

ICTS PhD Synopsis Seminar

Title : Thermalization, Chaos and Hydrodynamics in Classical Hamiltonian Systems

Speaker : Santhosh Ganapa (ICTS-TIFR, Bangalore)

Date : Wednesday, 02nd March 2022

Time : 02:00 pm (IST)

Abstract : In this talk we will discuss various aspects of thermalization, chaos and hydrodynamics in one dimensional classical Hamiltonian systems. We study two problems.

First, we will revisit the Fermi-Pasta-Ulam-Tsingou (FPUT) problem in order to understand what thermalization is and discuss what leads the system starting from a typical initial condition to a thermal state. Here we discuss the various possibilities like the role of averaging, the choice of observables, the choice of initial conditions and the role of chaos in thermalization.

Then, we study the evolution of a blast wave in an alternate mass hard particle (AHP) gas and study the evolution of conserved fields in the system at short times. We find a good agreement with the Taylor-von Neumann-Sedov (TvNS) solution, which was studied during the Second World War in the context of atomic explosions, everywhere except near the core of the blast. We then model this behaviour by using the Navier-Stokes-Fourier (NSF) equations.

Online Seminar : Zoom link:
<https://icts-res-in.zoom.us/j/88138941914?pwd=RkpUZTJ5dlFzTmx2c2s4QVV3MlBOQT09>
Meeting ID: 881 3894 1914
Passcode: 020203