

Government of India
Ministry of Science and Technology
Department of Science and Technology
(CDN Section)

Technology Bhawan,
New Mehrauli Road
New Delhi-110016
Dated: 14.02.2022

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of January, 2022.

The undersigned is directed to enclose herewith a copy of the Monthly Summary of important policy decisions taken and major achievements of the Department of Science & Technology for the month ending 31.01.2022 for information.

2. This has already been approved by Secretary, DST.

(Pulok Sen Gupta)
Under Secretary to the Govt. of India

To,

All Members of the Council of Ministers (as per Annexure-I)

Copy with enclosures, forwarded to:-

- i. Vice Chairman, NITI Aayog, NITI Bhawan, New Delhi. (vch-niti@gov.in)
- ii. The Chairman, Union Public Service Commission (chairman-upsc@gov.in)
- iii. Chief Executive Officer, NITIAayog, NITI Bhawan, New Delhi (ceo-niti@gov.in)
- iv. The Principal Secretary to the Prime Minister, Prime Minister Office, South Block, ND (pkmishra.pmo@gov.in)
- v. All members of NITI Aayog, NITI Bhawan, New Delhi. (vk.saraswat@nic.in, rc.niti@gov.in, vinodk.paul@gov.in)
- vi. Secretary to the President of India. (secy.president@rb.nic.in)
- vii. Secretary to the Vice-President of India. (secyvp@nic.in)
- viii. Principal Scientific Advisor to the Govt. of India. (vijayraghavan@gov.in)
- ix. All Secretaries to the Government of India (secy-goi@lsmgr.nic.in)
- x. The Principal Director General, Press Information Bureau, Ministry of Information and Broadcasting. (pdg-pib@nic.in)
- xi. The Director, Cabinet Secretariat, New Delhi. (cabinet@nic.in)
- xii. Dr. Rabindra Kumar Panigrahy, Sc. 'E', DST for uploading the Monthly Summary on DST's website. (rabindra.p@gov.in)
- xiii. PSO to Secretary, DST. (anuj.tripathi@nic.in)
- xiv. AD (OL), DST for Hindi Translation (kn.singh65@gov.in)

Department of Science & Technology
Monthly Report
January, 2022

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

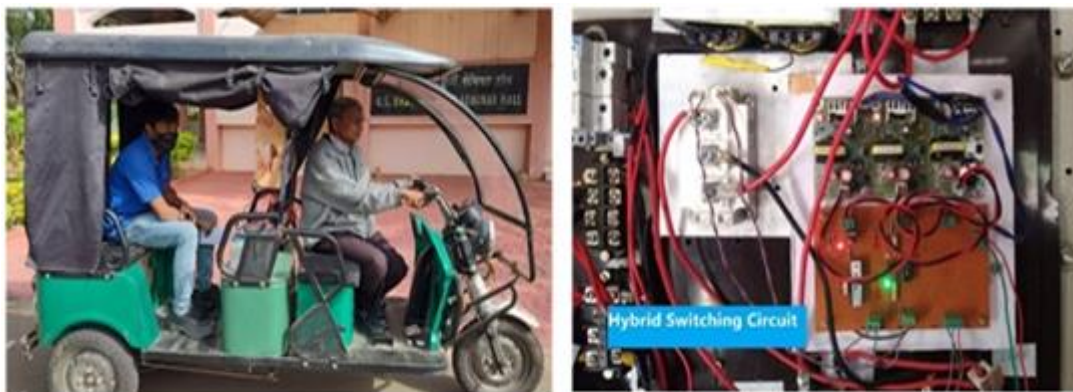
A. Science for society

1. A workshop Radiation Characterization from Sun to Earth, Moon, Mars and Beyond" funded by Indo-US Science and Technology Forum was held virtually from 24-28 January, 2022 at Aryabhata Research Institute for Observational Sciences (ARIES), Nainital. It has been jointly organized by ARIES, IISER Pune and NASA Ames Research Center and is a part of the activities commemorating "AzadiKaAmritMahotsav" at ARIES. About 130 students and 100 scientists from various parts of India and the USA participated in this workshop.
2. BioNest-Institute of Advanced Study in Science and Technology (IASST), Guwahati conducted a webinar on "Start-up India incentives for Start-up".
3. NIF Incubation and Entrepreneurship Council – NIFentreC, the Technology Business Incubator (TBI) hosted by NIF has signed a Memorandum of Understanding (MoU) with Amazon India with the objective of strengthening the commercial dissemination of Grassroots Innovations, Student Creativity-based Innovations, and Outstanding Traditional Knowledge-based ready to market products.
4. Following technologies were transferred to industry partners by NIF:
NIF's novel herbal formulation NIFAy.C-19 to combat COVID-19 (CONTAZAP) to M/s Baijnath Pharmaceuticals Private Limited, Paprola, Himachal Pradesh.
5. NIF facilitated granting of 3 patents to innovators (i) improved Hacksaw (ii) A Synergistic herbal composition for use in treating anestrus in animals and (iii) A manual bamboo strips making machine.
6. Online Workshop on "Electron Beam Lithography" along with a Webinar on "Advances in Electron Beam Lithography: Fundamentals to Applications" was organized by Indian Association for the Cultivation of Science (IACS), Kolkata. The webinar provided an overview of RF devices, photonic devices, large-scale device fabrication and other device applications.

7. Launch of National Science Day 2022 Theme “Integrated Approach in S&T for Sustainable Future” by Dr. Jitendra Singh, Hon'ble Minister of State (Independent Charge), Ministry of Science & Technology and Earth Sciences on 5th January 2022.
8. Under the “**Vigyan Ustav**” programme, 23 State/UT Science & Technology Councils have organized the programmes on the January month’s specific theme “**Innovation & Start-ups**” to discuss the state policies, programmes and incubation network in the state to strengthen the innovation and Start-ups ecosystem. The programme reached out to 44,000 stakeholders through various platforms.
9. As a part of “**Azadi Ka Amrit Mahotsav**”, “**Tech@75**” programme was organized on 12.01.2022 and 25.01.2022 in collaboration with the Ministry of Earth Sciences (MoES). Community groups & social changemakers from Rajasthan, Lakshadweep, Karnataka, Arunachal Pradesh, Manipur, Chhattisgarh and Nagaland have shared their experiences and feedback during the programme. Padma Shri awardees Dr. Anil Kumar Gupta, Founder of the Honey Bee Network, NIF; and Sh. Nanadro B Marak, West Agro Hills of Meghalaya graced the event and discussed the role of STI to nurture and strengthen the local innovations.

B. Technology Development

1. In the BMT Wing Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram second sheep completed 6 months under the project development of bioprosthetic heart valve. Bioprosthetic heart valves, both model 1 and 2 is completing 200 million cycles in the accelerated durability tester, which is an important milestone for the project.
2. A protocol to detect antibiotic resistance in Mycobacterium tuberculosis bacteria has been initiated by SCTIMST.
3. *A three-wheeler Electric Vehicle (auto rickshaw) working on Lead acid battery by connecting it to a supercapacitor in parallel working in a hybrid mode is demonstrated by International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad. The supercapacitor pack provided, an additional power (to the motor of the auto rickshaw) required for climbing an incline or when there is an increase in payload, thus resulting in enhancement of battery life and mileage/charge of the auto rickshaw.*



(Hybrid electric auto rickshaw)

4. Know-how Transfer Agreement signed between ARCI and Borosil Renewable Ltd for 'Anti-Reflective Sol from Organic Solvent based Composition for Solar PV Glass'.
5. ARCI Produced (7 Kg) of battery grade Carbon coated LiFePO₄ (C-LFP) using ARCI know-how, and electrochemical performance of indigenous C-LFP (135 mAh/g @1C) was found to be at par with the performances of commercial C-LFP materials (130 mAh/g @1C).

C. International Cooperation

1. **8th Governing Board meeting of I4F:** The 8th Governing Board meeting of the India-Israel Industrial R&D and Technological Innovation Fund (I4F) was held virtually on 18th November 2022. Dr. Srivari Chandrasekhar, Secretary DST, India and Dr. Amiram Appelbaum, Chairman of the Board, IIA, Israel were the Co-Chairs of the Governing Board. Among other discussions in the meeting, three joint R&D projects were approved under the Call for proposal-7. They are (i) Centrally Monitored IoT Nanosensors for Molecular Diagnostics in Healthcare and Screening Applications by 3 D Integrated Solutions, India and MS Tech, Israel; (ii) NoMoreMos- a mosquito control biological solution by Ross Life science, India and Forrest Innovations, Israel; and (iii) LASI – LEO Agro and Environmental Satellite IoT by AADYAH Aerospace, India and Ayecka Communication Systems, Israel.
2. **Meeting of Secretary DST with Ambassador of India to US:** H.E. Mr. Taranjit Singh Sandhu, Ambassador of India to the USA called on Secretary, DST on 6th January, 2022. Both Secretary and Ambassador expressed their concern on Emerging Technologies, and Energy Science & Clean Energy Technologies. Women in STEM, the India-US Joint Committee meeting, and Neutrino Science & high particle physics were also discussed. It was informed that NSF has agreed in principle to provide grant support to scientific agencies in the USA for proposed

collaboration with this Technology Innovation Hubs (TIH) in India. Need to connect the pharma sectors was also discussed in the meeting. On Energy Science & Clean Energy Technologies, it was briefed that discussions are ongoing to expand partnership in phase-3 of JCERDC and identified areas of mutual interest such as Clean Coal Technologies, Advanced Supercritical Carbon dioxide (SCO₂) cycle and Carbon Capture Utilization & Storage (CCUS). In the areas of Neutrino Science & high particle physics, possibilities of scaling up the exchange of scientific visits under this program were also mentioned.

3. **Meeting of Secretary DST with Ambassador of India to Italy:** Secretary DST and Italian Ambassador in New Delhi signed a new Executive Programme of Cooperation (PoC) for 2022-24 to jointly fund 13 proposals for Mobility of Researchers; 5 proposals for Significant Research and two Network of Excellences.
4. **Third India-Denmark Joint S&T Committee:** The third Joint S&T Committee with Denmark was held virtually on 14th January 2022. The Joint Committee discussed national strategic priorities and developments in Science, Technology, and Innovation of both countries with a special focus on green solutions of the future - strategy for investments in green research, technology, and innovation at the virtual meeting. The committee emphasised on development of bilateral collaboration on mission-driven research, innovation, and technology development, including climate and green transition, energy, water, waste, food, and so on as agreed by the two Prime Ministers while adopting the Green Strategic Partnership – Action Plan 2020-2025. They agreed to organise 3-4 webinars for partnership development and stressed promoting the call for proposals in green fuels, including green hydrogen. The Joint Committee also reviewed the progress of the ongoing projects of the last two joint calls being implemented in the areas of energy research; water; cyber-physical systems, bioresources & secondary agriculture.
5. **BRICS STI Cooperation:** India has successfully handed over the BRICS Chairmanship to China from January 2022. The theme for China's Chairship of BRICS 2022 is "Foster High-Quality BRICS Partnership Usher in a New Era for Global Development". A series of sectoral events and meetings including Minister level and BRICS Summit will be organized during the year.

To start with, the 15th meeting of the BRICS Science Technology Innovation (STI) Steering Committee was held virtually on 17th January 2022 to discuss the Calendar of BRICS STI activities and expected deliverables. The meeting was attended by representatives from BRICS scientific ministries and foreign Missions. During the meeting, the Chinese side presented a broad outline of activities to be carried out during

the whole year. It mainly includes thematic meetings, BRICS Young Scientist Conclave, and Senior official and Ministerial level meetings. All together 25 events have been planned. Out of these, India will host five-event namely BRICS Startups Forum meeting, Working Groups meetings on Energy; Biotechnology & Biomedicine; ICT & High-Performance Computing; STIEP Working Group Meeting and launching of BRICS innovation Launchpad as a microsite (Knowledge Hub). DPIIT is the main executing agency for BRICS startups Forum and the creation of innovation Knowledge Hub. The BRICS Young Scientist Conclave will be held in September 2022 in a virtual format and the thematic focus may be Carbon peak neutralization; Biomedicine, Artificial Intelligence, Material Science; Modern Agriculture the exact topic would be finalized later on. China has proposed to host the 10th BRICS S&T Ministerial meeting and Senior Official Meeting in September 2022 and the meeting theme would be centered around promoting Open, Inclusive, and Shared Science, Technology, and Innovation. At the sideline of the Ministerial meeting, an exhibition will be organized showcasing outcomes of successful projects supported under the BRICS Framework Programme (2015-2022).

6. **5th India Sri Lanka Joint Committee meeting on S&T cooperation:** The 5th India Sri Lanka Joint Committee meeting on S&T cooperation was held on 20 Jan 2021. The board mutually agreed to extend the Programme of Cooperation (POC) for another 3 years between both countries and identified new areas such as waste-water technologies, industry and biotech, sustainable agriculture, aerospace engineering, robotics, big data analytics, and artificial intelligence to be included in the POC. The group recommended conducting more webinars in the wake of the current pandemic situation for enhancing collaborative research and making collaborations stronger. The universities/institutes of both sides will be approached to conduct the webinars on the mutually selected themes.
7. **Indo-Canada meeting:** A meeting with Mitacs Canada was held on 11 and 25 Jan 2022 at the virtual platform of Microsoft Teams. The discussions were on future collaborations of DST with Mitacs. It was proposed that the High Commission of Canada in India may plan a virtual interaction with Secretary DST regarding the cooperation between India and Canada. Also, Mitacs will submit a detailed proposal for collaboration with DST.

D. National Technology Mission

1. The 3rd Mission Coordination Committee (MCC) meeting of **National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS)** held on 19th January 2022,

through Video Conference under the chairmanship of Dr. S. Chandrasekhar, Secretary, DST, with an agenda to interact, ascertain ground level implementation issues and overall achievements of all 25 Technology Innovations Hubs (TIHs) of NM-ICPS.

2. A meeting on Quantum Computing Technologies under the Chairmanship of Prof. K. VijayRaghvan, Principal Scientific Advisor (PSA) to the Govt. of India was held on 10th January, 2022 through VC. Agenda of the meeting was: Status on Quantum Computing Technologies.

E. Human Capacity Building

1. Around 1500 participants including Urban Planners, Govt. Officials, Faculty members, International Delegates, Representative of NGOs, Students benefitted from online training programmes and webinars conducted by National Institute for Disaster Management (NIDM), New Delhi under National Mission for Sustaining Himalayan Ecosystem (NMSHE) mission on issues related to climate change such as Disaster Management Plan, Managing Water Related Extreme Events, Flood and Impact on Waste Management Infrastructure, Sustainable Development Goal (SDG) 12: Responsible Consumption and Production etc.
2. Under the phase II of Manipur State Climate Change Cell (SCCC) supported by DST a consultation workshop on finalization of State Action Plan (for Health Sector) on Climate Change Version-2 was conducted in which 30 officials of Health Directorate and Environment & Climate Change were trained.
3. **“2nd Advanced Training Program on Water Resource Management, Glacier Monitoring & Climate Change Studies”**, an online capacity building program, 29th Jan – 18th February 2022 is organized by Centre of Excellence (CoE) on Water resources, Cryosphere, and Climate Change Studies established at Department of Geology, Sikkim University under NMSHE. Around 25 M.Sc./M.E./M.Tech. /Ph.D. students in relevant discipline of Geoscience/Environmental Science/Civil Engineering, Geography/ Glaciology/Remote Sensing have been selected for the programme.
4. **Celebration of National Girl Child Day:** The Department of Science and Technology has celebrated National Girl Child Day on 24 January in big way under the banner of Azadi ka Amrit Mahotsav. WISE-KIRAN Division has conducted number of the activities on the Day under its various programmes.

5. Under Vigyan Jyoti Programme, a webinar was organized on the theme ‘Girls with Dreams become Women with Vision’ wherein Dr Nisha Mendiratta, Head, WISE-KIRAN Division and Dr Amita Dev, VC, IGDTUW, Delhi gave motivational talk and interacted with Vigyan Jyoti girls. Another activity was also conducted under Vigyan Jyoti, wherein girls enrolled under Vigyan Jyoti at different Jawahar Navodaya Vidyalayas (JNVs) participated in various extracurricular activities viz. painting, speech, essay writing, singing, skit, etc. to celebrate the National Girl Child Day, 2022 in their respective JNVs.
6. IVRI Bareilly, IARI New Delhi, Tezpur University, and IISER Mohali have organized various events for girls and Women under the GATI initiative on the occasion of National Girl Child day.
7. Different Women Universities supported under CURIE have also organized various activities webinars on this occasion.
8. A press release has also been issued by the Department on the ‘National Girl Child Day’.
9. **Vigyan Jyoti:** In January, 4 C- STEM sessions were held. The sessions covered ideas from the basics of magnetic effects and carbon compounds. Three sessions of ‘**All Girls Maths Nurture Program**’ were also conducted. JNV Aurangabad organized a science exhibition for VJ Scholars on January 8, 2022 where VJ students prepared excellent projects on different themes of science.

Knowledge Partner Visit: JNV Jabalpur organized a visit to TFRI (Tropical Forest Research Institute) & IIIT, Jabalpur in January for Vigyan Jyoti students. JNV West Godawary organized a visit to National Institute of Oil Palm Research, West Godawary.

Tinkering Activities: JNV Nagpur conducted Atal Tinkering activities for Vigyan Jyoti Students on January 8, 2022.

Inauguration of Sparkle Series: Dr Nisha Mendiratta, Head, WISE-KIRAN Division, DST has inaugurated ‘Sparkle Series’ for Vigyan Jyoti Scholars. IIT Gandhinagar is conducting Sparkle Series.

10. **Gender Advancement for Transforming Institutions (GATI):** King’s College London hosted a symposium focused on “Building the evidence for Gender Empowerment: the importance of networks in gender advancement”, under the GATI Partnership.

Aston University, UK has set up meetings on Action planning for success and Lessons learned and Good Practice Examples for GATI Pilot institutions under the GATI initiative.

A website of GATI project was inaugurated and first workshop on GATI Pilot Project was organized at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru.

11. **Innovation in Science Pursuit for Inspired Research (INSPIRE) Scheme**

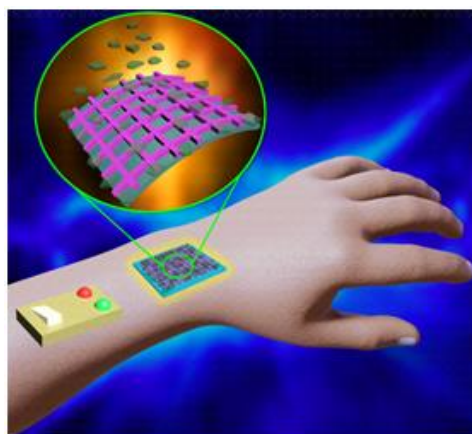
INSPIRE Awards - Million Minds Augmenting National Aspirations and Knowledge (Manak)

- Organized **INSPIRE-MANAK Awardee Meet** at **NIF Gandhinagar, Gujarat** on 5th January 2022 to discuss the future incubation and product development strategy with 8th NLEPC awardees.
- **District/State Level Exhibition and Project (D/SLEP) Competition** was organized by State of **Arunachal Pradesh, Jharkhand, Himanchal Pradesh and Delhi** in January 2022.

F. Scientific Research

1. Native protein structure is stabilized by various long and short range noncovalent interactions by Bose Institute (BI), Kolkata. It has been shown that the other half of the peptide group, namely the carbonyl moiety, can also be involved through the O...C=O interaction. This study exemplifies the hierarchical growth of the protein secondary structures, which would be important in the understanding of protein folding.
2. Anti- colorectal cancer (CRC) activity of an alkaloid-rich fraction of *E. coronaria* leaf extracts (AFE) and associated underlying mechanism have been studied by BI. It has been shown that AFE, which carries about six major compounds, is highly toxic to colorectal cancer (CRC) cells. The study provides a logical basis for consideration of AFE in future therapy regimen to overcome the limitations associated with existing anti-CRC chemotherapy.
3. Using observations of stellar occultation by Pluto from telescopes at Devasthal, Nainital, an international team of scientists involving scientists from Aryabhata Research Institute for Observational Sciences (ARIES), Nainital found that Pluto's atmospheric evolution is in plateau phase since 2015.

4. An international team of scientists led by ARIES scientists have discovered a new episodically accreting young star belonging to an extremely rare class of sources.
5. Science and Engineering Research Board (SERB) has launched "SERB International Research Experience (SIRE)" to impart high-end research training in frontier areas of Science and Technology which are of interest to India by providing opportunity to visit leading institutions/universities across the globe for a period of 02-06 months. A national call for application has been given. It is expected that the programme will help in building national capacity in frontier areas of S &T by providing opportunities for International R&D experience. The expertise gained by SIRE fellows will be directed to strengthen/initiate national programmes in their domain knowledge.
6. Recent research by astrophysicists at the Raman Research Institute (RRI), Bengaluru and collaborators has provided luminosity estimates for the detection of the first direct signatures of ultrahigh-energy cosmic-ray (UHECR) sources by upcoming large neutrino and γ -ray telescopes. The study also identified two blazars that should be the prime targets for study by these telescopes.
7. Work related to angled-Stencil Lithography based Metal mesh/Ti₃C₂TxMXene Hybrid transparent electrodes for Low-power and High-performance Wearable Thermotherapy was published by Indian Association for the Cultivation of Science (IACS), Kolkata. The hybrid transparent heater has been successfully employed on a human wrist as a skin-mountable thermotherapy device while the low-power consumption enabled portability for transit mode operation. The low-power consumption and portability of hybrid TCEs empower next-generation wearable thermotherapy applications.



(Wearable thermotherapy applications)