

## ICTS Skype Seminar

- Title : A new approach to study strong advection problems in turbulent diffusion theory.
- Speaker : Harsha Hutridurga, Imperial College London, UK
- Date : Tuesday, April 11, 2017
- Time : 1:30 PM
- Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore
- Abstract : This talk aims at giving an overview of a new analytical technique that myself, Thomas Holding and Jeffrey Rauch have developed to address multiple scales in advection-diffusion type models. The equation that we consider models the evolution of a concentration field subject to (i) advection by an incompressible fluid field, (ii) molecular diffusion. Our strategy, loosely speaking, is to recast the advection-diffusion equation in moving coordinates dictated by the flow associated with the advective field. The quantity of interest turns out to be the Jacobian matrix associated with the aforementioned flow. Our main result gives a sufficient structural condition on the Jacobian matrix which helps us characterise the strong advection limit. This talk will illustrate the theoretical results via various interesting examples. We address some well-known advective fields such as the Euclidean motions, the Taylor-Green cellular flows, the cat's eye flows and the ABC flows.