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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*

IIT-Roorkee Invented "First of its Kind Titanium-Based Coating"

Researchers at the Centre for Nanotechnology at Indian Institute of Technology (IIT-Roorkee) have claimed to have developed a "first of its kind titanium-based coating" that would enhance the durability of the components of naval submarine equipment. The researchers added that components of marine defence equipment, usually made of stainless steel (SS), which are submerged in saline water all the time, are quick to decay and corrode. However, when coated with Osbornite Titanium Nitride, they would last much longer. The finding, pegged by the researchers as 'a milestone in the defence manufacturing sector of the country', was also published in 'Surface and Coatings Technology', a peer-reviewed journal.

Renewable Grid Integration, Green Hydrogen Labs Inaugurated at IIT-Roorkee

Indian Institute of Technology (IIT) Roorkee inaugurated two new labs i.e. Renewable Grid Integration Laboratory and Green Hydrogen Laboratory at the Department of Hydro and Renewable Energy (HRED). HRED has developed these labs to ensure that the Department and IIT Roorkee continue to play a major role in reliable, resilient, and Atmanirbhar transition to a clean energy grid in India. HRED also added that these two labs aims at significantly reducing carbon emissions and increase the use of renewable energy sources and to pursue cutting-edge research ensuring high reliability in Renewable Energy.

IIT Madras to Develop an Indigenous Security Testing Solution for 5G Core Network Functions and Radio Access Network (RAN) Software

IITM Pravartak Technologies Foundation at Indian Institute of Technology (IIT) Madras, a Technology Innovation Hub for Sensors, Networking, Actuators and Control Systems (SNACS), supported by the Department of Science and Technology (DST) under National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS), along with its incubated startup, to develop an indigenous security testing solution for 5G core network functions and Radio Access Network (RAN) software. This technology solution could automatically identify zero-day vulnerabilities in the network in advance by using techniques such as fuzzing and test oracles & proactively detect and prevent zero-day vulnerability attacks in the 5G networks thereby reducing the network downtime.

CNSMS Synthesized Highly Crystalline Pyrite at Low Temperatures

Researchers at the Centre for Nano and Soft Matter Sciences (CNSMS), Bengaluru, an autonomous institute under Department of Science & Technology (DST) synthesised highly crystalline pyrite FeS_2 at low temperatures and utilized them for fabricating electrochemical energy storage devices such as batteries and high energy density supercapacitors (SCs). The team reported stabilising this intermediate metastable oxyhydroxide ($FeOOH$) and utilizing it as a precursor for sulfidation, in the presence of H_2S gas. Using a metastable precursor helped in lowering the annealing temperature, as $FeOOH$ converted into pyrite FeS_2 with fairly good crystallinity at a low temperature. This synthetic route of obtaining sulfides from their corresponding metastable oxyhydroxides could be extended to other transition metals to obtain crystalline materials in an energy intensive way. Electrodes for high-energy density SCs were fabricated from the as synthesized FeS_2 , resulting in superior performance in the presence of organic and ionic-liquid (IL)-based electrolytes.

Special Update: MeitY Launched India's First Indigenously Developed MRI Scanner

Ministry of Science & Technology (MeitY) launched India's first Indigenously developed, Affordable, lightweight, Ultrafast, High Field (1.5 Tesla), Next Generation Magnetic Resonance Imaging (MRI) Scanner in New Delhi. MeitY informed that under the National Biopharma Mission of Department of Biotechnology, Voxelgrids Innovations Pvt Ltd has developed the MRI Scanner under the Public-Private Partnership mode. With this indigenous MRI scanner, the cost of MRI scanning is expected to reduce considerably for the common man thus allowing a wider access to the otherwise highly priced MRI scans.