



## ICTS Statistical Physics & Condensed Matter Seminar

- Title** : Position-Momenta Uncertainties in Classical Systems
- Speaker** : Pradeep Kumar Mohanty (IISER Kolkata, West Bengal)
- Date** : Wednesday, 17 June 2026
- Time** : 11:30 AM (IST)
- Abstract** : We demonstrate that classical particles coupled to thermal baths that conserve angular momentum, or allow it to fluctuate about a nonzero mean, obey a position–momentum uncertainty relation formally analogous to the Heisenberg bound. For motion in an arbitrary central potential, this relation universally reduces to  $\Delta x \Delta p_x > L/2$  where  $L$  is the mean angular momentum (or the conserved initial value). We establish the physical realizability of such baths by constructing Langevin dynamics that preserve a Boltzmann energy distribution in steady state for both conserved and non-conserved angular momentum ensembles. We also outline experimental routes for observing this emergent classical uncertainty bound.  
Ref: Dipesh K. Singh and PKM, Phys. Rev. E 112, 054129 (2025).
- Venue** : Emmy Noether Seminar Room  
Zoom Link: <https://icts-res-in.zoom.us/j/98821749316?pwd=osAF8iULyI4OiClbviFFbahobbBO1q.1>  
Meeting ID: 988 2174 9316  
Passcode: 937246