

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

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School of Physical Sciences

Title:	Non-interacting fermions in a 2d rotating trap and random matrix theory
Speaker:	Satya Majumdar, University of Paris, Saclay, France
Date:	March 5, 2020 (Thursday)
Time:	16:00 Hours
Venue:	Physics Seminar Room (C-406), 3rd Floor, Centenary Building, IACS
Abstract:	We establish an exact mapping between the positions of N noninteracting fermions in a 2d rotating harmonic trap in its ground-state and the eigenvalues of the $N \times N$ complex Ginibre ensemble of Random Matrix Theory (RMT). Using RMT techniques, we make precise predictions for the statistics of the positions of the fermions, both in the bulk as well as at the edge of the trapped Fermi gas. In addition, we compute exactly, for any finite N, the Rényi entanglement entropy and the number variance of a disk of radius r in the ground-state. We show that while these two quantities are proportional to each other in the (extended) bulk, this is no longer the case very close to the trap center nor at the edge. Near the edge, and for large N, we provide exact expressions for the scaling functions associated with these two observables.

All are cordially invited to attend the seminar