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

IIG Developed New model for Improving HF Radio Communications

Scientists of the Indian Institute of Geomagnetism (IIG), an autonomous institute of DST developed a new model for radio wave propagation through the ionosphere that could help estimate the impact of space weather and facilitate the planning and operation of High Frequency (HF) radio communications. The HF radio propagation model developed by IIG scientists has important applications in planning the right strategies for the operation of Skywave communication systems during active space weather periods. The development of such strategies is essential for ensuring reliable Skywave communication systems in the face of natural disasters and other emergencies.

Researchers Developed Green Alternative to Synthetic Pesticides

Eggplant is the third most consumed Solanaceous vegetable in India after potato and tomato. It suffers 40-100 % fruit loss due to the pest Shoot and Fruit Borer (SFB). To combat the challenge, researchers at the Indian Institute of Science Education and Research (IISER), Pune, and the Indian Council for Agricultural Research (ICAR) Complex for North East Hill (NEH) Region, Umiam, Meghalaya developed green alternative by founding that a resistant eggplant variety, RC-RL-22 (RL22), releases geraniol that restricts SFB to lay eggs on its leave to synthetic pesticides.

Researchers Developed Polymer Absorbing Hazardous Waste

Researchers at the Indian Institute of Technology (IIT) Indore; Indian Institute of Science Education and Research (IISER) Thiruvananthapuram; and IIT Roorkee developed a new polymer capable of absorbing hazardous chemicals and other industrial wastes. Researchers introduced an ionic porous organic polymer (iPOP-Bpy) in a one-pot synthesis method as the synthesized polymer shows excellent efficacy in the adsorption of iodine, sensing of ammonia vapour, and solid-state device fabrication. Researchers also added that Volatile radio nucleotides are among the most hazardous toxic wastes produced in nuclear power plants. These wastes, if dumped into the environment, could cause severe radioactive contamination. Fast and efficient capture of such nucleotides is the only solution to these problems. This is the first report of successfully synthesizing the iPOP-Bpy molecule, which shows several promising multifunctional industrial implications.

CeNSE & IISc Bangalore Developed Alternative CMOS Platform for Operating Multiple Applications in Telecom Band

Researchers at Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science (IISc), Bangalore, developed an improved Silicon-based platform for economised and more efficient microchips. To develop the alternative, researchers characterized the linear and nonlinear properties of the Si-Rich Silicon Nitride (SRSN) platform, capable of serving as an alternative platform to realize low-cost on-chip applications. The SRSN material developed by the team exhibits high thermal stability compared with Si, with no demonstrated TPA and FCA losses at the telecom band. The TOC of the SRSN material was found to be much lower than that of Si. It could be an ideal platform for operating a multitude of applications in the telecom band

Special Update: IIT Madras Developed Data Science & IoT-based Method for Mobile Pollution Monitoring

Researchers at Indian Institute of Technology Madras (IIT Madras) developed a low-cost mobile air pollution monitoring framework in which, pollution sensors mounted on public vehicles could dynamically monitor the air quality of an extended area at high spatial and temporal resolution. IIT Madras, Project Kaatru (air in Tamil) leverages IoT, big data and data science to achieve the following goals:

- Obtain pan-India hyperlocal air quality map
- Exposure assessment for each Indian citizen
- Data driven solutions for policy, intervention and mitigation strategies