The Institution of Engineers, Malaysia

Organised by Material
Engineering Technical Division

BEM Approved CPD: 2
Ref. no: IEM26/HQ/532/T(w)

WEBINAR TALK ON

TOPIC 1: PREDICTIVE MODELING HEURISTICS AND EXPLAINABLE AI FOR PICKERING EMULSIONS STABILIZED BY COLLOIDAL LIGNIN

TOPIC 2 :POWER-TO-X: ELECTROCHEMICAL PATHWAYS TOWARDS A HYDROGEN-POWERED AND SUSTAINABLE FUTURE

Presented by:

Dr. Ronald Jesús Márquez Contreras &
Ir. Assoc. Prof. Ts. Dr. Henry Foo Chee Yew

4 DEC 2026, FRIDAY

3.00PM - 5.00PM

ONLINE - ZOOM

Registration Fees:

Student Members : Free
IEM Members : RM 15.00
IEM Non Members : RM 70.00

Synopsis topic 1 : Predictive Modeling Heuristics and Explainable AI for Pickering Emulsions Stabilized by Colloidal Lignint

This technical talk presents practical, data-driven heuristics for designing Pickering emulsions stabilized by colloidal lignin particles (CLPs). It explains how CLP size and concentration, lignin source and production route, oil-to-water ratio, pH, charge, and chemical modification influence interfacial coverage, droplet-size distribution, stability, and scalability.

A meta-analysis and machine-learning workflow combining support vector regression, Bayesian optimization, and explainable artificial intelligence (SHAP) transforms experimental findings into interpretable prediction and formulation rules.

The session concludes with processing maps, practical formulation windows, and opportunities for emulsion-derived hierarchical advanced materials.

Speaker 1 : Dr. Ronald Jesús Márquez Contreras



Dr Ronald Márquez is an Assistant Professor in the Department of Chemical Engineering at the University of Girona, Spain, and a researcher at the Laboratory of Sustainable Materials and Product Design (LEPAMAP-PRODIS).

His research focuses on sustainable materials, colloidal lignin particles, Pickering emulsions, interfacial self-assembly, and emulsion-derived hierarchical materials.

He applies meta-analysis, machine learning, Bayesian optimization, and explainable artificial intelligence to develop interpretable predictive models and practical formulation heuristics.

Synopsis topic 2 :Power-to-X: Electrochemical Pathways Towards a Hydrogen-Powered and Sustainable Future

This talk explores the concept of an electrochemical refinery as an integrated platform for converting renewable electricity into hydrogen, fuels, and value-added chemicals. It introduces the Power-to-X concept, highlighting electrochemical pathways that enable renewable energy conversion, storage, and utilisation across the energy and chemical industries.

The discussion will examine the emerging hydrogen economy and the role of electrochemical refineries in connecting green hydrogen production with downstream Power-to-X applications, supporting industrial decarbonisation and sustainable resource utilisation.

Key technological developments in advanced material design, synthesis, and characterisation will be presented alongside the engineering challenges of reactor development, pilot-scale validation, technology scale-up, and commercialisation. Finally, the talk will address future challenges, research opportunities, and a vision for advancing electrochemical technologies towards economically viable and sustainable industrial solutions, while identifying opportunities for interdisciplinary research, industry engagement, and collaborative partnerships.

Speaker 2 : Ir. Assoc. Prof. Ts. Dr. Henry Foo Chee Yew



Ir. Dr. Henry Foo Chee Yew is an Associate Professor at Curtin University Malaysia, specialising in Chemical Engineering and Nanotechnology.

With over 10 years of research experience, he has led six projects as Principal Investigator, secured more than RM2 million in research funding, and published over 70 research papers.

He currently leads an SRDC-funded project on the electrochemical regeneration of borax into sodium borohydride for solid-state hydrogen storage.

He is a Professional Engineer (BEM), Professional Technologist (MBOT), Chartered Engineer (Engineers Australia) and Energy Storage Lead at the Centre of Excellence in New and Sustainable Energy Research and Ventures (CONSERV).