INDIAN INSTITUTE OF TECHNOLOGY MADRAS

DEPARTMENT OF MECHANICAL ENGINEERING |

Ph.D. Seminar Talk 2

Title of the Seminar: Investigation into the Effects of Ultrasonic Waves on the Dynamics of Bubble Plumes Generated via Electrolysis.

Speaker: Mr. Saikat Chakborty (ME11D048)

Ph.D. Research Scholar, Department of Mechanical Engineering, IIT Madras.

DATE & TIME	VENUE	ONLINE
27 November 2026, Tuesday, 03:00 PM – 04:00 PM.	Arcot Ramachandran Seminar Hall, HTTP Lab, Department of Mechanical Engineering, IIT Madras.	**Join via Google Meet:** ---------

Guide: Dr. Saritkumar Das, ME.

Co-Guide: Dr. Dhiman Chatterjee, ME

SCAN TO JOIN

ABSTRACT

- Electrolysis-generated hydrogen bubble plumes are influenced by bubble departure, coalescence, diffusive growth, and plume-induced hydrodynamics. This study investigates the influence of ultrasonic waves generated by a piezoelectric transducer on bubble plumes produced during electrolysis.
- Using image processing techniques, bubble size distributions and velocities are measured both with and without ultrasound. The study demonstrates that the influence of ultrasound on bubble size near the cathode depends on the driving frequency, even when the input power remains the same.
- Similar bubble statistics at different heights along the bubble plume, under various operating conditions, will also be presented. Based on the present study, empirical relationships have been developed between bubble-normalized velocity and bubble diameter.
- It is anticipated that these findings will contribute to improved modelling of microbubble plumes and may eventually lead to more efficient green hydrogen production.