



## **ICTS Condensed Matter Seminar**

**Title** : Thermalized fluids – Solutions to truncated ideal hydrodynamical equations

**Speaker** : Sugan Durai Murugan (ICTS – TIFR, Bengaluru)

**Date** : Thursday, 20<sup>th</sup> October 2022

**Time** : 03:00 pm (IST)

**Abstract** : Finite dimensional ideal hydrodynamical equations are known to relax to an absolute equilibrium, characterized by a Gibbsian distribution, known as thermalized fluids. While their existence has been known for a while, its importance [1] and the route to thermalization are being studied only recently [2, 3]. Through DNS's, we show how Galerkin-truncated 3D incompressible Euler equations trigger the inevitable thermalization [4]. By identifying the source, how thermalization can be effectively reduced to a 1D problem, similar to Burgers [2, 5]. We also discuss how our current understanding can be exploited numerically to the possibility of dissipative solutions. Aply, with the recent conjectures on the OTOC in many-body quantum systems, regarding thermalized fluid as a many-body classical chaotic Hamiltonian system is extremely relevant [6]. Using decorrelators, we derive and show that in thermalized flows  $\lambda \sim \sqrt{T}$  [1], suggesting an underlying universality and providing evidence to the thermal scaling of Lyapunov exponent.

**Venue** : **Hybrid Mode**

**Offline:** Madhava Lecture Hall

**Online:** Please click on the below link to join the meeting

<https://icts-res-in.zoom.us/j/81957873763?pwd=T21PT3BFRTdCaldxUEtOL3BBajBKOT09>

Meeting ID: 819 5787 3763

Passcode: 202022