

No.Misc/MS/Cabinet/2023-CDN

Govt. of India
Ministry of Science and Technology
Department of Science and Technology
(CDN Section)

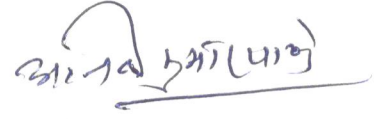
Technology Bhawan,
New Mehrauli Road
New Delhi-110016
Dated: 17.03.2023

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of February, 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 28.02.2023 for information.

2. This issues with the approval of Secretary, DST.



(Anil Kumar Pandey)

Deputy Secretary to the Govt. of India

To,

All Members of the Council of Ministers

Copy with enclosure, 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
February, 2023

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

A. Major Events

(a) Conference on Geospatial Policy for National Development:

1. The National Science Day (NSD) was celebrated on 28th February 2023 at Vigyan Bhavan, New Delhi and was inaugurated by Hon'ble Minister of Science and Technology. Six National Awards were given to Outstanding Science Communicators in the following categories:

- National Award for Outstanding Efforts in Science & Technology Communication in general.
- National Award for Outstanding Efforts in Science & Technology Communication through Print Media including Books and Magazines.
- National Award for Outstanding Efforts in Science & Technology Popularization among Children.
- National Award for Outstanding Efforts in Translation of Popular Science & Technology Literature in Languages Mentioned in the Eighth Schedule of Constitution of India and in English.
- National Award for Outstanding Efforts in Science & Technology Communication through Innovative and Traditional Methods.
- Outstanding Efforts in Science & Technology Communication in the Electronic Medium.

2. Some prizes were also distributed to PhD and PDF students for writing science stories. In addition to these awards / prizes the following Special Publications were released by the Hon'ble Minister:

- i. "Women Engineers in India Vol. I";
- ii. Compendium on "Landmark Achievements in Engineering and Technology in Independent India"
- iii. INAE Report of Committee on "Technological Preparedness for Dealing with National Disruptions"
- iv. A compendium of AWSAR selected popular science stories for the year 2021
- v. Vigyan Vidushi, 75 Women Trailblazers of Science.

(b) Conference on Geospatial Policy for National Development:

The Conference, held in New Delhi on 21-22 February 2023, was inaugurated by the Hon'ble Minister for S&T and Earth Sciences. This provided a platform for stakeholders from various sections to deliberate on the strategies for the implementation of the National Geo-spatial Policy-2022.

B. Science for Society

1. An MoU on adapting surveillance (Nikshay) data to create decision support systems for tuberculosis elimination in Kerala using spatial epidemiology was signed between Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum and Central TB Division, Ministry of Health and Family Welfare.
2. Field verification and detailed documentation for 17 plant varieties was conducted by National Innovation Foundation-India (NIF), Ahmedabad. In addition, the on-farm trial of Low Chilling Apple Variety (HRMN-99) for commercial cultivation was initiated with the support of Raigarh Administration, Govt of Chhattisgarh.
3. Grassroots Innovators supported by NIF from the States of West Bengal, Assam, Arunachal Pradesh, Nagaland, Manipur, Meghalaya, and Tripura had participated in the Innovation Festival 2023 held during Feb 11-12 at Regional Science Centre, Guwahati. The two-day innovation festival was jointly organized by NIF and Regional Science Centre, Guwahati and more than 30 innovators and artisans from different parts of North-eastern region leveraged the platform to demonstrate the potential of their innovations.
4. North East Centre for Technology Application & Reach (NECTAR), Shillong executed an aerial drone survey in Chhattisgarh, and Rajasthan under the Swamitva scheme of Survey of India under which all the abadi areas of the rural households are being mapped.
5. Inspiring the minds of Post-graduates for Research in Earth and Space Sciences (IMPRESS) training programme was conducted by Indian Institute of Geomagnetism, Navi Mumbai.
6. The Technology Vision 2047 exercise was launched by Technology Information, Forecasting & Assessment Council (TIFAC), New Delhi and a brainstorming workshop was organized to discuss various sectors such as SuShiksha (Good Education), Swasthya (Health & Health Care), Sevan (Mindful Consumption / Utilisation of Resources), Soochna (Information), Shrishti (Environment/Climate) and Suraksha (Security).
7. A workshop on Hydrogen Valley was organized by the Indian Institute of Technology Palakkad, ANERT Kerala, EMC Kerala, and the Government of Kerala along with DST on 15th February 2023 in Trivandrum.
8. DST supported, establishment of State Climate Change Cells - Phase II of **“Strengthening the State Climate Change Centre/Cell under NMSKCC (SCCC-NMSKCC) (Phase-II)** in the State of Telangana and the State of Chhattisgarh. The projects aims to serve as functional knowledge hub, catering to the information and knowledge needs of policy makers, scientific community and general public on climate change issues and to ensure climate centric orientation, capacity building for implementation of State Action Plans on Climate Change (SAPCC) and development of

knowledge base pertaining to climate variability in light of climate projection and vulnerability assessment.

9. A meeting with the United Nations Development Programme (UNDP) team and State S&T Councils was held on 16.02.2023 under SEED-SSTP programme of the Department to formulate a joint knowledge product on mapping of grass root innovations.

C. Technology Development

1. Two patents were granted to International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad for “Solar Selective Coating for Solar Energy Collector/Absorber Tubes with Improved Performance” and “a Method of Producing the same & Microwave Assisted Solgel Process for preparing In-Situ Carbon Coated Electrode Materials and the Product thereof”.
2. The technology transfer agreement for the production of battery grade carbon coated lithium iron phosphate (C-LFP) cathode material for Li-ion batteries on “exclusive rights for territories other than India” was signed by ARCI, Hyderabad with M/s. ALTMIN Pvt Ltd., Hyderabad.
3. National Innovation Foundation (NIF), Ahmedabad facilitated in granting of 9 patents to grassroots innovators.
4. Technology Information, Forecasting & Assessment Council (TIFAC) facilitated granting of the patent on Polyvinyl chloride surface co-immobilized with enzymes and uses thereof.

D. Human Capacity Building

1. Under the INSPIRE MANAK Programme, 27 district level and 3 State level exhibition project competitions and 4 mentorship workshops were organized.
2. Under INSPIRE scheme of the Department, ₹54,04,60,000/- was released towards Scholarship for 7426 ongoing students (Direct Mode) and ₹3,17,000/- was released towards Mentorship for 527 ongoing students in (Institutional Mode).
3. The Standing Committee on INSPIRE-SHE has recommended following 8 additional subjects to be incorporated at M.Sc. level for Scholarship support:
 - i. Biostatistics
 - ii. Bioinformatics
 - iii. Biotechnology
 - iv. Data Science
 - v. Environmental Science
 - vi. Materials Science
 - vii. Nano Science
 - viii. Remote Sensing and GIS

This provision will be effective from academic year 2022-23.

4. **National GLP Compliance Monitoring Authority (NGCMA):** A Training Course on “Computerised Systems and Data Integrity for GLP Test Facilities was conducted on February 24, 2024 wherein 110 candidates participated. The training course focused on the newly published OECD Principles of GLP.

E. Scientific Research

1. It is known that the c-MYC quadruplex acts as an excellent target for anti-cancer therapy. Though researcher have tried, the work with G-quad-ruplex targeting peptides is very limited. In a recent work conducted at Bose Institute (BI) Kolkata, a peptide has been found that can bind to c-MYC quadruplex, destabilize the tetrad core, and permit the formation of a substantially different structure from the quartet core seen in the canonical G- quadruplexes. This study provides a detailed insight into the peptide-quadruplex interface that encourages better pharmacophore design to target dynamic quadruplex structure. Present results are expected to contribute to the development, characterization, and optimization of G-quadruplex binding peptides for potential clinical application.
2. Synthesis of $\text{LaAl}_x \text{Mn}_{1-x} \text{O}_3$ ($x = 0.05, 0.15, 0.25$) has been reported by BI along with the studies on their structural and magnetic properties. These compounds have been synthesized through the Sol-gel citrate method and performed the Rietveld refinement of X-ray diffraction data to determine the lattice parameters. The surface elemental composition and oxidation states of $\text{LaAl}_{0.25}\text{Mn}_{0.75}\text{O}_3$ are investigated using X-ray photoelectron spectroscopy (XPS) in a wide energy window of 0- 1200 eV. The magnetic study shows the ferromagnetic transition of these materials.
3. Centre for Nano and Soft Matter Sciences, Bengaluru (CeNS) researchers have fabricated TiO_2/NiO thin film heterojunction diodes using electron beam evaporation and DC sputtering techniques. CeNS researchers in a collaborative study, have investigated the nanomaterials of vanadium oxide, nanocomposites of vanadium oxide (VO) and reduced graphene oxide (rGO) synthesized using the hydrothermal method.
4. CeNS researchers have explored a surface enhanced Raman scattering (SERS) substrate in a sandwich configuration, noble metal/analyte/defect-rich metal oxide for the detection of methylene blue (MB).
5. Scientists from Indian Association for the Cultivation of Sciences (IACS), Kolkata carried out pyrolysis of a multimetallic ZIF to obtain metallic nickel sites encapsulated by multiwalled nanotube shells.
6. Study of a microscopic model based on the motions of virus particles in a respiratory microdroplet, responsible for airborne transmission of diseases, to understand their indoor propagation was conducted by S N Bose National Centre for Basic Sciences (SNBNCBS), Kolkata.

7. The Square Kilometre Array(SKA) is an upcoming international mega-radio-telescope which seeks to address fundamental problems in astrophysics and cosmology. Among these, the SKA, in phase I, will make a power spectrum measurement of the evolution of hydrogen in the Universe through the poorly understood periods known as Cosmic Dawn and Epoch of Reionization. Leveraging on their expertise in global 21-cm experiments, Scientists from Raman Research Institute proposed a method to introduce global signal detection capability co-located with the SKA in the paper accepted for publishing in the Journal of Astronomy and Astrophysics.
8. Salient features of research outcome Wadia Institute of Himalayan Geology (WIHG), Dehradun, include: (i) Found out immense potential for the Bhiar Dhar cave near Chakrata (Uttarakhand) as a geotourism site and demands immediate actions for its conservation and development. Also recommended the hermit caves at Lakhamandal valley as another geoheritage site having multiple geo-tourism potentials;(ii) Identified fifteen avalanche sites based on slope morphology, grass clearing, presence of snow drifts, and debris cones in the Kedarnath area, and demonstrated that the Temple of Shri Kedarnath Complex is located at a reasonably safe place as far as avalanche hazard is concerned.
