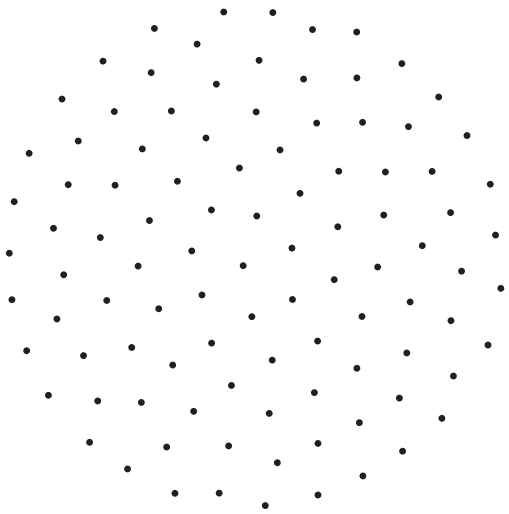


Friday 5 February 2021 at 14:15

Online (Zoom)



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Sylvia Serfaty

(NYU Courant)

Systems of points with Coulomb interactions

Large ensembles of points with Coulomb interactions arise in various settings of condensed matter physics, classical and quantum mechanics, statistical mechanics, random matrices and even approximation theory, and they give rise to a variety of questions pertaining to analysis, partial differential equations and probability.

Serfaty will first review these motivations and then present the “mean-field” derivation of effective models and equations describing the system at the macroscopic scale. She will then explain how to analyze the next-order behavior, giving information on the configurations at the microscopic level and connecting with crystallization questions, and will finish by describing the effect of temperature.

Sylvia Serfaty is the Silver Professor of Mathematics at the Courant Institute, New York University. She earned her PhD from Université Paris-Sud. Her previous positions include appointments at Université Pierre et Marie Curie and the École Normale Supérieure de Cachan. A large part of her work has focused on the Ginzburg-Landau model of superconductivity and on understanding why and when vortices form triangular lattices. She has more recently turned her attention to questions of statistical mechanics of systems with Coulomb-type repulsion, also arising in approximation theory and random matrices, and which turn out to be generalizations of the questions addressed for the behavior vortices in superconductors. She was a plenary speaker at the ICM Rio in 2018, and is the recipient of the EMS and Henri Poincaré prizes and of the Mergier-Bourdeix prize of the French Academy of Sciences. ▲