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STRIDES

Science, Technology, Research, Innovation & DEvelopmentS

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

EDITORIAL

As we bid goodbye to 2021, it is time for reckoning, to take stock of the lessons learnt, and to devise ways to use them in the path ahead for 2022. Even amidst the unprecedented challenges for humankind that 2021 brought, India's ranking in global S&T indices continued to rise and reached 46th position featuring among the top 50 innovative economies globally as per Global Innovation Index (GII). The country surged ahead in Supercomputing Mission, made scientific infrastructure accessible across institutions, and extended institutional support for women scientists.

The efforts of the Department of Science and Technology (DST) empowered communities, brought saffron bowl to the Northeast, advanced deep tech-based research in the country, reached out to remote places to involve an increasing number of students in innovation, and also helped develop several indigenous smart, low cost, technologies for advancing towards Atmanirbhar Bharat.

The New State of the Art Building, Office Block-I, constructed at Technology Bhawan campus, was inaugurated while DST has supported research in health, climate change, and other areas of research, including grassroot innovations to reach their benefits to common people.

The challenging times have tested our resilience and capability to serve the country in times of adversity, and we aspire to take such challenges head-on in the future to reach the benefits of S&T to the remotest of places.

Happy new year to all!

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

COVER STORY

DST-CII Tech summit deliberates on S&T collaboration opportunities between India, the Netherlands, Brazil, Canada & Russia

Union Minister of State (Independent Charge) of the Ministry of Science and Technology, Dr. Jitendra Singh, highlighted that while innovation has been an integral part of industry, digitization is changing the very nature of the innovative process, providing companies new opportunities to create value, evolve and grow, at the DST-CII Technology Summit.

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Dr. S. Chandrasekhar, a renowned and accomplished synthetic organic chemist has taken over the charge of Secretary DST. He has to his credit several distinguished national and international awards including Infosys Prize 2014 and fellowships of leading science academies.

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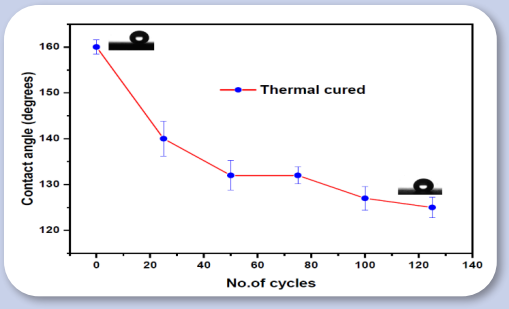
POPULAR SCIENCE STORIES



Durable superhydrophobic coatings for stainless steel can facilitate its usage in marine applications, pipelines, power generation & nuclear sectors

A team of researchers from ARCI, an autonomous institute of the Department of Science & Technology (DST), Govt. of India, investigated the durability of their developed superhydrophobic (SHP) coatings on a stainless steel SS 304 to improve its corrosion resistance.

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Indian Mathematician receives 2021 DST-ICTP-IMU Ramanujan Prize for Young Mathematicians from Developing Countries

Professor Neena Gupta, a mathematician at the Indian Statistical Institute in Kolkata, has been awarded the 2021 DST-ICTP-IMU Ramanujan Prize for Young Mathematicians from developing countries for her outstanding work in affine algebraic geometry and commutative algebra.

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Scientist with cerebral palsy working on deep learning architecture to ease functioning of differently-abled people

Dr. Akshansh Gupta, a specially-abled scientist, is working on deep-learning architecture for motor imagery brain-computer interface (BCI) that helps differently-abled people to do their daily routine work with ease.

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Rural population of Rameswaram empowered through seaweed cultivation & processing

The life of Mrs. Mutha Muthuvel Sambai from Rameswaram, Tamil Nadu, has changed for good through training in seaweed cultivation and farming and exposure to the market demands of seaweed.

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Farmers own fabricator customizing their agriculture tools and transport vehicle hoods

Aniket Kanade, from Kendure village, a rain shadow area in Shirur block of Pune district with rainfed low earning farming activities, is now a pioneer fabricator of hand-tools & bullock operated agricultural tools for rural farmers in his village.

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Scientists find faster method of predicting space weather

Scientists have identified a faster method of predicting space weather. Solar Radio Bursts (SRBs) from eruptions driven by Coronal Mass Ejections (CMEs) have been found to predict space weather hazards rapidly with the help of ground-based instruments.

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Water Quality in lower stretches of the River Ganga found to be alarming: study

Water Quality in the lower stretches of the River Ganga was found to be in an alarming situation by a team of scientists who developed the much-needed baseline of Water Quality Index (WQI) of the place.

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Climate Change makes children vulnerable to infectious diseases: study

Scientists have found that climate parameters accounted for 9-18% of the total infectious disease cases in a study to probe the association between climate parameters and infectious diseases in children under 16-years-of-age in Varanasi-city in central Indo-Gangetic Plane.

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New process enhances the corrosion-fatigue performance of high strength aerospace aluminum alloys

Indian Scientists have developed an environment-friendly process for improving the lasting of a material in the face of corrosion (corrosion-fatigue life) of high strength aerospace Aluminium alloys that make aerospace structures sufficiently light.

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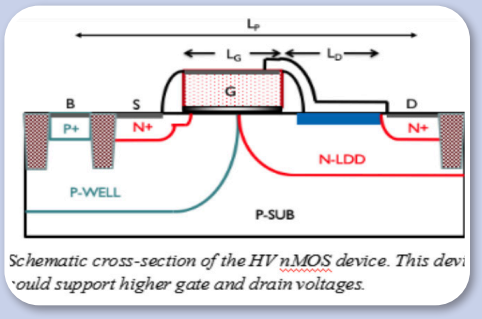

Schematic cross-section of the HV nMOS device. This devi ould support higher gate and drain voltages.

New low-cost semiconductor manufacturing process to benefit strategic sectors like space and defense

An Indian scientist has indigenously developed a low-cost semiconductor manufacturing process and used it to design integrated circuits (ICs) that can handle voltages up to 20 V.

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Change in course of Himalayan glacier can help to understand the glacial-tectonic interaction

Indian researchers studying an unnamed glacier in one of the less explored region in the upper Kali Ganga valley, Pithoragarh district, Uttarakhand, India, have reported that the glacier had abruptly changed its main course.

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POPULAR SCIENCE STORIES

Traditional water supply sources like wells & bawdies in Indore being rejuvenated to enhance adaptive capacity to climate change

The project supported by the Department of Science & Technology and Ministry of Environment, Forest & Climate Change (MoEFCC) Govt. of India under Climate Change Action Programme involves community engagements for effective management of water sources by developing sense of ownership & responsibility among the local population.

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New State of Monster black hole detected 5 Billion Light years away could help study role of gravity in evolution of galaxies in early Universe

Indian Astronomers have found an active galaxy in a very bright state with 10 times more X-ray emission than normal, equivalent to more than 10 trillion Sun, and located 5 billion light-years away that could help probe how particles behave under intense gravity and acceleration to the speed of light.

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Daily home-based meditation can increase the amount of grey matter in brains of patients with mild Alzheimers disease: Study

A recent study by Indian researchers has shown that a six-month daily home-based meditation can increase the amount of grey matter in brains of patients with mild cognitive impairment (MCI) or those with mild Alzheimer's disease. Meditation, therefore, appears to have a protective effect on the brain in these patients.

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- New indigenous smart technology system can automatically protect power grids from short-circuits
- The mystery behind the high abundance of Lithium in some evolved stars traced
- Swarnajayanti fellow exploring ways of enhancing ocean alkalinity for removing atmospheric carbon dioxide
- Swarnajayanti fellow working to map oxidised lipid pathways for treatment solutions to neurodegenerative diseases & immunological disorders
- Swarnajayanti Fellow from CDRI probing mitochondrion of malaria parasite for hints into alternative drug targets
- Swarnajayanti fellow working towards development of high-performance, safe and sustainable battery systems for heavy-duty applications
- Smaller solar storms in the last decade baffles scientists
- New similarities spotted between effects of magnetic and gravitation fields on quantum particles can shed light on existence of primordial black holes
- RS Ophiuchi: the recurrent nova that erupted again in August 2021 can give clues to formation of Type Ia Supernovae
- Kerala based start-up wins two prestigious awards at National level
- ARCI signs agreement to support Indigenisation of Lithium-Ion Battery Technology fabrication

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INTERNATIONAL STORIES

India calls for BRICS to work towards rightful place in the global innovation index

India's Minister for Science & Technology Dr Jitendra Singh, who chaired the 9th BRICS Science & Technology Ministers meet held today, has called for working towards rightful place for BRICS (Brazil, Russia, India, China, and South Africa) in the Global Innovation Index and this, he said, can be achieved through further strengthening the cooperation in the field of Science, Technology and Innovation (STI).

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India-Japan Science and Technology Seminar highlights need to evolve to bigger missions

Principal Scientific Adviser to Government of India, Prof K VijayRaghavan, highlighted the need to build upon the foundation of student exchange and individual collaboration between India and Japan to evolve to bigger missions between the two countries for addressing the demands of the entire planet and the region, at the India-Japan Science and Technology Seminar.

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India and the US announce new programme supporting innovations to tackle climate & clean energy challenges

A programme to support India-US S&T-based entrepreneurial initiatives that address the development and implementation of next-generation clean and renewable energy, energy storage, and carbon sequestration has been announced to tackle climate and clean energy challenges.

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MAJOR SUCCESS STORIES OF DST IN 2021

The year 2021 brought unprecedented challenges for humankind. DST and its autonomous institutions geared themselves up to help India deal with these challenges. The department also implemented the lessons learnt last year to reach out to the world with STI solutions that brought about positive transformations in every sphere, be it healthcare, sustainability, energy efficiency, food production or even in the way we work.

- India's ranking in global S&T indices continues to rise
- India surges ahead with Supercomputing Mission
- DST's efforts make scientific infrastructure accessible across institutions
- DST extends institutional support for women scientists
- Communities empowered through STI hubs, point of care diagnostic kits, and encouraging entrepreneurial initiatives
- Saffron bowl brought to the Northeast
- SERB-DST partners with Intel India to launch first-of-its-kind initiative to advance deep tech-based research in India
- National hackathon organised by IIT Madras & Sony India encourages citizens to come up with solutions using IoT Sensor Board
- A New State of the Art Building, Office Block-I, constructed at Technology Bhawan campus inaugurated
- INSPIRE Manak reaches out to remote places and involves increasing number of students
- Marching towards Atmanirbhar Bharat with several indigenous smart, low cost technologies under DST supported Make in India
- Leapfrogging towards sustainability with carbon footprint reducing technologies: EV, alternative & clean energies
- DST supported research helps move towards affordable health and wellbeing for all
- Grassroot Innovations: Vocal for Local
- DST supported research assesses state level vulnerability, health & other effects of climate change
- DST support looks towards better disaster management
- DST support helps access to clean and potable water for all
- DST supports agricultural technologies ranging from grassroot to lab based for doubling farmer's income
- Waste Management technologies with DST's support helps the march towards waste to wealth
- DST support has helped develop a slew of new age technologies
- DST's autonomous institutions contribute to multifarious research ranging from Health, Medical devices, Energy to unraveling the mysteries of the Universe

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