



Embassy of India, Berne

INDIA SCIENCE AND INNOVATION WEEKLY

25 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

IIT-Jodhpur Fabricated a New Device for High-Density Data Storage

Researchers at Indian Institute of Technology (IIT) – Jodhpur fabricated a memory device based on Resistive Random-Access Memory (RRAM) technology, for electronic gadgets that promises to provide high-density data storage. Currently the available technologies such as HDD, USB, SD cards, Solid State Drives (SSD), Dynamical Random-Access Memory (DRAM), and Static Random-Access Memory (SRAM) have limited data storage capacity & cannot handle the vast quantum of data. Therefore, memory devices need to be miniaturized to store the massive data in a small device, but, the currently available silicon-based memory technologies face serious reliability issues upon downscaling. IISc Bengaluru added that RRAM technology which has shown great promise for the next-generation computing memory storage technology have promises to overcome the problem.

ISRO to Develop Indigenous Capabilities Towards Space Tourism

Department of Space, Gov. of India, reported that Indian Space Research Organisation (ISRO) is in the process of developing indigenous capabilities towards space tourism through the demonstration of human space flight capability to Low Earth Orbit (LEO). Towards this objective Indian National Space Promotion and Authorization Centre (IN-SPACe) also seeks to promote active participation of private sector in carrying out end-to-end space activities, which include space tourism as well.

Scientists Identified New Co-Dopants that could Create Better Performing and more Stable Solar Cells

Scientists at Alagappa University identified co-dopants that could increase the photovoltaic performance of transparent metal oxides such as ZnO, In₂O₃ and SnO₂ thereby creating potential for more efficient, better performing and more stable solar cells as they showed excellent electrical and optical properties. Researchers explored that effective dopant could play in improving the efficiency of Tin oxide (SnO₂) as an efficient transparent metaloxide for solar devices & found that while Aluminium (Al) metal when incorporated into the SnO₂ lattice as a potential dopant, changes the electron concentration and series resistance of the film, addition of lanthanum (La) metal led to higher conductivity and heightened fill factor.

IISc-Bengaluru Developed New Tech to Generate Green Hydrogen from Biomass

Researchers at Indian Institute of Science (IISc)-Bengaluru developed an innovative technology with the support Ministry of New and Renewable Energy and the Department of Science and Technology that promises to produce hydrogen from the abundantly available biomass itself instead of the traditional raw material of fossil fuels. The new environment-friendly process consists of two steps. In the first step, biomass is converted into syngas – a hydrogen-rich fuel gas mixture – in a novel reactor using oxygen and steam. In the second step, pure hydrogen is generated from the syngas using an indigenously developed low-pressure gas separation unit.

Special Update: IIT Madras Developed Game-Changing Redox Flow Battery

Researchers at the Indian Institute of Technology (IIT) Madras through a project funded by ONGC Energy Centre Trust and the Pudukkottai-based company High Energy Batteries, developed 'Vanadium Redox Flow Battery' (VRFB). IIT Madras also added that Redox flow batteries (RFB) promise to become a game-changer for future energy storage systems in the stationary segment as adopting VRFB into the energy distribution chain would ensure continuous power supply from wind and solar farms. Since it utilises an aqueous electrolyte, it is safe and does not get affected by thermal runaway issues and the developed VRFB could operate at a high current density with 80-85% efficiency. Besides, this could be used as large-scale UPS [uninterrupted power supply] for office buildings.