

STRIDES

Science, Technology, Research, Innovation & DEvelopmentS

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

EDITORIAL

FROM HEAD OF DST MEDIA CELL

As the New Year progresses with new hopes and aspirations, DST prepares for bouncing back to make the new normal a better one. The action agenda prepared by the Technology Information Forecasting and Assessment Council (TIFAC) defining the overarching policy recommendations with reference to technological inputs, focusing towards local to global, thereby reviving Indian economy, was released. After the draft National Science Technology and Innovation Policy guided by self-reliance vision to position India among top 3 scientific superpowers was released to the public for their comments, a series of post-draft consultations were launched. These consultations brought some of the best minds together, who provided some of their deepest thoughts to strengthen the policy.

Despite the pandemic, scientific work has continued, and this was evident from the brilliant researches in areas ranging from astronomy, nanostructures, cancer therapy, heat-tolerant wheat variety to mathematics. Technology Transfer Agreements were signed too. This issue of the newsletter captures some of them. The newsletter also features the Satyendra Nath Bose National Centre for Basic Sciences (SNBNCBS), an autonomous institute of the Department of Science and Technology and its Director in an issue that reflects an ambitious scientific future for the country.

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

COVER STORY



DR HARSH VARDHAN RELEASES ACTION AGENDA FOR ATMA NIRBHAR BHARAT (AAAN)

Union Minister of Science and Technology, Earth Sciences Health & Family Welfare Dr. Harsh Vardhan, released the Action Agenda for AAAN that defines overarching policy recommendations with reference to technological inputs, focusing towards local to global thereby reviving Indian economy, on 29th December 2020.

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DRAFT 5TH NATIONAL STIP GUIDED BY SELF-RELIANCE VISION TO POSITION INDIA AMONG TOP 3 SCIENTIFIC SUPERPOWERS

The 5th National STIP finalized and available for public consultation is guided by the broad vision of achieving technological self-reliance and positioning India among the top three scientific superpowers in the decade to come, to attract, nurture, strengthen and retain critical human capital through 'people-centric' science technology and Innovation Ecosystem.

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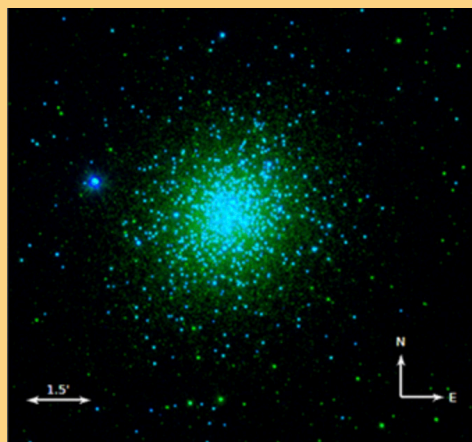
From Head Of DST MEDIA CELL
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Latest News Highlights

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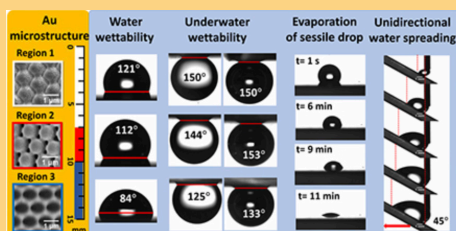
Meet the Scientist
Featured Institution



Astrosat's Ultraviolet Imaging Telescope spots rare ultraviolet-bright stars in a massive intriguing cosmic dinosaur in the Milky Way

Astronomers exploring the massive intriguing globular cluster in our Galaxy called NGC 2808 that is said to have at least five generations of stars have spotted rare hot UV-bright stars in it. These stars whose inner core is almost exposed, making them very hot, exist in the late stages of evolution of a Sun-like star.

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Scientists develop gold microstructure substrate with tunable wettability useful in water transportation & self-cleaning

Scientists have developed a gold microstructure substrate with the ability to repel water as well as bubbles with tunable wettability, which can be used in designing microfluidic devices, biosensors and useful in water transportation and self-cleaning.

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Technology Transfer Agreements to bring country's first indigenous device for correcting ballooning of brain arteries & device for healing of heart hole

Indians will soon have access to the country's first indigenous flow diverter stent for diverting blood flow away from localized ballooning of arteries in the brain and a device that promotes better healing of the hole in the heart.

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DST INSPIRE faculty from Chennai working on alternative anti-cancer therapy using transgenic zebrafish

Scientists are exploring an alternative anti-cancer therapy that involves targeting tumor generated the formation of new blood vessels which allow the delivery of oxygen and nutrients to the body's tissues, technically called angiogenesis.

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INSPIRE Faculty fellow's engineering of heat-tolerant variety with increase in grain yield may improve wheat productivity

We may soon have a wheat variety that does not lose its productivity under heat stress. Heat stress causes a dramatic reduction in yield and quality loss of wheat, the food crop that nurtures more than one-third of the world population.

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New findings on conjectures used in number theory with significance in cryptography on the cards

Interesting new findings on theoretical speculations in number theory may soon emerge from India. Scientists are working on new cases of Stark conjectures, hypothetical information about the leading terms of L-functions in number theory.

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Scientists found clue to anomalous behaviour of self-propelled particles like fish schools & flocking birds

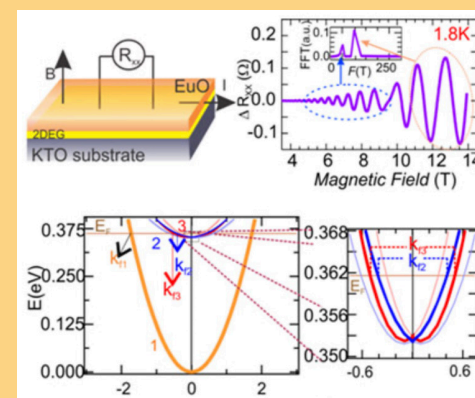
This understanding can be useful in nanotechnology applications like building small-scale energy-efficient bio-devices as well as biomedical applications like characterizing infection spreading in organs, antibiotic resistance and so on.

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Ultra-high mobility electron gas produced can increase information transfer speed & data storage density in quantum devices

Scientists have produced electron gas with ultra-high mobility, which can speed up transfer of quantum information and signal from one part of a device to another and increase data storage and memory.

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New technology can make power generation from waste steam more efficient



Waste steam from industrial processes could be a significant source of power if the variability of steam pressure and flow can be corrected. A new technology developed by scientists has introduced a method of correcting such pressure and flow inconsistencies.

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Liquid crystal-nanoparticle composites with nanoparticles synthesized from biowaste can reduce power consumption of display devices

Scientists have prepared liquid crystal - nanoparticle composite materials using nematic liquid crystal and nanoparticles synthesized from biowaste, which has the potential to reduce the power consumption of display devices such as liquid crystal displays, mobiles, and laptops.

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Plans afoot to increase interaction between journalists and scientists: DST Secretary

Calling for more space of science stories in the media, Secretary DST Professor Ashutosh Sharma highlighted plans to increase interaction between journalists and scientists so that the former can understand the work of scientists and the impact it could bring on society, at an interview in an audio-visual media.

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Scientists find clues on how some stars shed their outer layers

Scientists have found clues to

the mystery behind the strange characteristics of hot stars at a certain stage of evolution called Horizontal Branch Stars that are bright in ultra violet light and explored how they shed their outer layers.

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Scientists found new efficient method of producing disinfectant hydrogen peroxide

Scientists have found an efficient and inexpensive method for producing hydrogen peroxide, the chemical that has uses ranging from environmental, surgical and oral disinfection to propellant in rocketry.

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Complexity in science can be navigated using common sense: DST Secretary at ICMN



Secretary, DST, Prof Ashutosh Sharma, stressed that complexity in science can be navigated by using common sense and that it is important to relate research to larger questions of life, at the International Conference on Multifunctional Nano Materials (ICMN 2020).

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COVID-19 STORIES

Mathematical model provides roadmap to steer between damage to life & economy in a pandemic like COVID-19

Scientific study has now revealed the effectiveness of a sharp lockdown followed by a gradual release in containing a pandemic situation. Not only that, scientists have also

prescribed a roadmap of when to impose lockdown and by how much.

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Technology based startups played a crucial role in converting India from importer to second largest manufacturer of PPEs

A range of low cost innovative technologies developed and scaled up by start-ups from different corners of the country played a crucial role in India emerging globally as a the second largest PPE manufacturer in the world's battle against COVID-19.

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INTERNATIONAL

Newer ways of cooperation between countries need to be reimagined to face post COVID challenges: Dr. Harsh Vardhan at IISF

Union Minister for Science & Technology and Earth Sciences, Health & Family Welfare Dr. Harsh Vardhan underlined that there are several challenges that the world is getting ready to face in the post COVID era.

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Scientific collaborations are increasing & many were set up to fight the pandemic: Dr. Harsh Vardhan at IISF

Union Minister for Science & Technology and Earth Sciences, Health and Family Welfare, Dr. Harsh Vardhan, highlighted that India would play a major role in making COVID-19 vaccines accessible economically to the world at the sixth edition of IISF 2020.

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▶ NEW INITIATIVES

- ▶ Joint Call 2020 on Digital Transformation for Green Energy Transition (MICall20)
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MEET THE SCIENTIST

PROF. SAMIT K RAY



Director - S N Bose National Centre for Basic Sciences

Prof. Samit K Ray is internationally known for his pioneering contributions on Semiconductor nanostructures and devices, particularly on nanophotonics, photovoltaics, and quantum devices. He joined as the Director, S. N. Bose National Centre for Basic Sciences on lien from IIT Kharagpur in October 2016. Under his leadership, the TRC project at S. N. Bose Centre has been found to be a game-changer for a basic science institute promoting Translational Research with technology transfer and commercialization. The project has catered to significant progress on the 'Make in India' initiative with validation of proof of concepts, fabrication of prototypes and nurturing testbeds in user domains for promoting small-scale manufacturing facilities of biomedical devices. He has also been instrumental in starting a joint Ph.D. program with IISER Kolkata and establishing MOUs with NRDC and IIM Calcutta Technology Business Incubator.

Prof. Ray has served as the Head of the Department of Physics, founder Head of the School of Nanoscience and Technology, and Dean, Postgraduate Studies and Research at IIT Kharagpur. He has also worked as a visiting faculty / Scientist at the Tokyo Institute of Technology, Japan, University of Delaware, Newark, University of Texas, Austin, Max-Planck Institute for Solid State Research, Germany, Queen's University of Belfast, UK, National Taiwan University, Taiwan and CGU University, Taiwan

Prof. Ray is a recipient of several awards and an elected fellow of several science academies.

FEATURED INSTITUTION

SNBCBS makes notable research progress in computational materials science, quantum science, astronomy, gravitational physics and advanced materials



The centre has made notable research progress in the areas of Computational Materials Science, Quantum Science & instead of & Technology, Quantum Field Theory, Gravitational Physics, Statistical Physics and Theoretical & instead of & Observational Astronomy, Ultrafast Spectroscopy, Advanced Materials including nanomaterials, soft and biomaterials in recent years.

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