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

Technology Bhawan,
New Mehrauli Road
New Delhi-110016
Dated: 17.02.2023

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of January, 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 31.01.2023 for information.

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



(Khalid Ansari)

Under 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)
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Department of Science & Technology
Monthly Report
January, 2023

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

A. Science for Society

1. The Annual Session of Indian Science Congress (ISC) was held from Jan 3-7, 2023 in Nagpur. The Hon'ble Prime Minister addressed the 108th annual session of Indian Science Congress via video conferencing on January 03, 2023. During the session, Women Science Congress, Farmers Science Congress, Tribal Science Congress, Children Science Congress, Science and Society Meet and Pride of India Expo were organized.
2. Three popular science books on various topics of Science & Technology were published by Vigyan Prasar (VP), New Delhi. These books are (i) The Human Brain by Soumya Maitra (ii) Life in Ocean by Jayashree Das and Pradipta Banerjee (iii) Minimum Science for Everybody by Rakesh Popli and Ashok Sinha.
3. State Science and Technology Councils Conclave was organized in Bhopal during 21st-23rd January as a part of 8th edition of the India International Science Festival (IISF). During the conclave, two compendiums on Geographical Indications and Patents were released. The State S&T Councils discussed the strengths, opportunities, and way forwards in terms of the state-level STI ecosystem. Further, there were deliberations towards building & nurturing grassroots innovations and identifying & bridging the gap between knowledge and Socio-Economic development.
4. National Social Organizations and Institutions Meet (NSOIM) was organized during 21st - 23rd January 2023 as one of the events under IISF. Under the NSOIM, stakeholders from 250 S&T based Social Organizations, Societal Research & Academic Institutions and Entrepreneurs engaged in social development interacted and exchanged their ideas on sustainable models in the areas of (i) Water & Agriculture (ii) Women & Child Health and Nutrition (iii) Access to Education & Energy (iv) Livelihood and Mini-Social enterprise creation for social development and nation building.

B. Technology Development

1. Two patents on “A process for in-situ carbon coating on alkali transition metal oxides” and “Method of preparation of carbon-supported platinum electrode catalyst for PEM fuel cells

and product thereof’ were granted to International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad.

2. An MoU was signed between Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Government Engineering College, Barton Hill and GESCO Healthcare Pvt Ltd, Chennai for the prototype development of "Self-retaining Speculum for Endonasal Surgeries".
3. Technology Information, Forecasting & Assessment Council (TIFAC), New Delhi facilitated granting of two patents for “Development of on board catalytic Fuel production kit for car” and “Antihyperglycemic and Hypolipidemic compound and a process thereof”.

C. Human Capacity Building

1. Under Vigyan Jyoti programme of DST, special lectures by experts, Atal Tinkering lab activities, visits to knowledge Partners and career counseling sessions were organized. A workshop on Robotics was organized.
2. Two Women Universities have been selected to get support under CURIE program for development of infrastructure and research facilities.
3. R&D Support was provided to the following institutes:
 - Indian Institute of Technology-Madras, for “Development of Coast Water Quality Information System (CWIS) for the Coastal States of India”.
 - Vasavi College of Engineering, Hyderabad, Telangana for carrying out the Drone/UAV based Multi Sensor High Quality Precision Photogrammetry Laser Mapping and Data Capture Pressing for Geo-spatial Platforms.
 - Support under the Geospatial Chair Professor Scheme has been provided to IIT Kharagpur.
4. DST partially co-organized and coordinated the “**Resilience & sustainability Summit: Vision 2047**” during 17-19th January, 2023 held at Vigyan Bhawan, New Delhi. The event brought together the scientist, experts and researchers from various domains of climate change, disaster management and related fields.
5. Manipur State Climate Change Cell (SCCC) has installed 16 Automated Weather Stations for generation of weather data.
6. 90 Research Groups are involved in mega science projects which include 200 Faculty and Engineers and 200 PhD students and 35 Indian Industries. The output inter alia includes, 6 Collaborative Research Publications, 7 Research Publications, 4 Conference Papers, 4

Collaborative visits (16 human days), 4 Online Shifts and training of 18 technical human resources.

D. Scientific Research

1. The study conducted by Birbal Sahni Institute of Palaeosciences provides new tree-ring stable oxygen isotope ($\delta^{18}\text{O}_{\text{TR}}$) record based longest summer drought variability (508 years, 1508-2015 CE) for Kumaon-Garhwal Himalaya. The reconstructed past drought variability are observed to be reoccurring in the recent decades but the intensity is similar to the early part of the past extreme drought. The strength of the Indian Summer monsoon has declined over high altitude regions in the KGH. The $\delta^{18}\text{O}_{\text{TR}}$ regional record of Kumaon-Garhwal Himalaya is linked to oceanic phenomenon such as sea surface temperature (SST) in the Pacific and Indian Ocean.
2. Salient features of research outcome of Wadia Institute of Himalayan Geology include: (i) Established paleoclimate variability, hydrological changes in major rivers, glaciation in Ladakh, and human migration for trading via the Silk Route; (ii) Established that sandstone of the Middle Cambrian and Kunzum La Formation is immature in nature, and probably has been derived from a nearby mixed source, reflecting low degree of weathering; (iii) Observed an adverse impact of anthropogenic activities by farmers over agricultural fields by directly adding rice husks into the soil, and recommended that they should instead convert the rice husk into biochar that increases fertility of the soil and reduces the emission of GHGs significantly; (iv) actively involved in assessing the causes of subsidence and development of cracks in Joshimath township (Uttarakhand).
3. Researchers Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru in collaboration with researchers from JNCASR have developed a new type of smart window that can save energy and provide privacy. These smart windows, called "mist-driven transparency switching glass," are made by modifying the surfaces of two glass panes and then putting them together in a small cell with openings for mist. When cool mist is inserted into the cell, droplets form on the inner walls and scatter light, making the window translucent. This allows for a reduction in indoor temperature by more than 30% compared to a regular glass window. The scientists also made a large, 30x30 cm version that can be controlled wirelessly through a cellphone application, making it easy to use and connect to other devices.
4. CeNS researchers have developed a metal-free daytime radiative cooling (DRC) film which shows high cooling efficiency of 7.8 °C with respect to ambient temperatures. Owing to the high bandgap of the particles, the film doesn't absorb solar radiation.

5. Scientists at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, have used scandium nitride (ScN), a semiconducting material with supreme stability and Complementary Metal-Oxide-Semiconductor (CMOS) compatibility, to develop brain-like computing. This invention can provide a new material for stable, CMOS-compatible optoelectronic synaptic functionalities at a relatively lower energy cost and hence has the potential to be translated into an industrial product.
6. Scientist at JNCASR have shown for the first time that infrared light emission & absorption with GaN nanostructures. GaN, a widely used material for blue light emission, is one of the most advanced semiconductors. Though visible and ultraviolet light applications of GaN have already been realized, with LEDs and laser diodes commercially available, utilization of GaN for IR light harvesting or development of GaN-based IR optical elements is lacking. This work may benefit in addressing the demand for IR sources and detectors for energy, security, imaging, and other applications.

E. Scientific Infrastructure Building

1. **Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions (FIST) Program:** Under the Programme, twenty-seven projects are under consideration for financial concurrence to support the facilities in scientific departments and PG colleges.
2. **Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI):** 34 training programs have been conducted across the country imparting training to 1,155 researchers.
