



दूरभाष / Tel : 26962819, 26567373,
26562134, 26562122 (EPBAX)
फैक्स / Fax : 26569908, 26515637,
26863847, 26862418
वेबसाइट/website: www.dst.gov.in

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग
नई दिल्ली-110 016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
TECHNOLOGY BHAVAN, NEW MEHRAULI ROAD
NEW DELHI-110 016

No.Misc.1/13/2019-CDN

Dated 12.03.2021

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of February, 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 28.03.2021 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)

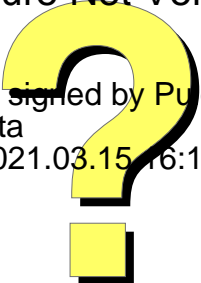
Copy with enclosures, forwarded to:-

- 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@ismgr.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. PSO to Secretary, DST. (anuj.tripathi@nic.in)
- xiv. AD (OL), DST for Hindi Translation (kn.singh65@gov.in)

Signature Not Verified

Digitally signed by Puok
Sengupta
Date: 2021.03.15 16:10:12 IST



Department of Science & Technology
Monthly Report
February, 2021

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

A. National Science Day Celebration:

1. National Science Day 2021 was organized at India International Centre, New Delhi on February 28, 2021 with Hon'ble Minister (S&T, ES and HFW) as Chief Guest and Secretary, DST Presided. Hon'ble Minister (S&T, ES and HFW) conferred **National S&T Communication Awards, Augmenting Writing Skills for Articulating Research (AWSAR) Awards, and SERB Women Excellence Awards.**
2. Hon'ble Minister (S&T, ES and HFW) also gave Rajendra Prabhu Memorial Shield for Appreciation in Science Media & Science Journalism, and Appreciation Shields for outstanding work in development of Science & technology Awards information Retrieval System (STAIRS), and outstanding work in development of S&T Database on Indian Origin Academicians.
3. Following National S&T Databases were released by Hon'ble Minister (S&T, ES and HFW) -
 - (i) S&T Awards in India
 - (ii) Indian Origin Academicians abroad
4. National Science Day was also celebrated across the country on February 28, 2021 with support from NCSTC, DST with activities like lectures, demonstrations, exhibitions, quiz programmes, etc. for students as well for the masses.

B. Science for Society

1. The Indian Council of Medical Research (ICMR) support Centre of Excellence in Heart Failure at the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMIST), along with the Heart Failure Association of India (HFAI), and the Indian Section of the International Academy of Cardiovascular Sciences (IACS) organized a virtual conference on "The Heart Failure Conflux". The conference brought together delegates from disciplines including clinicians, scientists, biomedical engineers, early career researchers and students from all over India to dwell on the major research areas of Heart Failure.
2. With the objective to strengthen dissemination of plant varieties, transplantation of grafted plants of *Sadabhar* Mango variety developed by grassroots innovator, was

carried out at Manipal University Jaipur, Rajasthan by National Innovation Foundation (NIF).

3. Orientation program by NIF was also organized on Scouting and Documentation of Grassroots Innovations for students in Chhattisgarh, Rural Women Training Workshop for Self Help Groups in Odisha and training for farmers in Meghalaya and Manipur on HRMN 99 apple variety.
4. Technology Information, Forecasting & Assessment Council has launched telemedicine demonstration project in association with IIT M for an inclusive reach to remote areas on a cost effective basis to provide quality medical care for women & children living in inaccessible/hilly terrain.
5. Marathi popular science articles were published in Krushival newspaper and The Wire (web portal) by Indian Institute of Geomagnetism (IIG). Articles on Uttarakhand flood tragedy and Global rise in temperature despite long lockdown was also published.
6. BioNest- Institute of Advanced Study in Science and Technology (IASST) organized an online Workshop on “Principles of Confocal Microscopy and its Biomedical Application.”

C. National Technology Mission

1. A total amount of Rs.269.50 crores has been released to 25 Technology Innovations Hubs (TIHs) under Recurring and Non-recurring heads established under National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS).
2. The 1st meeting of Inter-Ministerial Co-ordination Committee (IMCC) on National Mission on Quantum Technology & Application (NM-QTA) was held on 3rd February 2021 at NITI Aayog, New Delhi under the chairmanship of Shri Amitabh Kant, CEO, NITI Aayog. The agenda of the meeting was to evolve strategy to connect Mission and its Technology Innovation Hubs to the line ministries, PSU's and Industry.

D. Technology Development

1. LiFePO₄ (LFP) electrodes of 45m length were prepared by International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) using ARCI's indigenously developed LiFePO₄ powders. Li-ion cell made of Indigenous LFP electrode as cathode and commercial graphite as anode was also fabricated and cell validation is initiated. Li-ion cell made of Indigenous Lithium Titanate (LTO) electrode as anode and commercial NMC as cathode was fabricated and cell validation is in progress.
2. ARCI also developed at lab-scale, a low-temperature processed TiO₂ nanoparticles

based electron transport layer (ETL) for perovskite solar cell applications. 10% efficiency was obtained, which is comparable with the high temperature processed ETL.

3. 57th meeting of Standing Scientific Research Committee (SSRC) chaired by Secretary, Ministry of Coal was held to discuss New & Ongoing S&T proposals and thrust areas on future research related to the coal mining and other allied activities.
4. In the 21st Meeting of Project Appraisal and Approval Committee, CPCB, new projects were considered and ongoing projects were reviewed.
5. A meeting was held with Experts from IIT Kanpur, IIT Roorkee, IIT Delhi & NIT Warangal to discuss on Mission Innovation IC1: Smart Grids Achievements, ongoing activities and MI:2.0 Power Mission.
6. Review of project on Compatibility of fueling infrastructure materials with dimethyl ether and diesel blends.
7. Review of project on Development and Demonstration of Polymer Electrolyte Membrane (PEM) Based Electrochemical Methanol Reformer (ECMR) for Hydrogen Production.
8. Review of project on Effective Utilization of Methanol and Di-Methyl Ether (DME) in an Automotive Engine Using Advanced Combustion Modes.
9. Review of project on Methanol-diesel dual fuel engine for stationary applications.
10. Review of project on Design and Development of a Membrane Reformer Prototype for Production of Ultra-Pure Hydrogen from Methanol for Fuel Cell Based Vehicle and Power Generators.
11. Review of project on Technology Development for Utilization of Methanol in SI and CI engines.
12. Review of project on Development of an Electronically Controlled High Performance Hot Surface Ignition Engine Running on Methanol for Automotive Applications.
13. Review of project on Development and evaluation of catalyst for production of DME from Dehydration of Methanol.
14. Review of project on Landfill Fire Control Mechanism through Integrated Approach.
15. Review of project on Technical Resource Unit for validating the technologies deployed for mitigating ambient air pollution.
16. Review of project on Mitigation of Air Pollution: Micro-to-Macro Scale Study of Particle Capture by Liquid Droplets.
17. An Interaction Meeting held with BHEL, Hyderabad to discuss on ongoing activities

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 project.

18. Review of project on an Integrated and Collaborative India-US Research program: Improving Building Energy Efficiency (IBEE).

E. International Cooperation

1. Participated in the 13th Joint Steering Committee on Science and Technology Cooperation meeting between the European Union (EU) and India held virtually on **12th February, 2021**. The Director-General for Research and Innovation of European Commission (EC), Mr Jean-Eric Paquet, represented the EU and the Secretaries of Departments of Science and Technology (DST) & Biotechnology (DBT) represented India.
2. A meeting was held with officials from European Commission, UK and global covenant of Mayors to discuss on MI 2.0 cities mission research & innovation activities and future plans.
3. A meeting was held with officials from European Commission, UK, Sweden and UAE to discuss ongoing activities and future roadmap of MI 2.0: IC 7 - Affordable heating and cooling of buildings.
4. **India-Brazil S&T Cooperation:** A high-level delegation led by the Brazilian Minister for Science, Technology and Innovation H.E. Mr. Marcos Cesar Pontes visited India and met Dr. Harsh Vardhan, Union Minister for Health and Family Welfare, Science & Technology and Earth Sciences. Senior officials from different science and technology departments/ ministries were also present during the meeting.

Both sides discussed the wide range of scientific and technical issues and possible collaboration at bilateral level and multilateral platform such as BRICS. Indian side informed that a series of scientific events have been planned which will be steered and coordinated by India as Chair of BRICS in 2021. India showed its willingness to collaborate with Brazil in the key areas such as Health, drugs and vaccine for COVID-19; Medicines and vaccines, Biotechnology, Energy, Nanotechnology, ICT, Artificial Intelligence (AI), Cyber security; Monitoring of Biomes and Agriculture areas, Oceans, Water Quality, Air Quality and Atmospheric Pollution by satellite; development of Earth System Modelling for weather forecasting & Climate Change etc. Both sides consented that mobility of researchers is key for success of any collaboration. Both sides agreed that project-based mobility of researchers, students' needs to be increased to build long term strategic collaboration and networking among the

scientists and research organization of both sides. Both sides expressed satisfaction over the ongoing collaboration in the fields of science, technology, and innovation.

5. **India-Israel Industrial R&D and Technological Innovation Fund:** Under the India-Israel Industrial R&D and Technological Innovation Fund, a total of 09 projects were received in Healthcare, Information & Communication Technologies (ICT), and energy under the 6th joint call for proposals. Out of these 9 projects, five were recommended for support in principle. The due diligence meeting of these five projects was held in February for the final recommendation to support.
6. **India-USA Strategy and Planning Group meeting:** Strategy and Planning Group meeting to advance U.S.-India cooperation in AI and Smart & Connected Communities was held on February 26, 2021. The officers of DST, PSA office, NITI Aayog, and MEA from the Indian side and U.S. National Science Foundation, U.S. Department of Energy, U.S. National Institute of Standards and Technology, White House Office of Science and Technology Policy, Office of Science and Technology Cooperation, U.S. Embassy in New Delhi and Indo-US Science and Technology Forum from US side attended this meeting.

In the online meeting two points were discussed (i) A vision and scope for the expansion of U.S.-India science and engineering research collaborations in areas of national priority for both nations, with an initial focus on the nexus of artificial intelligence and smart and connected communities; and (ii) A framework or shared understanding of how to work together to enable multiple U.S. and Indian government agencies and non-governmental partners to leverage respective strengths and build upon and augment bilateral community visioning discussions [e.g., through the Indo U.S. Science and Technology Forum (IUSSTF) AI Partnership] to ensure more impactful and efficient bilateral research collaborations.

7. **IUSSTF Financial Review Meeting:** Indo-US Science and Technology Forum (IUSSTF) Financial Review meeting was held online on February 2, 2021 to review the financial statements of the Forum. The Co-chairs were Mr. Vishvajit Sahay, Additional Secretary and Financial Adviser, Department of Science & Technology from Indian side and Dr. Mark Coles, Senior Advisor, National Science Foundation, Washington, D.C. from the US side. The Committee reviewed the documents and discussions were held on review of the status of the criteria for Extramural Programs (EMPs) and IUSSTF's proposal of spending of EMP reserves for new programs. Committee also discussed the issue of getting utilization statements from its grantees on time.
8. **IGSTC Finance Committee (FC) meeting:** The 5th FC of the IGSTC convened by the Director, IGSTC, was held online on 23rd February 2021. FA, DST is the Co-

Chair representing the Indian side while the German Co-Chair of the FC is Dr. Gerold Heinrichs Head of Division, DLR-PTT.

The Finance Committee discussed on various issue of IGSTC such as regarding increasing the project cost support of Indian side, increase of funding limit to the Indian industrial partner, provision for Director's fund of certain amount for quick supports and moving of the new office building to Delhi. The recommendations of FC are under consideration of the Governing Body (GB) meeting scheduled in March 2021.

9. **Indo-Japan Joint Laboratories:** A joint online meeting between DST, India, and JST, Japan was held on 15th February 2021 to discuss the Phase 2 implementation of the Indo-Japan Joint Laboratories and its expected targets. Phase 1 of this project will be completing 5 years in 2022. Three Indo-Japan Joint Laboratories in the areas of (i) Architecting Intelligent Dependable Cyber-Physical System Targeting IoT and Mobile Big Data Analysis, between The University of Tokyo and IIT Bombay; (ii) Security on the Internet of Things Space, between Kyushu University and IIT Delhi. (iii) Data Science-based Farming Support System for Sustainable Crop Production under Climatic Change, between the University of Tokyo and IIT Hyderabad, is being supported by DST and JST.
10. **First Meeting of the BRICS Sherpa:** The International Cooperation (IC) division of DST presented the Concept Note of BRICS Action Plan 2021-2024 at the first meeting of the BRICS Sherpa held virtually on 24th February, 2021 and coordinated by MEA, New Delhi.
11. **Thirty Meter telescope Observatory member meeting:** An international Observatory member meeting of the TMT (Thirty Meter telescope) was held on 24th February 2021. India is one of the members of this mega-science project. The meeting was focused on shared contributions and commitments for the site (primary and back-up), funding, time of completion, and other logistics to complete the project. All members (US, Canada, Japan, China, India, and UC-USA) showed their commitment and support for this project. The Indian side also expressed keen interest to be a part of the project and for a contribution towards the TMT.

F. Human Capacity Building

1. **INSPIRE Awards-MANAK:** State Level Exhibition and Project Competition (SLEPC) was organized by 33 States/UTs/KVs/JNVs. Out of these, 557 have been selected for National Level Exhibition and Project Competition (NLEPC). 507 students participated in Mentoring and Prototype Development Workshops.
2. **Vigyan Jyoti:** Secretary, DST launched 2nd year of Vigyan Jyoti on the occasion of 'International Day of Women and Girls in Science' on 11th February, 2021 in the

presence of Commissioner, Navodaya Vidyalaya Samiti. The programme is now expanded in 100 districts of the country. DST Officials, Vigyan Jyoti Team, Deputy Commissioners, Asst. Commissioners, Principals and nodal officers of 100 JNVs had participated in this virtual launch function. Students also viewed this programme through live YouTube streaming.

Special Online Classes: In this month, 24 online classes for Class XII students and 30 classes for Class XI students had been conducted to give them more clarity of concepts and skills to face the competitive examinations.

3. **Women Scientists Scheme:** During February, Grants for 61 projects under WOS-A and WOS-B programmes, were released.
4. **SATYAM:** 13 Sanctions were issued under SATYAM-Special Call to combat with Covid-19 pandemic.
5. About 150 Ph.D. students continued their research work in different mega science projects. 10 research publications and 3 Ph.D.s emerged from mega projects. 5 Talks were given by Indian researchers in National/International events for ALICE project. Also, 2 webinars and 1 outreach activity were organized. A total of ten science and technology reports were published by Indian researchers towards CBM experiments of FAIR.
6. **Innovation in Science Pursuit for Inspired Research (INSPIRE) Scheme:**

INSPIRE Internship

- Two INSPIRE Internship Science camp reports were settled.

Scholarship For Higher Education (SHE):

- 4217 SHE scholars received their scholarship for pursuing B.Sc./M.Sc. Degree course in basic and natural sciences.
- 28 SHE scholars received their mentorship grant for Summer Internship while pursuing B.Sc./M.Sc. Degree course in basic and natural sciences.

INSPIRE Fellowship:

- 319 INSPIRE Fellows received their fellowship for pursuing their doctoral degree programme.
- 354 INSPIRE Fellows were upgraded from JRF to SRF.
- INSPIRE Fellowship 2020 Level-1 Evaluation, 1st Meeting was organised on 27.02.2021 at ARCI, Gurgaon. In this meeting more than 1400 applications were considered for Level-1 Evaluation.
- INSPIRE Fellowship-2019 Level-2 evaluation Result of 361 applicants was de-

clared and displayed on the DST INSPIRE website.

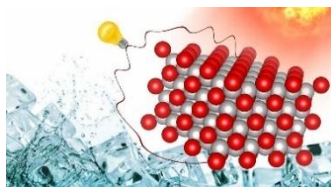
- Final Offer letter of INSPIRE Fellowship-2019 was issued to 239 selected INSPIRE Fellowship candidates.

INSPIRE Faculty Fellowship:

- 52 INSPIRE Faculty Fellows' Fellowship was released for pursuing their Post-doctoral programme.
7. National database on Indian Origin Academician Abroad was finalized and launched during National Science Day celebrations on **28th February, 2021**.
 8. National database on S&T Awards Information and Retrieval System (STAIRS) was finalized and launched during National Science Day celebrations on **28th February, 2021**.

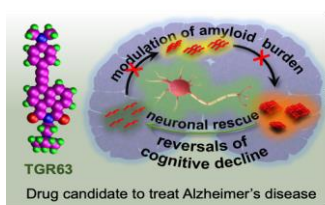
G. Scientific Infrastructure Building

1. It was shown by Bose Institute (BI) that a simplistic partonic energy loss mechanism and recombination of core and corona string segments at intermediate transverse momentum followed by hard-soft re-scatterings in the hadronic phase can qualitatively explain the jet shape broadening in heavy ion collisions.
2. Suaeda nudiflora (Willd.) Moq. (Chenopodiaceae), a mangrove associate and ethno-medicinal herb of Indian Sundarbans, was investigated as a promising source of bioactive compounds by BI.
3. A new parameter (B+), which quantitatively measures the segregation of binary stars in a cluster, was defined by Indian Institute of Astrophysics (IIA). This parameter was calculated for 23 open clusters and evidence of segregation of binaries more massive than 1 Msun for clusters as young as 250 Myr was found and the extent of segregation was observed to increase with the age of the cluster.
4. The 50 cm telescope was tested for its pointing and tracking at Leh by IIA and the same was transported to Indian Astronomical Observatory (IAO), Hanle.
5. A team of astronomers at Aryabhata Research Institute of Observational Sciences (ARIES) have reported one of the strongest flares, using the observations from ARIES one meter class telescopes, from a feeding supermassive black hole or blazar called as BL Lacertae some 10 million light years away.
6. Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) developed material to tap waste heat generated by appliances and reuse it. A new material, Silver Antimony Telluride, can facilitate energy conversion.



A representative image demonstrating thermo-electric effect.

7. JNCASR also developed a small molecule (TGR63) that disrupts the mechanism through which neurons become dysfunctional in Alzheimer's disease (AD). The molecule could be a potential drug candidate to halt or cure the leading cause of dementia.



8. Experimental and theoretical investigations at Raman Research Institute (RRI) on the effect of microwave controlled atomic ground state coherence on the phase-dependent amplification (PDA) of an optical probe field led to a novel, hybrid-PDA that can be potentially used to trade-off amplification for bandwidth during the transmission of phase coherent classical and quantum information.
9. Researchers at Raman Research Institute have experimentally demonstrated binary phase-shift keying and multi-stage four-phase shift keying of a microwave carrier and its corresponding demodulation in the optical regime using room temperature Rb atoms. The ground states used in this scheme are quantum memory storage spin states, which makes it inherently suitable for applications involving communication and storage and retrieval of quantum signals.
10. Structural reorganization of lipid molecules, which are the building blocks of a cellular membrane, were demonstrated in presence of graphene oxide flakes by S N Bose National Centre for Basic Sciences (SNBNCBS). Analysis of Magnonic crystals with complex geometry was also carried out at SNBNCBS.
11. Wadia Institute of Himalayan Geology delineated P-T-t-fluid evolution and its tectonic implications of the Karakoram terrane using petrological data, fluid inclusion and U-Pb zircon geochronological aspects of the garnet-bearing amphibolites. WIHG also detected geological features such as faults and chimneys based on multi-seismic attribute computations and artificial neural networks in the highly deformed and complex Krishna-Godavari offshore basin.
12. An improved purple potato variety for Late blight (*Phytophthora infestans*) disease

resistance and biochemical / processing traits and Wheat variety, for high grain yield were validated by National Innovation Foundation (NIF).

13. Proposals and applications were solicited from women researchers for consideration under Promoting Opportunities for Women in Exploratory Research (POWER) Fellowships by Science and Engineering Research Board (SERB) and 25 women researchers were recommended for award of POWER Fellowship. Thirty proposals were also recommended for support under Scientific and Useful Profound Research Advancement (SUPRA) Scheme of SERB.
14. Different project activities for establishment of Facility for Antiproton and Ion Research (FAIR) and India-based Neutrino (INO) continued. Regional Worldwide Large Hadron Collider Computing Grid (WLCG) Tier-2 facilities continued working round the clock.

Different project activities for Thirty Meter Telescope (TMT) project involving 4 R&D labs and 15 Indian industries continued.

15. **Fund for Improvement of S & T Infrastructure in Universities and Higher Educational Institutions (FIST):** The minutes of the 25 FIST Advisory Board (FISTAB) Meeting were finalized and approval obtained from Secretary, DST. FISTAB approved Rs 79.335 crores for 5 years duration for 86 Proposals in different subject areas from various academic institutions, Universities and PG Colleges for Scientific Infrastructure Building. The FIST Advisory Board Meeting (FISTAB) deliberated on various policy issues for focusing on supporting interdisciplinary problems, solution-centric and translational research, and increasing the scope for participation of industries and start-ups and new ideas, aiming towards Atmanirbhar Bharat.
16. **Promotion of University Research and Scientific Excellence (PURSE):** The minutes of the Eleventh Meeting of the Programme Management Board (PMB) on PURSE were finalized and approved by Secretary, DST. The PMB recommended four proposals for strengthening the research ecosystem in the University System with varying quantum of funds. The Award letter along with the revised Terms and Conditions have been communicated to the Universities for obtaining the requisites documents for processing the case for releasing the PURSE Grant.
17. **Sophisticated Analytical and Technical Help Institutes” - (SATHI)**
 - The minutes of 4th & 5th Expert Committee meeting of Sophisticated Analytical and Technical Help Institutes (SATHI), held on 17th December 2020 & 04th January 2021 respectively through VC, have been finalized and approved by Secretary, DST.
 - The 16th "SATHI Ki Baat" Meeting was held virtually on 18th February 2021, 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 catalogue / brochure of SATHI facility after incorporating the logo of SATHI, web hosting address, purchased / installed / commissioned equipment at dedicated building(s) of SATHI, updated FY papers, its carry-forward permission and Section-8 company formation/ formation.

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

Two webinars on Mass Spectroscopy were organized in month of February 2021 by SAIF Centre at IIT Bombay to make researchers and users aware of the facilities.

19. MoU between Govt of Odisha and Survey of India signed on 05-02-2021 for Drone based Large Scale Mapping of rural abadi area for 51,710 villages and Establishment of CORS network comprising approx. 48 stations in a period of 48 months.