भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Applied Physics & Machine Learning Seminar Series, IIT Hyderabad

Online webinar on **Dec 15, 2020 at 04:00 PM**

Date : 15-12-2020
Time : 04:00 PM (IST)
Speaker : **Prof. Micheline Abbas**
Affiliation : University of Toulouse, Toulouse, France
Title : Flowing particles meeting a wall: interplay between viscous and inertial effects.
Link : https://meet.google.com/pvv-ocne-xiv

Abstract

Quite often, the flow of suspensions or liquid-solid mixtures reveals macroscopic features, which understanding requires examining micro-scale (particle) arrangement and interactions (of hydrodynamic or interfacial nature like attraction/repulsion or solid collision). Examples include rheology and stability of wall-bounded flows. We are interested in problems where inertial effects at the particle scale are not negligible compared to viscous effects. Numerical simulations are used to solve fully coupled non-linear fluid and particle equations of motion. I will show that i) inertia can lead to unexpected effects on the dynamics of even a small number of particles, especially near solid walls and ii) how challenging it is to rationalize the observed dynamics by existing theories. Potential applications are particle/cell sorting in microfluidic devices, transport of mixtures in arbitrary geometries, and surface erosion when submitted to particle-laden flow.

Short Bio:

Micheline Abbas is associate professor, since 2010, at the University of Toulouse (Chemical Engineering department). Her scientific activities focus on understanding and modelling the dynamics of multiphase dispersed fluids (like suspensions or emulsions), in cases where the system is subject to external force field (gravitational, magnetic) or to flow. Typical environmental and engineering applications are fluidization, separation, mixing and transport.