at Technology Bhawan & NSDI office, R.K.Puram was disposed of in accordance with the prescribed procedures. This not only helped free up valuable space but also generated a revenue of ₹ 5,66,518/- for the government exchequer.
- **Disposal of condemned vehicles of the Department:** Following the due procedures, five (05) Departmental vehicles on surpassing prescribed useful life span or reaching End Life for Vehicles, were condemned on approval of competent authority. Thereafter, the same were sold by Auction through MSTC portal to 'Registered Vehicle Scrapping Facilities' for scrapping. The disposal of condemned vehicles freed up parking space for 5 wheelers. And also generated a revenue of ₹ 4,31,383 to the Govt exchequer.
- The scrap, obsolete, in-service, beyond economic repair (BER) and used consumable items accumulated at Technology Bhawan were disposed of in accordance with the prescribed procedures. This not only helped free up approximately 500 sq.ft. of valuable space but also generated a revenue of ₹3,81,730 for the government exchequer.
- Furthermore, scrap and obsolete items accumulated at the Vigyan Sadan Transit Hostel cum Guest House, located at Sector-10, RK Puram, New Delhi, were successfully disposed of. This process resulted in the reclamation of 800 sq.ft. of space and generated additional revenue of ₹14,455.

### 1.7 International Day of Yoga, was organized on 11<sup>th</sup> June, 2025:

- The Department of Science and Technology (DST) observed the *International Day of Yoga* on 21<sup>st</sup> June, 2025 with enthusiasm and active participation of officers and staff members. The programme was organised in the premises of the Department in alignment with the guidelines issued by the Ministry of Ayush, Gol.

- The yoga session was conducted by a qualified yoga instructor, who guided participants through various *asanas*, *pranayama*, and *meditation techniques*, highlighting their importance for physical fitness, mental well-being, and stress management. The event aimed at promoting healthy lifestyle and foster awareness about the holistic benefits of yoga in daily life..
  - In addition, a lecture on “*Meditation for a Healthy and Happy Life*” was conducted on 19<sup>th</sup> June, 2025. The session was enlightening and aimed at collectively contributing to the spirit of the International Day of Yoga by fostering awareness about mental well-being and holistic health.
- 1.8 **Swachhata Pakhwada 2025** has been organised during 1<sup>st</sup> to 15<sup>th</sup> May, 2025 wherein Cleaning activities at different places of the Department has been undertaken during the Pakhwada and an essay writing and slogan writing competition was organized on 7<sup>th</sup> May, 2025 for officers/officials of DST topic “*Transforming offices into responsible space*” and “*Clean Habits, Clean Nation*” respectively.
- 1.9 **Swachhata Hi Sewa and Special Campaign 5.0** for Institutionalizing Swachhata and minimizing pendency in Government offices was organized in two phases – Preparatory Phase from 16<sup>th</sup> September, 2025 to 30<sup>th</sup> September 2025 and Implementation Phase from 2<sup>nd</sup> October 2025 to 31<sup>st</sup> October, 2025. Some of the activities organized under special campaign were:
- (i) Lecture cum Awareness Session in a lecture on “Ayurveda for People and Planet with special emphasis on Holistic Approach towards Swachhata and Health” and a session on “Prevention of Cervical Cancer” was conducted by Dr. Seema Singhal, Professor and Consultant Gynae Oncologist, AIIMS, New Delhi.
  - (ii) As part of the campaign, organized multiple activities on 26<sup>th</sup> September, 2025 (Friday), which included:
    - (a) Exhibition on Single-use mixed plastic waste to high quality plasto-fuels for transportation and Industrial Heating by Gati Shakti Vishvavidyala, Vadodara, Gujarat;
    - (b) Exhibition on Resource recovery from Waste Electrical and Electronic Equipment (WEEE); Eco-friendly Technology for recycling plastic and metallic components by CIPET, Bhubaneshwar;
  - (iii) Rangoli Competition on Swachhotsava;
  - (iv) Clean Street Food initiative (to showcase hygienic street food practices);
  - (v) Blood Donation Camp (in association with Indian Red Cross Society);
  - (vi) India Postal Life Insurance Awareness Stall (for safai Mitra)

- 1.10 Rashtriya Ekta Diwas:** Rashtriya Ekta Diwas was observed on 31st October 2025 to commemorate the birth anniversary of Sardar Vallabhbhai Patel, the architect of national integration of independent India. To mark the occasion, a pledge-taking ceremony was organised on 31<sup>st</sup> October 2025. In addition, a 'Run for Unity' was also organised on the same day, witnessing enthusiastic participation from officers and staff.
- 1.11 150<sup>th</sup> Anniversary of 'Vande Mataram':** The 150th Anniversary of 'Vande Mataram' was commemorated on 7th November 2025. On this occasion, a mass singing of 'Vande Mataram' was organized, in which a large number of officers and officials participated, reflecting a spirit of patriotism and national pride.
- 1.12 Celebration of Constitution Day:** To commemorate the adoption of the Constitution of India by the Constituent Assembly on 26th November 1949, the Department of Science and Technology organised a pledge ceremony at Technology Bhawan. Scientists, officers, and staff of DST have participated in large numbers in the reading of the Preamble to the Constitution of India. Constitution Day was also observed in the subordinate offices and Autonomous Institutes/Statutory Bodies under the administrative control of DST.
- 1.13 Armed Forces Flag Day:** Armed Forces Flag Day was observed on 7th December 2025. On this occasion, voluntary contributions were collected from officers, scientists, and staff of DST in support of the welfare of the Armed Forces personnel and their families.

## 2 Staff Position

Staff position in respect of officers/ officials of DST (Secretariat proper) is as follows:

Group A								
	Category	General	OBC	SC	ST	EWS	PH	Total
Gazetted	Scientific	78	14	10	4	0	3	109
	Non-Scientific	35	6	11	2	0	1	55
Group B								
Gazetted	Scientific	0	0	0	0	0	0	0
	Non-Scientific	34	9	6	3	0	1	53
Non-Gazetted	Non-Scientific	41	11	3	2	0	3	60
Group C								
Non-Gazetted	Non-Scientific	58	40	36	6	0	5	145

### 3 Parliament Unit

- Parliament Unit serves as central coordinating point for all parliamentary work of the Department. It is responsible for handling entire parliamentary work of the Department, viz. Parliament Questions, fulfilling assurances, analyzing reports of Parliamentary Committees, etc. It ensures that the parliamentary work pertaining to the Department of Science & Technology is accomplished as per the prescribed schedule and procedures.
- The unit maintains liaison with the Ministry of Parliamentary Affairs, Secretariats of Lok Sabha/ Rajya Sabha, other Ministries/Departments (including Scientific Departments) with a view to fully discharge the parliamentary obligations of the Department of Science & Technology.
- The Unit coordinates work relating to consideration of Detailed Demand for Grants by the Parliamentary Standing Committee and also coordinates the visits of the Parliamentary Committees to various scientific institutions which are under the administrative control of this Department.
- The Unit has also developed an IT enabled searchable repository of Parliament Questions that were answered in the past for aid of officers and officials of Programme Divisions for easy retrieval and reference. Parliament Unit regularly updates this portal and till date, replies given to Parliament Questions up to Monsoon Session 2025 have been updated in the portal.

### 4 Implementation of Official Language Policy

- Department of Science and Technology continued its efforts to ensure effective implementation of the Government's Official Language Policy by promoting the use of Hindi in official work and by ensuring compliance with the provisions of the Official Languages Act, 1963 (as amended in 1967), the Official Languages Rules, 1976 framed thereunder, and the various orders/instructions issued by the Department of Official Language from time to time.
- The Department has a full-fledged Rajbhasha Section under the Leadership of Joint Secretary (OL) comprising a Deputy Secretary (Hindi), a Deputy Director (OL), and other supporting staff. In addition to monitoring the implementation of the Official Language Policy and the Annual Programme in the Department of Science and Technology, the Section makes arrangements for imparting in-service training to employees in Hindi language, Hindi typing, and Hindi stenography. It also undertakes translation of material received in English from various Divisions/Sections of the Department into Hindi, as required.
- To promote the use of Hindi in the Department and to create a conducive environment for officers and staff to work preferentially in Hindi, various programmes were implemented during the financial year 2025–26. As part of these efforts, quarterly meetings of the Departmental Official Language Implementation Committee were held during the year.

Further, Hindi workshops were organized to encourage officers and staff to carry out more administrative work in Hindi.

- **Hindi Fortnight Celebrations:** Hindi Fortnight was formally observed in the Department of Science and Technology from 14 to 28 September, 2025, during which various Hindi competitions were successfully organized for departmental personnel, including essay writing, Hindi crossword puzzles, picture description, and engaging activities such as Antakshari.
- **Hindi Salahakar Samiti:** During the year, Hindi Salahakar Samiti of the Ministry was constituted, and a meeting of the Committee was held on 28<sup>th</sup> October, 2025.



**Fig.** A meeting of the Hindi Salahakar Samiti was convened under the esteemed Chairmanship of the Hon'ble Minister.

- **Hindi Magazine 'Vittan 2025':** To promote the Official Language, DST published a Hindi Magazine '*Vittan*', dedicated entirely to the staff of the Department. The Hon'ble Minister inaugurated the second issue of the magazine during Hindi Salahakar Samiti.



**Fig.** Release of DST Hindi Magazine 'Vittan 2025' by Hon'ble Minister during the meeting of Hindi Salahakar Samiti.

- **Inspections Conducted by the Parliamentary Committee on Official Language:** The Parliamentary Committee on Official Language conducted inspections of the following subordinate offices of Department of Science & Technology:
  - a. Institute of Nano Science and Technology, Mohali – 28 February, 2025
  - b. National Atlas & Thematic Mapping Organisation, Kolkata – 27 August, 2025
  - c. Indian Association for the Cultivation of Science, Kolkata - 27 August, 2025
  - d. Indian Academy of Sciences, Bengaluru – 23 September, 2025
  - e. International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad – 17 November, 2025
- **Inspections of its Subordinate Offices conducted by DST:** In accordance with the guidelines issued in the Annual Programme 2025-26 by the Department of Official Language, MHA, a team of DST Rajbhasha Section conducted inspections of the following subordinate offices to review the progress of the official language Hindi:
  - (a) Indian Academy of Sciences, Bengaluru
  - (b) National Innovation Foundation, Gandhinagar
  - (c) Satyendra Nath Bose National Centre for Basic Sciences, Kolkata
  - (d) North East Centre for Technology Application and Reach (NECTAR), Shillong
  - (e) Anusandhan National Research Foundation, New Delhi
  - (f) Indian Association for the Cultivation of Science, Kolkata
  - (g) Aryabhata Research Institute of Observational Sciences (ARIES), Nainital
  - (h) Jawaharlal Nehru Centre for Advanced Scientific Research
- With a view to promoting and propagating progressive use of Hindi, Rajbhasha Section, in coordination with subordinate offices of the Department of Science and Technology, organized various Official Language Conferences, details of which are as follows: (a) *Do Diwasiya Dakshin Bharat Kshetriya Vaigyanik aur Prashasanik Rajbhasha Sammelan* held from 6 to 7 March, 2025 at the Centre for Nano and Soft Matter Sciences, Bengaluru. (b) *Tritiya Do Diwasiya Akhil Bharatiya Vaigyanik, Takniki evam Rajbhasha Sangosthi* held from 13 to 14 November, 2025 at the Institute of Advanced Study in Science and Technology (IASST), Guwahati.

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## 5 Right to Information (RTI)

- The Department of Science and Technology has been implementing the Right to Information Act, 2005 in its letter and spirit.

- The DST has been regularly making suo-moto disclosures on its website to ensure transparency in its functioning, as required under Section 4(1)(b) of the RTI Act, 2005. As per stipulation, third party audit of the suo-moto disclosure made in the DST's web site is being successfully carried out annually by DST.
- During the period from 1<sup>st</sup> January 2025 to 14<sup>th</sup> December 2025, 1203 RTI applications and 71 First Appeals were received by the Department out of which 1192 RTI applications and 69 Appeals have been disposed of as per the provisions of the RTI Act, 2005.

## 6 Public Grievance Redress (PG)

- The Public Grievance redress mechanism is an instrument to gauge and measure the efficiency and effectiveness of an organization as it provides important feedback on its work. An essential pre-requisite to making the public service delivery system more accountable and responsive is to have a robust public grievance redress and monitoring mechanism.
- Department of Science and Technology has made concerted efforts to redress the grievances and appeals received from its stakeholders and the public at large.
- 1610 public grievances were received by the Department during the period from 1st January 2025 to 14th December 2025. In addition to this, there was a backlog of 55 grievances. Out of these 1665 grievances (1610+55), a total of 1596 grievances have been disposed of by 14th December, 2025.
- Further, 115 appeals were received in respect of public grievances during the period from 1st January 2025 to 14th December 2025. In addition to this, there was a backlog of 5 appeals. Out of these 120 appeals (115+5), 112 appeals have been disposed of by 14th December, 2025.

## 7 Special Campaign 5.0

- The Department of Science & Technology (DST), its subordinate offices and Autonomous Institutions (AIs) vigorously participated in the Special Campaign 5.0 which was carried out during 2nd-31st October, 2025. The Achievements/ Outcomes of this Special Campaign 5.0 are as under:-
  - (i) DST, along with its subordinate and Autonomous Institutions carried out cleanliness drives at 819 sites.
  - (ii) A total of 18038 files were reviewed and out of them 7907 files have been identified for weeding out. All 7907 files identified for weeding have been weeded out during the Implementation phase of Special Campaign 5.0.

- (iii) A total of 1107 e-files have been closed after a review of 4610 e-files.
- (iv) All the eight pending VIP references identified during the preparatory phase were disposed of.
- (v) All the ninety Public Grievances which were identified during the preparatory phase were disposed of during the implementation phase.
- (vi) All the seven Public Grievance Appeals identified during the preparatory phase were also disposed of.
- (vii) A total of ₹ 18,16,311/- has been generated as revenue by DST, its Subordinate, and Autonomous Institutions by way of disposal of scrap, and 210588 sq. ft. of space has been freed.

DST and its Subordinate and Autonomous Institutions have issued more than 50 tweets by using the Special Campaign 5.0 hashtag. Moreover, 4 press releases about the Special Campaign 5.0 conducted in the Department of Science and Technology have also been issued.

## **8 Vigilance Unit**

- Vigilance Unit of the Department of Science & Technology (DST) is headed by Chief Vigilance Officer (CVO), a Scientist- 'G' of the Department. He is supported by a Deputy Secretary, a Under Secretary, a Section Officer and other Secretarial Staff.
- Apart from handling vigilance related cases of the Department, its subordinate offices and autonomous institutions, it also deals with complaints received directly from complainants, the Central Vigilance Commission (CVC), Central Bureau of Investigation (CBI) and other sources. It plays an active role in ensuring the prompt disposal of these complaints. The Vigilance Unit also handles vigilance disciplinary proceedings and maintains a regular touch with the CVC and when necessary, with the CBI.

During 2025 (as on 31.12.2025), Vigilance Unit dealt with the following number of complaints:

Source	Opening Balance	Recd. During the year	Total	Disposed	Balance
CVC	0	39	39	39	0
Others	0	19	19	19	0

- The Vigilance Unit also consolidates various reports/returns received from the Subordinate Offices and Autonomous Institutions on vigilance matters and furnishes these reports (monthly, quarterly and annual basis) to the Central Vigilance Commission (CVC) and Department of Personnel and Training (DoPT). The Department also maintains Agreed List in consultation with the CBI and List of Officers of Doubtful Integrity of Gazetted status.

- Besides, CVO maintains close liaison with all Attached/Subordinate Offices/Autonomous Institutes under DST to ensure timely completion of various vigilance tasks. The CVO keeps a watch over all cases pending at different stages including the cases of its attached, Subordinate Offices and Autonomous Institutions to ensure a time bound disposal of such cases. A Vigilance Portal has also been operating to provide vigilance status of the officials of DST.
- Emphasis on preventive vigilance aspects is also being focused as a measure to prevent occurrence/reoccurrence of vigilance cases. In pursuit of this objective in a systematic manner, this Unit sought presentation from the organization under the administrative control of the Department on their functioning to facilitate the introduction of preventive vigilance measures in order to plug loopholes, wherever required. In this regard, vigilance inspection of three Autonomous Institutes i.e. Sri Chitra Tirunal Institutes of Medical Science & Technology (SCTIMST), Institute of Advanced Study in Science & Technology (IASST) and North East Centre for Technology Application and Reach (NECTAR) was done by Vigilance Unit of this Department.

### 8.1 Glimpses of VIGILANCE AWARENESS WEEK, Year' 2025:

- In accordance with the directives of the CVC to spread awareness about transparency, accountability and corruption free governance, Vigilance Awareness Week (VAW) was observed in DST from 13th October to 30th October '2025. During this occasion an Integrity Pledge was administered to employees of DST by Additional Secretary, DST. Events like Essay Writing Competition, Slogan Writing Competition, Drawing Event for children of employees, Poster Making competition, Story Weaving Competition, Workshop on theme of VAW 2025, Workshop for MTS staffs on filing of Immovable Property Return (IPR) were organized for DST employees during this week.



Fig. Integrity Pledge administered in DST



**Fig. A Drawing Event for the Children of DST employees**



**Fig. A Workshop was conducted on the theme of VAW '2025**

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## **9 Status note on compliance of Cyber Security**

Following cyber security activities and measures were undertaken during the year 2025, reflecting progressive strengthening and maturity of the cyber security posture of the Department of Science & Technology (DST):

1. Conducted quarterly cyber security review meetings with NIC, Cyber Security Team and internal stakeholders to review compliance status, incidents and risk mitigation actions.
2. Ensured 100% timely analysis and response to all cyber security advisories, alerts and incidents reported by CERT-In and NIC-CERT with defined response timelines.

3. Prepared and finalized the Cyber Crisis Management Plan (CCMP) of DST during the year, clearly defining roles, responsibilities, escalation matrix and response mechanisms.
4. Coordinated with all autonomous bodies under DST (covering 100% of major units) for preparation of their respective CCMPs, including facilitation of Cyber Crisis Management Group (CCMG) formation.
5. Initiated infrastructure upgrades aligned with Business Continuity Planning (BCP) requirements, including network redundancy and high availability measures for critical systems.
6. Initiated network cable restructuring across major office blocks, improving network reliability, fault isolation and manageability.
7. Ensured renewal of AMC for 100% critical network, security, and ICT infrastructure, avoiding service disruption and strengthening operational continuity.
8. Initiated phased replacement of obsolete systems, endpoints, and wireless access points, covering identified high-risk and end-of-life assets.
9. Installed a new enterprise-grade Layer-3 (L3) Core Switch to enable High Availability (HA) and strengthen the network backbone in support of BCP implementation.
10. Implemented Standard Operating Procedures (SOPs) for hardware installation, formatting, shifting and disposal, ensuring uniform compliance across all ICT operations.
11. Ensured maintenance of a centralized asset inventory covering 100% of ICT assets, including endpoints, network devices and security equipment.
12. Conducted physical verification of ICT assets quarterly through designated teams to validate inventory accuracy and identify gaps.
13. Organized and conducted phishing simulation exercise to assess user awareness and strengthen resilience against social engineering attacks.
14. Conducted multiple cyber security awareness sessions for DST officers and officials, covering email security, password hygiene, and emerging cyber threats, with wide departmental participation.
15. Organized and facilitated application security workshops to promote secure application development and deployment practices.
16. Organized a department-wide cyber security quiz contest, with participation from officers and officials across divisions to objectively assess awareness levels.
17. Facilitated recognition of quiz winners, with prizes awarded by the Secretary, DST to reinforce positive cyber security behaviour and awareness.

18. Facilitated re-validation and follow-up cyber security audits by NIC and CDAC during the year, ensuring closure of observations and compliance with prescribed guidelines.
19. Ensured systematic tracking and 100% follow-up of recommendations arising out of audits, reviews and assessments.
20. Continued adoption of a preventive and proactive cyber security approach, resulting in improved preparedness, reduced risk exposure and enhanced resilience against emerging cyber threats.
21. Conducted comprehensive review and enhancement of cyber security policies, including endpoint security, patch management, incident response, and audit tracking, aligned with MeitY and CERT-In guidelines.
22. Ensured to deploy Unified Endpoint Management (UEM) / Endpoint Detection & Response (EDR) solutions across 100% of endpoints, and revoked local administrative privileges to enforce least-privilege access.
23. Ensured to identify and remove unauthorized and potentially unwanted applications from endpoints and disabled AutoPlay functionality on removable and fixed drives to mitigate malware risks.
24. Ensured system time synchronization across all ICT devices to enable accurate logging, monitoring, and forensic analysis.
25. Ensured to update High-Level Design (HLD) and Low-Level Design (LLD) documentation for the Technology Bhawan network, ensuring secure architecture, segmentation, and scalability.
26. Enforced MAC address binding on network switch ports to prevent unauthorized device connectivity.
27. Ensured upgradation of all end-of-life and unsupported operating systems and implemented regular OS and security patch updates in line with CERT-In advisories.
28. Ensured timely renewal of SSL certificates and coordinated security audits through CERT-In empaneled agencies, preventing compliance lapses.
29. Circulated periodic cyber security advisories to all users highlighting emerging threats, safe practices, and compliance requirements.
30. Ensured zero major cyber security incidents or service disruptions during the reporting period through effective monitoring and response mechanisms.

## 10 Data & Strategy Unit (DSU)

The Data & Strategy Unit (DSU) of the Department of Science and Technology (DST) was established in response to the D.O. letter from Sh. Bhaskar Khulbe, Advisor to the Hon'ble Prime Minister, dated February 02, 2021. DSU plays a pivotal role in fostering integration within the Department by developing robust monitoring and data systems, with a strong emphasis on data quality and security.

The Unit also facilitates regular data analysis to support evidence-based policy decisions. Key responsibilities include coordinating with scheme divisions, external partners such as States, Ministries/Departments, research organizations, private players, and academic institutions, and overseeing the Data Governance Quality Index (DGQI) action plan under the guidance of NITI Aayog.

### 10.1 Key Achievements and Initiatives:

- **DGQI Leadership:** DSU secured the **1st rank** in DGQI practices among Scientific Ministries/Departments with an exceptional score of **4.68/5.00**, and also participated in the **DGQI 3.0 workshop**, which introduced the new **VEDAM platform** for annual Ministry/Department-wise DGQI questionnaire & submitted the departmental inputs.
- **Engagement with Scientists:** The Unit actively interacts with newly appointed DST scientists apprising them of Department's various activities, budget, and expenditure.
- **Collaborative Spaces:** DSU has established a shared platform within DST for open discussions on data management and its significance. Additionally, DSU collaborates with other agencies such as ANRF, TDB, and others.
- **Financial Oversight:** DSU coordinates financial data submissions for the Budget Expenditure Review meetings.
- **Reports Generation:** DSU undertook comprehensive analysis of PFMS reports and prepared multiple Budget–Expenditure summary reports. These reports were designed to be clear, concise, and visually engaging through the use of informative graphs, charts, and data infographics. The outputs facilitated better understanding and effective decision-making during **Budget–Expenditure review meetings** and were also generated as and when required by the competent authority, with active collaboration among team members.
- **DSU developed banners** highlighting the INSPIRE Programme components—MANAK, SHE, Faculty Fellowships, Fellowship oversight, and the overall programme impact since inception—which were showcased during the DST Annual Foundation Day 2025.
- **Standardized File Format Recommendation:** DSU proposed a standardized file format for documenting projects across various departmental schemes to ensure

systematic tracking and accurate record-keeping of both new and ongoing projects. Adopting this uniform format will enable easy identification of project details and support the development of a precise and reliable sanction database for future reference.

- **Annual Project Report:** DSU after in depth analysis of CNA, Hybrid TSA Module & Vigyan Dhara Phase prepared the “Annual Project Report” for FY 2024-25, visually summarizing funding distribution across states, institutions, and gender categories for New Projects supported by the DST.
- **Dashboard Development:** Since Year’ 2017, the Unit has maintained interactive dashboards for all DST schemes and is developing program-specific dashboards to enhance monitoring, evaluation, and research.
- Developing a **unified dashboard for INSPIRE Programme** to provide combined Year-wise sanction-based insights for the SHE, MANAK Fellowship, and Faculty Fellowship Components, developed and is maintaining the Budget–Expenditure Tableau dashboard for the Vigyan Dhara Scheme, facilitating real-time monitoring and effective financial oversight.
- **Internship Programme:** DSU runs a vibrant Internship Programme, encouraging students from diverse academic institutions to contribute innovative ideas toward achieving the Unit’s objectives.
- In collaboration with the e-PMS team, the unit is developing a system on the e-PMS portal that utilizes PFMS reports to categorize and track sanctions—distinguishing those released on PFMS from those pending—for further tracking, monitoring, and analysis purposes.
- Working on designing a user-friendly Chat Bot is underway.
- **Participation in Key National Events:** Engaged in major industry and technology events, including **ESTIC ‘2025**, the **India Mobile Congress (IMC) 2025 at Yashobhoomi**, the **11th Data Centre Cloud Conference at Shangri-La**, contributing to broader outreach, collaboration, and sectoral insights, the team participated in **2<sup>nd</sup> Bharat Defence Summit at Le Meridian, New Delhi & AISS 2025**.
- Engagement with DST Secretary on the theme “**STI for Nation Building: DST’s Journey Towards Viksit Bharat @2047**”, under the DSU Lecture Series. A session with Dr. R. Kiruba Sankar (ICAR-CIARI) on the theme “**Augmenting Livelihood Resilience of Nicobar Tribes through a Coastal Fisheries Information Hub in Car Nicobar Island**” was also conducted
- **Streamlining Data Processes:** Develops weekly thematic posters and data infographics, providing clear and concise visual insights into key schemes of the Department of Science and Technology (DST). Collaborates closely with DST Data Officers to enhance

and streamline data collection processes. Recent highlights include contributions to The *Budget 2025–26*, and The *ANRF Expenditure Overview (FY 2024–25)*.

- **Capacity Building:** The DSU participated in the Vigyan Dhara implementation meeting, focusing on the tracking and monitoring of assignments, as well as the mapping of agencies to strengthen capacity-building efforts.
- **AI Conference:** DSU attended the National Conference on Artificial Intelligence in Governance and Legalities Post GPT-4O, reflecting its commitment to innovation.
- **Webpage for Dashboards:** Designed a dedicated supporting webpage to showcase the DSU dashboards, intended for integration with the official DST website to enhance visibility and accessibility.

The DSU remains committed to enhancing the Department's data capabilities, fostering collaboration, and supporting informed decision-making for the advancement of Science and Technology in India.



**Fig.** Glance of DSU's Dashboard, Report & Data Infographic

Scan for DSU Dashboards



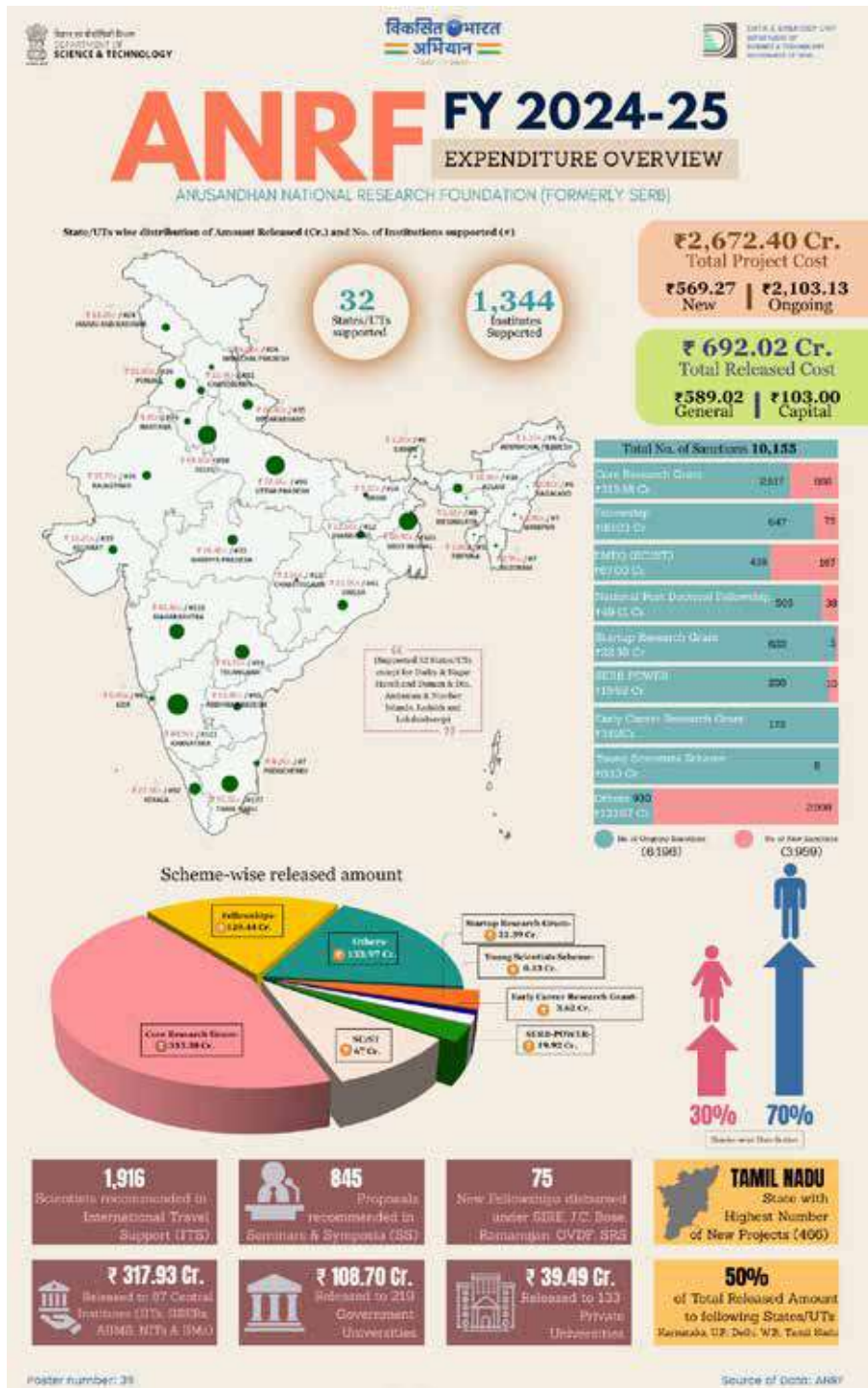


Fig. A report on ANRF Expenditure Overview FY: 2024-25

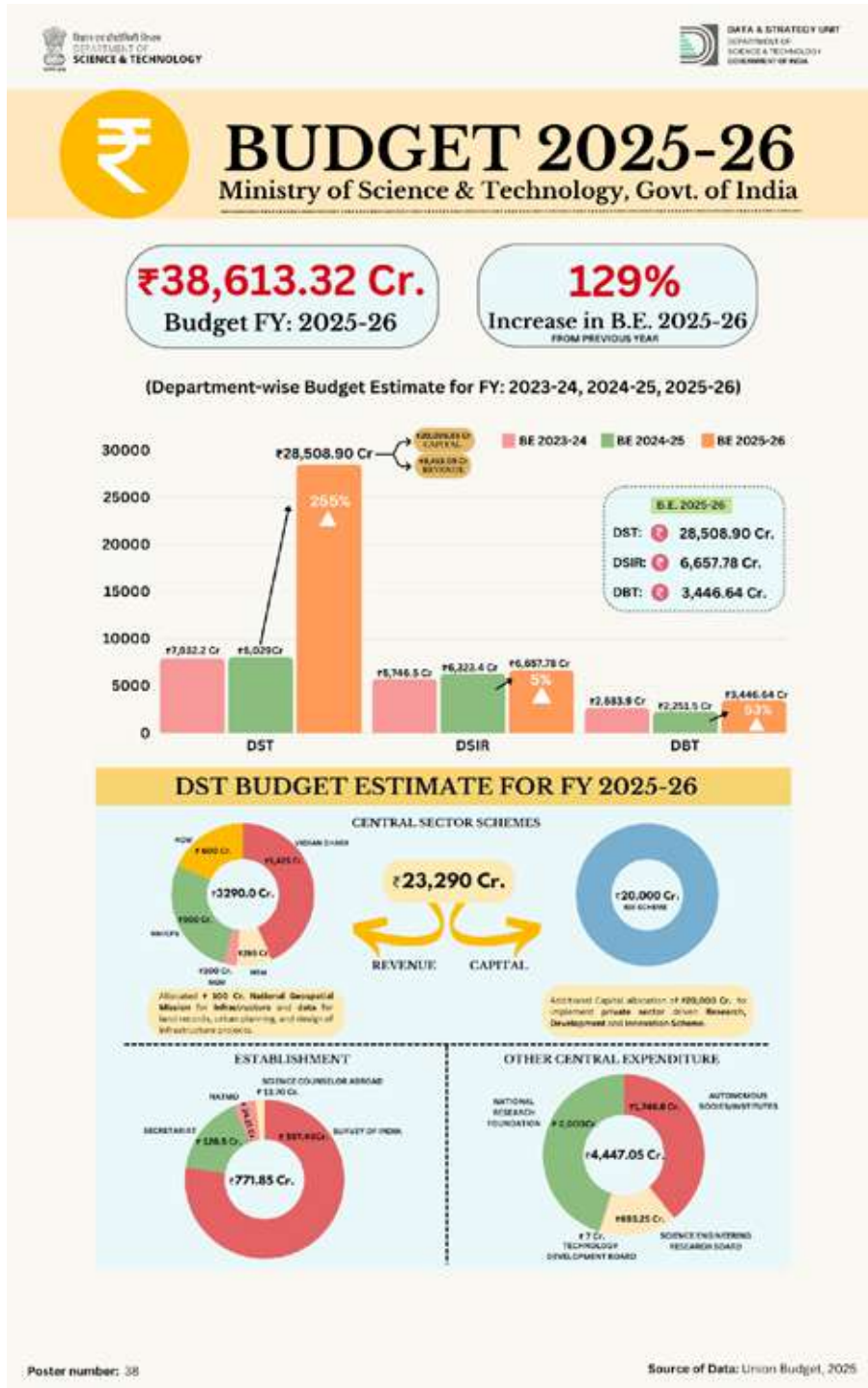
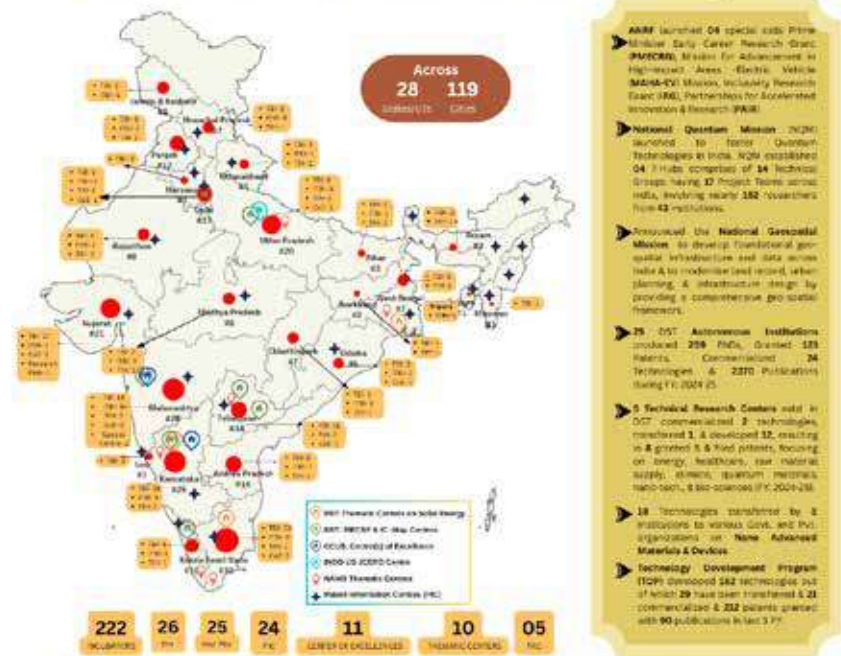
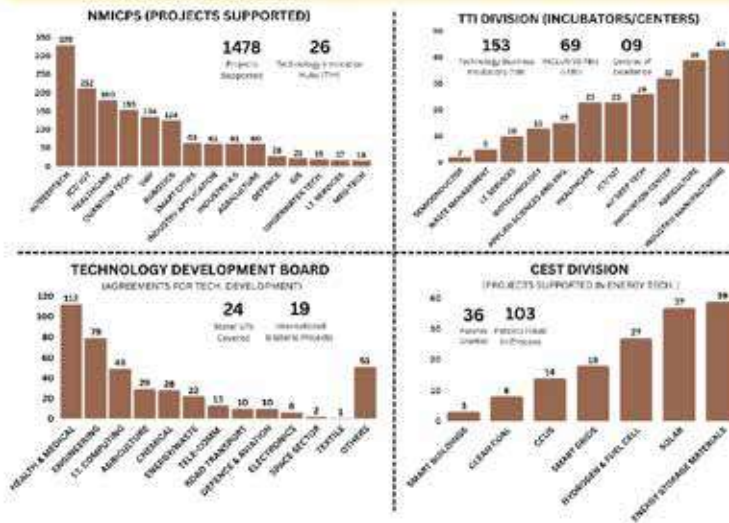


Fig. A consolidated report on Budget 2025-26

## DST Celebrates "National Technology Day"



### SECTOR-WISE SUPPORT FOR TECHNOLOGY DEVELOPMENT



Poster number:

Source of Data: DST Programs Division

Fig. On International Technology Day, DSU prepared a Data Infographic showcasing Department's various Programmes supporting country's Technological Development.



## AUDIT OBSERVATION

### Annexure-I

Position as on date 08.01.2026

Detailed position of Action Taken Notes (ATNs) as per Audit Para Monitoring System (APMS) portal to be included in the Annual Report of DST for the year 2025-26 is given below: -

S I . No.	Year	No. of Paras/PA Reports on which ATNs have been submitted to PAC after vetting by Audit	Details of the Paras/PA report on which ATNs are pending		
			No. of ATNs not sent by the Ministry even for the first time	No. of ATNs sent but returned with observations and Audit is awaiting their resubmission by the Ministry	No. of ATNs which have been finally vetted by audit have not been submitted by the Ministry of PAC
	2024-25	Nil	Nil	Nil	Nil

\* Source : APMS portal

### Annexure-II

Position as on date 08.01.2026

Summary of important Audit observations pertaining to DST: -

- NIL -

## BUDGET

## FINANCIAL STATEMENT

Summary of Financial Requirement						
						(₹ In crore)
Sl. No.	Head of Development Projects/ Programme Schemes	Expenditure 2024-25	B E 2025-26	RE 2025-26	BE 2026-27	
1	Science And Technology Institutional And Human Capacity Building	542.38	0.00	0.00	0.00	
2	Research and Development	48.41	0.00	0.00	0.00	
3	Innovation, Technology Development and Deployment	325.56	0.00	0.00	0.00	
4	National Mission On Interdisciplinary Cyber Physical System (NM-ICPS)	715.97	900.00	750.60	700.00	
5	National Quantum Mission	62.36	600.00	755.15	900.00	
6	Super Computing	221.00	265.00	530.00	0.01	
7	Vigyan Dhara	271.98	1425.00	2009.14	1425.00	
8	National Geospatial Mission	0.00	100.00	35.00	100.00	
9	Research, Development and Innovation Scheme	0.00	20000.00	3000.00	20000.00	
10	Secretariat	106.25	126.45	119.64	121.50	
11	Survey of India	483.00	597.49	548.24	561.30	
12	NATMO	31.71	34.21	34.02	32.38	
13	Science Counsellors Abroad	12.10	13.70	16.73	15.01	
14	Autonomous Institutions and Professional Bodies	1575.63	1746.80	1624.81	1643.87	
15	Science and Engineering Research Board	721.00	693.25	543.25	543.25	
16	Technology Development Board	5.00	7.00	7.00	7.00	
17	National Research Foundation (NRF)	0.00	2000.00	1948.00	2000.00	
18	Recovery	-100.94				
<b>TOTAL (REVENUE+ CAPITAL)</b>		<b>5021.39</b>	<b>28508.90</b>	<b>11921.58</b>	<b>28049.32</b>	

Note: Scheme at Sl. No.1, 2 & 3 has been unified in a new scheme namely Vigyan Dhara mentioned at Sl. No.7.

## ANNEXURE

**Statement showing Grants-in-aid ranging from ₹ 10 lakhs and above, both recurring & non-recurring, released to private institutions/ voluntary organizations during the year Jan 2025-Dec 2026**

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
1.	Guru Nanak Khalsa College of Arts, Science and Commerce, Mumbai, Thane, Maharashtra, 400019	Department of Science and Technology	150.000	8,250.000	FIST: To create research infrastructure
2.	Birla Institute of Technology and Science (BITS), Pilani, Pilani Campus, Jhunjhunu, Rajasthan, 333031	-do-		322,500.000	SATHI: To create research infrastructure
3.	St Josephs College Irinjalakuda, Thrissur, Kerala, 680121	-do-	150.000	4,800.000	FIST: To create research infrastructure
4.	RK University, Rajkot, Gujarat, 360020	-do-		6,375.000	FIST: To create research infrastructure
5.	M S Ramaiah Institute of Technology, Bengaluru Urban, Karnataka, 560054	-do-		6,000.000	FIST: To create research infrastructure
6.	BITS Pilani KK Birla Goa Campus, Zuarinagar, South Goa, 403726	-do-		7,500.000	FIST: To create research infrastructure
7.	Siddaganga Institute of Technology, Tumakuru, Karnataka, 572103	-do-		5,000.000	FIST: To create research infrastructure
8.	Guru Nank Institute of Dental Sciences and Reserach, Kolkata, Kolkata, West Bengal, 700114	-do-	150.000	3,265.500	FIST: To create research infrastructure
9.	Sri Ramakrishna College of Arts and Science for Women, New Sidhapudur, Coimbatore, Tamilnadu, 641044	-do-	150.000	5,100.000	FIST: To create research infrastructure
10.	G.T.N. Arts College (Autonomous), Dindigul, Tamil Nadu, 624005	-do-	150.000	3,750.000	FIST: To create research infrastructure

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
11.	KIIT Deemed to Be University, Bhubaneswar, Khordha, Orissa, 751024.	-do-	3,328.110		PURSE: To create research infrastructure
12.	Amity University Rajasthan, Jaipur, Rajasthan, 303002	-do-	4,454.154		PURSE: To create research infrastructure
13.	Shree Dhanvantary Pharmacy College Kim Surat Gujarat, Surat, Gujarat, 394110	-do-	300.000		FIST: To create research infrastructure
14.	Rungta College of Engineering and Technology Bhilai Chhattisgarh, Durg, Chhattisgarh, 490024	-do-	150.000	3,750.000	FIST: To create research infrastructure
15.	Koneru Lakshmaiah Education Foundation (KLEF), Vaddeswaram, Krishna, Andhra Pradesh, 522502	-do-	5,736.057	2,664.911	PURSE: To create research infrastructure
16.	Ramakrishna Mission Vivekananda Educational and Research Institute, Belur Math, Howrah, West Bengal, 711202	-do-	150.000	6,750.000	FIST: To create research infrastructure
17.	Vellore Institute of Technology, Vellore, Tamil Nadu, 632014	-do-	2,118.104		PURSE: To create research infrastructure
18.	Dayanand Anglo Vaidic Post Graduate College, Dehradun, Uttarakhand, 248001.	-do-	150.000	3,975.000	FIST: To create research infrastructure
19.	SRM University Ap, Amaravathi, Guntur, Andhra Pradesh, 522502	-do-		9,000.000	FIST: To create research infrastructure
20.	Guru Nanak Dev Engineering College, Ludhiana, Punjab, 141006	-do-	150.000	4,500.000	FIST: To create research infrastructure
21.	METS, Institute of Pharmacy, Bhujbal Knowledge City, Adgaon, Nashik, Maharashtra, 422003.	-do-	150.000	4,275.000	FIST: To create research infrastructure
22.	KIIT Deemed to be University, Bhubaneswar, Khordha, Orissa, 751024	-do-		31,950.000	PURSE: To create research infrastructure
23.	PMS College of Dental Science Research, Thiruvananthapuram, Kerala, 695028	-do-	150.000		FIST: To create research infrastructure

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
24.	BMS College of Engineering, Bengaluru, Urban, Karnataka, 560019	-do-	134.000		FIST: To create research infrastructure
25.	SRM Institute of Science and Technology	-do-		11,250.000	SUPREME: To create research infrastructure
26.	Charotar University of Science and Technology, Changa, Anand, Gujarat, 388421	-do-	1,477.127		PURSE: To create research infrastructure
27.	Birla Institute of Technology, Ranchi, Jharkhand, 835215	-do-	4,814.775	8,252.783	PURSE: To create research infrastructure
28.	Thapar Institute of Engineering and Technology, Patiala, Punjab, 147004	-do-	3,678.700	111,000.000	PURSE: To create research infrastructure
29.	Gandhi Institute of Technology and Management (GITAM), Visakhapatnam, Andhra Pradesh, 530045	-do-		1,867.500	PURSE: To create research infrastructure
30.	SRM Institute of Science and Technology, Kattankulathur, Kanchipuram, Tamilnadu, 603203.	-do-	4,865.328		PURSE: To create research infrastructure
31.	Amity University Rajasthan, Jaipur, Rajasthan, 303002.	-do-	4,685.030		PURSE: To create research infrastructure
32.	Jammu and Kashmir Student Welfare Society Anantnag, Jammu and Kashmir	-do-	2,324.000		Curious Minds Exploring the Wonders of Science in J K
33.	Andaman Nature Club Port Blair, Andaman and Nicobar	-do-	1,959.872		Innovative Physics Teaching with Affordable Hands-on Science Activities in Andaman and Nicobar Islands
34.	Kerala Educational Development and Employment Society (KEDES), Kerala	-do-	3,195.200		Mobile Science Exploratory Taking the Message of Science and Technology to the Masses
35.	Pragati Vigyan Sanstha Meerut, Uttar Pradesh	-do-	4,105.200		Vigyan Ghar A House of Scientific Creativity and a Trending step in Science Popularization through Community engagement world's First science-based Reality show
36.	Swami Rama Himalayan University, Dehradun, Uttarakhand	-do-	2,099.552	Nil	Empowering Rural Women: Health, Well-Being and Socio-Economic Upliftment

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
37.	Vimala College Thrissur, Kerala	-do-	1,377.696	Nil	Samvaad Bridging Science and Sustainability through Research-Oriented Learning and Community Engagement
38.	Yuva Vigyan Parishad Gwalior, M.P.	-do-	3,928.000	Nil	Fostering Scientific temper through popular science lecture series and demonstration of experiments- Fun with Chemistry
39.	Astronomica Science Activity and Education Society Hoshangabad, M.P.	-do-	2,715.200	Nil	Science Awareness Jatha for Tribal Children of Madhya Pradesh
40.	Vishwas Dnyan Prabodhini and Research Institute Nashik, Maharashtra	-do-	3,713.600	Nil	Science on Wheels in Tribal Rural Areas of Nashik
41.	Take Bogo Welfare Society Lower Subansiri, Andhra Pradesh	-do-	2,314.560	Nil	Organizing of Outreach Activities for Creating Awareness on Animal and human Health among the different target groups in rural areas of six selected blocks of Arunachal Pradesh
42.	Institute for Environmental and Social Affairs (IESA) Jaipur, Rajasthan	-do-	2,815.600		To promote scientific communication between educators and students by demonstration camps and hands-on activities in tribal district of Banswara of Rajasthan State
43.	Bharat Jan Vigyan Jatha Guwahati, Assam	-do-	2,757.792		Invigorating the Traditional Toys (Puppet) of Assam as Science and Communication Tools: An outreach program
44.	Eswar Kodapala, Orissa	-do-	2,689.536		Project Proposal towards Implementing Samvaad Initiatives for the students to campaign for Developing safe drinking water habits so as to avoid diseases
45.	Society of Pollution and Environmental Conservation Scientists, Dehradun, Uttarakhand	-do-	2,649.840		Climate Change Monitoring and Analysis using ISRO Bhuvan & Data Collection Devices

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
46.	Institute of Management and Advanced Studies Lucknow (U.P.)	-do-	2,059.200		Public Outreach Programme for Fostering Scientific Temperament through Folk Media and Community engagements
47.	Samaj Sewa Ewam Shiksha Samiti, Pauri Garhwal, Uttarakhand	-do-	2,618.880		Developing Asha Worker as Science Communicator with help of S T for extract delusional in society
48.	Jan Kalyan Sewa Samiti Lucknow (U.P.)	-do-	2,753.300		Promoting Understanding of Science among the Public
49.	Kundan Welfare Society Gurgaon (Haryana)	-do-	2,680.000		To Develop Scientific Understanding among Students through industrial visits
50.	Sneh Roshni Shikha Evam Samajik Sanstha, Ghaziabad (U.P.)	-do-	2,754.400		Hands-on Training Program to foster science and mathematics learning and celebrate national science festive 4 blocks of Ghaziabad
51.	Maheswari Educational Society, Visakhapatnam, Andhra Pradesh	-do-	3,385.200		Science and Indigenous Technology on Wheels
52.	Anmol, Delhi	-do-	3,415.000		Popularizing Science amp Technology among school children amp Gen public through Science on Wheels STEMM BUS in Delhi
53.	Parichay Lucknow (U.P.)	-do-	4,642.400		Bringing Knowledge to Your Doorstep Through Science on Wheels
54.	Society For Peoples Action in Rural Service and Health Gadchiroli, Maharashtra	-do-	2,638.458		Forward Future Empowering the next generation thinkers of schedule Caste Communities of Gadchiroli Dist. Maharashtra through Samvaad
55.	Marwadi University Rajkot, Gujarat	-do-	1,756.000		Proposal for Organizing Outreach Program for Government School Students from SC Category in Gondal and Bhavnagar

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
56.	Baba Farid College Bathinda, Punjab	-do-	2,209.344		Awareness of Healthy Agricultural Practices Using Cost-Effective Technologies to Mitigate Cancer in the Malwa Region Punjab
57.	Manpower Management Centre, Gurgaon, Haryana	-do-	1,000.00		Directories of Extramural R&D Projects for the year 2021-22, 2022-23 & 2023-24
58.	Punjab Engineering College, Chandigarh	-do-	1,678.85		National S&T survey for Higher Education Sector
59.	The Energy and Resources Institute (TERI), New Delhi	-do-	1,954.89		National S&T Survey on Resources devoted to R&D activities, 2024-25 for central sector & private sector
60.	The Energy and Resources Institute (TERI), New Delhi	-do-	2,317.68		Long-term development and maintenance of NSTMIS website including the digital repository for S&T publications and preparation of online directory of R&D institutions
61.	CEPT University	-do-	222.996		R&D
62.	Amrita School of Engineering, Coimbatore	-do-	1,115.424		R&D
63.	Manipal University Jaipur	-do-	2,498.720		R&D
64.	P S G College of Technology	-do-		1,360.293	R&D
65.	Pillai HOC College of Engineering and Technology Navi Mumbai.	-do-	2,351.376		R&D
66.	Jain University, Bangalore	-do-	2,297.500		R&D
67.	P.S.R. Engineering College, Sivakasi, Virudhunagar, Tamil Nadu	-do-	1,264.030		R&D
68.	Amrita Vishwa Vidyapeetham, Amrita School of Engineering, Amritanagar, Coimbatore, Tamil Nadu	-do-	1,689.605		R&D
69.	Pandit Deendayal Energy University, Gujarat	-do-	-	2,200.000	R&D
70.	VIT, Vellore	-do-	-	1,400.000	R&D
71.	Shriram Institute for Industrial Research, New Delhi	-do-	-	3,850.000	R&D
72.	UPES, Dehradun	-do-	-	2,890.000	R&D

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
73.	GLA, Mathura	-do-	-	1,820.000	R&D
74.	CIT, Tamilnadu	-do-	1,970.000	-	R&D
75.	VIT, Vellore	-do-	1,657.844	-	R&D
76.	Plaksha University, Mohali, Punjab	-do-	1,331.617	68.084	R&D
77.	Jain Uniiversity, Bangalore Rural, Karnataka	-do-	4,000.000	5,160.000	R&D
78.	Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh - 201001	-do-	133.926	2,206.535	R&D
79.	Sri Ramachandra Institute of Higher Education and Research	-do-	6,064.526	754.512	R&D
80.	Rajalakshmi Engineering College, Thandalam, Chennai, Tamil Nadu	-do-	-	1,497.716	R & D under SHRI
81.	Bharati Vidyapeeth Deemed University, Pune, Maharashtra.	-do-	2,089.880		R & D under SHRI
82.	Amrita Institute of Medical Sciences, Kochi	-do-	1,814.920		R & D under SHRI
83.	Pankajakasthuri Ayurveda Medical College & P.G. Centre, Thiruvananthapuram, Kerala, India	-do-	1,150.000		R & D under SHRI
84.	International Crops Research Institute For The Semi-Arid Tropics Hyderabad, Telangana	-do-	-	1,580.446	R & D under SHRI
85.	Malla Reddy Engineering College (Autonomous), Hyderabad, Telangana	-do-		1,501.336	R & D under SHRI
86.	VIT Bhopal University, Madhya Pradesh	-do-		2,222.660	R & D under SHRI
87.	Sanskriti Foundation, Gokulam, Mysore	-do-	2,436.755		R & D under SHRI
88.	Shri Mata Vaishno Devi University, Katra, J&K	-do-	4,248.400	1,287.583	R & D under SHRI
89.	Search and research development society Bhopal, Madhya Pradesh	-do-	3,064.780	2,211.041	R & D under SHRI
90.	Academy of Maritime Education and Training (AMET), Chennai	-do-	1,901.943		R & D under SHRI

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
91.	Velammal Institute of Technology, Tiruvallur, Tamil Nadu	-do-	1,621.200		R & D under SHRI
92.	Banasthali Vidyapith University, Rajasthan	-do-	1,418.400		R & D under SHRI
93.	Center of Policy Research and Governance Mandi House, New Delhi	-do-	2,819.832		R & D under SHRI
94.	MooljiJaitha College Jalgaon, Maharastra	-do-	1,176.200		R & D under SHRI
95.	Kumaraguru College Of Technology, Coimbatore	-do-	1,298.912		R & D under SHRI
96.	Sophitorium Institute of Technology and Lifeskills, Khordha, Orissa	-do-	1,600.000		R & D under SHRI
97.	National Institute of Advanced Studies (NIAS), Indian Institute of Science Campus, Bangalore	-do-	3,805.241		R & D under SHRI
98.	Pankajakasthuri Ayurveda Medical College and PG Centre (Under Pankajakasthuri Herbal Research Foundation), Thiruvananthpuram	-do-	4,382.719		R & D under SHRI
99.	National Institute of Advanced Studies (NIAS), Bengaluru	-do-	2,000.000		R & D under SHRI
100.	Thampi Institute of Medical Education and Research Trust, Kanyakumari, Tamil Nadu	-do-	1,081.759		R & D under SHRI
101.	The University of Trans-Disciplinary Health Science and Technology Bengaluru Urban, Karnataka	-do-	1,602.080		R & D under SHRI
102.	Noorul Islam Centre For Higher Education, Thuckalay, Kanyakumari	-do-	3,000.000		R & D under SHRI
103.	PSIT Startup and Incubation Foundation, Uttar Pradesh	-do-	3,920.000	4,000.000	DST-NIDHI ITBI
104.	KR Innovation Centre, Tamil Nadu	-do-	5,105.000	2,110.000	DST-NIDHI ITBI
105.	Sharda Launchpad Federation, Uttar Pradesh	-do-	1,020.000	5,036.980	DST-NIDHI ITBI

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
106.	Guru Nanak Dev Engineering College, Bidar, Karnataka	-do-	1,821.851		DST-NIDHI ITBI
107.	GADVASU - Dairy Innovation & Incubation Centre, Punjab	-do-	4,495.000		DST-NIDHI ITBI
108.	Innovation and Incubation Hub MNNIT Foundation, Uttar Pradesh	-do-	3,200.000	1,300.000	DST-NIDHI ITBI
109.	DTUIIF, Delhi Technical University (DTU), Delhi	-do-	3,672.363		DST-NIDHI ITBI
110.	CIED IUST Foundation, Jammu & Kashmir	-do-	4,317.000	7,406.000	DST-NIDHI ITBI
111.	Swami Vivekanand Technical University, Chhattisgarh	-do-		4,000.000	DST-NIDHI ITBI
112.	National Institute of Technology, Agartala, Barjala, Jirania, Tripura	-do-		4,500.000	DST-NIDHI ITBI
113.	National Institute of Technology Silchar, Assam	-do-	4,300.000		DST-NIDHI ITBI
114.	National Institute of Technology Srinagar, Jammu & Kashmir	-do-	3,216.086		DST-NIDHI ITBI
115.	DAVV Incubation Centre, Madhya Pradesh	-do-	2,424.356	5,000.000	DST-NIDHI ITBI
116.	AMU Innovation Foundation, Uttar Pradesh	-do-	2,000.000	3,000.000	DST-NIDHI ITBI
117.	Sanskriti Tech Incubation Foundation, Uttar Pradesh	-do-	1,500.000	1,500.000	DST-NIDHI ITBI
118.	Down Town Venture Labs foundation, Assam	-do-	1,950.000		DST-NIDHI ITBI
119.	GGV Startup Foundation (GSF), Chhattisgarh	-do-	2,100.000		DST-NIDHI ITBI
120.	G H Raisoni University Technology Business Incubator Foundation, Madhya Pradesh	-do-		4,625.000	DST-NIDHI ITBI
121.	Vidya Jyothi Institute of Technology, Telangana	-do-		1,650.348	R&D
122.	RV University, Karnataka	-do-		1,491.565	R&D
123.	RMK Engineering College, Tamilnadu	-do-	1,141.920		R&D
124.	Rajalakshmi Engineering College, Tamilnadu	-do-	1,273.600		R&D

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
125.	Thapar Institute of Engineering And Technology University, Punjab	-do-	3,264.679	2,526.926	R&D
126.	The Synthetic And Art Silk Mills' Research Association, Maharashtra	-do-	1,572.873		R&D
127.	Karpagam Academy Of Higher Education, Tamilnadu	-do-	2,773.720		R&D
128.	Pandit Deendayal Energy University, Gujarat	-do-	1,000.000		R&D
129.	Mar Epharem College of Engineering and Technology, Tamilnadu	-do-	1,122.836		R&D
130.	Karunya Institute of technology and sciences, Tamil Nadu	-do-	2,216.935		R&D
131.	Kalasalingam Academy of Research and education, Tamil Nadu	-do-	889.850	2,021.400	R&D
132.	Sardar Patel College of Engineering, Maharashtra	-do-	989.410	1,738.344	R&D
133.	Dr. MGR Educational & Research institute, Tamil Nadu	-do-	1,644.000	2,515.520	R&D
134.	GITAM, Andhra Pradesh	-do-	3,718.995		R&D
135.	Lifecare Innovations Pvt. Ltd., Haryana	-do-	3,684.230		R&D
136.	BITS-Pilani, Rajasthan	-do-	1,071.080	1,000.000	R&D
137.	VIT University, Tamil Nadu	-do-	1,052.674		R&D
138.	Medicaps University, Madhya Pradesh	-do-	1,232.653		R&D
139.	Pandit Deendayal Energy University, Gujarat	-do-	3,549.489		R&D
140.	Kongu Engineering College, Tamil Nadu	-do-	1,169.876		R&D
141.	AIC Banasthali Vidyapith Foundation, Banasthali, Rajasthan	-do-	3,060.000		DST-NIDHI Accelerator
142.	Kalinga Institute of Industrial Technology, Orissa	-do-	3,200.000		DST-NIDHI Accelerator
143.	Jyothy Institute of Technology Foundation, Bangalore, Karanataka	-do-	3,200.000		DST-NIDHI Accelerator

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
144.	Centre For Cellular and Molecular Platforms (C-CAMP) Bangalore, Karnataka	-do-	3,095.200		DST-NIDHI Accelerator
145.	Pilani Innovation and Entrepreneurship Development Society (PIEDS), Bits Pilani, Rajasthan	-do-	3,200.000		DST-NIDHI Accelerator
146.	Global Incubation Services (GINSERV), Bangalore, Karnataka	-do-	3,200.000		DST-NIDHI Accelerator
147.	Chitkara University, Rajpura, Punjab	-do-	2,800.000		DST-NIDHI Accelerator
148.	Dayananda Sagar Entrepreneurship Research and Business Incubation Foundation- Bengaluru, Karnataka	-do-	3,200.000		DST-NIDHI Accelerator
149.	Indian School of Business, Mohali, Punjab	-do-	3,200.000		DST-NIDHI Accelerator
150.	LV Prasad Eye Institute, Hyderabad	-do-	1,477.200		R&D
151.	The Energy & Resources Institute, New Delhi	-do-	1,357.000		Review meeting
152.	Centre for Innovation Incubation and Entrepreneurship Initiatives (CIIE), IIM-Ahmedabad	-do-	1,552.119		GIA
153.	Centre for Entrepreneurship Development Centre (EDC), Venture Centre, Pune, Maharashtra	-do-	2,482.870		GIA
154.	IIM Calcutta Innovation Park	-do-	2,501.487		GIA
155.	Chitkara Innovation Incubator Foundation CIIF, Chitkara University, Punjab	-do-	1,585.000		GIA
156.	Sona College of Technology	-do-	9,500.000	3,500.000	Grant -In Aid
157.	VIGNAN'S Foundation for Science, Technology and Research	-do-	1,006.000		Grant -In Aid
158.	Indian STEP & Business Incubator Association	-do-	1,000.000		Support for innovation event
159.	CIBA, GOA	-do-	5,148.196		Support to NIDHI TBI

Sr. No.	Name of the institution / organization / individual	Ministry / Department giving the grant	Recurring (₹ in thousands)	Non-recurring (₹ in thousands)	Purpose of the grant
160.	Flre Don Bosco, Goa	-do-	7,000.000	2,000.000	Support to NIDHI TBI
161.	JSSATE-STEP, Noida	-do-	2,824.000		Support for innovation event
162.	Anusandhan National Research Foundation (ANRF)	-do-	146473.694	19844.931	Research & Development
163.	Birla Institute of Technology Mesra, Noida Campus, G B Nagar-201301, Uttar Pradesh	-do-	1,800		R&D under CSRI
164.	Manipal Institute of Technology, Manipal Academy of Higher Education, Udupi, Karnataka	-do-	1780.257		For implementing R&D project

## ABBREVIATIONS

ABDB	Functional Areas Dataset and Administrative Boundary Database
ACBP	Annual Capacity Building Plan
AcSIR	Academy of Scientific and Innovative Research
AD	Alzheimer's Disease
AFM1	Aflatoxin M1
AGWs	Atmospheric Gravity Waves
AI	Artificial Intelligence
AI/M	Artificial Intelligence and Machine Learning
AIIMS	All India Institute of Medical Sciences
AIMSCS	Advanced Institute of Mathematics, Statistics and Computer Science
AIRTF	ASEAN-India Research Training Fellowship
AI-SE	ANRF MISSION AI for Science and Engineering
AISRF	Australia India Strategic Research Fund
AMCM	Advanced Materials and Critical Minerals
AMRITI	Advanced Materials Research Initiative for Technology Implementation
AMRUT 2.0	Atal Mission for Rejuvenation and Urban Transformation 2.0
AMRUT	Atal Mission for Rejuvenation and Urban Transformation programme
AMT	Advanced Manufacturing Technologies
ANPR	AI-powered Automatic Number Plate Recognition
ANRF	Anushandhan National Research Foundation
APMS	Audit Para Monitoring System
APSSDI	Arunachal Pradesh State Spatial Data Infrastructure
ARCI	International Advanced Research Centre for Powder Metallurgy and New Materials
ARG	Advanced Research Grant
ARI	Agharkar Research Institute, Pune
ARIES	Aryabhatta Research Institute of Observational Sciences, Nainital
ARTPARK	I-HUB for Robotics and Autonomous Systems Innovation Foundation
ASC	Asian Science Camp
ASHESH	Advancement towards Stable and Highly Efficient Solar cell based on Halide perovskite
ASR	Automatic Speech Recognition
ASSAF	Academy of Science of South Africa
ASV	Autonomous Surface Vehicle
ASV	Autonomous Surface Vessel
ATNs	Action Taken Notes
AWLRs	Automatic Water Level Recorders
AWS	Automatic Weather Station
BCP	Business Continuity Planning
BDS	Bharat Data Sagar

BDTD	Biomedical Device & Technology Development
BER	Beyond Economic Repair
BI	Bose Institute, Kolkata
BIM	Building Information Modelling
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BITS	Birla Institute of Technology and Science, Pilani, Hyderabad
BMFTR	German Federal Ministry for Research, Technology and Space
BNDTM	Bhartiya Nirdeshak Dravyas
BNUAI	B Naik Uprising Agro Industry Pvt. Ltd.
BRICS	Brazil Russia India China South Africa Cooperation
BSIP	Birbal Sahni Institute of Palaeosciences, Lucknow
BWG	Boundary Working Group
BYIP	BRICS Young Innovator Prize
BYSF	BRICS Young Scientist Forum
C.D.	Community Development
C31Hub	IHUB NTIHAC Foundation
CAP	Cold Atmospheric Plasma
CAU	Central Agricultural University
CBC	Capacity Building Commission
CBCS	Centre of Behavioural and Cognitive Sciences
CBI	Central Bureau of Investigation
CBM	Compressed Brayonic Matter
CBU	Capacity Building Unit
CCMG	Cyber Crisis Management Group
CCMP	Cyber Crisis Management Plan
CCP	Climate Change Programme
CCRUM	Central Council for Research in Unani Medicine
CCU	Carbon Capture and Utilization
CCUS	Carbon Capture, Utilization and Storage
CDW	Charge-Density-Wave
CeNS	Centre for Nano and Soft Matter Sciences
CEPT	Centre for Environmental Planning and Technology University, Ahmedabad
CERI	Clean Energy Research Initiative
CEST	Climate, Energy and Sustainable Technology
CETP	Clean Energy Transition Partnership
CFCs	Common Facility Centers
CFP	Call for Proposals
CIMFR	Central Institute of Mining and Fuel Research, Dhanbad
CIPET	Central Institute of Petrochemicals Engineering & Technology, Chennai
CMEs	Coronal Mass Ejections

CNC	Computer Numerical Control
COD	Chemical Oxygen Demand
CoE	Centres of Excellence
COFs	Covalent Organic Frameworks
CORS	Continuously Operating Reference Station
COSTI	Committee on Science, Technology and Innovation, Indonesia
CPR	Centre for Policy Research
CPWD	Central Public Works Department
CRAT	Climate Risk Assessment Tool
CRRRI	Central Road Research Institute
Cryo-EM	Cryo-Electron Microscopy
CSC	AI-Based Cancer Stem Cell
CSIR	Cognitive Science Research Initiative
CSIR	Council of Scientific & Industrial Research
CSIR-CGCRI	CSIR–Central Glass and Ceramic Research Institute
CSIR-NAL	CSIR–National Aerospace Laboratories
CSP	Concentrated Solar Power
CSRP	Collaborative Scientific Research programme
CTCRI	Central Tuber Crops Research Institute
CVC	Central Vigilance Commission
CVO	Chief Vigilance Officer
D/SLEPCs	District/State Level Exhibition & Project Competitions
DAS	Data Analysis School
DAY-NRLM	Deendayal Antyodaya Yojana- National Rural Livelihood Mission
DBT	Department of Biotechnology
DBT	Direct Benefit Transfer
DC	Direct Current
DCLC	Direct Contact Liquid Cooling
DCS	Data Content Standards
DCUSPC	Department of Science and Technology Constitute Unit and Special Project Council
DEM	Digital Elevation Models
DGQI	Data Governance Quality Index
DPR	Detailed Project Report
DPSRU	Delhi Pharmaceutical Sciences and Research University, Delhi
DRDO	Defense Research and Development Organization
DRI	Down-Range Initiator
DRS	Decision Review Systems
DST	Department of Science & Technology
DST-CPR	DST-Centre for Policy Research
DSTE	Department of Science, Technology and Environment, Government of Puducherry

DSU- DST	DATA & STRATEGY UNIT
DTIH	Dental Technology Innovation Hub
DULT	Directorate of Urban Land Transport
DWFI	Daugherty Water for Food Global Institute
ECMR	Electro-Chemical Methanol Reformer
EDA	Electronic Design Automation
EDR	Endpoint Detection & Response
EEL	Experimental & Empirical Methods in Linguistics
EFC	Expenditure Finance Committee
EGSTIC	Expert Group on Science, Technology, Innovation Cooperation
EHe	Extreme Helium
EIACP	Council's Environmental Information, Awareness, Capacity Building and Livelihood Programme
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMR	Extramural Research
EMS	Electromagnetic Susceptibility
EPOC	Executive Programme of S&T Cooperation
ESAT	Energy-Stability-Area-Time
ESI	Electric Spark Ignition
EST	Environmentally Sound Technologies
ESTIC	Emerging Science, Technology and Innovation Conclave
EU	India-European Union
EV	Electric Vehicle
EWS	Economically Weaker Sections
FAIR	Facility for Antiproton Ion Research
FAST-SF	Focus Area Science Technology–Summer Fellowship
FIB-SEM	Focused Ion Beam–Scanning Electron Microscope systems
FICCI	Federation of Indian Chambers of Commerce and Industry
FIST	Fund for Improvement of S&T Infrastructure
FLG	Few-layer graphene
FMC	Facility Management Committee
FPOs	Farmer Producer Organizations
FSCTR	Fire Side Corrosion and Steam Side Oxidation
FSID	Foundation for Science Innovation and Development
GAM	Geodetic Asset Map
GAR	Geodetic Asset Register
GB	Governing Body
GCP	Ground Control Point
GCPs	Ground Control Points
GDI	Geospatial Data Sharing Interface

GDI	Integrated Geospatial Data-Sharing Interface
GDPDC	Geospatial Data Promotion & Development Committee
GFAP	Glial Fibrillary Acidic Protein
GI	Geographical Indications
GIAs	Geospatial Innovation Accelerators
GISE	Geospatial Information Science and Engineering
GLP	Good Laboratory Practice
NGLP	National Good Laboratory Practice
GNDB	Geographical Name Database
GoI	Government of India
GPE	Gravitational Potential Energy
g-SAM	Gram Panchayat Spatial Assets Mapper
HBN	Hexagonal Boron Nitride
HAL	NIF's Herbal Analytical Laboratory
HAM	Human Amniotic Membrane
HDSR	Hanle Dark Sky Reserve
HER	Hydrogen Evolution Reaction
HFNC	High Flow Nasal Cannula
HHV	Hind High Vac
HIPAA	Health Insurance Portability and Accountability Act
HLD	High-Level Design
HPC	High-Performance Computing
I&E	Innovation & Entrepreneurship
IACS	Indian Association for the Cultivation of Science
IAG	International Association of Geodesy
IAO	Indian Astronomical Observatory
IARDP	Industry Academia Research and Development Programme
IASc	Indian Academy of Sciences, Bangalore
IASP	Indian Association for the Study of Population
IASST	Institute of Advanced Study in Science & Technology
IC	International Cooperation
ICAR	Indian Council of Agricultural Research
ICC 2025	International Cartographic Conference
ICP	Inductively Coupled Plasma
IDEAS	Institute of Data Engineering, Analytics and Science Foundation
IDSF	Interim Data Sharing Framework
IGSTC	Indo-German Science and Technology Centre
IHFC	I-Hub Foundation for Cobotics
IIA	Indian Institute of Astrophysics
IIG	Indian Institute of Geomagnetism

IIIT	Indian Institute of Information Technology
IIRS	Indian Institute of Remote Sensing, Dehradun
IISc	Indian Institute of Science
IISER	Indian Institute of Science Education and Research
IISF	India International Science Festival
IIT	Indian Institute of Technology
IITTNiF	IIT Tirupati Navavishkar I-Hub Foundation
IJHS	Indian Journal of History of Science
IJPAM	Indian Journal of Pure and Applied Mathematics
IMC	India Mobile Congress
INCA	Indian National Cartographic Association
INSA	Indian National Science Academy, New Delhi
INSPIRE	Innovation in Science Pursuit for Inspired Research
INST	Institute of Nano Science and Technology
IORA	Indian Ocean Rim Association
IoT	Internet of Things
IPR	Immovable Property Return
IPR	Intellectual Property Rights
IRCTC	Indian Railway Catering and Tourism Corporation
IRG	Inclusivity Research Grant
IRS	Indian Register of Shipping, Mumbai
ISC	International Science Council
ISCA	Indian Science Congress Association, Kolkata
ISJSB	Indo-Swiss Joint Scientific Board
ISRF	India Science and Research Fellowship
ISTM	Institute of Secretariat Training & Management
iTBI	inclusive-Technology Business Incubator
ITC	Netherlands - University of Twente
ITO	Indium Tin Oxide
ITP	Industry Transition Partnership
ITS	International Travel Support Scheme
IUCAA	Inter-University Centre for Astronomy and Astrophysics
IUSSTF	Indo-U.S. Science and Technology Forum
JBG	J.C. Bose Grant
JCM	Joint Committee meeting
JKRIS	Jammu & Kashmir Remote Sensing Information System
JNCASR	Jawaharlal Nehru Centre for Advanced Scientific Research
JRF	Junior Research Fellowship
JSTC	Joint Science and Technology Committee
JTLM	Joint Technical Level Meeting

JWG	Joint Working Group
KCs	Karmayogi Coaches
KFDV	Kyasanur Forest Disease Virus
KoSO	Kodaikanal Solar Observatory
L&T	M/s Larsen & Toubro
LEGC	Low Expansion Glass-Ceramic
LFMP	Lactose-free milk powder
LHC	CERN Large Hadron Collider
LHC	Large Hadron Collider
LLD	Low-Level Design
LSM	Large Scale Mapping
M3	Maharashtra Methane Mission
MAD	Mutual Acceptance of Data
MAHA	Mission for Advancement in High-impact Areas Scheme
MAIDS	Maulana Azad Institute of Dental Sciences
MANAK	Million Minds Augmenting National Aspiration and Knowledge
MARIAD	Management and Analysis of R&D and Innovation Administrative Data
MeitY	Ministry of Electronics and Information Technology
MES	Materials for Energy Storage
MFBR	Mega Facilities for Basic Research
MHUs	Mobile Health Units
MI	Mission Innovation
MI-10	10th Mission Innovation Ministerial
MIMO	Multiple-Input Multiple-Output
MIS	Management Information System
MISC	MI Steering Committee
MKSP	Mahila Kisan Sashaktikaran Pariyojana
MMCs	Metal Matrix Composites
MMOU	Multilateral Memorandum of Understanding
Mn	Manganese
MoEFCC	Ministry of Environment, Forest and Climate Change
MoPR	Ministry of Panchayati Raj
MoU	Memorandum of Understanding
MPU	Mobile Processing Unit
NAC	National Academic Committee
NAKSHA	National Geospatial Knowledge – based land Survey of urban Habitations
NAMD	Nano and Advanced Materials Divisions
NAMRIA	National Mapping and Resource Information Authority
NAPCC	National Action on Climate Change
NASI	National Academy of Sciences, Allahabad

NATMO	National Atlas and Thematic Mapping Organization
NCG	National Centre for Geodesy
NCGG	National Centre for Good Governance
NCSC	National Children's Science Congress
NCSM	National Council of Science Museums
NCVET	National Council for Vocational Education and Training, New Delhi
NDFI	Normalized Difference Fraction Index
NDR	National Data Registry
NECTAR	North East Centre for Technology Application and Reach, Shillong
NEP	National Education Policy
NER	North Eastern Region
NESTI	National Experts on Science and Technology Indicators
NFB	Neurofeedback
NGCMA	National GLP Compliance Monitoring Authority
NGNIS	National Geographical Name Information System
NGP	National Geospatial Policy
NGP	National Geospatial Programme
NIDHI	National Initiative for Developing and Harnessing Innovations
NIDHI-CoE	NIDHI–Centre of Excellence
NIF	National Innovation Foundation
NIGST	National Institute for Geo-informatics Science and Technology, Hyderabad
NIIST	National Institute for Interdisciplinary Science and Technology
NIMHANS	National Institute of Mental Health and Neurosciences
NIRF	National Institutional Ranking Framework
NIS	National Innovation System
NIT	National Institute of Technology
NLS	National Land Survey
NLST	National Large Solar Telescope
NM	National Meet
NMCG	National Mission for Clean Ganga
NM-ICPS	National Mission on Interdisciplinary Cyber Physical System (NM-ICPS)
NMR	Nuclear Magnetic Resonance
NMSHE	National Mission for Sustaining the Himalayan Ecosystem
NMSKCC	National Mission on Strategic Knowledge for Climate Change
NPCI	National Payments Corporation of India
NPCSCB	National Programme for Civil Services Capacity Building
NPDF	National Postdoctoral Fellowship
NPLP	New Press Less Process
NQM	National Quantum Mission
NRC	National Research Council

NRDC	National Research Development Corporation
NRDMS	Natural Resources Data Management System
NRF	National Research Foundation
NRSC	National Remote Sensing Centre, Hyderabad
NSC	National Science Chair
NSCSTI	National Standards for Civil Services Training Institutions
NSD	National Science Day
NSDI	National Spatial Data Infrastructure
NSF	National Science Foundation
NSTMIS	National Science and Technology Management Information System
NZIP	Net Zero Innovation Partnership
OECD	Organisation for Economic Co-operation and Development
OEMs	Original Equipment Manufacturer
OGC	Open Geospatial Consortium
OPV	Organic Photovoltaic
ORAN	Open Radio Access Network
ORGI	Office of the Registrar General & Census Commissioner, India
OSGOF	Office of the Surveyor General of the Federation
PAIR	Partnerships for Accelerated Innovation and Research
PCCC	Puducherry Climate Change Cell
PCHE	Printed Circuit Heat Exchanger
PCM	Phase Change Material
PEG	Polyethylene Glycol
PEM	Proton-Exchange-Membrane
PEMD	Power Electronics, Machines and Drives
PEMFC	Polymer Electrolyte Membrane Fuel Cell
PF	Petaflop
PGIMER	Postgraduate Institute of Medical Education and Research
PHCs	Primary Health Centres
PIC	Patent Information Centre
PINSA	Proceedings of the Indian National Science Academy
PLA	Polylactic Acid
PLD	Pulsed Laser Deposition
PM ECRG	Prime Minister's Early Career Research Grant
PoC	Programme of Cooperation
PPH	Postpartum Hemorrhage
PPVFRA	Protection of Plant Varieties and Farmer Rights Act
PRATUSH	Probing ReionizATIOn of the Universe using Signal from Hydrogen
PRAYAS	Promoting and Accelerating Young and Aspiring technology entrepreneurs
PRC	Policy Research Cell

PRITHVI	The Palaeoscience Film Festival of India
PTC	Parabolic Trough Collector
PTT	Photothermal Therapy
PURSE	Promotion of University Research and Scientific Excellence
PV	Photovoltaic
PVDF	Polyvinylidene fluoride
PwDs	Persons with Disabilities
QA	Quality Assurance
QCI	Quality Council of India
QDM	Quantum Diamond Microscope
QKD	Quantum Key Distribution
QPU	Quantum Processor Unit
QT	Quantum Technology
QTA	Quantum Technologies & Applications
RCGs	Regional Centers for Geodesy
RCGs	Regional Geodesy Centres
RD&D	Research, Development, and Demonstration
RDIF	Research Development and Innovation Fund
ReRAM	Resistive Random-Access Memory
RF	Radio Frequency
RHI	Rural Healthcare Infrastructure
RPTO	Remote Pilot Training Organization
RRI	Raman Research Institute
RS	Resistive Switching
RSF	Russian Science Foundation
RSIC	Regional Sophisticated Instrumentation Centres
RSOFC	Reversible Solid Oxide Fuel Cell
RU	Radio Unit
S&T	Science and Technology
SABER	Sounding of the Atmosphere using Broadband Emission Radiometry
SAIF	Sophisticated Analytical Instrument Facilities
SAMEER	Society for Applied Microwave Electronics Engineering & Research, Kolkata
SARAS	Shaped Antenna measurement of the background RAdio Spectrum
SAST	Single Axis Solar Tracking
SATHI	Sophisticated Analytical & Technical Help Institute
SAXS	Small Angle X-ray Scattering facilities
SC	Scheduled Cast
SCERTs	State Councils of Educational Research and Training
SCO	Shanghai Cooperation Organization
SCSP	Scheduled Caste Sub Plan

SCTIMST	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram
SCTIMST	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum
SCTIMST	Sri Chitra Tirunal Institutes of Medical Science & Technology
SDG	Sustainable Development Goals
SDI	Spatial Data Infrastructure
SECs	Subject Expert Committees
SEED	Science for Equity Empowerment and Development
SERD	Solar Energy Research and Development Program
SHE	Scholarship for Higher Education
SHRI	Science and Heritage Research Initiative Cell
SIA	Social Impact Assessment
SIIC	SIDBI-Innovation & Incubation Centre
SIMATS	Saveetha Institute of Medical and Technical Sciences, Chennai
SKBU	Sidho-Kanho-Birsha University
SLFM	Second-Level Fund Manager
SLM	Secretary Level Meeting
SNBNCBS	S.N. Bose National Centre for Basic Sciences, Kolkata
S-NSF	Swiss National Science Foundation
SOEC	Solid Oxide Electrolysis Cell
SOFC	Solid Oxide Fuel Cell
SoI	Survey of India
SOPs	Standard Operating Procedures
SPI	Standardized Precipitation Index
SPiDR	Smart Prediction with Infrared Detection of Residual Cancer
SRF	Senior Research Fellowship
SRFP	Summer Research Fellowship Programme
SRSAC	State Remote Sensing Application Centre
SSA	Segment Support Assemblies
SSDI	State Spatial Data Infrastructure
SSP	Seed Support Program
SSPL	Steady-State Photoluminescence
SSR	Scientific Social Responsibility
SSTP	State Science and Technology Programme
ST	Scheduled Tribe
STED	Stimulated Emission Depletion Microscopy
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology & Innovation
STM32	STMicronics 32-bit
STPV	Solar Thermal-Photovoltaic
STW	Science & Technology for Women

SUNIL	Strengthening, Upscaling & Nurturing Innovations for Livelihood
SVAMITVA	Survey of Villages and Mapping with Improvised Technology in Village Areas Scheme
SVM	Smart Village Movement
SYST	Scheme for Young Scientists & Technologists
TAG	Technical Advisory Group
TBCs	Thermal Barrier Coatings
TBI	Technology Business Incubator
TBI	Traumatic Brain Injury
TDB	Technology Development Board
TDP	Technology Development Programme
TEC	Technology Enabling Centre
TENG	Ttriboelectric Nanogenerator
TES	Thermal Energy Storage
TEXMiN	Technology Innovation in Exploration & Mining Foundation
TFs	Task Forces
TIDE	Technology Interventions for Disabled & Elderly
TiHAN	NMICPS Technology Innovation Hub on Autonomous Navigation Foundation
TIHs	Technology Innovation Hubs
TIMED	Thermosphere Ionosphere Mesosphere Energetics and Dynamics
TIO	TMT International Observatory
TMT	Thirty Meter Telescope
TNA	Technology Needs Assessment
ToT	Transfer of Technology
TRCM	Time-Resolved Confocal Microscopy
TRCs	Technical Research Centres
TRL	Technology Readiness Level
TSAA	Telangana State Aviation Academy, Hyderabad
TSP	Tribal Sub Plan
TTI	Technology Translation and Innovation
TTRPs	Technology Translation Research Parks
TTS	Text-to-Speech
TV	Technological Verticals
UAVs	Unmanned Aerial Vehicles
UIS	UNESCO Institutes of Statistics
ULBs	Urban Local Bodies
UNGEGN	United Nations Group of Experts on Geographical Names
UN-GGCE	United Nations Global Geodetic Centre of Excellence
UNGGIM	United Nations Global Geospatial Information Management
UN-GGIM-AP	United Nations Committee of Experts on Global Geospatial Information Management– Asia Pacific
UNL	University of Nebraska–Lincoln

USA	United States of America
VAW	Vigilance Awareness Week
VSK	Vidya Samiksha Kendra
WARI	Water Advanced Research and Innovation Fellowship Program
WASH	Water and Sanitation
WEEE	Waste Electrical and Electronic Equipment
WGSTI	Working Group on Science Technology & Innovation
WIHG	Wadia Institute of Himalayan Geology
WISE	Women in Science and Engineering - KIRAN
WISER	Women Involvement in Scientific and Engineering Research
WMT	Waste Management Technologies
WP	Working Party
WTI	Water Technology Initiative
WTPs	Women Technology Parks
XPS	X-Ray Photoelectron Spectroscopy
XRD	X-ray Diffractometers
ZTS	ZnO-TiO <sub>2</sub> -Sepiolite



Department of Science & Technology  
 Ministry of Science & Technology  
 Technology Bhawan, New Mehrauli Road  
 New Delhi - 110016, INDIA