

ICTS Statistical Physics Journal Club Seminar

- Title** : Collective description of trapped fermions: Exact results
- Speaker** : Manas Kulkarni (ICTS-TIFR, Bengaluru)
- Date** : Thursday, 13th May 2021
- Time** : 03:00 pm (IST)
- Abstract** : Exact results for collective behaviour of trapped Fermions have remained elusive. Apart from mean-field approaches (Local Density/Thomas-Fermi approximation), there has hardly been any progress on studying collective phenomena. I will give a brief review of some exact results in low dimensions. I will then discuss our recent results [1] for collective description of noninteracting fermions in a 2D harmonic trap rotating with a constant frequency and in the presence of an additional repulsive central potential. I will show that in the large-N limit, the bulk density has a rich and nontrivial profile with a hole at the center of the trap and surrounded by a multi layered “wedding cake” structure. I will discuss a rich phase diagram that emerges in this system. I will then discuss connections to orthogonal polynomials, unitary evolution of certain quantum spin chains and Random Matrix Theory.
- [1] M. Kulkarni, S. N. Majumdar, G. Schehr, Phys. Rev. A 103, 033321 (2021)
- Venue** : Please click on the below link to join the seminar
<https://zoom.us/j/98292249357?pwd=WW5DK2RoU1B2UXpwMFhIUmhpaiszdz09>
Meeting ID: 982 9224 9357
Passcode: 791738