

STRIDES

Science, Technology, Research, Innovation & DEvelopmentS

BRINGS NEWS ON S&T DEVELOPMENT FROM DST SUPPORT AND BEYOND

EDITORIAL

FROM HEAD OF DST MEDIA CELL

Strength of a policy rests upon the range of people it can cater to. The new Science Technology and Innovation Policy STIP 2020, which is now being formulated, revolves around the core principles of being decentralized, evidence-informed, bottom-up, experts-driven, and inclusive. A major step has been taken in this direction with the Union Minister for Science and Technology, Earth Sciences, Health and Family Welfare, calling on people to participate in the formulation of a people-centric STIP 2020. He made this public participation call at the launch of 'In Conversation With' -- a series of exclusive interactions with thought leaders from across the country on STIP 2020.

This newsletter covers this major event, which is followed by two events in which the Minister engages with the State S&T Ministers and other state representatives and with the scientific diaspora.

In parallel, the Department of Science and Technology (DST) continues with its background support with the research, development, and innovation for COVID 19 along with the associated institutions carrying on their research and development to keep pace with all requirements of the country, despite challenges they faced. The newsletter covers these developments in the multiple disciplines of science that DST encompasses.

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

COVER STORY



DR. HARSH VARDHAN CALLS FOR PUBLIC PARTICIPATION IN FORMULATING STIP 2020

Union Minister for Science & Technology, Earth Sciences, Health & Family Welfare Dr. Harsh Vardhan invited stakeholders and the public at large in the country and abroad to participate in formulating an evidence-driven, inclusive Science Technology and Innovation Policy (STIP 2020) for the country. He said that it would bring about technology indigenization to become self-reliant, mainstream traditional knowledge systems with conventional R&D, strengthen industry-academia, government interconnectedness and promote equity.

Dr. Harsh Vardhan was speaking at the inauguration of 'In Conversation With' - a series of exclusive interactions with thought leaders from across the country and Indian Diaspora on STIP 2020, which is being formulated. He also launched the 'STIP 2020 Page on MyGov Portal' along with 'popularization Quiz for school children' on 28th August 2020 in a virtual event here.

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From Head of DST Media Cell

Covid News Highlights

INSIDE THE E-NEWSLETTER

Popular Science Stories

Meet the Scientist

Cover Story

DST Overseas

New Initiatives

COVID NEWS HIGHLIGHTS

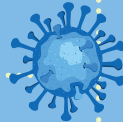


DST OVERSEAS

DST Secretary highlights digital transformation opportunities that emerged from COVID 19 disruptions

Secretary, DST, Professor Ashutosh Sharma, emphasised that the future is all about convergence of digital technologies and that COVID 19 virus has provided the country opportunity to be part of the change rather than resisting it, at webinar on Digital Transformation in COVID 19.

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JNCASR scientists devise adaptive model to estimate & strategize critical resources in pandemic

Scientists from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute under Department of Science & Technology, Government of India, and Indian Institute of Science (IISc), have developed a model to address this problem using an adaptive strategy and the early phase of COVID 19 as an example.

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Bangalore based startup brings mobile app for detection & risk assessment of COVID 19 infected individuals

CAWACH, an initiative by DST, has selected Bangalore based startup Acculi Labs to develop a COVID risk assessment profile called Lyfas COVID score. Acculi Labs is armed with 'Lyfas' a clinical-grade, non-invasive, digital functional biomarker smartphone tool for screening, early detection, root cause analysis, acute event risk assessment, prognosis, and home monitoring of chronic diseases which they have repurposed to Lyfas COVID score.

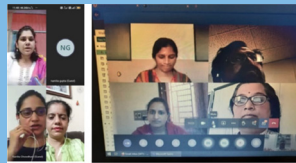
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ARCI & Vehant Technologies co-develop UV System for baggage Scan Disinfection to fight COVID 19

Both domestic and international travel has been a major reason for spread of the COVID 19 infection. Baggage, an inevitable part of travel involves handling by multiple people and can be contact points for spread of the virus and should be disinfected quickly each time they change hands. With increase in the passenger traffic at airports, railway stations and commercial establishments during the post-lockdown period, there is an immediate necessity for a rapid system for the baggage disinfection within few seconds to effectively fight against COVID 19.

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DST reaches out to women scientists facing challenges during COVID 19

The pandemic and associated lockdown has affected people in different ways. Due to closure of institutions, woman scientists specially those working on projects to address societal challenges through S&T solutions, have been facing several challenges in carrying out fieldwork, data collection, surveys required in their projects and other administrative issues such as timely documentation, the release of fellowships and so on. Keeping their needs in mind, KIRAN division DST held an online interaction meeting with these women scientists to help them overcome the challenges.

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TIFAC thinking beyond: A small effort to big leap towards Atma Nirbhar Bharat

TIFAC, a technology think tank under DST has recently brought out a white paper on Focused Interventions for 'Make in India': Post COVID 19 based on the theme to "Provide Local Solutions for Global Challenges". This white paper captures sector-specific strengths, market trends, and opportunities in five (5) sectors, critical from country's perspective, include healthcare, machinery, ICT, Agriculture, manufacturing, and electronics with reference to supply and demand, self-sufficiency and production capacity of technologies.

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India-European Union Agreement on Scientific and Technological Cooperation renewed for next five years (2020-2025)

India and European Union have renewed its Agreement on Scientific and Technological Cooperation for the next five years (2020-2025). This has been done by exchange of Note Verbale between two sides. The Agreement was initially signed in on 23 November 2001 and renewed two times in past in 2007 and 2015.

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India-Canada IC-IMPACTS Annual Research Conference discussed ways of taking cooperation to new level

India-Canada IC-IMPACTS Annual Research Conference discussed ways of taking the cooperation between the countries to the next level by strengthening existing international connects, sharing best practices in multiple areas, and initiating new collaborations in government and institutions.

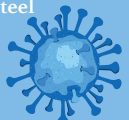
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Ministerial meeting of Indo-US Strategic Energy Partnership highlight major accomplishments, prioritizes new cooperation areas

A virtual ministerial meeting of the U.S.-India Strategic Energy Partnership (SEP) to review progress, highlight major accomplishments, and prioritize new areas for cooperation was co-chaired on July 17, 2020 by U.S. Secretary of Energy Dan Brouillette and Indian Minister of Petroleum and Natural Gas and of Steel Shri Dharmendra Pradhan.

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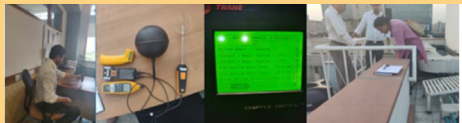


Figure 1: Thermal parameters being measured during Comfort Audit of Radiant Cooled Buildings

Shadesmart & Radiant Cooling technologies supported by DST promotes energy-efficient cooling in buildings

Indian building sector has realized the importance of energy efficiency; it is yet to be effectively integrated in the construction industry. Smart, dynamic shading devices to keep rooms cool in climate zones and latitudes of India and low energy technologies for air-conditioning can help progress towards energy efficiency in the country, a large part of which experiences high-temperature conditions.

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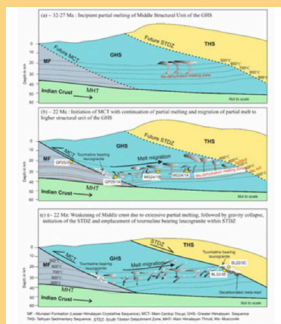


Figure 2: Carbon showing different stages of tectonic evolution of the Himalayas

Localized strain and partial melts in shear zones may control seismicity in Kumaun Himalaya

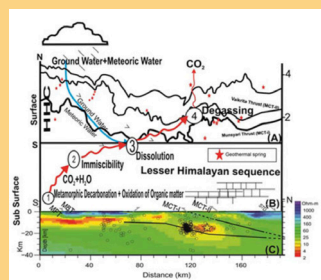
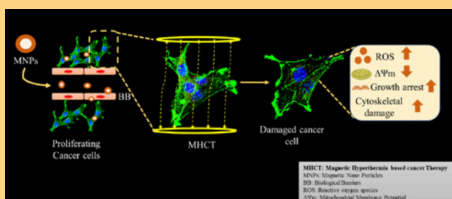
A study by the Scientists from Wadia Institute of Himalayan Geology, Dehradun an autonomous institute under the Department of Science and Technology (DST), Govt. of India suggests that, unlike other parts of the western Himalaya, in Kumaun, partial melting of the crust is caused by activation of a tabular to sheet-like, planar or curvilinear zone composed of rocks that are more strained than rocks adjacent to the zone (major shear zones), instead of continuous zone of mid-crustal partial melts.

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INST efforts to make magnetic hyperthermia-mediated cancer therapy as desired therapy for inoperable tumours

Scientists from Institute of Nano Science & Technology an autonomous institute of Department of Science and Technology (DST), Government of India have synthesised different magnetic nano-transducers like Stevioside-coated magnetite nanoparticles; Citric acid-coated Magnetic nanoclusters and Manganese and Zinc doped magnetite nanoparticles for successful application as magnetic hyperthermia agents for cancer therapy.

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Himalayan Geothermal Springs release huge amount of carbon dioxide in the atmosphere

Carbon outflux from Earth's interior to the exosphere through volcanic eruptions, fault zones, and geothermal systems contribute to the global carbon cycle that effects short and long term climate of the Earth. Himalaya hosts about 600 geothermal springs having varied temperature and chemical conditions. Their role in regional and global climate, as well as the process of tectonic driven gas emission, needs to be considered while estimating emissions to the carbon cycle and thereby to global warming.

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NEW INITIATIVES

- ▶ India-Israel Industrial R&D and Technology Innovation Fund (I4F)
- ▶ Invitation of proposals for PURSE scheme
- ▶ India-Russia Joint Technology Assessment and Accelerated Commercialization Programme Call for Application from Indian Techno-Entrepreneurs
- ▶ DST Jointly launches Accelerating CCUS Technologies (ACT) Call
- ▶ DST-NWO relaunches "Cleaning Ganga and Agri Water" Call with revised timelines

▶ DST Secretary highlights importance of industry participation in Quantum Technology & Science in India at ASSOCHAM webinar

▶ INST scientists develop simple economical nonsurgical prevention of cataract

▶ IIA scientists discover He-enhanced cool bright stars among the metal-rich parts of Omega Centauri globular cluster

▶ Equipment-free, a simple paper-strip based naked-eye fluoride ion detection and quantification kit in drinking water to evade Fluorosis-based disorders

▶ SNBNCBS develops a No-touch & Painless device for non-invasive screening of bilirubin level in new-borns

▶ Women ranging from college going students to middle-aged housewives prepare for entrepreneurship journey

▶ Webinar on Popular Science Writing reaches across India & beyond its borders

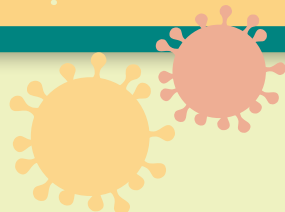
▶ Seismicity study of Arunachal Himalaya reveals low to moderate earthquakes at 2 crustal depths

▶ Bangalore based researchers synthesize durable, efficient, cost-effective catalyst for sustained & efficient Hydrogen Evolution

▶ Slanted titanium dioxide nanorods can form efficient self-cleaning surfaces

▶ Asian elephant cubs show handedness in trunk behaviour earlier than adult usage of trunks

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MEET THE SCIENTIST

PROFESSOR GIRIDHAR U. KULKARNI



FNASc, FASc, FAPAM President, Jawaharlal Nehru Centre for Advanced Scientific Research

Professor G. U. Kulkarni, President, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) is internationally known for pioneering contributions to several areas of Materials Chemistry ranging from synthesis of metal nanocrystals having unusual structures and functions to the development of 2D as well as 3D nanopatterns based on these nanomaterials and towards their translation as real devices. His research bridges the perennial gap between fundamental research and technology development which is evident from the large number of articles he has published in journals of international repute, the patents he holds, and technologies he developed.

He made substantial contribution to the scientific ecosystem of India in the form of value-added products in nanotechnology, which include physiotherapeutic strain sensors, exhaled breath monitoring devices, metal nanowire network coatings in optoelectronic applications, and the latest being a self-powered face mask in the context of Covid 19 – a contemporary contribution by raising to the national needs. His scientific journey in this path is rather unique. From designing of active materials to demonstrable prototypes, he chooses the inventive steps carefully, keeping in mind the scalability, while constantly addressing the challenges faced by the present technologies. Indeed, Prof. Kulkarni's group sets a fine example of taking laboratory-based inventions to high-end nanotechnology products.

A Professor of the Chemistry and Physics of Materials Unit, JNCASR and Director (In-charge) at CeNS, Bangalore, he is the recipient of several national and international awards. Some recent ones include Materials Research Society of India-Distinguished Lectureship Award (2019-20), The Prof. C.N.R. Rao National Prize for Chemical Research-2020 by CRSI, Raja Ramanna State Award 2018, SASTRA-CNR Rao Award for Excellence in Chemistry & Materials Sciences, 2019-20, MR-SI-Distinguished Lectureship Award, 2019-20, Bangalore Nano National Award 2012, MRSI-ICSC Superconductivity and Materials Science Annual Prize-2011. He is a Fellow of the National Academy of Sciences, Allahabad, Indian Academy of Sciences, Bangalore and Asia Pacific Academy of Materials (APAM). He has held visiting and adjunct positions at Cardiff University, Tokyo University, TASC-INFM, Trieste, Scuola Normale Superiore, Pisa, while being a recipient of International Senior Fellowship of University of Bayreuth 2016-19, Adjunct Research Professorship 2009-11, Birck Nanotechnology Centre, Purdue University, USA. Prof. Kulkarni is also the Editor-in-Chief of Bulletin of Material Science (BOMS) since 2017.

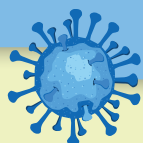
FEATURED INSTITUTION



CeNS surges ahead with COVID solutions & novel nano- and soft- functional materials.

The Centre for Nano and Soft Matter Sciences (CeNS) engaged in materials research at all relevant length scales, with current focus on a variety of metal and semiconductor nanostructures, liquid crystals, gels, membranes and hybrid materials has recently contributed significantly to the COVID 19 challenge. When the whole world was –debating about the effectiveness and breathing comfort of face masks to fight COVID 19 effectively, its innovation attracted headlines for their uniqueness.

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