MONDAY

COLLOQUIUM

Random Matrix Universality in Fermionic Quantum Gases

Grégory Schehr (CNRS-Sorbonne Université, Paris)

1 Dec 2025 (Monday) | 16:00 Hrs (Tea / Coffee 15:45 Hrs) | Venue: TIFRH Auditorium

I will present recent results on noninteracting fermions confined in d-dimensional traps, focusing on finite-temperature correlations and full counting statistics, i.e., the fluctuations of the number of fermions in a given spatial region. Our analytical predictions, based on random matrix theory, reveal universal features in these fluctuations. In collaboration with experimentalists, we compared these predictions with measurements on ultracold Fermi gases performed using a quantum Fermi microscope in continuous space, finding excellent agreement in a wide range of temperature. This work establishes a direct connection between theory and experiment in the statistical physics of trapped quantum gases.

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