International Conference on Hydrogen Energy and Sustainability (HES -2025)
10-12th October 2025
IIT (BHU) Varanasi

Friday, 10 October 2025

Venue	DEV & VARDHANA GOSWAMI LECTURE COMPLEX, IIT BHU VARANASI	Venue
8:00-9:00	Registration and Breakfast	8:00-9:00
9:00-9:45	Inauguration Chief Guest: Dr. V.K. Saraswat (Honourable Member, NITI Aayog) Venue: Conference Hall 1	9:00-9:45
9:00-9:05	Dignitaries on Dias	9:00-9:05
9:05-9:10	Garlanding on Statue of Malviya Ji followed by Lamp Lightening	9:05-9:10
9:10-9:15	Kulgeet	9:10-9:15
9:15-9:18	Welcome Address by Convener HES 2025	9:15-9:18
9:18-9:20	Welcome Address by Head Dept of Chemical Engineering and Technology Prof. M.K. Mondal	9:18-9:20
9:20-9:25	Address by Director IIT BHU Prof. Amit Patra	9:20-9:25

9:25-9:35	**Address by Chief Guest Dr. V.K. Saraswat**				**9:25-9:35**
9:35-9:45	**Conference Opening**				**9:35-9:45**
9:45-10:30	**Plenary Talk 1: Dr. V.K. Saraswat (Honourable Member, NITI Aayog)**				**9:45-10:30**
10:30-11:00	**High Tea/Poster**				**10:30-11:00**
Venue	**Conference Hall 2**		**Conference Hall 3**		**Venue**
11:00-13:30	**Session 1: Hydrogen Production**		**Session 2: Hydrogen Application**		**11:00-13:30**
	Speaker	**Title**	**Speaker**	**Title**	
11:00-11:25	**Dr. Ranjith Krishna Pai** DST, New Delhi **(Keynote)**	Department of Science and Technology- Hydrogen and Fuel cell Program	**Dr. Anirudh Gautam** Center for Railway Research **(Keynote)**	Hydrogen Applications in Indian Railways	**11:00-11:25**
11:25-11:50	**Prof. Arvind Kumar Chandiran** IIT Madras **(Keynote)**	Halide Perovskites for Solar Water Splitting	**Mr. Sidharth Mayur** h2e Power **(Keynote)**	Fuel Cell	**11:25-11:50**
11:50-12:10	**Prof. Kumud Malika Tripathi** IIT Jodhpur **(Invited)**	Photocatalytic Hydrogen Evolution from Diesel Soot Derived Carbon Nano Onions: A Circular Path to Sustainable Energy	**Mr. Om Prakash Verma** Jhonson Prism Cement **(Keynote)**	Scope of Hydrogen Usage in the Cement Industry	**11-50-12:15**
12:10-12:20	**Prof. Loveleen Kaur Brar** (TIET, Patiala)	Synthesis of TaO/MoO@C3N4	**Prof. Umamaheswarrao P**	Performance and Emissions Optimization of a CI Engine	**12:15-12:25**

		Electrocatalysts for Water Splitting	(Bapatla Engineering College)	Using RSM and Machine Learning Models using Hydrogen-Enriched Sesame Biodiesel blends	
12:20-12:30	**Dr. Santosh Kumar Singh** (IIT (ISM) Dhanbad)	Assessment and optimization of solar-driven organic Rankine cycle for sustainable hydrogen production	**Dr. Priyanshu** (IIT Jammu)	Fixed-Wing UAV Integrated with a Hydrogen Fuel Cell to Enhance Long-Endurance and Sustainable Flight	**12:25-12:35**
12:30-12:40	**Dr. Soumendra Kumar Das** (IIT (ISM) Dhanbad)	Efficient Prediction of Band Gap and Band Edge Position in Pure and Substituted C2N Monolayer for Photocatalytic Water Splitting Using Different Semilocal Meta-GGA Functionals	**Dr. Akanksha Kumar Pathak** (IIT (ISM) Dhanbad)	Physics-Based 2D Simulation of the Coup de Fouet Effect in Lead-Acid Batteries for Renewable Integration	**12:35-13:45**
12:40-12:50	**Himanshu Asati** (IIT Jodhpur)	Visible Light Responsive Carbon Nano Onions-MoS2 Heterostructures for Green Hydrogen Production	**Ankur Kumar** (IIT BHU)	Numerical Study of Helium Jet in Crossflow Under Active Forcing: Optimizing Penetration and Mixing	**12:45-12:55**
12:50-13:00	**Dr. Silviya R** (Jain University)	N-Doped Carbon Supported Co-W Phospho-Boride Electrocatalyst for Efficient Hydrogen Evolution in Alkaline Seawater	**Anbumani P** (BITS Pilani)	Degradation Signature Analysis of PEMFCs using Data-Driven Techniques for Hydrogen-Powered Vehicles	**12:55-13:10**

13:00-13:10	**Ajeet Kumar** (IIT Kanpur)	g-C3N4-supported ASnO3 (A = Fe, Ni) perovskite-based dual S-scheme heterostructure: Efficient hydrogen evolution via photocatalytic water splitting	**Arjun Singh Kachhawa** Jai Narain Vyas University, Jodhpur	Photocatalytic Water Splitting Under Visible Light Using B, N-Doped Functionalized Graphene Sheets	**13:10-13:20**
13:10-13:20	**Apoorva B C** (CHRIST University, Bangalore)	Alkaline Urea Splitting for Green Hydrogen production with Cobalt Sulfo-Boride MOF Electrocatalyst			
13:20-13:30	**Anup Mahata** (IIT Delhi)	Poly-phosphamide driven proton relay for membrane fabrication and electrocatalytic proton reduction			
13:30-14:30	**Lunch Break**				**13:10-14:30**
Venue	**Conference Hall 2**		**Venue: Conference Hall 3**		**Venue**
14:30-16:30	**Session 3: Hydrogen Production**		**Session 4: CO_2 Utilization**		**14:30-16:30**
	Speaker	**Title**	**Speaker**	**Title**	
14:30-14:55	**Dr. Sujay Karmakar** CGM NETRA, NTPC **(Keynote)**	Hydrogen Energy in Power Industry	**Dr. Vaibhav Pandey** NTPC **(Invited)**	Renewable Carbon to Jet Fuel: Scalable Pathways for Aviation Decarbonization	**14:30-14:50**
14:55-15:20	**Dr. Pramod Kumar** HPCL Bengaluru	Turquoise Hydrogen: A technology for Hydrogen	**Dr. Neha Antil**	Ruthenium Nanoparticles Immobilized on Water-Stable	**14:50-15:10**

	(Keynote)	Production with no CO_2 emission	Max Planck Institute CEC, Germany **(Invited)**	Carbon-Based Supported Ionic Liquid Phases for CO_2 Hydrogenation to Formates	
15:20-15:40	**Prof. Koustuv Ray** IIT Kharagpur **(Invited)**	Ni1-xCox alloy catalyst for hydrogen production from hydrocarbon cracking and oxygenates reforming	**Prof. Prateek Khatri** NIT Rourkela **(Invited)**	Non-noble metal supported catalysts for methane oxidation under oxygen-rich conditions	**15:10-15:30**
15:40-15:50	**Dr. Thillai Sivakumar Natarajan** (CSIR-Central Leather Research Institute)	Catalysts-Driven Hydrogen Production from Aluminiumâ€“Water Systems: Reaction Mechanism and Kinetic Perspectives	**Prof. Jigisha k Parikh** (Sardar Vallabhbhai National Institute of Technology, Surat)	A green reaction pathway for the CO_2 utilization	**15:30-15:40**
15:50-16:00	**Dr. Keshav Kumar** (IIT Guwahati)	Comparative Study of Traditional Reformer, Membrane Reformer, and Double Stage Membrane Reformer for Enhanced Hydrogen Production Using Methanol Steam Reforming	**Garima** (IIT KANPUR)	Effect of Al_2O_3, SiO_2, TiO_2, and SiO_2 â€“ Al_2O_3 supports on the Ni catalyst for CO_2 methanation	**15:40-15:50**
16:00-16:10	**Aakash Rajpoot** IIT (ISM) Dhanbad)	Turquoise Hydrogen and Carbon Nanotube Production via Catalytic Methane Decomposition over Fe-Co-Zn/Î³-Alâ‚‚Oâ‚ƒ Nanocatalyst	**Jenish S** (IIT Jammu)	Comparison of PSA and TSA for the Separation of CO_2 â€“ N_2 mixtures by Computational and Experimental Investigations	**15:50-16:00**
16:10-16:20	**Sachin Kumar Sharma** (IIT Guwahati)	Structurally Tuned nife-LDH/CNT Electrocatalyst	**Rajvikram Singh** (IIT Kanpur)	Optimization of a catalytic system for RWGS: Influence	**16:00-16:10**

		for Efficient Hydrogen Evolution		of active metal, support and calcination temperature	
16:20-16:30	**Bhavtosh Pandey** (HBTU)	Hydrogen Policy Landscape and Energy Management Architecture in India: Prospects, Complexities, and The National Green Hydrogen Mission	**Lavanya Yalagandula** (BITS Pilani)	Dual-functional Catalyst for Efficient CO_2 Conversion into Value-added Products	**16:10-16:20**
			Rajeev Ranjan (IIT Roorkee)	Role of catalyst supports in enhancing selective hydrogenation of CO_2 to formic acid over Ni-based catalysts	**16:20-16:30**
	Venue: Conference Hall 1				
16:40-17:25	**Plenary Talk 2: Prof. R Sonde, BITS Goa and IIT Delhi** **Science - Speed - Safety - Scale to realise hydrogen economy for India. Sharing of Jodhpur hydrogen valley experience so far**				**16:40-17:25**
17:25-18:30	**High Tea/ Poster Session**				**17:25-18:30**

DAY-2
Saturday, 11 October 2025

Venue	DEV & VARDHANA GOSWAMI LECTURE COMPLEX, IIT BHU VARANASI				Venue
08:00-09:00	Registration and Breakfast				08:00-09:00
	Venue: Conference Hall 1				
9:00-9:45	Plenary Talk 3: Prof. K. K. Pant, Director IIT Roorkee Clean Hydrogen Production from Biomass and MSW via Gasification				9:00-9:45
9:45-10:30	Plenary Talk 4: Prof. Neeraj Rai, Mississippi State University, USA				9:45-10:30
Venue	Conference Hall 2		Conference Hall 3		Venue
10:40-13:30	Session 5: Hydrogen Production		Session 6: Waste to Energy		10:40-13:30
	Speaker	Title	Speaker	Title	
10:40-11:05	**Mr. Sushil Kumar Singh** (Chairman, Deendayal Port Authority) **(Keynote)**	Role of Ports as Hubs for Green Hydrogen production, export, and bunkering, and their contribution to the National Green Hydrogen Mission	**Dr. Sunil Dhole** (JNK Chemdist Tech. Pune) **(Keynote)**	Decarbonizing the Chemical Industry Through Innovative Alternatives in Green Hydrogen Production	10:40-11:05
11:05-11:30	**Dr. Lingaiah Nakka** (IICT, Hyderabad) **(Keynote)**	Bi-metallic Catalytic Systems for Hydrogen rich Syngas Production via Bi-reforming of Methane	**Prof. Vimal Chandra Srivastava** (IIT Roorkee) **(Keynote)**	Waste to energy	11:05-11:30

11:30 -11:55	**Prof. Sebastian Peter** (JNCASR, Bangalore) **(Keynote)**	Advanced Materials for Hydrogen Generation: From Water Recycling to Scalable Technologies	**Prof. Tarak Mondal** (IIT Ropar) **(Invited)**	A Sustainable Route for the Production of Hydrogen from Agricultural Residue	**11:30-11:50**
11:55-12:05	**Prof. Taraknath Das** (IIT Roorkee)	Dry Reforming of Methane for the syngas production using supported Ni-catalyst: Catalyst regeneration and MW-cnts Separation	**Prof. Asma Iqbal** (NIT Srinagar)	Valorizing Non-Recyclable Waste to Energy using Downdraft Gasifier	**11:50-12:00**
12:05-12:15	**Prof. Vandana Meena** (NIT Kurukshetra)	Sillã©n-Type babio2x (X = Cl, Br) Oxyhalides as Promising Photocatalysts for Sustainable Hydrogen Generation and Environmental Remediation	**Prof. Minal Prashant Deshmukh** (MIT WPU, Pune)	An Eco-Friendly Solution for Bioethanol Production from Microalgae with Optimized Process Parameters and Emission Characteristics	**12:00-12:10**
12:15-12:25	**Dr. Deepak Chandra Sau** (CSIR-National Metallurgical Laboratory)	Development of a Process for Production of Hydrogen from Iron Oxide Waste Fines (wustite)	**Prof. Siva Mohan Reddy Narapureddy** (IIT Roorkee)	In-situ hydrogen production and battery electrode materials from metal effluent and biomass	**12:10-12:20**
12:25-12:35	**Rinkoo bhabal** (CHRIST University, Bangalore)	Bimetallic CoNi-MOF-derived electrocatalyst for green hydrogen production by urea electrolysis in wastewater	**Prof. Jyoti Prasad Chakraborty** (IIT BHU)	Pyrolysis of Biomass	**12:20-12:30**
12:35-12:45	**Sri Himaja Pamu** (BITS Pilani)	Harnessing Sunlight for Photocatalytic Hydrogen Evolution via Band-	**Dr. Apoorv Verma** (Kaunas University of Technology),	Insights from lab-scale experiment and numerical simulation to investigate the	**12:30-12:40**

		Engineered lanio3-lavo4 Heterostructures	Lithuania	hydrogen flow behaviour during underground storage	
12:45-12:55	**Lomas Rishi** (IIT Jammu)	Methane Decomposition over FeCo/Al_2O_3: Catalyst and Reaction Conditions Optimization	**Pankaj Parmar** (IIT Kharagpur)	Thermochemical Conversion of Biomass Waste to Energy: Product Yield, Characterization, and Optimization in Pyrolysis Systems	**12:40-12:50**
12:55-13:05	**Abhishek Anand** (IIT BHU)	Role of CeO_2–YSZ Intermediate Layers in Improving Hydrogen Permeance of Palladium Membranes on Porous α-Al_2O_3 Supports	**Mrinmoy Kumar Sarmah** (IIT Guwahati)	Experimental Investigation of Syngas Production in A 25 kw Dual Fluidized Bed Gasifier (DFBG)	**12:50-13:00**
			Dr. Sindhu S (Amrita Vishwa Vidyapeetham)	Pyrolysis Kinetics Study of Lignocellulosic Biomasses	**13:00-13:10**
13:05-14:00	**Lunch Break**				**13:10-14:00**
Venue	**Conference Hall 2**		**Venue: Conference Hall 3**		**Venue**
	Session 7: Hydrogen Storage		**Session 8: CO_2 Capture**		
	Speaker	**Title**	**Speaker**	**Title**	
14:00-14:25	**Prof. Pratibha Sharma** (IIT Bombay) **(Keynote)**	Metal Hydride Based Hydrogen Storage	**Prof. Saroj Kumar Nayak** (IIT Bhubaneshwar) **(Keynote)**	Advanced Functional Materials for Energy Transition	**14:00-14:25**
14:25-14:50	**Prof. Jitendra Sangwai** (IIT Madras) **(Keynote)**	Underground Hydrogen Storage	**Prof. Swapna Rabha** (IIT Madras) **(Keynote)**	CO_2 Capture: Challenges, Advances and Future opportunity	**14:25-14:50**

14:50-15:10	**Prof. Sushant Kumar** (IIT Patna) **(Invited)**	Ammonia Synthesis Under Mild Reaction Conditions: A Way to Make Hydrogen Storage and Transportation More Economic and Realistic	**Prof. Himanshu Goyal** (IIT Madras) **(Invited)**	Modelling of Joule heated reactors: Applications in H_2 production and CO_2 capture	**14:50-15:10**
15:10-15:20	**Prof. Subrata Panda** (IIT BHU)	Effect of Pressure Compaction on Microstructural Evolutions and Hydrogen Storage Properties of Magnesium Powders	**Manvendra Kumar** (Defence Institute of Advanced Technology, Pune)	PLIF-Based Diagnostics of CO_2 and CF_4 Suppression Mechanisms in Hydrogen–Methane Flames	**15:10-15:20**
15:20-15:30	**Prof. Sumeet Kumar Dubey** (UPES Dehradun)	Unveiling the PCI Characteristics of Mg-Ni Alloy: A Step Towards Efficient H2 Storage	**Saswata Dhar** (Defence Institute of Advanced Technology)	Collective Suppression Effect of Hydrogen-Air Mixture with CO_2 and Propene	**15:20-15:30**
15:30-15:40	**Chaithanya Purushottam Bhat** (BITS Pilani)	Ti-Functionalized Newly Modelled Penta-Hexa-Deca Graphene as a Promising Hydrogen Storage Material: A First-Principles Study	**Abhimanyu Singh Khichi** (IIT Madras)	A Comprehensive Investigation of CO_2 Absorption and Desorption Performance Using Novel Amine Solvents	**15:30-15:40**
15:40-15:50	**Digvijay Kumar Gupta** (IIT Guwahati)	Hydrogen Storage Potential and Technical Analysis of Salt Caverns of India	**Praveen Kumaar R** (IIT Madras)	Evaluating the Absorption performance and Degradation Behavior of MEA in Cyclic Post-Combustion CO_2 Capture	**15:40-15:50**
15:50-16:00	**Gaurav Arora** (IIT Delhi)	Modelling the Effect of Process Variables on Hydrogen Uptake and Release in a Metal Hydride Storage System	**Athira V B** (National Chemical Laboratory- NCL Pune)	Optimization of porous support and fabrication of thin film composite (TFC) membrane for CO2 gas separation in simulated flue gas conditions	**15:50-16:00**

16:00-16:10	**Dr. Shyam Sunder Rao** (IIT BHU)	Study the direct synthesis of methanol from the natural gas over ZSM-5 catalyst under mild reaction conditions	**Ishita mandal** (Indian Institute of Petroleum and Energy)	Design of plate-type heat exchangers for absorption-based carbon capture plants for Indian power plants	**16:00-16:10**
16:00-16:30	**High Tea/ Poster Session**				**16:10-16:30**
	Venue: Conference Hall 1				
16:30-17:30	**Pannel Discussion**				**16:30-17:30**
17:30-19:00	**Poster Session**				**18:00-19:00**
19:00-22:00	**GALA Dinner**				**22:00**

DAY-3
Sunday, 12 October 2025

Venue	DEV & VARDHANA GOSWAMI LECTURE COMPLEX, IIT BHU VARANASI				Venue
08:00-09:00	Registration and Breakfast				08:00-09:00
	Venue: Conference Hall 1				
09:00-09:45	Plenary Talk 5: Prof. Shantanu Roy Executive Director IIT Delhi-Abu Dhabi				09:00-09:45
09:45-10:30	Plenary Talk 6: Prof. Sukumar Mishra Director IIT (ISM) Dhanbad				09:45-10:30
Venue	Conference Hall 2		Conference Hall 3		Venue
	Session 9: Hydrogen Production		Session 10: CO_2 Utilization		
	Speaker	**Title**	**Speaker**	**Title**	
10:40-11:05	**Prof. Amit Kumar** IIT Guwahati **(Keynote)**	Hydrogen Generation through Membrane Reformer	**Dr. Dev Kumar** Thermax, Pune **(Keynote)**	Biofuel: Bio and E methanol the next low carbon fuel for Shipping and Aviation	10:40-11:05
11:05-11:30	**Mr. David Cassidy** CEO, Clean Hydrogen Technology, USA **(Keynote)**	How to take your ideas from concept to success – CHT as a case study	**Dr. Rakesh Saini** Principal Scientist, CSIR - IMMT Bhubaneswar **(Invited)**	Sustainable utilization of industrial solid waste substrate via thermochemical route	11:05-11:25
11:30 -11:55	**Dr. Sudhir Sarawat** CEO Horizon India Group **(Keynote)**	Fuel Cell	**Dr. Ejaz Ahmad** IIT (ISM) Dhanbad **(Invited)**	Cox Free Turquoise Hydrogen Production from Coal Bed Methane: A Futuristic	11:25-11:45

				Approach Towards Carbon Neutral Mining	
11:55-12:15	**Dr. Snigdha Mishra** University of Leicester, UK **(Invited)**	Deep Eutectic Solvents for Sustainability	**Dr. Madhulika Gupta** IIT (ISM) Dhanbad **(Invited)**	Decoding the Role of Substitution Patterns and Surface Polarity in Biomass Recalcitrance	**11:45-12:05**
12:15-12:25	**Dr. Binod Kumar** IIT Jammu	Development of a 3D-Printed Integrated Heat Exchanger and Catalytic Reactor for 1 kW Ammonia-Fed Solid Oxide Fuel Cell Systems	**Prof. Sivasubramanian Velmurugan** National Institute of Technology Calicut	Valorization of Phormidium Valderianum for CO_2 Fixation and Phycocyanin as a Natural Food Colorant	**12:05-12:15**
12:25-12:35	**Dr. Nainsi Saxena** IIT (ISM) Dhanbad	Catalytic Decomposition of Coalbed Methane for Turquoise Hydrogen Production and Carbon Nanotube as byproduct Using Nickel-Supported Bentonite as catalyst	**Dr. Saumya Tiwari** IIT Kanpur	Methane-CO_2 Reforming in Molten Carbonate Salt Medium for Sustainable Syngas Production	**12:15-12:25**
12:35-12:45	**Dr. Aniruddha Santosh Bhide** CHRIST, Bangalore	Energy Efficient Green Hydrogen Generation via Formaldehyde Electrooxidation Using a CuFe-Based Catalyst	**Kaushik Kundu** IIT Delhi	H_2-rich syngas production through ML-driven catalyst optimization with experimental validation	**12:25-12:35**
12:45-12:55	**Anusha Yajurvedi** University of Antwerp, Belgium	Induction Heating of Commercial Catalysts for Ammonia Cracking: Hydrogen Production and Asset Valorisation	**Dr. Priyanshu** IIT Jammu	A Novel Beam-Down Parabolic Dish Concentrator System Integrated with Transcritical CO2 Rankine Power Cycle and PEM Electrolyzer for Green	**12:35 -12:45**

				Hydrogen Production: Design, Optical Analysis, and Techno-Economic Optimization	
12:55-13:05	**Sachin Kumar Vishwakarma** IIT BHU	Experimental Investigation of Joule Heated Membrane Separator for Ultra-Pure Hydrogen Production Using Methanol Steam Reforming	**Deepa Agrahari** Madan Mohan Malviya University of technology	Optimized Biohydrogen Production from Industrial Spent Wash via Integrated Dark Fermentation and Microbial Fuel Cell Using Clostridium biocatalyst	**12:45-12:55**
13:05-13:15	**Amarendra Nayak** Ravenshaw University, Cuttack, Odisha	An Interface Engineering Strategy of FeS2/CoS2@MoS2 as an Electrocatalyst for Efficacious Water Splitting	**Deeksha Jaiswal** IIT Kanpur	Ti_3C_2TX-based Zr@MXene for CO_2 Capture and Conversion	**12:55-13:05**
			Matam Sandeep Chandra IIT Madras	Modelling of CO_2 desorption process from aqueous amine solution by coupling phase transfer with reaction kinetics	**13:05-13:15**
13:15-14:30	**Closing Ceremony, Awards Distribution and Lunch Break**				**13:15-14:30**