

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 women across the world chose to challenge for creating an alert world and beacon change, dignitaries in Science, Technology, Engineering, Mathematics, and Medicine brainstormed on challenges faced by women in their path of participation in these disciplines. Meanwhile, science communicators and women scientists were recognised for their contributions on National Science Day.

Exciting news poured in from autonomous institutions of the Department of Science and Technology about new molecular sensor that will aid identification of new drugs of therapeutic value, of novel classification method based on Deep Learning (DL) network for evaluation of hormone status that can predict progression of breast cancer and much more.

Women technology parks from Dehradun have supported women self-reliance dreams of rural women, while DST schemes have encouraged women to dream despite challenges. Scientists from Bangalore have developed a new technology for High Electron Mobility Transistor that will make India self-reliant in power transistor technology, while astronomers have found that metal-rich environment is crucial for light giant planets but not necessary for heavy giant ones.

The newsletter features such stories along with a feature focusing on the work of the Indian Institute of Astrophysics and its worthy Director, Professor Annapurni Subramaniam.

—DR AKHILESH GUPTA, EDITOR-IN-CHIEF

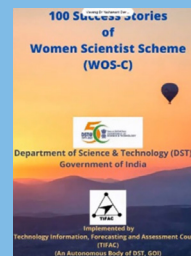
COVER STORY



DR HARSH VARDHAN AWARDS SCIENCE COMMUNICATORS, WOMEN SCIENTISTS ON NATIONAL SCIENCE DAY

National Science Day is celebrated every year on 28th February to commemorate the announcement of the discovery of the 'Raman Effect' by Sir C.V. Raman, for which he was awarded the Nobel Prize in 1930. The government of India designated 28 February as National Science Day (NSD) in 1986. Since then, theme-based science communication activities are carried out all over the country on this occasion.

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EXPERTS HIGHLIGHT NEED TO ADDRESS CHALLENGES FACED BY WOMEN TO INCREASE THEIR PARTICIPATION IN S&T

Experts highlighted the need to address the challenges faced by women to increase their participation in science and technology at the India-Japan joint celebration of International Women's Day.

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▶ From Head Of DST MEDIA CELL
Cover Story

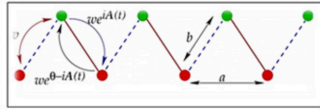
Popular Science Stories

INSIDE THE E-NEWSLETTER

International Stories
New Initiatives

Meet the Scientist
Featured Institution





A schematic diagram of the driven one-dimensional periodic lattice. The red and green circles denote two sublattice sites. The lattice constant is a , and two sites in a unit cell are separated by distance b . The intracell hopping amplitude is v , whereas the intercell amplitudes are $w e^{i\phi(t)}$ and $w e^{i\phi(t) + \theta}$ respectively for to and fro tunneling in the presence of a time-periodic vector potential $A(t)$ and a non-Hermiticity measure θ . The non-Hermiticity mimics the environmental effect on the lattice.

New state of the materials discovered that can lead to better, tunable, controllable quantum technologies

Scientists have discovered a new exotic, strange state of materials in contact with an environment that alters its physical properties in the presence of an electromagnetic field, leading to better quantum technologies, which are tunable and controllable as per the user requirements.

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Scientists develop molecular sensor that will aid identifying new drugs of therapeutic value

Researchers have recently developed a molecular sensor, which can identify cancer drugs by detecting how such chemicals modify microtubules inside living cells. Microtubules are part of the cytoskeleton, a structural network within the cell's cytoplasm, and they alter in response to several chemicals.

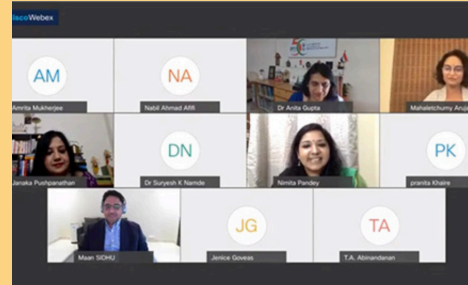
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Classification method based on Deep Learning (DL) network, for evaluation of hormone status, can predict progression of breast cancer

Scientists have developed a classification method based on Deep Learning (DL) network to evaluate hormone status for prognosis of breast

cancer. The proposed framework is a reliable alternative to manual methods for automatic grading systems used to determine scoring of estrogen receptor status for predicting progression of breast cancer.

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Women leaders deliberate on various policies and best practices to promote women in S&T

Eminent women leaders in science and technology underlined the need for a change in the mindset of people to end the of stereotyping of women and give them due respect and recognition at a panel discussion organized on the occasion of International Women's Day.

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DST Secretary encourages young scientists to take risks & do profound science

Secretary DST Professor Ashutosh Sharma encouraged young scientists to do something big to overcome emerging challenges in areas ranging from sustainable development to the rise of intelligent machines at the centenary celebrations of Jamia Milia Islamia (JMI) University.

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Youth need to focus on innovation & on creating new jobs: DST

Secretary

Secretary DST Professor Ashutosh Sharma underlined that the time for innovation has come and the youth now need not limit themselves to finding jobs, but also focus on creating hundred other jobs.

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DSTs schemes encourage women to dream despite societal challenges

The women-exclusive schemes of DST aim to bring gender parity in S&T through various initiatives. It addresses various challenges faced by women scientists in STEM education and career and expanding its wings for supporting women from all walks of life to build their careers in STEM fields.

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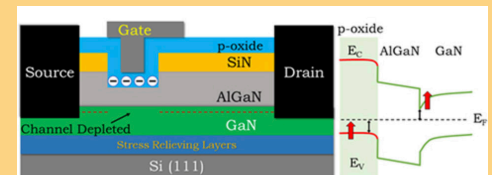


Fig. 1. Device structure depicting proposed novel aluminum titanium oxide, which acts as p-type gate oxide to achieve normally-OFF operation in GaN HEMTs and the energy band diagram depicting the proposed concept [1].

New technology for High Electron Mobility Transistor will make India self-reliant in power transistor technology

This first-ever indigenous HEMT device made from gallium nitride (GaN) is useful in electric cars, locomotives, power transmission and other areas requiring high voltage and high-frequency switching would reduce the cost of importing such stable and efficient transistors required in power electronics.

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Women Technology Parks give wings to self-reliance dreams of rural women

Dr. Neelu Ahuja, a Professor in Computer Science Department, of Petroleum and Energy Studies (UPES), Dehradun is passionate about initiatives that would change lives of rural women and other marginalized sections of the society. She is confident that science and technology could play a vital role in income generation of rural women of Uttarakhand, a state for which she has grown a deep attachment through her 20 years of professional life in it.

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DST's programmes provide support for women from all walks & stages of life to boost their career in STEM fields

A group of schools students from the North East of India were star-struck. They were visiting IIT Guwahati, where they were meeting scientists from NASA and interacting with them. The students were introduced to various opportunities in science and technology and emerging technologies like 3D printing, flexible electronics, design, polymers, solar cells, and so on during a programme called Vigyan Jyoti.

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- ▶ India Science Research Fellowship (ISRF) 2021 announced
- ▶ IIG focuses on new methods of predicting earthquakes, magnetic anomaly maps, predicting state of ionosphere
- ▶ Thought leaders, scientists & industry leaders offer insights on using glue grant to develop education hub
- ▶ Metal rich environment crucial for light giant planets, but not necessary for heavy giant ones
- ▶ Technologies offer innovative solutions to water-related problems like clean drinking water & flood management
- ▶ PSA highlights need for increasing opportunity of knowledge generation at the WIHG celebration of NSD
- ▶ Scholars deliver talk on range of topics on NSD celebration of ARCI
- ▶ NSD special lecture harps on the use of S&T to keep people safe, jobs safe & economy safe
- ▶ Science & Technology Policies to immensely contribute India become Atmanirbhar: DST Secretary
- ▶ Stakeholders discuss the implications & implementation of the Guidelines for acquiring & producing Geo-Spatial Data and Geo-Spatial Data Services including Maps
- ▶ Comprehensive gateway of STI information on SERB supported projects on finger tips

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INTERNATIONAL

Women achievers from India & Japan stress on determination & patience in overcoming challenges

Women achievers from India and Japan emphasized the importance of determination and patience in overcoming challenges while sharing the journey of their life at the India-Japan joint celebration of the International Women's Day.

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Indian and Brazilian S&T Ministers discuss collaborations in range of areas like health, AI, Environment

Union Minister for Science & Technology and Earth Sciences, Health and Family Welfare Dr. Harsh Vardhan discussed a wide range of scientific and technical issues and possible bilateral and multilateral collaborations such as BRICS with a high-level delegation led by Brazilian Minister for Science, Technology and Innovation H.E. Mr. Marcos Cesar Pontes who he received on February 24, 2021.

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▶ NEW INITIATIVES

- ▶ Call for Applications under Accelerate Vigyan
- ▶ India Sweden joint Industrial R&D call 2021
- ▶ Fulbright-Nehru and other Fulbright fellowships for Indian citizens
- ▶ Indo-Russia joint Research Call 2021

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MEET THE SCIENTIST

PROF. ANNAPURNI SUBRAMANIAM



Director, Indian Institute of Astrophysics

Annapurni Subramaniam is renowned for her work on star clusters, stellar populations, galaxies, and ultra-violet astronomy.

Leading the Indian team of the Observatory software, she completed the delivery of Common software in 2019 for the Thirty Meter Telescope (TMT), which is being built by an international consortium with India as a partner.

As the calibration scientist for the UV Imaging Telescope (UVIT) on board India's first space observatory, ASTROSAT, she compiled and predicted its performance before the launch, planned and completed calibration after its launch. She also developed a mandatory user tool for safe observations of the telescope.

She is currently the Chief Editor of the Journal of Astrophysics and Astronomy, jointly published by the Indian Academy of Sciences and Astronomical Society of India, and also a scientific Editor of Research in Astronomy and Astrophysics, published by the Chinese Academy of Sciences.

She is the Principal Investigator of the proposed next-generation UV-Optical space telescope (INSIST), leveraging on the experience gained from AstroSat and UVIT. INSIST is completing 2-years of pre-project phase, funded by ISRO.

Dr. Subramaniam has received several awards and fellowships, including Kavli Fellow, instituted by Kavli Foundation and National Academy of Sciences, USA, the C.V. Raman Young scientist award for physical sciences, from the Karnataka Government for the year 2018, and also the SERB-POWER fellowship (2021).

FEATURED INSTITUTION



IIA explores stellar mysteries over 75 years

Indian Institute of Astrophysics (IIA), a premier institute in the country devoted to

research and development in astronomy, astrophysics, and related physical sciences, which is celebrating the Golden Jubilee, has several research achievements in its kitty.

The institute, which explores the solar system, our galaxy, external galaxies, and other distant objects in the Universe, has recently redrawn the coevolution of the black hole and the galaxies, detected fluorine in hot extreme Helium stars, thus tracking their evolution mystery and also found prodigal stars from first one billion years of the Universe in the Milky Way.

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