

INSIGHT SEMINAR: Disorder and interactions in quantum systems

THIERRY GIAMARCHI

May 18, 2026

12:00 to 13:00

Elements Room

As discovered in the seminal paper of P. W. Anderson in 1958 when an equation such as the Schroedinger equation is subjected to a random potential the nature of the solutions changes drastically going from plane waves to localizes states. An important question is what happens to this phenomenon when instead of looking at the properties of one single particle one wants to deal with a large number of interacting quantum particles, as is relevant for several experimental realizations, both in cold atomic gases and in condensed matter.

I will give in this talk an overview of this class of phenomena, with questions ranging from the phases that can be reached in such interacting disordered systems to the consequences for the transport properties, and finally the delicate question of the role of the temperature, in presence or absence of a thermal bath. I will also discuss what happens for other classes of potentials than the plain disorder, such as quasiperiodic potentials, or colored noise, both from a theoretical perspective but also in contact with recent experiments in cold atomic gases. I will point to the challenges in the field.

Hosted by: Prof. Dr. Leticia Tarruell