भारतीय प्रौद्योगिकी संस्थान मंडी

INDIAN INSTITUTE OF TECHNOLOGY MANDI

Institute Colloquium

FLUID MECHANICS THROUGH PICTURES

28 February, 2025

05:00PM

Auditorium, North Campus

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Professor (Rtd.) - Mechanical Engineering Department and the Centre for Product Design and Manufacture

Indian Institute of Science, Bangalore

Fluid Mechanics Through Pictures

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Abstract

Fluid flows are very amenable to visualization, which has led to major advances in the understanding of fluid mechanics. Ludwig Prandtl, considered to be the founder of modern fluid mechanics, was a pioneer in using simple flow visualization techniques to develope key insights into complex phenomena and which also led to his proposal of the revolutionary boundary layer theory. Flow visualization continues to be an important component of fluid mechanics research and teaching. Using pictures and videos, I will try to explain some important fluid mechanics concepts and also discuss some of the research done in our laboratory. Topics that will be covered include streamlined and bluff bodies, cricket ball swing, reverse sprinkler, fish swimming, unsteady arterial flows, turbulent convection and creating clouds in the laboratory.

About the speaker:
Jaywant H Arakeri served in the faculty of the Mechanical Engineering department and the Centre for Product Design and Manufacture at the Indian Institute of Science, Bangalore till 2022. Currently he is a visiting professor at IIT, Jodhpur and an honorary professor at JNCASR, Bangalore. All his education has been in aeronautical engineering, BTech (IIT, Madras), ME (IISc) and PhD (Caltech). His research is primarily focused on the fundamental understanding of various phenomena in fluid mechanics and heat transfer, in particular related to turbulence, transition to turbulence, unsteady flows, bio-fluid mechanics and evaporation from porous media. Some of his recent research topics include the role of turbulence in condensation and droplet growth in clouds, flows around flexible surfaces like fish tails and heart valves, unsteady flows, like those found in arteries and related to pulsed propulsion, heat and moisture loss from soils and leaves, and precision agriculture. He has written several popular science articles in Resonance. He was an Editor-in-Chief of the journal Sadhana, and is a Fellow of the Indian National Academy of Engineering and Indian Academy of Sciences.