

ICTS Biophysics Seminar

- Title** : The Role of Cell Geometry in Cytoplasmic Streaming
- Speaker** : Alexandra Jain (Princeton University, USA)
- Date** : Monday, 26 August 2024
- Time** : 11:30 AM (IST)
- Abstract** : This work probes the role of cell geometry in orienting self-organized fluid flows in the late-stage *Drosophila* oocyte. Recent theoretical work has shown that a model, that relies only on hydrodynamic interactions of flexible, cortically anchored microtubules (MTs) and the mechanical loads from molecular motors moving upon them, is sufficient to generate observed flows. While the emergence of flows has been studied in spheres, oocytes change shape during streaming and it was unclear how robust these flows are to the geometry of the cell. We use biophysical theory and computational analysis to investigate the role of geometry and find that the shape of the domain sets the axis of rotation and that the flow is robust to biologically relevant perturbations of the domain shape. Using live imaging and 3D flow reconstruction, we test the predictions of the theory/simulation, finding consistency between the model and live experiments, further demonstrating a geometric dependence on flow direction in late-stage *Drosophila* oocytes.
- Venue** : Amal Kumar Raychaudhuri Meeting Room
Zoom Link: <https://icts-res-in.zoom.us/j/99439389905?pwd=r6EHg6ncy258LcACmazI0ylfak9Aq6.1>
Meeting ID: 994 3938 9905
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