ICTS Fluid Dynamics Seminar

Title : Energy transfer in variable density flows: filtering and point-splitting approach

Speaker : Prasad Perlekar (Tata Institute of Fundamental Research, Hyderabad)

Date : Thursday, 26 February 2026

Time : 11:30 AM (IST)

Abstract : Energy transfer in turbulent flows is typically described either through correlation functions, via the Kármán-Howarth-Monin relation, or through a scale-by-scale budget of filtered energy (Frisch 1995). For constant-density turbulence, the equivalence between these two descriptions is well understood. In compressible turbulence, however, several definitions of filtered energy exist, and for most of them the associated formulation in terms of correlation functions is unclear. We develop a general framework to determine the multi-point correlation functions corresponding to any specified filtered energy. As a demonstration, we show that the Favre filtered energy--defined as the ratio of the squared filtered momentum to the filtered density--and the terms in its budget can be written as an infinite series of multi-point correlation functions.

Venue : Emmy Noether Seminar Room
Zoom Link: https://icts-res-in.zoom.us/j/96472114505?pwd=GcZbeH571gQyh9HRRB6uUluvaXF7ue.1
Meeting ID: 964 7211 4505
Passcode: 817925