

## **Students' Annual Seminar**

### **Pseudo turbulence by buoyancy-driven bubbles in a Hele-Shaw cell**

#### **Rashmi Ramaadugu**

In this talk, I will be discussing the dynamics of buoyancy-driven bubbles in a Hele-Shaw cell.

We conduct high-resolution direct numerical simulations (DNS) to investigate the pseudo-turbulence generated by a swarm of buoyancy-driven bubbles confined between two parallel plates separated by a thin gap (Hele-Shaw cell). Prior experimental work<sup>[1]</sup> shows  $k^{-3}$  scaling of energy spectrum. Using scale-by-scale energy budget analysis for the gap-averaged Navier-Stokes equation, we show that the gravity balancing the viscous dissipation gives this  $k^{-3}$  scaling of the energy spectrum. We also show the effect of density contrast and the confinement on the spectral properties of the flow.

#### **References:**

1. Bouche, E. and Roig, V. and Risso, F. and Bilet, A.-M. Homogeneous swarm of high-Reynolds-number bubbles rising within a thin gap. Part 2. Liquid dynamics. *Journal of Fluid Mech.*, 544:508, 521, (2014)

***Monday, Feb 10<sup>th</sup> 2020***

***10:30 AM (Tea/Coffee at 10:15 AM)***

***Seminar Hall, TIFR-H***