



## **ICTS Fluid Dynamics Seminar (Online)**

**Title** : Parity Breaking in Classical and Quantum Fluids

**Speaker** : Dylan Reynolds (The City College of New York)

**Date** : Wednesday, 24<sup>th</sup> January 2024

**Time** : 06:30 PM (IST)

**Abstract** : Odd viscosity is a dissipationless transport coefficient that can arise in parity broken fluids, and typically leads to viscous stresses perpendicular to the flow. While extensively studied in classical 2D systems, the generalization to quantum systems, and extension to 3D active matter, has revealed a much wider class of novel and exciting phenomena. Many of these observable effects, such as the forces on obstacles and chiral edge modes at fluid boundaries, can be seen across all scales of physics. In this way, odd viscosity and parity-breaking can help bridge our understanding between seemingly unrelated systems.

In this talk I will start from a phenomenological perspective and outline the possible transport coefficients allowed by the symmetries of the viscosity tensor. I will then look at some specific systems which I have studied in detail that exhibit parity breaking effects, namely, classical systems such as Hele-Shaw flows and ferrofluids, and quantum systems such as polaritons and fractional quantum Hall fluids. In some cases, it will be possible to elaborate on the microscopic mechanisms that lead to odd viscosity. Throughout the talk I will attempt to make connections between the various systems and highlight the commonalities between them. I will finish with some of my future research objectives that aim to elaborate and expand upon these connections.

**Venue** : Please click on the below link to join the seminar

<https://icts-res-in.zoom.us/j/91768652539?pwd=VHpYMjJtZ3dLR1p3UWovQWtQVCt6UT09>

Meeting ID: 917 6865 2539

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