

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

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Technology Bhawan,  
New Mehrauli Road  
New Delhi-110016  
Dated: 15.06.2021

**OFFICE MEMORANDUM**

Subject: Monthly Summary to the Cabinet for the month of May, 2021.

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 31.05.2021 for information.

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

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

To,

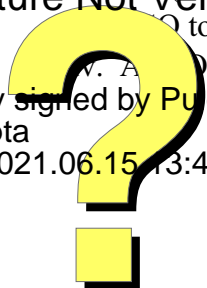
All Members of the Council of Ministers (as per Annexure-I)

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. Shri Sanjay Kumar Mishra, Sc. 'G', DST for uploading the Monthly Summary on DST's website (sanjaykr.mishra@nic.in)
- xiii. Shri Anuj Tripathi, Sc. 'G', DST. (anuj.tripathi@nic.in)
- xiv. Shri V. A. Singh, Sc. 'G', DST for Hindi Translation (kn.singh65@gov.in)

Signature Not Verified

Digitally signed by Pulok Sengupta  
Date: 2021.06.15 13:46:45 IST



**Department of Science & Technology**  
**Monthly Report**  
**May, 2021**

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

**A. Science for Society**

1. 26 finalists represented 'Team India 2021' at the Regeneron International Science and Engineering Fair ISEF from 16- 21 May 2021 and competed with 1833 finalists from 64 countries, regions and territories across the globe for \$5 million in awards and prizes. 'Team India' comprised of winning projects at the 'IRIS National Fair', a program of EXSTEMPLAR Education Linkers Foundation; funded by Broadcom and supported by Department of Science and Technology, Government of India. IRIS National Fair was held virtually this year and saw participation from more than 65,000 students and science enthusiasts; wherein the projects represented a wide range of scientific disciplines and were judged under 21 categories. Each project went through a stringent judging process to get selected as Team India 2021; and subsequently mentored by members of the IRIS Scientific Review Committee prior to ISEF. Team India 2021 won 9 Grand Awards and 8 Special Awards.
2. A virtual training programme "**Use of Self-Produced seed of Soybean for sowing, Seed Germination Testing at farm, Importance of Seed treatment and Sowing Methods**" was organized for Agricultural Department (Govt. of Maharashtra) by Agharkar Research Institute.
3. Technology Information, Forecasting & Assessment Council (TIFAC) organized a brainstorming session on "Addressing COVID Resurgence – S&T Perspective" bringing doctors, industry, policymakers and other stakeholders on a virtual platform. The deliberations were focused on Clinical health perspectives, India's preparedness in pharma and drugs, vaccines trials and availability, medical equipment and infrastructure.
4. NIF undertook the on site evaluation of Sudhakar Seedless green grape variety through Krishi Vigyan Kendra, YCMOU, Nashik wherein it was found to have higher yield potential than the popular check varieties and also exhibited high bunch weight, longer shelf life and good quality berries which positions it as a grape variety with high export potential.
5. NIF has developed an improved prototype of tractor operated weeder for cotton crops and has also arrived at an improved design of atmospheric water generator.

6. The identification, confirmation, processing of 15 plant specimens were undertaken by NIF towards development of monograph for extra ayurvedic ethnobotanical practices in association with Central Council for Research in Ayurvedic Sciences (CCRAS), New Delhi.
7. Vigyan Prasar (VP) continued to aggregate, collate, edit and design various products related to Science & Technology Communication Popularization and its Extension.
8. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) launched a dedicated website to Moyamoya disease, a rare cause of stroke predominantly in children. This website is designed to provide information on Moyamoya disease and its treatment options to patients, caregivers and medical professionals
9. NIDHI4COVID2.0 initiative was launched by National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science & Technology (DST), Government of India (GoI) under NIDHI-Seed Support Program for supporting startups which are developing new technologies and products which would enable the country to fight against COVID-19 pandemic wave 2.0. This new initiative would facilitate startups support to scale up their technologies, helping them reach the product deployment stage as fast as possible. It was launched on 19th May, 2021 and startups and innovators can apply on or before 31st May, 2021. Around 390 applications have been received under the call, Programme Division is now screening the proposal by involving Implementing Agency for taking the proposal to next level for screening by the expert committee.
10. Programme Division launched call for proposal for Inclusive TBI (iTBI) program. Worked for approval of guidelines and application format and integrating it with ePMS portal of DST. The call was launched on 25<sup>th</sup> April 2021 and closed on 25<sup>th</sup> May 2021. Also integrated launch of NIDHI Seed Support Program with ePMS portal of DST. This call of proposals NIDHI Seed Support Program is being invited from DST-TBIs. The call is open till 09<sup>th</sup> July 2021.
11. To meet the high demand of Oxygen for the country in future, aligning of CAWACH program to support to Mission Bharat O2 from IIT Kanpur was carried out.
12. **Meeting for Project management committee (PMC) on NIDHI Entrepreneurship in Residence (NIDHI EIR) and NIDHI-Promotion and Acceleration of Young and Aspiring innovators & startups (NIDHI - PRAYAS)** was organized on May19-20th 2021 to evaluate the shortlisted proposals. The PI's shortlisted 24 EIR and 22 PRAYAS proposal, who made a presentation before the PMC about their proposals through virtual mode. The committee evaluated these proposals on the basis of various parameters which include the Preparedness & Track record of the TBI, Implementation strategy, Affili-

ation to the academic host institute for pipeline generation and tapping young entrepreneurs/students, Pipeline submitted/shared, Team capabilities, Regional consideration, Overall Assessment. Finally the committee recommended 15 EIR and 15 PRAYAS proposals for consideration by DST. The committee also reviewed all the existing 31 PRAYAS and 22 EIR centers.

13. Programme Division officers attended the virtual meeting with all the participating Technology Business Incubators (TBIs) of NIDHI4COVID2.0 initiative to formulate the guidelines for the implementation of the initiative.
14. Training Program on Innovation & Entrepreneurship i.e Women Entrepreneurship Development Programme (WEDP), Technology Based Entrepreneurship Development Programme (TEDP) & Faculty Development Programme (FDP) by Academic & Engineering Institutes was launched all over the country through online mode. For selection of implementation agency the draft guidelines & advertisement material has been prepared. The advertisement will be launched on DST and NSTEDB website in the month of June'2021.
15. As per one of the major outputs of the Geospatial Chair Professor (GCP) Scheme of NGP-DST, Geomatics Engineering – which involves the collection, measuring, monitoring, and archiving geospatial data has been included as one of the subjects to the list in the GATE exam for the Year 2022.

## **B. National Technology Mission**

1. The 2<sup>nd</sup> Mission Coordination Committee (MCC) meeting of National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) was held on 21<sup>st</sup> May 2021 through Video Conference under the chairmanship of Prof Ashutosh Sharma, Secretary, DST, to have an interactive discussion with all the 25 Technology Innovations Hubs (TIHs) on various financial, administrative and technical issues. Also, the DPRs which have been revised as per latest SAC and MGB recommendations, had been received from all the 25 TIHs and shared with all the SAC members for comments and will be discussed in forthcoming SAC meeting.
2. The draft EFC on National Mission on Quantum Technology & Application (NM-QTA), modified as per the suggestions during Empowered Technology Group meetings, has been circulated with different ministries and now the comments are awaited from few ministries.

### **C. Technology Development**

1. A Project Appraisal Committee (PAC) meeting was held to discuss on the Project Proposals received under NCAP, Ministry of Environment, Forest and Climate Change (MOEF&CC) by CPCB.
2. An interactive meeting was held with experts from BHEL Hyderabad to discuss on Development of High Temperature Spin Test Rig and Accelerated Testing of Advanced Ultra Super Critical (AUSC) Steam Turbine Rotor Segments under Transient and Steady State Thermo-Mechanical conditions ongoing activities and future roadmap.
3. Participated as an Expert Panel Member for the “Facility of Low Carbon Technology Deployment” (FLCTD) Innovation Challenge – Electrical Energy Storage vertical for 2020–21 jointly implemented by the Bureau of Energy Efficiency (BEE) and the United Nations Industrial Development Organization (UNIDO) on 7<sup>th</sup> May 2021.
4. Various R&D activities were supported under different schemes of the division to promote/ develop the various geospatial technologies and tools. The details are as follows:
  - On 6-7<sup>th</sup> May 2021, National Centre for Geodesy brainstorming organized by IIT Kanpur deliberated on ways to fix up horizontal, vertical, gravity and total gauge Reference Frames in line with the requirement of the fresh Geospatial Guidelines issued in February 2021 and the draft National Geospatial Policy.
  - Call for proposal (**CFP**) in the area of **Geospatial Technology Development** focusing in the sectors of Geospatial Data Capture Technologies / gathering, Data Management, and Data Processing Geospatial Technologies have been **issued on 16<sup>th</sup> May 2021**. The last date of ONLINE receipt of the proposals is 15<sup>th</sup> June 2021.
5. International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) developed Super-hydrophobic functionalized carbon textiles as multifunctional advanced materials for effective and economic separation/removal of contaminated oil/toxic chemicals in the water.
6. Lithium Iron Phosphate (LFP) and Lithium Titanium Oxide (LTO) electrode with high active material loading of 22 mg/cm<sup>2</sup> and 20 mg/cm<sup>2</sup> respectively were fabricated by ARCI for making LFP-LTO battery with capacity of ~ 10Ah
7. Ag-Cu/CuO nanoparticles coated fabric samples exhibited 99.7% bacterial disinfection in 30 seconds (using ASTM E2315) and were able to retain antibacterial properties even after 30 washes. Prototype masks were prepared by ARCI using this fabric for demonstration. LFP Electrode LTO Electrode
8. Indigenously produced Lithium ion cells supplied to electric vehicle OEMs for end user validation tests by ARCI.

9. National Innovation Foundation (NIF) facilitated granting of 7 patents to its grass root innovators on i) herbal compositions for management of liver disorders and method thereof; ii) herbal compositions for treatment or prevention of a bone fracture and methods thereof; iii) herbal composition for treatment of malaria; iv) herbal compositions and medicaments thereof for treatment of joint pain; v) system for monitoring and operating user's activities and electronic appliances; vi) herbal compositions for prevention and treatment of stress and as a feed additive in birds; vii) herbal composition for promoting or enhancing seed germination, growth and disease resistance.
10. Improved prototypes of five ideas and innovations by school students viz. Automatic Toilet Cleaner, Leg operated Mouse, Smart dustbin, Cap for blind, Mobile bio toilet were developed and were selected in the 7th NLEPC (National Level Exhibition and Project Competition) of INSPIRE Awards – MANAK.
11. Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) signed MoU with M/s Meril Diagnostics Pvt. Ltd for the technology transfer of Multiplex RT-PCR Kit for COVID-19 detection. A Technology Transfer agreement for CHITRA Multiplex RT-PCR Kit for COVID-19 detection was also signed with Huwel Lifesciences Pvt. Ltd, Hyderabad, Telengana to commercialize the kit.
12. Considering emerging healthcare requirements to combat the COVID 19 epidemic, Science and Engineering Research Board (SERB) announced special call (Joint SERB-TDB Call) to catalyze R&D on critical components and innovations concerning Make-in-India Oxygen Concentrators. The call seeks investigation and innovation in the development of (individual/portable) oxygen concentrators in domains of alternate materials and mechanisms for oxygen separation; design, development, and manufacturing of critical components such as valves and oil-less compressors, design improvements for greater performance, AI-optimized oxygen flow devices, and oxygen-level IoT sensors etc.
13. Part of the national effort to mitigate Oxygen shortage and spreading of Covid-19 to tier-II, tier-III and smaller cities, faculty members of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) are developing OxyJani, an oxygen concentrator that can be deployed in smaller cities, and this system has unique advantages over those existing in the market.
14. The technology of "Single Use dynamic Bed Bioreactor (SUB) for manufacturing of Vaccines and Biologics" indigenously developed by M/s. OmniBRx Pvt. Ltd. Ahmedabad, Gujarat, which was evaluated by Technology Information, Forecasting & Assessment Council (TIFAC) under Srijan Programme has been validated by M/s. Bharat Biotech Ltd., Hyderabad. This technology may be used to enhance the yield of Vaccines by other tech users.

## **D. International Cooperation**

1. **24th Session of the UN-CSTD:** India participated in the round table of the 24th Session of the UN-CSTD held virtually on May 18, 2021, on the title "Using Science, Technology, and Innovation to close the gap on Sustainable Development Goal 3 on good health and well-being". Reading the message on behalf of Prof Ashutosh Sharma, Secretary, DST at the high-level roundtable Head, International Division, Department of Science and Technology, Govt of India highlighted the covid-19 vaccination drive launched by Govt of India for taking care of overall health and well-being of all sections of society.

The participants of this high-level roundtable included Minister of Information and Communication Infrastructure of Gambia, Minister of Science and Technology of Philippines, Minister of Science and Technology of Pakistan, and Secretary (Education), Ministry of Education, Science and Technology of Nepal, in addition to the panelist from WHO, Academician from Brazil and Board Chair of Woman in Global Health, United Nations Young Leader for Sustainable Development Goals. The panelists and Ministerial delegations discussed at length on measures and initiatives launched by respective governments for using science, technology, and innovation to close the gap on sustainable development goal 3 on good health and well-being, particularly during and post-corona pandemic. India also participated in various side events of the 24th Session of the UN-CSTD which was also organised in virtual mode during May 17-24, 2021.

2. **BRICS Science, Technology, and Innovation (STI) Cooperation:**

### ***i. Seventh meeting of BRICS Astronomy Working Group (BAWG)***

Under the Science, Technology, and Innovation track of the BRICS 2021 calendar, India hosted the seventh online meeting of BRICS Astronomy Working Group (BAWG) meeting of Brazil, Russia, India, China, and South Africa from 19-20 May 2021. From the Indian side the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune and Department of Science and Technology (DST), Government of India coordinated the meeting. It witnessed the participation of all five BRICS countries with more than 50 participants including researchers, academicians, and government officials. Lead scientific researchers from each BRICS country presented the country report highlighted their research activities and infrastructure.

The delegates deliberated on strategic and operational matters and recommended further networking on the existing Telescopes in the BRICS countries and create a regional Data Network. They agreed to develop a flagship project in this area. The members of the working group further discussed and indicated future directions of research such as building a network of intelligent telescope and data network; study

of transient astronomical phenomena in the universe; big data; artificial intelligence; machine learning application to process the voluminous data generated due to enhance multi-wavelength telescope observatory. BAWG noted the importance of enhancing collaboration among astronomers from the BRICS countries. BRICS scientific ministries welcomed the ideas mooted by experts' group.

***ii. Fourth BRICS Working Group meeting on Biotechnology and Biomedicine***

The fourth BRICS Working Group meeting on Biotechnology and Biomedicine was hosted online mode by China on May 25-26, 2021. The BRICS Biotechnology and Biomedicine Working Group provides a platform for researchers from BRICS member countries to discuss and deliberate on emerging issues in the various fields of biotechnology and biomedicine. The Department of International Cooperation, Ministry of Science and Technology (MOST), and China National Center for Biotechnology Development, China sponsored and organized the meeting. More than 60 participants from BRICS including researchers, academicians, and government officials participated in this meeting.

The key scientific institutions which participated from BRICS countries include the Department of Science and Technology (DST), Department of Biotechnology (DBT), Indian Institute of Technology (IIT), Delhi, All India Institute of Medical Sciences (AIIMS), New Delhi, Indian Institute of Technology (IIT), Jodhpur, Banaras Hindu University (BHU), Delhi University (DU) from India; Tianjin Medical University Cancer Institute and Hospital, Tianjin, China, Peking University, China, International Centre for Genetic Engineering and Biotechnology, China, Department of Science and Innovation, South Africa, Skolkovo Institute of Science and Technology (Skoltech), Russia, Federal University of Rio de Janeiro, Brazil, Ministry of Health, Brazil, South African Medical Research Council (SAMRC), South Africa. The members of the working group suggested future directions for research collaboration among BRICS countries in the areas such as antimicrobial resistance, artificial intelligence, and Digital Health Medicine, Non-communicable diseases, neurological disorders, Agro-biotechnology, food and nutrition, cancer, long Post-Covid challenges and complications including molecular pathogenesis of COVID-19 virus.

India proposed BRICS Consortium to address post-COVID challenges, tackling non-communicable diseases as flagship programme whereas Russia proposed sustainable agro-biotechnology for healthy food & nutrition, advanced virtual reality assisted technology for neurorehabilitation and China proposed cancer research as Flagship Programme. The deliberations have been agreed by all BRICS nations unanimously.

***iii. Fifth BRICS Working Group meeting on High Performance Computing (HPC) and Information Communication Technologies (ICT):***



The fifth BRICS Working Group meeting on High-Performance Computing (HPC) and Information Communication Technologies (ICT) was hosted and organized in online mode by South Africa on May 27-28, 2021. More than 50 participants from BRICS countries including researchers, academicians, and government officials participated in this meeting.

The key scientific institutions participated from BRICS countries include the Department of Science and Technology (DST), Ministry of Electronics and Information Technology (MEITY), Centre for Development of Advance Computing (C-DAC) from India; National Laboratory of Scientific Computation (LNCC), Brazil, Senai Cimatec, Research Institute in Brazil, Research Computing Center, Moscow State University (RCC MSU), Russia, Guangzhou University, Sun Yat-sen University from China and Department of Science and Innovation, South Africa, National Research Foundation (NRF), South Africa, South African Weather Service, South Africa.

The members of the working group suggested future directions of research collaboration among BRICS countries in the areas such as HPC and weather-Climate-Environment Applications; Application of Supercomputers to Drug Design, “AI+HPC” based Precision Medicine and Public Health particularly for fighting Pandemics, Geoinformatics for Sustainable Development. India agreed to share the concept note on cooperation amongst the BRICS startups in deep technology in areas of healthcare, agriculture, and education. China proposed AI+HPC+5 G-based digital twins’ platform and Open-Source ecosystem for smart manufacturing, precision farming, and precision medicine. Brazil and South Africa proposed the flagship project on digital Earth.

The deliberations of above said Working Group meetings have been agreed upon by all BRICS nations unanimously. The Working Group recommendations may be included in the next BRICS Call for Proposals. BRICS call secretariat representative has indicated that the next call may likely be announced in the second half of the year 2021.

3. **5<sup>th</sup> India Belgium joint committee meeting on cooperation of Science and Technology:** In the framework of the Agreement between the Government of the Kingdom of Belgium and the Government of the Republic of India in the field of scientific and technical cooperation, signed on 3 November 2006, the 5th India Belgium joint committee meeting on Cooperation in Science and Technology was held online on January 18th, 2021. The meeting was hosted by the Belgian Federal Science Policy Office (BELSPO) and chaired by the Head of the Department Federal, Inter federal, and International Cooperation of BELSPO from the Belgian side and Head, International Cooperation Division of the Department of Science and Technology (DST) from the Indian side. Both sides discussed the ongoing progress and planned the future road

map during the meeting.

4. **Due-Diligence meeting of projects under India-Russia Joint Technology Assessment and Accelerated Commercialization Programme:** The Due-Diligence meeting of projects was held on May 5-7, 2021, recommended under India-Russia Joint Technology Assessment and Accelerated Commercialization Programme. This programme is jointly funded by Foundation for Assistance to Small Innovative Enterprises (FASIE), Russia and DST.
5. **7<sup>th</sup> Governing Board Meeting of I4F:** The 7<sup>th</sup> Governing Board meeting of the Indo-Israel Industrial R&D Fund was held virtually on 6<sup>th</sup> May 2021 to discuss the progress of the ongoing projects and recommendations of new projects under the CFP-06. The Call for proposal 6 was launched for applied R&D projects in the areas of Agriculture, Energy, Healthcare, Information & Communication Technologies (ICT) and Water. Nine projects were jointly received and evaluated separately on both sides. Out of the nine projects, four projects were recommended for support from both sides under CFP-6 of I4F.
6. A virtual presentation was made about the current status and potential for air conditioning in India followed by DST contribution in Low Energy Heating and Cooling at 13<sup>th</sup> International Energy Agency Heat Pump Conference, Republic of Korea organized by Heat Pumping Technologies.
7. A meeting was held with IC1 Co-leads and experts from IIT Roorkee to discuss on Mission Innovation IC1: Smart Grids ongoing activities and future road map.
8. An interactive meeting was held with experts from IIT Roorkee to discuss on Mission Innovation IC7: Affordable Heating and Cooling of Buildings ongoing activities and future roadmap.
9. A meeting was held with officials from Mission Innovation (MI) member countries to discuss on MI 2.0 Cities Mission.
10. A meeting was held with officials from Mission Innovation (MI) member countries to discuss on an impact of the MI platform modules / activities and next steps for MI future opportunities for Mission Innovation Challenges.
11. A Review Meeting was held under the chairmanship of Secretary, Department of Biotechnology to discuss on Mission Innovation India Activities.
12. A meeting was held with officials from UK and European Union to discuss on ongoing activities, future roadmap and creating repository regarding Innovation communities on affordable heating and cooling of buildings.
13. Leader of the Indian delegation (approved) has participated in various meetings of the virtual 2<sup>nd</sup> session of United Nations Group of Experts on Geographical Names (UN-

GEGN) scheduled from 3-7 May 2021 at 6:30 pm. All other members of the delegation watched the above meetings proceedings with interpretation in the official languages live on UN Webcast at <http://webtv.un.org/>.

14. Virtual meeting was held on 12<sup>th</sup> May 2021 as preparatory meeting for discussing the agenda items of the UN-Global Geospatial Information Management-Asia Pacific (UNGGIM-AP) under the chairman-ship of Surveyor General of India. The main aim of the meeting was to present a comprehensive view of the Country during the deliberations of UNGGIM-AP meetings (scheduled for 18<sup>th</sup> & 20<sup>th</sup> May 2021).
15. The members of the Indian Delegation along with Surveyor General of India (leader of delegation) attended the virtual Executive Board meeting of UN-Global Geospatial Information Management-Asia Pacific (UNGGIM-AP) on 20<sup>th</sup> May, 2021. The main aim of the meeting was to discuss the work plan for 2021, funding opportunities and draft framework of the Asia Pacific Information Platform and the service center to the member Countries.
16. National Steering Committee under the Chairman ship of Secretary-DST was constituted for organizing the second United Nations World Geospatial Information Congress (UNWGIC) to be held in India tentatively in the year 2022.
17. A virtual meeting under the Chairmanship of Surveyor General of India was held on 25<sup>th</sup> May 2021. The main aim of the meeting was to catalyse & integrate Country's activities in-alignment with United Nation- Group of Geospatial Information Management (UNGGIM) priorities.

## **E. Human Capacity Building**

1. **Vigyan Jyoti:** Several activities have been conducted under Vigyan Jyoti during May. A summarized view is given below:

**Logo of Vigyan Jyoti:** Vigyan Jyoti program is the first initiative of WISE-KIRAN Division to promote young girls in underrepresented areas of STEM. A logo for Vigyan Jyoti program was designed based on its mandate. This logo has been approved by Secretary, DST.

**Flip Book:** A flip book on simple Science & Mathematics projects has been compiled under Vigyan Jyoti and is ready for release. The projects have been identified by JNV Teachers and IBM, AIF, NVS and DST team gave final shape to this Flip Book.

**Proposal for Class X Students:** A meeting of DST, NVS and AIF officials was conducted in order to discuss proposal submitted by Mr Shashank Karnam for syllabus based activities and Science Utsav for Class X students under Vigyan Jyoti. Mr Karnam gave a presentation on the proposal during the meeting. IBM India will support

this proposal under its CSR.

**Meeting:** A virtual meeting was conducted with the Principals of 8 Aspirational Districts to discuss the expansion plan of Vigyan Jyoti. Discussion was also held on achievements and challenges faced in last one year of Vigyan Jyoti. (Shared via DST's twitter handle @IndiaDST)

**Quiz Competition:** STEM Quizzes were organized as an activity for the month of May for the Vigyan Jyoti Scholars of Class XII. Stream-wise (PCMB, PCM and PCB) Google form links were shared with JNVs.

**Webinars/Lecture:** Sessions on "Role of Communication in Learning: Experiences from Science Popularization" , "Science, Technology and Innovation (STI) for Nation Development", "Creating Young Leaders through Tide Turner Challenge", "Natural Disaster: Education and Preparedness", "The World of Small Particles", "Career in Science: A wholesome package of Thrill, Satisfaction and Challenges", "Introduction to High Performance Computing", "COVID 19 Symptoms, Diagnosis, Treatment and RT PCR Test", "Semiconductor Electronics", etc. have been conducted.

**Role Model Interaction and Special Lectures:** Role model interactions have been organized by different JNVs during May. Few role model scientists are Ms Niralee Verma, Central Pollution Control Board, New Delhi, Ms. Sino George, Manager of Policy Holder Services, IT Department of New York State Insurance Fund; Dr. Neelu Singh, Non FRI, Dehradun; Dr. Kumud Tripathi, NIT, Sikkim; Dr. Roja Bardeskar, MS (Obgyn), Dhule ; Dr. Darshna Chaudhary, Maharishi Dayanand University, Roh-tak ; Dr Anand P. Barmai, IIIT Dharwad; Shri. Chidanand Jadar, NIT Agartala; Dr. Mita Tarafder, CSIR - National Metallurgical Laboratory, Jamshedpur; Dr. Charitha Cherugondi, IIT Kanpur; Rajani Kanth Gudipati, Friedrich Miescher Institute, Switzerland; Dr. Ravindra P. Veeranna, CSIR CFTRI Mysuru; Dr. Anita Mohan, IIT BHU.

**Special Programme on Cyber Security:** Special Programme on Cyber Security was conducted by various JNVs during May. Vigyan Jyoti Scholars from total 25 Districts viz. 9 districts (Patna Region), 8 Districts (Chandigarh Region), 2 Districts (Hyderabad region) and 6 Districts (Jaipur region) have attended this programme.

**Special Online Classes:** During this month, 119 recorded lectures have been made available to Class XII VJ Scholars. Further, 2 online classes and 6 tests have been conducted for JEE/NEET.

- 2. Gender Advancement for Transforming Institutions (GATI):** During May, Program Division requested 30 institutions for their consent to participate in GATI pilot. Further, grouping of selected Indian Institutions with UK Institutions has been done for mentoring purpose. Discussion meetings were conducted in this regard with British

Council and other partners and same has been shared via DST's twitter handle @IndiaDST.

- 3. Women Scientists Scheme:** Till 31 May 2021, 90 files under WOS-A and 8 under WOS-B have been processed out of that 61 sanctions in WOS-A and 3 in WOS-B have been issued. Final settlement of 12 projects under WOS-A and 2 under WOS-B has been done under this lot. In view of pandemic situation, extension of project tenure for one year under Women Scientists Scheme (WOS-A and WOS-B) without any additional cost has been approved.
- 4. CSRI-SATYAM:** Extension of Fellowship to CSRI-PDFs for additional 6 months during pandemic has been approved by Secretary, DST. Further, research projects under Cognitive Science Research Initiative (CSRI) and Science and Technology of Yoga and Meditation (SATYAM) have also been extended for another one year without any additional cost.
- 5. Innovation in Science Pursuit for Inspired Research (INSPIRE) Scheme Scholarship For Higher Education (SHE):**
  - 861 SHE scholars received scholarship for pursuing B.Sc./M.Sc. Degree course in basic and natural sciences.
  - 228 SHE scholars received mentorship grant for undertaking Summer Research Internship while pursuing B.Sc./M.Sc. Degree course in basic and natural sciences.**INSPIRE Fellowship:**
  - 175 INSPIRE Fellows received fellowship for pursuing doctoral degree programme.
  - 94 INSPIRE Fellows got upgraded from Junior Research Fellow (JRF) to Senior Research Fellow (SRF) for pursuing doctoral degree programme.**INSPIRE Faculty Fellowship:**
  - 25 INSPIRE Faculty Fellow's fellowship grant was released for pursuing Post-doctoral programme.
- 6.** Support for the extended tenure of Geospatial Chair Professor, Prof. P. Shanmugam, IIT Madras for strengthening the promotion of Geo-spatial education and S&T at National and sub-national level was provided.
- 7.** Support of Honorarium to the Expert Members of the '**Capacity Building and Training on Geospatial Science and Technology**' committee and Geospatial Analytics for Revival and Restoring the Economic Growth in Post COVID-19 screening committee, respectively.

## **F. Scientific Infrastructure Building**

1. Raman Research Institute (RRI) experimentalists and collaborators have successfully demonstrated real time imaging through fog. They employ a novel low-cost method that utilizes an inexpensive incoherent light source, a low-cost scientific camera, and a software developed for this purpose.
2. The demand for metallic nanoparticle ornamented nanohybrid materials of graphene oxide (GO) finds copious recognition by virtue of its advanced high-tech applications. Experimentalists at RRI have fabricated a GO-Ag nanoparticle hybrid via a novel laser based technique. The synthesized hybrid nanostructure exhibited higher antibacterial action resistance to *Escherichia coli* (*E. coli*) opening up potential applications in antibacterial coatings.
3. The Science and Engineering Research Board (SERB) approved setting up of, up-to 3 Centres of Excellence (CoEs) in the area of Earth and Atmospheric Sciences, for developing Artificial Intelligence & Machine Learning (AI & ML) approaches to geohazard, weather & climate prediction. These CoEs will be developed as network centres in linkages with Ministry of Earth Sciences. SERB solicits R&D proposals to establish these CoEs in the country, in the following areas: i. AI & ML for better weather and ocean forecasting and long-term environmental sustainability. ii. Deep learning models for early warning of extreme geohazards. iii. AI/ML models to predict climate extremities and climate change mitigation, through high precision analytics.
4. SERB is seeking proposals under Intensification of Research in High Priority Areas (IRHPA) to establish SERB National Biosafety Level Facilities (BSL-3 and BSL-4). These centres will provide state-of-the-art biosafety facilities for research and diagnostics work on highly infectious microbes, such as *Mycobacterium tuberculosis*, encephalitis virus, SARS-CoV-1, SARS-CoV2, MERS-CoV, and Chikungunya.
5. Wadia Institute of Himalayan Geology, (WIHG) has established protocol for measurement of Hf isotopes using multi-collector inductively coupled plasma mass spectrometer attached with a laser ablation system.
6. WIHG established the genesis and tectonic evolution of the rarely occurred dunites in the central part of Nagaland–Manipur Ophiolites (NMO), NE, India, and investigated the frequency magnitude distribution (b-value) and fractal dimension (Dc-value) along and across the strike of Garhwal–Kumaun Himalaya using broadband seismic network.
7. Electrochromic studies of WO<sub>3</sub> films coated on Al-mesh and ITO electrodes are being optimized by Centre for Nano and Soft Matter Sciences (CNSMS) to achieve good

opaque state.

8. Photoluminescent composites prepared and studied by CNSMS for selective reflection and response time.
9. Scientists at S N Bose National Centre for Basic Sciences (SNBNCBS) Synthesized freestanding two dimensional copper oxide nanosheets (2D CuO NS) at room temperature by a surfactant free one pot co-precipitation process.
10. Oxygen electromigration studies was carried out by SNBNCBS on long and submicron width strips of La<sub>0.85</sub>Sr<sub>0.15</sub>MnO<sub>3</sub> films on LaAlO<sub>3</sub> substrate with lithographically defined oxygen source created by local electrochemical oxidation.
11. Quantum teleportation (QT) studied by Bose Institute (BI) using a shared state such that one half of pure two-qubit (either maximally entangled or non maximally entangled, prepared and send to bob by alice) state resides each with Alice and Bob. A subset of qubit channels has been shown to exist for which the final state becomes useful for universal QT when the initially prepared state is either useful for universal QT or not useful for universal QT. Moreover, the nonunital channels (dissipative interactions) are found to be more effective than unital channels (non dissipative interactions) in producing useful states for universal QT from non maximally entangled pure states.
12. A comparative analysis done by BI on structural proteins revealed that extensive substitutions of hydrophobic to polar and charged amino acids in spike glycoproteins of SARS-CoV2 creates an intrinsically disordered region (IDR) at the beginning of membrane-fusion subunit and intrinsically disordered residues in fusion peptide. IDR provides a potential site for proteolysis by furin and enriched disordered residues facilitate prompt fusion of the SARS-CoV2 with host membrane by recruiting molecular recognition features.
13. Formation of biofilm by *Vibrio cholerae* plays a crucial role in pathogenesis and transmission of cholera. Nanoparticles may serve as an effective alternative to conventional antibiotics for targeting biofilms and virulence factors. The BI conducted study on the effectiveness of gold nanoparticles (AuNPs) of different size and shape (spherical: AuNS10 and AuNS100, and rod: AuNR10, the number indicating the diameter in nm) on both the inhibition of formation and eradication of biofilm of the two biotypes of *V. cholerae*, classical (VcO395) and El Tor (VcN16961).
14. TIFAC prepared a document titled 'S & T Approach for Addressing Resurgent COVID-19 (STAARC)' highlighting technology and policy interventions required to contain COVID-19 surge.

15. TIFAC jointly with CSIR-CFTRI, Mysuru explored techno-economic feasibility of running Mobile Processing Unit in North-Eastern region of India along with local industry association for processing of fruits & vegetables into value added products to reduce wastage of local produce and to enhance income of small marginal farmers.
16. MoU between Govt of Arunchal Pradesh and Survey of India signed on 11-05-2021 for **Drone based Large Scale Mapping of rural abadi area** and **Establishment of CORS network under SVAMITVA scheme.**
17. MoU between Govt of Gujarat state and Survey of India signed on 21-05-2021 for **Drone based Large Scale Mapping of rural abadi area** and **Establishment of CORS network under SVAMITVA scheme.**
18. MoU between UT of Ladakh and Survey of India signed on 25-05-2021 for **Drone based Large Scale Mapping of rural abadi area** and **Establishment of CORS network under SVAMITVA scheme.**
19. MoU between Govt of Himachal pradesh state and Survey of India signed on 27-05-2021 for **Drone based Large Scale Mapping of rural abadi area** and **Establishment of CORS network under SVAMITVA scheme.**
20. Online meeting to review **SVAMITVA** scheme, under the chairmanship of Joint Secretary MoPR, held on 05-05-2021, 06-05-2021, 07-05-2021, 12-05-2021, 13-05-2021, 19-05-2021, 21-05-2021, 25-05-2021 and 27-05-2021 attended by Surveyor General of India, Officials of SOI and State Revenue & Panchayati Raj Department.
21. Online meeting to discuss issues related to **GIS schema under SVAMITVA** project, under the chairmanship of Surveyor General of India, was held on 10-05-2021 and attended by Officials of SOI.
22. Online **Annual Meeting to review the progress made by the Survey of India** under the Chairmanship of Secretary, DST held on 24-05-2021 was attended by Surveyor General of India and Officials of SOI.
23. Online Review Meeting of **LSM (Haryana) Project/SVAMITVA Scheme** under the chairmanship of the Financial Commissioner, Revenue-cum-Addl. Chief Secretary, Deptt. of Revenue and Disaster Management, Govt. of Haryana, held on 08-05-2021, 15-05-2021 and 29-05-2021 was attended by Surveyor General of India and Officials of SOI.
24. Online meeting to review **SVAMITVA** scheme, under the chairmanship of Secretary MoPR, held on 28-05-2021 was attended by Surveyor General of India, Officials of SOI and State Revenue & Panchayati Raj Department.



25. Online meeting of regional Committee of United Nations Global Geospatial Information Management for Asia and the Pacific (**UN-GGIM-AP**) Executive Board, held on 18 and 20 May 2021, was attended by Officials of DST, NSCS, Surveyor General of India and Officials of SoI.
26. Online meeting regarding Second Session of United Nations Group of Experts on Geographical Names (**UNGEGN**), held on 03 to 07 May 2021 was attended by Officials of DST, SoI and NATMO.
27. Comments of SoI on following **change in place name Proposals** submitted to DST during May 2021.
  - i) City Hoshangabad to Narmadapuram in Madhya Pradesh.
  - ii) Village Dhumalwadi to Nandgiri in Maharashtra.
  - iii) Village Mohmmad Hedi to Brahmpuri in Haryana.
  - iv) Railway Station Budugumpa to Dhanakanadoddi in Karnataka.
28. A virtual workshop on **“How to Write a Success Story”** for the projects supported under SYST, was conducted on 3<sup>rd</sup> May, 2021.
29. Expert Committee meeting for SYST was organized virtually on 6-7 May, 2021 to review ongoing and completed projects.
30. A virtual brainstorming session **“S&T Perspective for addressing second wave of COVID-19”** with Core Support Groups of TARA programme and Subject Experts was held on 27<sup>th</sup> May, 2021 (03:00 -06:00 PM). The session was focused upon ideas on affordable, simple, repairable, and multi-functional rural/urban technologies (viz. telemedicine facilities, medical aid supply and support, rural ambulance, herbal based local food, pre & post COVID nutrition, Community Resilience Centre, Energy based options, mental health of people, post COVID livelihood revival etc.).
31. Sensitization and interaction meeting was held on 31.05.2021 with experts from Project Advisory Committee (PAC) and Expert Committee (EC) of Scheduled caste Sub Plan (SCSP) and Tribal Sub Plan((TSP) to discuss the Monitoring Framework for evaluation of proposals under Science Technology and Innovation (STI) Hub category.
32. Three new Intellectual Property Rights (IPR) Cells have been established in Gujarat. These IPR cells have been established at Silver Oak University, Uka Tarsadia University and CHARUSAT University.
33. A Master Training Programme on Green Building Technologies at Bolmoram Training Centre was conducted by State Council of Science, Technology & Environment, Meghalaya from 26<sup>th</sup> April to 6<sup>th</sup> May 2021.

34. Various programmes/ sessions/webinars were conducted by Gujarat State Council of Science and Technology on Solar Energy, Cyclone: Do's and Don'ts, Science Story telling session on Chandrayan-2, Technical session on HAM radio, COVID-19 outreach programme, Online Summer Camp on Artificial Intelligence, Awareness session on COVID-19 vaccination, Myth Busters session for women vaccination, training programme for rural women participants for skill development in folk dying to make them self-reliant, programme on food habits, nutrition, health and wellness activities for women etc.
35. **Fund for Improvement of S & T Infrastructure in Universities and Higher Educational Institutions (FIST)**: The second interaction meeting on “Fund for Improvement of S&T Infrastructure (FIST) was convened on 20 May, 2021 through Microsoft Teams by involving stakeholders from various academic institutions, associated with ongoing FIST projects sanctioned in different subject areas. The stakeholders were apprised of the recent changes incorporated in the FIST Program, recent government direction about the EAT (Expenditure, Advance and Transfer) Module of Public Finance Management System, mapping the research facilities in the Indian Science & Technology and Engineering Facilities Map (ISTEM Portal), timely utilization of funds and depositing the interest earned in the project through Bharatkhoosh.
36. **Promotion of University Research and Scientific Excellence (PURSE)**
- a. The University of Lucknow, Uttar Pradesh organized an International Webinar on the topic “Coronavirus Pandemic: Impact of Science & Technology in India” under the aegis of the DST- PURSE programme, which was held on May 31<sup>st</sup> 2021. The webinar was attended by about 100 participants and a total of 8 talks were delivered by experts from different fields of Science and Technology as well as from Industry.
  - b. Cochin University of Science and Technology (CUSAT), Kerala organized an International Conference on Advances in Polymer Technology during May 27- 29, 2021 with the aid of facilities acquired through PURSE programme of DST. The Conference was conducted in Webinar mode with a participation of two hundred participants. Nineteen invited lectures were held in three days conference and a total of 75 papers were presented in the latest trend in the field of Polymer Technology, energy, environment and nanocomposites.
  - c. The ongoing PURSE supported Universities were apprised about the latest Government Guidelines about the mandatory use of EAT Module of Public Financial Management System for Expenditure utilization and fund management.
37. **Sophisticated Analytical and Technical Help Institutes” - (SATHI)**
- a. The 19th "SATHI Ki Baat" Meeting was organized on 20th May 2021, convened on

Microsoft Teams to review the recently supported “Sophisticated Analytical and Technical Help Institutes” (SATHI) centres at three host institutes (IIT Delhi, IIT Kharagpur and BHU- Varanasi) and for discussion about the latest technical and financial progress. The minutes of the meeting were finalized.

- b. As DST is setting up several SATHI centres to house major analytical instruments to provide common services of high-end analytical testing with an aim to avoid duplication and reduce dependency on foreign sources under SATHI scheme, an article is being published by Press Information Bureau on 15.05.2021.

38. **Sophisticated Analytical Instrument Facilities (SAIF):**

- a. DST supported SAIF facility at Panjab University, Chandigarh has partnered with Molekule, USA to donate air purification & Air Pro RX units to hospitals across the country to help aid in the battle against the COVID 19 Pandemic and provide patients, doctors, and staff with much needed clean air. These units will be installed at emergency wards, ICUs, COVID wards, vaccination centres and waiting rooms to prevent the transmission of coronavirus. As of now, this activity has reached to 11 states in India covering 46 hospitals.

- b. *As a part of process of strengthening the SAIF facility at Panjab University, MALDI Mass Spectrometer was successfully installed at the centre. This facility was inaugurated by the Hon'ble Vice-Chancellor, Panjab University, Chandigarh and Media has also covered this activity.*

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