



Embassy of India, Berne

# INDIA SCIENCE AND INNOVATION WEEKLY

04 September 2023

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

## JNCASR Designed New Pathway to Improve Electronic Properties of Nitride Semiconductors

Researchers at Bengaluru's Jawaharlal Nehru Centre for Advance Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology, found a new way to increase the efficiency of nitride semiconductors used in thermoelectricity, plasmonics, and artificial synaptic devices. Researchers designed a strategy to improve the hole mobility in semiconducting p-type scandium nitride (ScN) as a fundamental challenge of certain type of nitride semiconductors such as p-type scandium nitride (ScN) in realizing high-efficiency electronic device applications is their low hole mobility or the ability of a hole to travel across it in the presence of an applied electric field.

## India Launched World's 1<sup>st</sup> Prototype of the BS 6 Stage II 'Electrified Flex Fuel Vehicle'

Ministry of Road Transport & Highways (MORTH), Govt. of India launched the world's first prototype of the BS 6 Stage II 'Electrified Flex Fuel Vehicle', developed by Toyota Kirloskar Motor. Ethanol being an indigenous, eco-friendly, and renewable fuel holds promising prospects for India, it also aligns with objectives of attaining energy self-sufficiency and positively impacting the environment. Talking about innovations in biofuels MORTH informed about the refinery in Numaligarh in Assam where bamboo is being used for manufacturing bio ethanol.

## IIT Kanpur Developed New Protective Layer for Microwave Metamaterial Absorbers

Researcher at Indian Institute of Technology (IIT) Kanpur developed new Protective Layer for Microwave Metamaterial Absorbers, which has far-reaching implications for a multitude of fields. The newly safeguarded transparent microwave metamaterial absorber could be applied directly to optical transparent windows, making them capable of absorbing over 90% of incident electromagnetic waves at microwave frequencies. This translates to both stealth applications in defense and a means to combat electromagnetic pollution caused by the proliferation of radiation-emitting devices. Unlike earlier designs prone to scratching, this patented protective coating retains the electrical and optical properties of the absorber, rendering it reliable under adverse conditions. The Protective Layer for Microwave Metamaterial Absorbers & Method has been patented in India.

## CSIR-CMERI Developed Compact Electric Tractor

Central Mechanical Engineering Research Institute (CMERI) at Council for Scientific and Industrial Research (CSIR) indigenously designed and developed compact 100% Pure Electric Tractor named CSIR PRIMA ET11 mainly to cater small and marginal farmers of India. CSIR also added that farmers could charge the tractor using conventional home charging socket in 7 to 8 hours and operate the tractor for more than 4 hours at field. Otherwise, tractor can run more than 6 hours in case of normal Haulage operation. Also this impactful technology has been licensed to K N bioscience, Hyderabad to take it to the ground level and mass production.

## Special Update: ISRO Successfully Launched First Sun Mission

On 02 Sept. 2023, Indian Space Research Organisation (ISRO) successfully launched the Aditya-L1 spacecraft, from the Second Launch Pad of Satish Dhawan Space Centre (SDSC), Sriharikota. Aditya-L1 spacecraft was successfully injected into an elliptical orbit of 235x19500 km around the Earth. ISRO also added that Aditya-L1 is the first Indian space based observatory to study the Sun from a halo orbit around first Sun-Earth Lagrangian point (L1), which is located roughly 1.5 million km from earth. Aditya-L1 carries seven scientific payloads indigenously developed by ISRO and National Research Laboratories including Indian Institute of Astrophysics (IIA), Bengaluru and Inter University Centre for Astronomy & Astrophysics (IUCAA), Pune. Aditya-L1 spacecraft will undergo four earth-bound orbital maneuvers before placing in the transfer orbit towards the Lagrange point L1. Aditya-L1 is expected to arrive the intended orbit at the L1 point after about 127 days.