



Embassy of India, Berne

# INDIA SCIENCE AND INNOVATION WEEKLY

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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*

## Researchers Developed a Parent Oxoborane, that has Potential to Generation Hydrogen in Standalone Systems

Researchers CSIR, National Chemical Laboratory (NCL), Pune, and CSIR-Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar developed a parent oxoborane (molecular formula  $H-B=O$ ) that may have application in the generation of hydrogen. "The study describes the synthesis of the first parent oxoborane ( $-HB=O$ ) and a rare hydroxy oxoborane ( $-B(=O)OH$ ), which could be considered as boron analogues of formaldehyde and formic acid. By using water as an oxygen source, researchers achieved two important goals: (a) they could avoid the use of peroxide or nitrous oxide which are hazardous and (b) the side product is  $H_2$ , a clean and sustainable fuel."

## IIT-Madras Plans to Study Decarbonisation

As part of decarbonisation efforts by the Indian Institute of Technology (IIT) Madras, the energy consortium at IIT-Madras plans to take up research projects focusing on carbon capture technology and green ammonia production. The research includes identifying alternative fuels, particularly hydrogen and building mechanisms and capabilities. The project would also look at developing material for carbon capture, building cost-efficient DC circuit breakers, which are essential for energy efficiency and developing a standardised protocol for carbon footprint assessment.

## IIT-Delhi Developed Mobile Robot "Robomuse 5.0"

Researchers at Indian Institute of Technology (IIT) Delhi, developed a mobile robot called "Robomuse 5.0", which would be suitable for various industries to carry payloads up to 100 kg and perform object manipulation by installing an arm on top of it. A licensing agreement has been signed between IIT Delhi's Technology Innovation Hub, named IHFC, and a Pune-based company, SVR InfoTech, for the technology transfer of Robomuse 5.0. Researcher also added that "Robomuse 5.0, with its ROS (Robot Operating System)-enabled features, has a modular mechanical design with a zero turning radius. As a result, autonomous navigation and control are very simple".

## IIT-Delhi Developed AI/ML Model, Predicts 2023 to be a Normal Monsoon Year

Researchers at the DST Centre of Excellence in Climate Modeling at Indian Institute of Technology (IIT) Delhi, in collaboration with IIIT Delhi, MIT USA, and JAMSTEC Japan, developed a state-of-the-art machine learning model for monsoon rainfall prediction. The team predicted an All India Summer Monsoon Rainfall (AISMR) of ~790mm in the oncoming monsoon season, meaning a normal monsoon for the country in 2023. The prediction is made using a model trained with historical AISMR data, Niño3.4 index data & categorical Indian Ocean Dipole (IOD) data for the period 1901-2001.

## Special Update: DoT Launched Bharat 6G Alliance

With the aim to provide universal and affordable connectivity, developing indigenous technology, telecom and semiconductor manufacturing ecosystem & taking lead in 6G Technology to drive Innovation and Collaboration in Next-Generation Wireless Technology, Department of Telecommunications (DoT) launched Bharat 6G Alliance. In addition, DoT made the following announcements:

- Formation of the Bharat 6G Alliance (B6GA), a collaborative platform consisting of public and private companies, academia, research institutions, and Standards development organizations.
- The website for Bharat6G Alliance was also launched, the link for the same is <https://bharat6galliance.com>
- B6GA would forge coalitions and synergies with other 6G Global Alliances, fostering international collaboration and knowledge exchange

Further, India is developing Advance optical communication with zero latency that shall help in fields like Telemedical and Telesurgery