



Embassy of India, Berne

INDIA SCIENCE AND INNOVATION WEEKLY

11 July 2022

*Ask the right questions, and nature will open the door to her secrets
- Dr. C.V. Raman, The Nobel Prize in Physics 1930*

IISc Developed a Design Framework to Build Next-Generation Analog Computing Chipsets

Researchers at Indian Institute of Science (IISc) developed a design framework to build next-generation analog computing chipsets that could be faster and require less power than the digital chips found in most electronic devices. Further, researchers, based on the design built a prototype of an analog chipset called ARYABHAT-1 (Analog Reconfigurable technology And Bias-scalable Hardware for AI Tasks). This type of chipset could be especially helpful for Artificial Intelligence (AI)-based applications like object or speech recognition – think Alexa or Siri – or those that require massive parallel computing operations at high speeds.

JNCASR Discovered New Material that Converts Infrared Light to Renewable Energy

Scientists at the Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of Department of Science and Technology (DST), Govt. of India, discovered a novel material called Single-crystalline Scandiumnitride (ScN) that could emit, detect, and modulate infrared light with high efficiencies and making it useful for solar and thermal energy harvesting and for optical communication devices. Scientists utilized a scientific phenomenon called polariton excitations that occur in tailored materials when light couples with either the collective free electron oscillations or polar lattice vibrations to achieve and discovered the novel material.

BITS Pilani Developed Low-Cost, Sensitive Device for Ultralow Detection of TNT

Researchers from the Birla Institute of Technology and Science – Pilani, Hyderabad campus developed low-cost, sensitive device for ultralow detection of TNT. BITS Pilani researchers synthesized two small fluorescent molecules (fluorophores) highly selective and sensitive to ultra-low levels of TNT. The solid fluorophores glow with a green-yellow colour under UV light; once they come in contact with traces of TNT (in solid/solution/vapour), the glow quenches (dims out). The study results show that the method can sense even minute traces of TNT as low as 15 parts perquadrillion (ppq, 15×10^{-15}). Further, researchers developed this new method by employing an inexpensive, metal-free process to synthesize fluorophores at room temperature & conducted validation tests to verify the device's performance.

IIT Madras Identified a Bacterium that could Turn Agricultural Waste Into Industrial enzymes

Researchers at Indian Institute of Technology (IIT) Madras identified a bacterium 'Bacillus sp PM06' that could turn agricultural waste into industrial enzymes through a cost-effective and environment-friendly process & other value-added products. IIT Madras researchers also added that the study demonstrated simultaneous saccharification and fermentation of different agro residues by a single novel organism & is unique because it takes a sustainable and environmentally friendly approach.

Special Update: Testbed 'TiHAN' Inaugurated for Autonomous Navigation at IIT Hyderabad

To promote collaborative research between academia, industry and R&D labs for next-generation mobility solutions both at national and global level, Ministry of Science & Technology inaugurated a unique, first of its kind, state of the art, futuristic "autonomous navigation" facility "TiHAN Testbed" with the aim to develop unmanned ground and aerial vehicles at Indian Institute of Technology (IIT) Hyderabad. "TiHAN Testbed" is funded by the Ministry of Science & Technology is a multidisciplinary initiative, which would make India a global player in the futuristic and next generation "Smart Mobility technology". Further, TiHAN-IITH would allow testing the next generation autonomous navigation technologies accurately and allow faster technology development and global market penetration.