Stochastic Hartree NLS in 3d and Many-Body Quantum Systems in a Random Potential

Speaker: Francesco Carlo De Vecchi - Università di Pavia

Time: Wednesday March 25,13:00-14:00

Location: Room M3, Lungotevere Dante, 376 (Roma)

In this talk, we consider a non-linear Schrödinger equation (NLS) on a three-dimensional torus, where the linear operator is given by the Anderson Hamiltonian (describing the motion of a quantum particle in a random (white noise) potential), and with a nonlinearity of the Hartree-type. We discuss the local and global well-posedness of this equation under various assumptions regarding the initial data and the Hartree kernel. Furthermore, we establish the Anderson-Hartree-NLS as an effective equation for describing many-body bosonic systems. In particular, we prove the convergence of the linear N-body Schrödinger equation to the BBGKY hierarchy in the mean-field limit, specifically addressing the case of the Coulomb interaction in a random environment. The talk is based on a joint work with Xiaohao Ji and Immanuel Zachhuber.