

## ICTS Colloquium

- Title** : Emergence of structure in cortical circuits through bottom-up dynamical principles
- Speaker** : Sarthak Chandra (Massachusetts Institute of Technology)
- Date** : Thursday, 21 March 2024
- Time** : 04:00 PM (IST)
- Abstract** : Modularity and hierarchy are fundamental and functionally critical features of neural circuits. However, their developmental emergence remains unclear. In this talk, I will demonstrate how simple bottom-up dynamical rules can give rise to structure in the cortex, with emphasis on modularity in grid cells and hierarchy in the visual cortex. For grid cells, I will introduce a novel principle called “peak selection”, explaining how local interactions can form modules through topological quantization, leading to numerical predictions that yield the best match to data till date. For the visual cortex, I will show how competitive synaptic growth driven by spontaneous retinal waves can lead to the emergence of a spatially arranged visual cortical hierarchy with primate-like retinotopy.
- The formulation of these simple dynamical principles governing neurodevelopment results in diverse testable hypotheses for future developmental, connectomic and physiology studies.
- Venue** : Madhava Lecture Hall & Online
- Please click on the below link to join the seminar
- <https://icts-res-in.zoom.us/j/95801543801?pwd=MnZlZUtuFR1eENyZGx1NThvM0hqdz09>
- Meeting ID: 958 0154 3801
- Passcode: 212122