DST
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STRIDES

Science, Technology, Research, Innovation & DEvelopmentS

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

EDITORIAL

The month of January saw the scientific fraternity prepare for one of the most important days for science in India—The National Science Day. The theme for the day was launched, and S&T institutions, schools, and colleges across the country started organising events and programmes based on the theme -- Integrated Approach in S&T for Sustainable Future. A four-fold integrated approach in S&T for Sustainable Future would kick off on this day.

These would include integration of all the scientific departments which can work on a theme-based approach; extended scientific integration encompassing engineering; medical and other institutions; extra-scientific integration involving the identification of the needs of other ministries and extended science-driven all-inclusive approach integrating startups & industry.

The month also saw several efforts of the Ministry of Science and Technology to promote equity in science. These highlighted the wonderful success stories of women-led programmes and startups, durable Braille maps using state of the art technology to make mapping accessible to visually challenged students, Padma awards for Grassroot innovator of agricultural equipment from rural Karnataka.

The month also saw significant research outcomes in atmospheric sciences about how Air pollutants & meteorological variables influence pollen concentration, spotting of a star with a heartbeat but without a magnetic field, and many more, which find place in this newsletter.

The newsletter also features the work of Indian National Science Academy (INSA) in catalysing and promoting science.

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

COVER STORY

Dr Jitendra Singh launches theme of National Science Day (NSD) 2022: Integrated Approach in S&T for Sustainable Future

Union Minister Dr Jitendra Singh launched the theme of National Science Day (NSD) 2022 'Integrated Approach in S&T for Sustainable Future'. He highlighted that a four-fold integrated approach in S&T for Sustainable Future will help us come out of our culture of working in silos as suggested by the Prime Minister to play a leading role in the global arena.

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Union Minister Dr. Jitendra Singh says, women start-ups are leading the innovative success stories of India

Speaking at the inaugural session of the 12th batch of the Women scientist Scheme-C, WISE-KIRAN IPR of DST training programme here today, Dr Jitendra Singh said that many of the big scientific projects including that of Gaganyaan are being led by women scientists.

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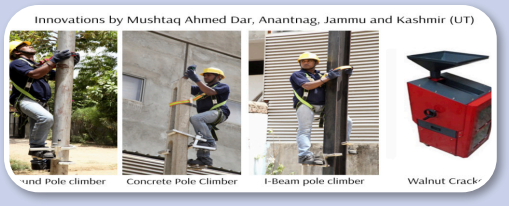
POPULAR SCIENCE STORIES



Devices by serial innovator from Anantnag making walnut processing easier for common people

Mushtaq Ahmed Dar, a grassroots innovator from the Anantnag district in the Union Territory of Jammu & Kashmir, has brought out a series of innovations for making the processing of walnuts easier and more efficient, as well as a device for climbing poles.

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Special electro-active nanoparticles developed for potential applications in touch & acoustic sensor

Indian Scientists, for the 1st time, have proposed an efficient way to induce a property called piezoelectric delta phase in polymer (PVDF) nanoparticles making it useful for applications in touch sensors, acoustic sensor, and piezoelectric nanogenerators.

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Visually challenged students will have access to user-friendly durable Braille maps using advanced technology

Visually challenged students from all over the country will have the access soon to Braille Maps designed and developed using Digital Embossing Technology, enabling them for ease of use, user friendly, better feeling and durable in terms of quality.

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Carbon-rich stars steal heavy elements from their low mass companions

Scientists have long been intrigued by the presence of much higher fraction of elements heavier than iron than is expected in carbon-rich stars. A new research by Indian astronomers has now traced its origin to the low mass companions of these stars, from which the materials have been stolen.

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A device for faster weaving of Pochampally silk by an innovator from Telangana revives traditional silk sari industry

An innovator from Nalgonda in Telangana has reduced the tedious and cumbersome hand-winding process of yarn for weaving of the famous Pochampally silk, thus reviving the traditional art as well as the silk sari industry on which many in the area are dependent.

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Highly efficient electrocatalytic method of synthesising ammonia developed

Indian Scientists have developed a highly efficient method for electrochemical synthesis of ammonia that may be useful for the industrial preparation of the chemical.

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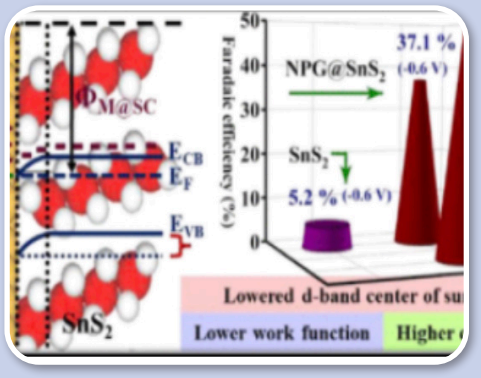

Scientists trace first clue to understand transient high energy pulses from magnetars several thousand times to that of the sun

Scientists have found the first clues to understand violent short duration flares from a compact star of rare category called magnetar located thirteen million light years away. These compact stars with the most intense magnetic field known, of which only thirty have been spotted so far in our galaxy, suffer violent eruptions that are still little known due to their unexpected nature and their short duration.

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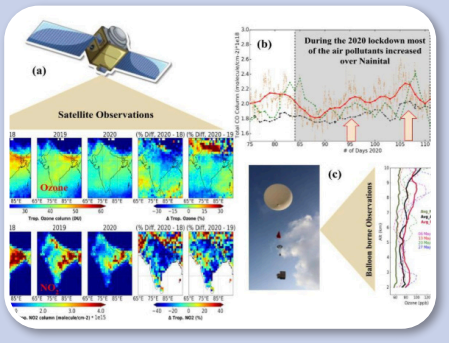
Air pollution in parts of central-western India and north India increased during the pandemic in contrast to the general trend

POPULAR SCIENCE STORIES



Reduction of economic activities during the pandemic-related lockdown had resulted in decrease of air pollution in most parts of India, but satellite observations show that parts of central-western India and north India showed an increase in pollution in contrast to the general trend.

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Scientists develop high-performance transistor models and circuits useful for space and defense applications

Indian researchers have developed a high performance industry-standard model for Aluminium gallium nitride (AlGaN/GaN) High Electron Mobility Transistors (HEMTs) with simple design procedures which can be used to make high-power Radio Frequency (RF) circuits owing to its high breakdown voltage.

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« MoU signed between Technology Development Board (TDB) and Swajal Water Private Limited, a tech Startup company founded by IIT alumni

« Air pollutants & meteorological variables influence pollen concentration: study

« Long lived correlations between waves in atomic systems at ultralow temperatures can be exploited for efficient quantum computing

« A star with a heartbeat & without a magnetic field discovered

« Spectacular landscape changes detected in Gujarat's Kachchh region due to major earthquakes in recent geological past

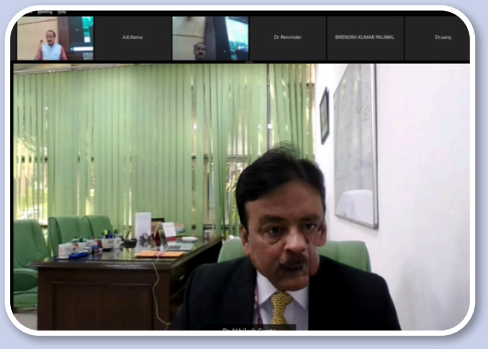
« SwarnaJayanti Fellow developing doping agents for efficient next-generation low-cost semiconductor materials

« SwarnaJayanti fellow working to develop technology for prediction and control of vapor explosion induced accidents in boilers

« SwarnaJayanti fellow from Bangalore working on theoretical understanding of strange metals related to high-temperature superconductors

« Importance of gender diversity & creation of enabling environment for equal participation of women in STEMM disciplines discussed at workshop

« Institutional collaboration, formulation Of state S&T policies, & widening scope of Centre-State engagements discussed at Centre State STI coordination meeting



« Role of states in developing priorities & strategies to strengthen the STI ecosystem emphasized at Madhya Pradesh Vigyan Sammelan

« TDB supports development and production of receiver modules essential for an app that provides navigation support

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NEW INITIATIVES

- Call for Ignition Grants titled "Technology-based Energy Solutions: Innovations for Net Zero"
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- Call for proposals under DST's TEC Program
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MEET THE SCIENTIST

PROF. CHANDRIMA SHAHA
PRESIDENT, INSA

Cell, a unit of every living being, is what fascinates Professor Chandrima Shaha, the first woman President of the Indian National Science Academy (INSA). Her research interests center around mechanisms associated with cell death in diverse organisms. She is widely recognized for the discovery of cell death pathways in a unicellular pathogen of medical importance.

Prof. Chandrima Shaha, is also the JC Bose Chair Distinguished Professor of the National Academy of Sciences at the Indian Institute of Chemical Biology (IICB), Kolkata. She is a biologist who started her career with a Ph.D. from the CSIR-IICB and pursued post-doctoral studies at the Kansas University Medical Center and the Population Council at Rockefeller University. Consequent to her return to India, she was appointed Chief of the Cell Death and Differentiation Laboratory at the National Institute of Immunology (NII) at New Delhi.

In 2011, she became the director of the institute and continued her association as Professor of Eminence post-superannuation in 2016. Following her stint as vice president of international affairs of INSA, in 2020, Prof. Shaha became the President of INSA.

An elected fellow of World Academy of Sciences as well as all three Science Academies of India, she served as member of councils of all three National Academies. Notable awards include Ranbaxy Science Foundation Award for basic sciences; J.C. Bose Fellowship of Govt of India; Shanti Swarup Bhatnagar Medal of INSA; Om Prakash Bhasin Award; Archana Sharma Memorial Award; Darshan Ranganathan Memorial Award; Chandrakala Hora Memorial Medal and Shakuntala Amir Chand Prize.

FEATURED INSTITUTION

INSA catalyses & promotes science by identifying, grooming & developing scientific talent and advising on science

Indian National Science Academy (INSA), established in 1935 at Kolkata (now at New Delhi), catalyses and promotes science and is a body for promoting excellence in science through identifying, grooming and developing scientific talent and advising on science.

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