NEWSLETTER MAY 2023

Campus wide Hydrogen Valley Innovation Cluster at the premises of IISc campus

BeST Cluster facilitates the submission of the EoI to Department of Science and Technology to set up a Campus-wide Small-scale Hydrogen Valley Innovation Cluster in the premises of Indian Institute of Science (IISc) Bengaluru. EoI submitted by the IISc as the lead applicant (Co-ordinator: Prof. Dasappa S, Chair, ICER, IISc) with a wide range of consortium partners.

BHARAT - Bio Hydrogen from Agricultural Residue and Application in Technologies

EoI submitted by the IISc as the lead applicant with a wide range of consortium partners on 14th May 2023 to the Department of Science and Technology, GoI

Consortium partners				
Academic / Research	**Industry off-takers / demo**	**Industries / Start-up Technolgies**	**Policy**	**Project developer / Consultant**
IISc Jain University CoE PS&RM IITD MAHE M S Ramaiah VIT Vellore Jamia Milia Islamiah RV College CSIR-NAL	Volvo India Reliance Hero Future energies	Biovikas Densepower Fluitron Grassroots Syscon 1H1 labs Autometers Schneider electric Luxusfur	Dept of Industries and Commerce, GoK	Avant Garde Livegreen

Focus areas		

Generation
• Primary source: Oxy-steam gasification of biomass
• Adjunct source: Electrolyzer (PEM / SOEC)
• Catalytic processes for the synthesis of a range of downstream fuels and chemicals
	Storage
	• Liquid Organic Hydrogen Carriers
	• Compressed storage
	• Metal hydrides
	
	Distribution
	• Liquid carrier transport
	• Dehydrogenation and dispensing
	• Compressed dispensing
	• Metal hydrides
		Utilization
		• Transport applications
		  ○ Hydrogen – Fuel for PEM and ICE
		  ○ Methanol – ICE
		  ○ DME – for engines and fuels
		  ○ Ethanol
		• Fertilizer sector and stored hydrogen as liquid fuel – green Ammonia
		• Steel sector
		• Glass sector

BeST initiates collaboration with Transform Rural India Foundation

The BeST Cluster hosted a visit for Transform Rural India Foundation (TRIF), a non-profit organization committed to transforming rural India through better livelihoods, education, healthcare, and skilling, while engaging the community and government. Interactions between TRIF and Digital Podiatry Products from the BeST Cluster's Digital Health Theme for their programs on NCD and developers of point-of-care diagnostics for sickle cell anemia from ShanMukha Innovations Private Ltd (IISc) to support the government on its mission to eradicate the disease by 2047. Collaboration with TRIF has been initiated as last mile delivery partner that will help us achieve the shared vision of taking technology to societal benefit.

Opportunities in Hydrogen Safety with CoE PS&RM IIT Delhi

Director, Centre of Excellence in Process Safety & Risk Management for a Hydrogen Economy in IIT Delhi, visited the BeST Cluster at IISc. Collaboration opportunities in Hydrogen Safety Space were discussed. CoE PS&RM is a joint initiative of IITD-FITT-Nayara-Gexcon to develop human capital and to carry out training, research, consultancy and advisory in domain areas of Process Safety, Risk management, Hydrogen Safety and Green Hydrogen, as also providing consultancy and advisory to industries, Govt. and Public Sector units of GoI.

Global Collaborative opportunities through Consulate General of Canada

Dr. Neha Pankow, Head Strategy and Business Development, BeST Cluster, visited the Consulate General of Canada in Bengaluru to discuss mutual areas of interest in S&T domains. It was a great discussion with Abhi Malik, at the consulate general of Canada, to further explore intersections in the areas of clean energy, one health, and capacity building.

(https://www.psa.gov.in/st-clusters)

To achieve the top of the pyramid, one of the BeST cluster's efforts is to foster internationalization by teaming up with foreign clusters, foreign industries, and research institutes.

6G for Vehicle To Everything Communication

Simplified architecture of intelligent transportation system (ITS) showing V2X connectivity.

(Images: Jogesh Chandra Dash and Debdeep Sarkar)

The era of connected autonomous vehicles with advanced applications requires a significantly enhanced and extremely intelligent vehicle-to-everything (V2X) communication network. The sixth-generation (6G) communication systems will fulfill these requirements of the next-generation V2X. This is one of the technologies of interest to the BeST Cluster under the 'urban mobility' theme towards truly intelligent transport systems.

Researchers at IISc (team led by Dr. Debdeep Sarkar, Assistant Professor at the Department of Electrical Communication Engineering) have been working on designing antennas that can empower 6G technology, which is instrumental in realizing efficient V2X (Vehicle to Everything) communications. They show how self-interference in full-duplex communication antennas can be reduced, and consequently, the movement of signals across the communication network can be faster and more bandwidth-efficient. Such full-duplex antennas are particularly helpful for applications that require almost instantaneous relay of commands, like driverless cars.

The antenna developed by Sarkar and his postdoc fellow Dash, by virtue of its design, relies on passive interference, allowing it to operate as a full-duplex system. By doing so, they have eliminated the need for bulky and expensive components, making the antenna compact and cost-efficient which can be easily integrated into the rest of the circuitry of any device.

CONGRATULATIONS

Prof. Navakanta Bhat, Centre for Nano Science and Technology, IISc | PathShodh Healthcare Pvt Ltd | Advisory board BeST Cluster
Yashraj Bharti Samman Award 2022-23; Category – Innovation in Healthcare

Prof. Uma Ramakrishnan, National Centre for Biological Sciences | One Health Theme Lead BeST Cluster
Featured in the book "Vigyan Vidushi: 75 Women Trailblazers of Science" | Molecular Ecology Prize 2023.

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