

Department of Science & Technology
Monthly Report
September, 2023

I. Important policy decisions taken and major achievements during the month:

A. Science for Society

- The monthly meeting of Secretaries of Science Ministries and Departments was held on 13th September 2023, under the Chairmanship of Dr. Jitendra Singh, Hon'ble Minister of State (IC) for Science & Technology. Some key issues such as rationalization of awards and decorations in 6 science Ministries/Departments; consideration of service conditions of scientists in the Ministry; preparation for India International Science Festival (IISF), 2023; updation of Prayas Portal; roll out of Anusandhan National Research Foundation (ANRF); status update on Vigyan Gati, etc were discussed. Secretary DST along with senior officials from the department participated and presented relevant inputs.
- **National Quantum Mission (NQM)**
- A compendium on achievements of Quantum Enabled Science & Technology (QuEST) programme was launched by Hon'ble Minister of Science and Technology on 29th September, 2023. The outcomes and achievements of the QuEST programme will be subsumed into NQM.
- 3rd Meeting of the Scientific Advisory Committee (SAC) of "National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)" of the Department of Science & Technology was held on September 19, 2023 wherein the performance of all 25 Technology Innovation Hubs was reviewed.
- A state-of-the-art Medical Cobotics Centre set up at IIIT Delhi jointly by Technology Innovation Hubs of IIIT Delhi and IIT Delhi under National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) of DST was inaugurated on 22nd September, 2023. This centre is one of its kind facility in the country in the area of research & innovation, medical trainings and start-up incubation. In this unique centre Doctors and Engineers work in collaboration to promote new technology solutions in the medical domain.
- A National Round table on "Solar Radiation Modification (SRM) Research in India" was organized by DST and hosted by the Indian Institute of Science, Bengaluru on 21 and 22 September, 2023 to deliberate on the impact of SRM geoengineering on monsoon, floods and droughts, and overall climate change, on India based on mathematical simulation models.
- 5th meeting of UNESCO Steering Committee held on Friday, 29 September 2023 through the online mode to discuss draft Open Science Outlook. A senior scientist of DST participated as India's representative and a member of the UNESCO Steering Committee and presented India's recent initiatives on open

science.

- Wadia Institute of Himalayan Geology (WIHG) organized 7th National Geo-Research Scholars Meet from 12-14 September 2023. About 100 research scholars from pan-India presented their research work.
- Indian National Academy of Engineering (INAE), Chennai Chapter organized a Webinar on “Asset & Process Integrity Monitoring: A Lab to Market Journey” on Saturday, 2nd September 2023 over WebEx. INAE Bhubaneswar Chapter jointly organized with SOA University, CSIR-IMMT Bhubaneswar, IIT Bhubaneswar and IEEE Bhubaneswar Sub-section the Lecture-26 of the Distinguished Lecture Series on "From Research to Innovation: A Way forward for India's Higher Educational Institutions"
- Institute of Advanced Study in Science and Technology (IASST) organised a lab experience-based scientific education session at Dakshin Beltola school, Guwahati on September 15, 2023. 136 students participated in the demonstration-based teaching class.
- National Academy of Sciences (NASI) reported that a two days' workshop on the 'Role of Women Scientists in S&T based Entrepreneurship Development' is jointly organized by NASI & CSIR- IHBT on September 18 &19, 2023 at IHBT, Palampur.
- Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) organised an Industry-Academia Meet on 22nd September 2023, with the participation of 25 industries and R&D organisations from Bengaluru & adjoining states who are engaged in the fields of health, energy, agriculture, services, life sciences, & manufacturing.
- The first meeting of DST's newly launched programme called SUPREME – Support for Up-gradation Preventive Repair & Maintenance of Equipment was held on 22nd September, 2023 at IITD, Delhi. 91 proposals were considered in the meeting out of which 20 projects were screened in to the next level for the presentation.
- Under SATYAM (Science and Technology for Yoga and Meditation) program, a screening meeting was organized on 22nd September, 2023 at INSA New Delhi to evaluate 99 proposals received under Call for Proposals 2023.

B. Technology Development

- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad produced about 40 kg of copper bronze and Nickel bronze powders by inert gas atomization for cold spray coating under DST-project on National Centre for development of advanced material and manufacturing processes for clean coal technologies for power applications. 55 kgs of Fe-Mn-SiCu alloy ingots were produced by vacuum induction melting under DST-IGSTC project.
- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad developed a modified aluminium alloy (Al7050) for additive manufacturing to avoid solidification cracking and Y2O3 dispersed Al-

Mg-Si alloy with improved mechanical properties under Indo-Italy Project.

- Indian Association for the Cultivation of Science (IACS) reported that their researchers designed a range of nucleoside derived hydrogels with inherent anti-leishmanial activity against both *L. major* promastigotes and amastigotes with no cytotoxic effect on normal human cells. This gel system may find promising applications in combating Cutaneous leishmaniasis by topical treatment.
- Different project activities including production of in-kind components for establishment of Facility for Antiproton and Ion Research (FAIR) and design and development of in-kind components for establishment of Thirty Meter Telescope (TMT) continued. Conceptual and Final Design Report for IT Cables approved by FAIR. NSF, USA released first phase of R&D funding to the TMT project.
- National Mission on Inter-disciplinary Cyber Physical Systems (NM-ICPS):
 - The Mission Office, NM-ICPS has conducted site visits to review the current progress of activities at the following TIHs:
 - i. I-DAPT Hub Foundation, IIT BHU on 01.09.2023
 - ii. IIITB COMET Foundation, IIIT Bangalore on 05.09.2023
 - iii. I-HUB Quantum Technology Foundation, IISER Pune on 27.09.2023

C. Human Capacity Building

- National Innovation Foundation (NIF) and NIF Incubation and Entrepreneurship Council, the Technology Business Incubator (TBI) hosted by NIF have disseminated 6 grassroots technological innovations and provided hands-on training to local communities in rural areas of Jharkhand and Odisha for increasing livelihood opportunities.
- North East centre for Technology Application and Reach (NECTAR), Tripura campus organized a 5 day training on Bamboo shoot processing, Cookies & Pickle Making from 18th to 22nd September 2023. 25 participants were trained in this training programme. A 10 day training on bamboo bottle making was organized from 12th September to 22th September, 2023 at NECTAR, Tripura Campus and trained 21 participants.

• WISE-KIRAN Scheme

a. Achievements under **Vigyan Jyoti Scheme:**

Orientation: Fifty-one Orientation cum Student-Parent counseling has been conducted at different JNVs.

Career counseling session: Forty-one Career counseling sessions has been conducted at different JNVs.

Role Model interaction: One Hundred Eight Role Model Sessions have been conducted by different JNVs.

Visit to Knowledge Partners (KP): Eighty-seven KP visits have been

conducted during September.

Tinkering Activities: Fifty-one tinkering workshops has been organized for Vigyan Jyoti scholars.

Science Camps: Twenty-three Science camps have been conducted during September.

Special Classes: Fifty-nine subject specific lectures have been conducted for Class XII Vigyan Jyoti scholars.

Sparkle Series: Four online workshops focused on conceptual understanding and critical thinking of *Mathematics*, *Science*, and *Computational Thinking* for Vigyan Jyoti Scholars of Class XII were conducted in collaboration with IIT Gandhinagar.

C-STEM: Five sessions of C-STEM were conducted for Vigyan Jyoti Scholars of Class X.

Knowledge Centre Kullu organized “Science Model Preparation” on 2nd September 2023.

Knowledge Centre Leh conducted a session on Mental Health and Stress Management for VJ scholars on 4th September 2023.

Knowledge Centre SBS Nagar organized “Declamation Contest- Chandrayaan & its Impact” on 8th September 2023.

Knowledge Centre North 24 Parganas conducted Maths Quiz on 21st September 2023.

Knowledge Centre Chandel organized “Science & Maths Quiz Competition” on 22nd September 2023.

b. A PAC meeting of CURIE (Consolidation of University Research for Innovation & Excellence in Women Universities) was conducted during 12-13 September, 2023 at Guru Nanak Dev University, Amritsar to evaluate new proposals for supporting women PG Colleges under CURIE.

c. First meeting of the subject Expert Committee (SEC) on Physical and Mathematical Sciences was conducted under ‘WISE-Post Doctoral Fellowship (WISE-PDF)’ during September 22-23, 2023 at Ramaiah University of Applied Sciences, Bangalore to evaluate the screened in proposals.

d. First meeting of the Subject Expert Committee (SEC) on Earth and Atmospheric Sciences was conducted under ‘WISE-Post Doctoral Fellowship (WISE-PDF)’ Program of DST during September 29-30, 2023 at North-Eastern Hill University (NEHU), Shillong to evaluate new proposals.

- **INSPIRE Scheme**

- a. INSPIRE Awards - Million Minds Augmenting National Aspirations and Knowledge (Manak) - State Level Exhibition and Project Competition was organized at Lakshadweep on September 25th, 2023.
- b. District Nodal Officers Meetings was held in Maharashtra and Uttar Pradesh.
- c. Teachers Meeting was held in KVS (1), Maharashtra (1), Gujarat (4) and CBSE Schools in which 4000 teachers participated.
- d. Mentoring workshops was organized at Mizoram (For State Awardees) at innovation facility center, MINECO, Khatla, Aizawal, Mizoram during the month of September.
- e. 5 lakhs sms was sent to schools seeking nominations for MANAK program.

INSPIRE Fellowship:

- ₹31,67,00,000/- was released towards ongoing fellowship to 586 INSPIRE Fellows.
- 74 INSPIRE Fellows were upgraded from JRF to SRF considering their research progress.

INSPIRE Faculty Fellowship:

- ₹8,03,00,000/-has been approved for the sanction of first instalment grant to 44 INSPIRE Faculty Fellow.
- 68 ongoing INSPIRE Faculty Fellows were sanctioned their instalment grant amounting to ₹8,97,00,000/-.

D. International Cooperation

- Indian Institute of Geomagnetism organized the 3rd International Workshop on Equatorial Plasma Bubbles (EPB-3) during 13-15 September 2023. 51 participants including both foreign and Indian nationals participated in this workshop.
- The 7th National Scientific Advisory Committee meeting was held on 27th August 2023 at IIT Bombay to review the progress of project “Sustainable Energy system for Achieving Novel Carbon Neutral Energy communities (SUSTENANCE)” supported under the India-EU joint call on Integrated Local Energy Systems.
- Officials of the Department participated in the Fraunhofer’s Exclusive Conference on Hydrogen Technologies” and “6th Fraunhofer Innovation and Technology Platform 2023 at Bengaluru on 6-7 September, 2023. Head, Climate Change & Clean Energy (C3E) Division also attended the expert panel discussion on the Hydrogen ecosystem and path breaking innovations through a series of powerful presentations and developed a robust framework for Indo-German collaboration during the conference at Bengaluru.
- Second Phase Evaluation Meeting was completed by Expert Panel on 25th September 2023 at IIT Bombay on shortlisted proposals received against the DST, CCU Test Bed Call.

E. Scientific Research

- **Aryabhata Research Institute of Observational Sciences (ARIES)** reported that their scientists have unveiled the origins of carbonaceous aerosols in the Himalayas by using extensive high-resolution ground-based observations and found that the influence of fossil fuel combustion extends throughout the year.
- **Birbal Sahni Institute of Palaeosciences (BSIP)** reported that their researchers assessed the origin of two unusual morphotypes from the 1.6 Ga old Chorhat Sandstone, based on detailed morphological analysis. Eleven fossil flowers and three fossil fruits of the late Paleocene-early Eocene age have been reported from the Gurha lignite mine, Rajasthan.
- **Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST)** reported that a research team from cardiology department has led many cardiovascular disease registries on heart failure like the Trivandrum registry, the Kerala HF registry and the National HF registry of more than **10000 patients**.
- **Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)** reported that a research team of their institute have discovered that magnetic stress that stems from the peculiar arrangement of atomic spin drives the simultaneous structural, magnetic, and metal-insulator transition. This new mechanism will result in discovery of new classes of materials that exhibit metal-insulator phase transition.
- **Centre for Nano and Soft Matter Sciences (CeNS)** reported that their researchers along with JNCASR have fabricated a highly stable and fast-charging anode for Li- and Na- ion batteries.
- **Wadia Institute of Himalayan Geology (WIHG)** obtained results from the analysis of continues GPS measurements in the intermontane Dehradun basin, show that the shallow crust is deforming periodically in the horizontal E-W, N-S directions apart from the vertical direction. In another study, it has been shown that the metamorphic temperature of HHCS of Dhauliganga valley (Garhwal Himalaya) increases from 646 to 801°C with increasing structural level whereas pressure remained same. Another study has shown that the fluid inclusions data from the mantle xenolith of the Manipur ophiolite, show preservation of immiscible carbonic and saline-aqueous fluids, in which carbonic (CO₂) rich fluid inclusions presumably show metasomatic in origin.
- Technology Information Forecasting and Assessment Council (TIFAC) had undertaken a project for “**Evaluating Impact of Conversion/Replacement of Coal fired Furnace by Gas Based Furnace in the Moradabad Brass cluster**”, sponsored by SIDBI. The first visit towards assessing the impact of conversion was conducted on 18th and 19th Sept., 2023 along with SIDBI, MITCON, Biren gas, Foundation for MSME and Brass Artisan Cluster Association. 25 units were assessed on aspects such as fuel consumption, energy efficiency, productivity, environmental aspects, working conditions, safety and hazard, challenges and issues etc.

F. Publications by Research Institutes

- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) reported that one national patent was granted.
- Aryabhata Research Institute of Observational Sciences (ARIES) published 10 research papers in refereed journals.
- Birbal Sahni Institute of Palaeosciences (BSIP) published 11 research papers in high-impact factor journals.
- Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) reported that two Indian patent is granted and 11 research papers are published.
- Institute of Advanced Study in Science and Technology (IASST) has published 07 (seven) research articles in reputed peer-reviewed journals.
- Indian Institute of Astrophysics (IIA) published 14 papers in refereed journals.
- Agharkar Research Institute (ARI) published 08 papers in refereed journals.
- Indian Institute of Geomagnetism (IIG) published 04 research papers in SCI indexed journals.
- Centre for Nano and Soft matter Sciences (CeNS) published two articles in international journals, and three patents were granted.
- National Innovation Foundation (NIF) reported that they facilitated granting 13 patents during September, 2023.
- Indian Academy of Sciences approved 95 articles for publication in their Journals.

G. Scientific Infrastructure Building

- In order to finalize the role and scope of work of the envisaged innovation hub, a brainstorming workshop “**Manthan**” was held on the 28th-29th August 2023, at CDFD, Gandipet, Hyderabad, with a distinct objective of bringing together a diverse spectrum of stakeholders from both the Innovation and Geospatial technology sectors onto a shared platform. It intended to solidify the articulation of the innovation hub's role and scope of operations.
- An Expert Committee meeting was held on 14th September, 2023 at the Bharati Vidyapeeth Institute of Environment Education and Research in Pune, to review and recommend the 114 proposals received online against a Geospatial Capacity Building Call under various categories. Additionally, EC also discussed the roadmap for strengthening the Geospatial Capacity building program of the Division.
- Officials of DST have participated in a meeting organized by New Emerging & Strategic Technologies (NEST) division, Ministry of External Affairs on **Geospatial Industry in India: Opportunities for Advancing Trade, Commerce and Technology Collaboration Globally** on September 27, 2023.
- Support was provided to IIT Ropar for ‘**Deep Learning Based Automated Mapping of Glacial Lakes in Himalayas**’. The project aimed at developing novel, automated methodology utilizing deep learning for glacial lake mapping

using medium resolution satellite data.

R&D Infrastructure

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

- The final meeting of the Subject Expert Committee on Chemical Sciences (FIST-2023 Programme) was organised on September 1 and 2, 2023. The thirty-three screened in departments from different institutions and universities were invited to make presentations before the Committee. Nineteen proposals were recommended for the next level of processing.
- The Second Meeting of the Subject Expert Committee on Earth and Atmospheric Sciences (FIST 2023 Programme) was held on November 23, 2023. Three proposals were recommended for support.
- The FIST-Life Sciences Selection Experts Committee (FIST 2023 Programme) conducted its final selection meeting on September 26th and 27th, 2023. Twenty-two screened departments from universities and institutions presented the proposal before the committee. The committee recommended fourteen proposals to be supported after extensive deliberation.
- The final meeting of the Subject Expert Committee—Mathematical Sciences (FIST 2023 Programme) for the presentation of short-listed proposals was conducted on November 23, 2023. Six projects have been recommended for support with varied amounts of funding.
- The FIST-Postgraduate Colleges Selection Experts Committee (FIST 2023 Programme) conducted its final selection meeting on September 1 and 2, 2023. All sixty-two screened-in college teams presented the proposal before the committee. The committee recommended thirty proposals to be supported after extensive deliberation.
- All these FIST-2023 call recommended proposals will now be placed before the FISTAB Committee for further deliberations in the forthcoming meeting on October 13, 2023.
- A Memorandum of Understanding (MoU) between Survey of India and Govt. of Uttarakhand, Board of Revenue, Uttarakhand was signed on 08-09-2023 for Survey/ Re-Survey of Entire Revenue Recorded Land of Uttarakhand state.

National Thematic and Mapping Organisation (NATMO):

- Atlas for Visually Impaired (India) in Hindi, UV curing (Braille Printing) completed for 106 sheets of Preface.
- Atlas for Visually Impaired (India) in English, UV curing (Braille Printing) completed as per details below:
 - a. Map of Natural Vegetation – 89 sheets
 - b. Map of Annual Temperature – 78 sheets
 - c. Write up of Annual Temperature – 114 sheets

- d. Write up of Annual Rainfall – 102 sheets
- **National Atlas Commemorative Volume**
 - a. Schemes and Beneficiaries: Tribal Development – Mapping Completed.
 - b. Industry – Mapping Completed
- **India Scheduled Tribe: An Untraveled Illustration (Tribal Atlas of India)**
 - i. India Scheduled Tribe: Health – Mapping completed for the following: -
 - a. Life Expectancy at Birth
 - b. Modern Methods of using Contraceptives
 - c. Institutional Delivery (15-49) age group
 - d. New Born Check-up received (24 hrs. of Birth)
 - e. Full Immunization of Children (12-23 months of age)
 - f. Prevalence of Tobacco Consumption
 - g. Prevalence of Alcohol Consumption
 - ii. India Scheduled Tribe: Specially Abled – Mapping completed for the following
 - a. Disability Rate
 - b. Sex Ratio
 - c. Disability Type
 - d. Rural Population
 - e. Urban Population
 - f. Work Participation Rate and Working Population of Physically Challenged ST Workers
 - g. Specially Abled ST Literature
 - h. National Institutes
- **District Planning Map Series (DPMS):**
 - a. District Sonitpur, Assam – Mapping completed.
 - b. District Ahmedabad, Gujrat; Mandi, Himachal Pradesh and Jhargram, West Bengal – ready for final printing.
- **Monograph: India Major Scheduled Tribe:** Data compilation on the theme
 - (a) DEMOGRAPHY for Kol and Varli Completed
 - (b) OCCUPATION for Sugalis and Munda completed