

# STRIDES

SCIENCE, TECHNOLOGY, RESEARCH, INNOVATION & DEVELOPMENTS

Showcasing DST achievements in S&T and innovation

## Editorial

The festive season has kick started preparations for India's most significant celebration of science – the India International Science Festival (IISF) which is scheduled to take place in January 2024. The event will include 17 events involving a variety of target groups like teachers, students, startups, young scientists, women, media and so on, that will lead to science and technology outreach in Amrit Kaal. The triumph of science and technology lies in its uptake by the people and outreach is the tool that can help S&T reach its moment of triumph as the main fulcrum of development of the country.

The season also was the occasion for establishing the foundation stone of the new Auditorium-cum-Guest House Complex in the premises of the "Technology Bhavan", Department of Science & Technology (DST).

The month also brought with it a Compendium of Technologies that showcases translational work of young scientists for resolving socially relevant problems, developed under the SYST and several S&T developments ranging from first detection of radiation from extra-galactic black hole source to ecological mysteries of Western Ghats rock outcrops.

Some of the S&T developments featured in the newsletter like newly designed marigold-like nanostructured material that shows record high efficiency of converting sunlight to usable heat, efficient electrodes for superior supercapacitors and affordable radiative paint that can keep buildings, tiles and so on cool in the hot summer months can bring direct benefit to people in the near future.

The numerous benefits of science, the curiosity that science generates along with effective outreach efforts like the IISF can help promote the relevance of science as an indispensable part of human journey towards better life.

Editor-In-Chief: Dr Akhilesh Gupta

## Cover Stories

**Union S&T Minister says India International Science Festival is an outreach festival for those who could get benefitted by Science, Technology and Innovation for 'Ease of Living'**

The Union Minister, Dr Jitendra Singh briefed the media about the upcoming 9th India International Science Festival (IISF) - 2023 to be held in Faridabad in January 2024.



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**Union S&T Minister Dr Jitendra Singh launches the software application "Dashboard" portal of the Ministry of Science & Technology for real-time, prompt and effective parliament business**

Union Minister, Dr Jitendra Singh laid the Foundation Stone of the new Auditorium-cum-Guest House Complex in the premises of the "Technology Bhavan" which is the headquarters of the DST. He unveiled the plaque at the site and also took part in the Bhoomi Pujan.



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विज्ञान और प्रौद्योगिकी विभाग  
DEPARTMENT OF  
SCIENCE AND TECHNOLOGY  
सत्यमेव जयते





## High rainfall afforded resilience to tropical rainforests around 50 million years ago

High rainfall helped the survival of equatorial rainforests at a time when Earth was globally warm and atmospheric CO<sub>2</sub> concentration was a whopping more than 1000 ppmv, around 50 million years ago.

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## Inspire Faculty Fellow synthesizes phosphorescent emitters which can develop highly efficient Organic Light-Emitting Diodes

Rajakannu Palanisamy, an Inspire Faculty Fellow of the DST along with his team has synthesized a number of new phosphorescent emitters which can help develop highly efficient OLEDs with high-efficiency.



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## Inspire Faculty fellow decodes molecular mechanism behind intriguing green alga surviving in extreme conditions like saline-soda lakes

A young researcher has divulged the secret of how one of the smallest green algae called Picocystis Salinarum survives the harshest of conditions by resorting to physiological adaptation to highly saline-alkaline/hyperosmotic conditions.



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## Compendium of technologies developed by young researchers as solutions to socially relevant problems released

A Compendium of Technologies that showcases translational work of young scientists for resolving socially relevant problems, developed under the SYST was released by Prof. Abhay Karandikar, Secretary, DST.



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## First detection of radiation from extra-galactic black hole source paves way for understanding underlying physical processes around such sources

Radiation emitted from the vicinity of an extragalactic black hole located in the Large Magellanic Cloud, a small companion galaxy to the Milky Way have been detected for the first time through technique called X-ray polarimetry, paving the way for understanding the underlying physical processes around black hole sources.

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## Tripartite MoU paves way for Centre of excellence (Pilot) to foster the Geospatial Technology, Innovation and Solutions

India will soon have a Centre of excellence to foster the Geospatial Innovation & Research and to cater to emerging technology solution requirements of the Geospatial domain in the country.

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## Newly designed Marigold-like nanostructured material shows record high efficiency of converting sunlight to usable heat

A new material designed with

unique marigold-like carbon nanostructures and demonstrating highest efficiency so far of converting solar to heat energy, can transform the solar-thermal energy market in India targeting towards net zero carbon emission.

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## Unique blazar 5.2 billion light years away reveals its secondary black hole for the first time

For the first time scientists have been able to 'see' the secondary black hole in the binary system of a unique blazar 5.2 billion light years away by measuring polarized light from it.

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## Efficient electrodes for superior supercapacitors synthesized

Scientists have synthesized a class of porous and crystalline organic materials called COFs incorporated with quinone groups and sulphur-containing thiophene groups that can act as efficient and versatile electrodes for pseudocapacitors because of their low density, high stability, and well-defined atomic arrangements.

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## 4th edition of ASEAN India Grassroots Innovation Forum (AIGIF) launched to strengthen STI co-operation between India & ASEAN Member States

India along with 10 ASEAN Member States (AMS) were represented by 200 participants, at the 4th edition of the annual ASEAN India Grassroots Innovation Forum (AIGIF) that was launched in Langkawi, Malaysia on 28th November 2023.



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## Investment, Collaboration, and Robust R&D-translation ecosystem



## can create impact at National level in CCUS: Experts

Experts from research and academia highlighted the need for investment both from the government and industry in CCUS and the importance of leading experts in the field to work collaboratively towards India's net zero targets through CCUS.



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## Moonlighting activity of bacterial enzyme-Unusual relationship between biodegradation of organophosphates and iron uptake

Scientists studying the soil bacteria *Sphingobium fuliginis* found a very unusual relationship between biodegradation of organophosphates and its iron uptake capacity.

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## New study unravels the ecological mysteries of Western Ghats rock outcrops and their vital role in understanding climate resilience

Vegetation on rock outcrops in the Western Ghats which are primarily dependent on the elevation of the area as a proxy for climate variables and distance from the sea bear crucial relevance in the context of global warming, according to a new study.



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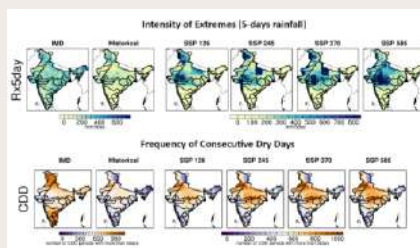
## New technology for converting CO<sub>2</sub> to CO holds potential for carbon capture and energy saving in the steel sector

A new energy-efficient carbon dioxide capture technology that converts carbon dioxide to carbon monoxide under electro catalytic conditions under ambient temperatures in the presence of water has been developed with potential for application in the steel sector.

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## Hydroclimate extremes will be more intensified in near-future over the Indian River Basins (IRBs)

Frequency of extreme rainfall is likely to increase over the Western Ghats and Northeast river basins, while an increase in heavy rainfall intensity is projected over the Upper Ganga and Indus basins.



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## Novel therapeutic formulation developed for improved treatment of Indian red scorpion sting

A new therapeutic drug formulation (TDF) comprising of low doses of commercial equine ASA, AAAs and vitamin C, for inhibiting the Indian red scorpion venom-induced toxicity and associated symptoms can help improve clinical management of scorpion sting patients.

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## DST successfully completes Special Campaign 3.0 on Swachhta and minimizes pendency in Government

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## Ionospheric disturbances during peak solar flares show dependence on flare energy

## Indigenously developed Cold spray technology can reduce costs of repair of engineering components

## India can steer 6G standardization & become a global exporter of such technologies: DST Secretary

## A new multi-component alloy-based catalyst designed for efficient production of Green Hydrogen

## Markers isolated from medicinal plant found in NE with anti-diabetic properties can help develop remedial medicines

## Different phases of Geomagnetic storms bring significant variation in EMIC waves-a critical tool during satellite launches

## Researchers find doping technique to create material for efficient memory devices

## Roundtable chalks roadmap for leveraging Kashmir's untapped potential through skill development and Innovation driven Entrepreneurship

## Newly developed affordable radiative paint can reduce electricity consumption for cooling buildings

[Articles & Blogs](#)

# India International Science Festival 2023

**Theme:** Science and Technology Public Outreach in Amrit Kaal

The 9th edition of the India International Science Festival (IISF) 2023 will be held at the Campus of Translational Health Science and Technology Institute (THSTI) and Regional Centre for Biotechnology (RCB) of Department of Biotechnology in Faridabad from January 17th-20th, 2024.

IISF 2023 with the theme 'Science and Technology Public Outreach in Amrit Kaal' aims to provide a platform for inspiring the public at large as well as individuals with diverse levels of interests like students, educators, scientists, researchers, industry professionals, entrepreneurs and science communicators.

The festival will have a total of 17 themes to showcase scientific achievements offering diverse benefits to participants and the general public.



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