

ICTS Seminar

Title : Effect of rotation on irreversibility in turbulence and instabilities in thermal convection

Speaker : Priyanka Maity, ICTS-TIFR, Bangalore

Date : Monday, March 11, 2019

Time : 1:30 PM

Venue : Amal Raychaudhuri Meeting Room, ICTS Campus, Bangalore

Abstract : The first part of the talk is concerned with Effect of rotation on turbulent flows. Turbulent flows are known to break the “detailed balance” or time reversibility, which is attributed due to the fact that the gain in energy is slower and energy loss is abrupt. The probability density function (PDF) of Lagrangian power show that an abrupt change in energy is more probable due to energy loss than due to energy gain. However, as the rotation rate (Ω) is increased the energy gain and energy loss for any value of energy becomes equally probable and detailed balance is restored.

The second part of the is concerned with the effect of Coriolis force on pattern forming instabilities in Rayleigh-B\'enard convective system. The presence of Koppers-Lortz type instability was observed in fluid with $Pr = 7$ as the secondary instability and the primary instability being the steady roll solution. However, the bifurcation point at which the transition takes place decreases with increasing Coriolis force.