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Government of India
Ministry of Science and Technology
Department of Science and Technology

Technology Bhawan,
New Mehrauli Road
New Delhi-110016
Dated: 21.04.2023

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of March, 2023.

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 31.03.2023 for information.

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



(Anil Kumar Pandey)

Deputy Secretary to the Govt. of India

To,

All Members of the Council of Ministers

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, NITI Aayog, 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
March, 2023

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

A. Celebration of International Women's Day 2023

International Women's Day 2023 program was conducted on 6th March, 2023 in New Delhi on the theme "Digital Innovations and Technologies for Gender Equality". 100 S&T based social organizations, social research and academic institutions and entrepreneurs engaged in social development interacted and exchanged their ideas on women's education, AI-based system for detecting cervical cancer, cancer prevention, empowerment through digital innovations & technologies, women-led innovations & strategies of sustainability, their impact and future prospective.

Secretary, DST released a booklet on the activities and status of WISE-KIRAN and a Status Report on gender Baseline Survey of GATI Institutions during the event. Certificates were also distributed to the women scientists who had completed one-year training in Intellectual Property Rights under WOS-C. As an effort to create awareness amongst all the working ladies of Technology Bhawan, Technology Development Board organized a Mental Health Wellness programme on the occasion of International Women's Day, 2023.

B. Science for Society

1. Under the Assessment of Technology Maturity for Atmanirbharta (ATMA) Programme, Technology Information, Forecasting & Assessment Council (TIFAC), New Delhi, assessed the following three technologies which are recommended by Apex Committee for providing handholding support:

- Light-activating engineered herbal gel for minimally invasive superficial tumor therapy.
- A Vitamin based novel formulation for increasing the immune efficiency in low birth weight babies.
- Process technology for separating and purifying individual actives in curcumin extracts.
- Under tele-digital health, pilot project, demonstration was organised by TIFAC at **Centre for Development of Advanced Computing (CDAC)**, Mohali for three new initiatives to be incorporated in the project viz. Oral cancer screening by AI, an innovative ECG device and an AI enabled contactless access system. Discussion with CDAC was held for interlinking tele-digital health care data with Ayushman Bharat Health Account (ABHA) under Digital Health Scheme.

2. TIFAC facilitated granting of patent titled "Spacer for use in taper roller or angular contact bearings."

3. The Devasthal Observatory campus of ARIES, Nainital, was inaugurated on 21st March, 2023 by the Hon'ble Minister for Science & Technology and Earth Sciences, Dr. Jitendra Singh in the gracious presence of the Hon'ble Governor of Uttarakhand Lt. Gen (Retd.) Gurmeet Singh.
4. The 3rd Belgo-Indian Network for Astronomy and Astrophysics (BINA) workshop on "Scientific potential of the Indo-Belgian cooperation" was hosted by ARIES. 150 scientists from India, Belgium and many other countries participated in the workshop.
5. A workshop was conducted by National Academy of Sciences, India (NASI), Allahabad at Chitrakoot, Satna on 'Entrepreneurship Development', which was attended by a large group of students, rural folks and the tribal community.

C. Technology Development

1. MoU signed among International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, Central Glass and Ceramic Research Institute (CGCRI), Hindustan Petroleum Corporation Limited (HPCL), Centre for High Technology-Oil Industrial Development Board (CHT-OIDB) for the consortium project on Development and Scale-up of Indigenous Next Generation Solid Oxide Fuel Cell Technology and Demonstration of Process Line (10 kW) for Prototype Production
2. A patent on "An Improved Gas and Coolant Flow Field Plate for Polymer Electrolyte Membrane Fuel Cells" was granted to ARCI.
3. National Innovation Foundation (NIF), Ahmedabad facilitated granting of 17 patents namely (i) a Portable Bath System; (ii) Cotton Ball Picking Machine; (iii) A Water Filter System; (iv) Multi-Meter For Reduction of Energy Wastage; (v) Water Dispenser for differently abled; (vi) Herbal compositions for treatment or prevention of neurological disorders; (vii) Process for preparing herbal compositions for treatment or prevention of inflammatory diseases; (viii) Herbal composition for therapeutic management of asthma; (ix) Herbal composition with anti-inflammatory, analgesic, anti-pyretic properties for alleviation of arthritis; (x) A process of preparing topical herbal composition for skin disorders; (xi) Herbal compositions for treatment of gastric ulcers ; (xii) Herbal formulation for treatment of bone fracture ; (xiii) Process for preparing an herbal formulation for inhibiting proliferation of plasmodium; (xiv) Herbal Composition For Therapeutic Management of Tuberculosis And Process Of Preparation thereof; (xv) Herbal Compositions For Aiding Haemostasis; (xvi) A Synergistic Herbal extract composition for use in treating and preventing Jaundice and (xvii) Medication to cure mastitis in animals.
4. A large quantity of well-dispersed, homogenous high-temperature nanofluids as heat transfer fluids were prepared by ARCI for solar thermal applications. These nanofluids have shown excellent stability without sedimentation.

D. Human Capacity Building

1. Under the INSPIRE MANAK Programme, 16 district level and 3 State level exhibition project competitions and two mentorship workshops were organized.

2. Under INSPIRE scheme, ₹ 36.42 crore was released towards scholarship for 5462 students (Direct Mode), ₹0.92 crore was released towards scholarship and mentorship for 209 students (Institutional Mode) and Rs. 37.54 crore was released towards fellowship to 988 scholars.
3. Under Vigyan Jyoti Programme, orientation session on career counselling, cyber security and stress management were conducted, science camps, science quizzes and Atal Tinkering Lab workshops were organised in different Jawahar Navodaya Vidyalayas.

E. Scientific Research

1. Wadia Institute of Himalayan Geology (WIHG), Dehradun established glacier thinning in the Garhwal Himalaya using limited ground-based surveys and extensive remote sensing analyses.
2. B cells are an essential component of humoral immunity. Their primary function is to mount antigen-specific antibody responses to eliminate pathogens. Despite an increase in B-cell number, in a recent study conducted by Bose Institute, it is found that serum-IgG levels were low in patients with breast cancer.
3. A study to understand the long-time asymptotic behaviour of the position distribution of a run-and-tumble particle (RTP) in 2D, that too, in the presence of translational diffusion was undertaken by the Scientists of Raman Research Institute (RRI), Bengaluru.
4. RRI researchers verified some earlier findings about Markarian (Mrk) 180 (a BL Lacertae galaxy) associated to the Telescope Array (TA) hotspot of ultra-high energy cosmic rays. In the study, 'Exploring the Emission Mechanisms of Mrk 180 with long term X-ray and γ -ray data', they have ruled out the possibility of Mrk 180 to be a source of the UHECR events contributing to the TA hotspot for conservative strengths of extragalactic magnetic fields.
5. For the first time using data obtained from a combination of optical tweezers and cryogenic field emission scanning electron microscopy, an inverse correlation between the crossover modulus and the average pore diameter of the aging suspension microstructures for the different suspension concentrations and probe particle sizes has been established by the Scientist of RRI.
6. Scientist from S.N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata, demonstrated the efficient re-configurability of spin-wave (SW) dynamics as well as SW avoided crossing by varying bias magnetic field orientation in triangular shaped Ni₈₀Fe₂₀ nanodot arrays. This result paves way for the development of integrated on-chip magnonic devices operating in the gigahertz frequency regime.
7. A team of scientists from Aryabhata Research Institute of Observational Sciences (ARIES), Nainital, discovered a solar eruption maintaining "surprisingly" constant temperature in the solar atmosphere.
8. Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow has conducted a study delineating the Permian eustatic changes across the Gondwana continents that will be useful in inter-regional correlations and palaeogeographic reconstructions and discusses their palaeodepositional model.
9. In another study conducted by BSIP Fossil fossils from the early Paleogene of the Indian subcontinent highlight the significant role of north moving Indian plate in its early

diversification. The study suggests that the major proliferation of this genus took place around Paleocene and Miocene. This study would further help in better understanding of the historical biogeography of pan-tropical genus *Ficus* as there is a persistent incongruity between fossil data and existing molecular phylogenetic results.

10. A multi-institutional Centre of Excellence has been supported by this Department with IIT Bombay as lead and IIT Hyderabad and Industrial partners as collaborators, envisaging coordinated and synchronized research for technology development and uptake on Indigenous Membranes, Simulation modeling, Life cycle analysis and techno economic feasibility of desalination membranes.
11. 8 Applied Research and Technology Assessment projects have been supported in the month of March 2023 in the areas like Hybrid RO-humidification-dehumidification technology, optimal spray technology, antifouling membranes, hybrid Solar thermal power desalination technologies etc.

F. Scientific Infrastructure Building

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

Thirty Eight (38) departments and PG colleges have been supported for establishing the scientific infrastructure under FIST Program of this Department.

2. Promotion of University Research and Scientific Excellence (PURSE)

Support has been provided to five universities by the Department as the special drive to strengthen the research infrastructure in Universities of various States.

3. Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI)

Nine STUTI Program Management Units have identified several DST supported Department/Institutes which have conducted 10 training programs across the country that imparted training to 350 researchers.

4. Sophisticated Analytical Instrument Facilities (SATHI)

SATHI center at Banaras Hindu University has been strengthened by providing major grant from DST to expand their R&D activities.

5. Sophisticated Analytical Instrument Facilities (SAIF): The support has been provided to two SAIF Centers Karnataka University, Dharwad and Mahatma Gandhi University, Kottayam for augmenting research infrastructure.

6. The Third Programme Management and Monitoring Committee (PMMC) meeting for review of the progress of the NCG (National Centre of Geodesy) and RCG's established across the country was held on 15th March 2023. During the meeting possible future research areas to strengthen the Geospatial Science in the Country were also discussed.

7. Expert Committee meeting on Geospatial Capacity Building was held on 23rd March 2023. The meeting aimed to review the various Summer/ Winter Schools and Geo-innovation Challenges held in the current Cycle ending on 31st March 2023, bottlenecks faced, possible solutions and alignment of the next call for proposals as per the requirement of the Country.

8. Series of meetings under the chairmanship of Shri R. S. Sharma, Chairman, Geospatial Data Promotion and Development Committee (GDPDC) were held at DST, New Delhi with various stakeholders such as Survey of India (SOI), National Remote Sensing Center (NRSC), Geological Survey of India (GSI), Directorate General of Hydrocarbon (DGH), NBSS&LUP, BISAG-N, The Federation of Indian Chambers of Commerce & Industry (FICCI)/ AGI and Forest Survey of India (FSI). These meetings aimed to discuss activities being carrying out by the concerned departments and their possible role and contribution in implementation of the National Geospatial Policy (NGP-2022).
9. MoU between Survey of India (SoI) and Govt. of Tamil Nadu was signed on 07-03-2023 for Sharing of Tamil Nadu CORS Data and Upgradation of Infrastructure by SoI.
10. A delegation of Survey of India participated in the 'UN-GGIM-AP Executive Board Meeting" and, International Seminar on 'Geo-Enabled Effective Land Administration' from 13-03-2023 to 14-03-2023 in Singapore. The delegation also participated in the meeting of Geo-Connect Asia 2023 from 13-03-2023 to 16-03-2023 in Singapore.
11. Joint Boundary Field Inspection between DDS, Bangladesh and IC, Tripura, India at Habibganj (Bangladesh) / Khowai (Tripura, India) sector held during 18-03-2023 to 22-03-2023 which was attended by officials of SoI.

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