

**Abstract:**

This Minisymposium is geared towards the analytic and stochastic methods relevant for the description of interacting quantum systems, in particular with realistic interactions like Coulomb potentials. This is motivated by applications in quantum field theory, condensed matter physics, and atomic and molecular physics. These are static problems treated by spectral theoretic and stochastic methods as well as dynamic problems like the derivation of effective one-particle equations retaining bounds on the errors. Typically a controlled approximation of a high dimensional linear system like the N-particle Schrödinger equation by a low dimensional, possibly nonlinear, equation is in the center of investigation. Simple examples are the Thomas-Fermi equation. Both the derivation of such equations as well as their analysis are of interest.