

# STRIDES

Science, Technology, Research, Innovation & DEvelopmentS

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

## EDITORIAL

### FROM HEAD OF DST MEDIA CELL

Science builds true and accurate knowledge about how the world works. The Yoga Day celebrated by the Department of Science and Technology captured this spirit of scientific approach to yoga. It discussed the connection of health, mind, and heart with yoga and meditation which can bring about a healthy and balanced life. The celebrations find a place in the cover of the newsletter, this time followed by several stories of scientific validation of health benefits of different forms of Yoga.

The Yoga Day lecture by AIIMS Professor KK Deepak during the celebrations outlined the ways in which varied heart diseases and conditions can be addressed holistically through Yoga. He also spoke about the scientific evidence behind Yoga practice adapting people to challenges imposed on the nervous system and crises related to movement or blood flow, making people more resilient.

The newsletter also features how researchers have developed a non-expensive way to coat carbon on lithium metal oxide electrodes for lithium-ion batteries, a unique desalination technology through solar thermal forward osmosis that brings relief to a remote, drought-prone village Tamil Nadu among many others.

The newsletter features the Institute of Nano Science and Technology (INST), Mohali (Punjab), a global nano-science institute which moves with the motto of "Knowledge of Nanoscience for the Nation"

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

## COVER STORY



### DST PROMOTES A SCIENTIFIC APPROACH TO YOGA ON 7TH INTERNATIONAL YOGA DAY

"There is a connection between health, mind and heart and yoga and meditation can greatly help us living a healthy and balanced life", Secretary, Department of Science and Technology (DST) Professor Ashutosh Sharma pointed out at the webinar organized by DST under Science and Technology of Yoga and Meditation (SATYAM).

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### IGSTC INDUSTRIAL FELLOWSHIP LAUNCHED TO SUPPORT

### YOUNG INDIAN RESEARCHERS FOR INDUSTRIAL EXPOSURE AT GERMAN INDUSTRIES AND INDUSTRIAL R&D INSTITUTIONS

The Indo-German Science & Technology Centre (IGSTC) Industrial Fellowship programme was launched by Secretary, Department of Science and Technology, Govt. of India Prof. Ashutosh Sharma on the occasion of IGSTC's 11th Foundation day on 14th June 2021.

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Cover Story

Popular Science Stories  
COVID News Highlights

INSIDE THE E-NEWSLETTER

International Stories  
New Initiatives

Meet the Scientist  
Featured Institution



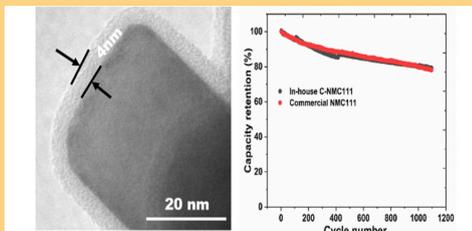


Fig.1 (left): A high resolution of transmission electron microscopy of one of the particles showing uniform carbon coating (right): Electrochemical characteristic of ARCI developed C-NMC111 in par with commercial material.

### A novel technology for coating carbon on lithium metal oxide electrode, can double battery life

Researchers have developed a non-expensive way to coat carbon on lithium metal oxide electrodes for lithium-ion batteries. The life of the lithium-ion cells prepared using these electrode materials is expected to be doubled due to protective carbon coating.

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### Sea water desalination through solar thermal forward osmosis brings relief to drought prone Tamil Nadu village

Narippaiyur, a village in Ramanathapuram District, a drought prone area situated in the South-East corner of Tamil Nadu will benefit from 20,000 litres per day of fresh water produced from sea water – thanks to the solar thermal Forward Osmosis (FO) sea water desalination system installed in the place.

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### Researchers find Therapeutic Effects of Yoga in Depression

A new research suggests that Yoga in addition to standard antidepressant

treatment can bring relief to patients with Major Depressive Disorder (MDD) both clinically and biologically and can also bring about earlier remission.

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### S&T can address challenges like urbanization, health, agriculture and environment by taking them up locally: Secretary DSIR at WIGH

Science and Technology (S&T) can address challenges like urbanization, health, agriculture and environment by taking them up locally at the field level, Secretary DSIR and Director General, CSIR, Professor Prof. Shekhar C. Mande said at a lecture.

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### Climate change to increase sea level in Lakshadweep Islands, will affect airport & residential areas: Study

Sea-level will rise around the Lakshadweep Islands in the range between 0.4 mm/year to 0.9 mm/year, says a study conducted projecting different greenhouse gas scenarios.

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### Study Explored Benefits of Yoga in Chronic Low Back Pain

Researchers who measured pain, pain tolerance and body flexibility have found that yoga leads to pain relief, increases tolerance of pain and improves flexibility in patients of chronic low back pain.

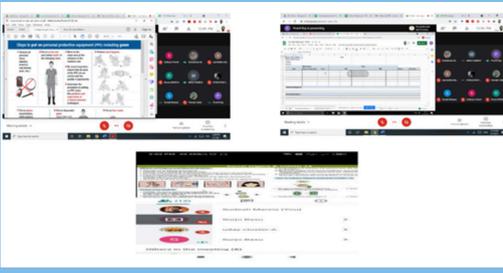
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- ▶ Journey of Women Scientists: From Break in Career to become Patent Professionals
  - ▶ Space-time induces neutrino oscillations
  - ▶ Researchers find an improved method of imaging objects through fog
  - ▶ Cold desert Ladakh was actively flooding during the post-glacial warming: Study
  - ▶ Cryo-EM facilities can help research in structural biology, enzymology & drug discovery to combat new & emerging diseases
  - ▶ Cancer causing virus affects the glial cells in central nervous system: Study by DST supported FIST facility
  - ▶ New waste water treatment technology can reduce costs for low and medium scale enterprises
  - ▶ Aerosol particles below 3 nm which can reach sizes having climatic impacts, formed frequently in urban locations in India
  - ▶ 3-D seismic data can help apprehend precursors of marine geohazards from interactions between seabed & marine sediments
  - ▶ Instrumentation facility at IISc Bangalore can accurately trace toxic metals at very low concentrations
  - ▶ Novel technique could help detect tropical cyclones for Bay of Bengal Basin earlier than satellites
  - ▶ A new study will help accurate estimation of black carbon over the Himalaya, a key contributor to global warming & improve weather & climate predictions
  - ▶ New eco-friendly process enhances fatigue life of aluminium alloy used in aerospace components
  - ▶ Participants from across the country participate in World Environment Day celebrations held at WIHG
  - ▶ DST supported climate change research being strengthened to prepare country for future
  - ▶ Bharat Ratna Professor Rao receives the Eni International Award for Research in Energy Frontiers
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# COVID NEWS HIGHLIGHTS



## New Software helps identify patients likely to require ventilator support thus detecting emergency & ICU needs early

A software can now identify patients likely to require ventilator support in an ICU and referral in time and make necessary arrangements before emergency sets in. The software called Covid Severity Score (CSS) Software consists of an algorithm that measures a set of parameters. It scores each against a pre-set dynamic algorithm multiple times for each patient and allocates a Covid Severity Score (CSS) mapping it in a graphical trend.

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## Pune based start-up all set to bring non-toxic, gentler, long lasting hand sanitiser to the market

An environment friendly hand sanitizer that is gentle on the hands and does not dry them, will soon be available in the market. The alcohol free, aqueous, non-inflammatory and non-toxic hand sanitizer has been developed from Silver Nanoparticles by a Pune based start-up.

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## 850 oxygen plants being set up in various districts of country: Secretary DRDO

A total of 850 oxygen plants are being set up in various districts of the country from PM Cares Fund for catering to the needs of the country to fight the pandemic COVID-19, Dr G Sathesh Reddy, Secretary, DRDO, highlighted at DST Azadi Ka Amrit Mahotsav Discourse Series.

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## Indigenously designed & manufactured high purity oxygen concentrator being supplied to Indian hospitals

An indigenously designed oxygen

concentrator, which ensures high-purity oxygen supply, is now out in the market. An Indian startup has designed and developed this affordable portable oxygen concentrator and is now manufacturing it for supply to various hospitals in the country.

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## A new AI-driven platform will facilitate early-COVID interventions over Whatsapp

A new AI-driven platform will now help early intervention through rapid screening of COVID 19 with the help of Chest X-ray interpretation over WhatsApp for doctors who have access to X-ray machines. The solution called XraySetu can work with low-resolution images sent via mobiles, is quick and easy to use, and can facilitate detection in rural areas.

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## TDB supported science-based startups play critical role in combating COVID 19

Science-based startups are playing a crucial role in proactively bringing technologies for combatting the COVID 19 pandemic to the people and helping the nation deal with the crisis.

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## Dignitaries underline necessity of focusing on sunrise sectors in a post COVID world with science, technology and innovation

Dignitaries underscored the necessity of focusing on sunrise sectors for future growth and development in a post COVID world, and this only science and technology will be able to do, at an online discourse titled 'On the Other Side of the Pandemic...A Science Policy Interface'.

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## DST supported disinfection system makes N95 Masks, PPE, medical gear reusable and reduces excessive COVID 19 bio-medical waste generation

A N95 Mask/PPE disinfection system developed by Mumbai-based start-up, Indra Water, has been installed at multiple Government hospitals across Maharashtra & Telangana.

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## INTERNATIONAL



▶ **Three Indian S&T led enterprises selected for joint R&D and technology transfer with Russia**

▶ **DST supported SAIF facility at Panjab University partners with Molekule, USA, to donate air purification units to hospitals in India**

▶ **High Performance Computing (HPC) and Information Communication Technologies (ICT) discussed at BRICS Working Group Meeting**

▶ **BRICS meeting deliberated on emerging issues in Biotechnology and Biomedicine**

**▶ NEW INITIATIVES**

- ▶ NIDHI ACCELERATOR call [Read More](#)
- ▶ India Belgium Networking call 2021 [Read More](#)

## MEET THE SCIENTIST

### PROF AMITAVA PATRA



#### Director, INST Mohali

Prof. Amitava Patra, who pioneered the study of two-photon spectroscopy and ultrafast carrier dynamics on the contemporary topic of 2D structures, perovskite, metal clusters, polymeric nanoparticles, and quantum dots for light-harvesting applications, is amongst the world's top 2% scientists in 2020 with a global rank of 149 in Physical Chemistry (Ranking is based on C-score).

He is interested to learn the mechanisms for photo-initiated processes such as exciton dynamics, ultrafast carrier dynamics, electron transfer, and energy transfer of nanomaterials for solar energy conversion.

He is the recipient of several awards and fellowships, including National Prizes for Research in Chemical Spectroscopy and Molecular Structure, MRSI-ICSC Materials Science Annual Prize, C.N.R. Rao National Prize for Chemical Research, DAE-SRC Outstanding Investigator Award, A.V. Rama Rao Foundation Prize in Chemistry, AsiaNANO 2010 Award, CRSI Bronze Medal, Ramanujan Fellowship, MRSI Medal.

Prof. Amitava Patra has been elected as a Fellow of the Optical Society of America (OSA) and the Royal Society of Chemistry (FRSC). He is a Fellow of the Indian Academy of Sciences (FASc), India, the National Academy of Sciences (FNASc), India, and the West Bengal Academy of Science and Technology and is a Senior Professor at the Indian Association for the Cultivation of Science.

## FEATURED INSTITUTION



### INST steering ahead with nanoscience and technology-based breakthroughs

With the motto of "Knowledge of Nanoscience for the Nation," the Institute of Nano Science and Technology (INST), Mohali (Punjab), is steering ahead, advancing knowledge, and educating young minds in nanoscience and technology that will best serve the nation.

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