

Mathematical and Numerical Methods for Complex Quantum Systems

Schedule of Talks

Venue: All talks will be held in the UIC Math department room no. **SEO 636**.

Wednesday, March 26	Mathematical and numerical methods for complex quantum systems
9:00 – 9:30	COFFEE
9:30 - 9:45	Opening Remarks
9:45 - 10:25	Stefan Teufel (University Tuebingen) “Semiclassical approximations to quantum mechanical equilibrium distributions”
10:30 - 11:00	COFFEE BREAK
11:00 - 11:40	George Hagedorn (Virginia Tech) “The Time-Dependent Born-Oppenheimer Approximation and Non-Adiabatic Transitions”
11:45 - 12:10	Qin Li (California Institute of Technology) “Semi-classical limit for the Schroedinger equation with lattice potential and band-crossing”
12:15 - 14:00	LUNCH
14:00 – 14:40	Mathieu Lewin (Paris-Cergy) “Dispersive effects in infinite quantum systems”
14:45 - 15:25	Weitao Yang (Duke University) “Fractional Perspectives of DFT and Exchange-Correlation Energies/Electronic Excitation Energies from Pairing Matrix Fluctuations”
15:30 - 16:00	COFFEE BREAK
16:00 - 16:40	Xu Yang (University of California) “Frozen Gaussian approximation for wave propagation in periodic media”
16:45 - 17:10	Zhennan Zhou (University of Wisconsin-Madison) “Numerical approximation of the Schrodinger equation with the electromagnetic field by the Hagedorn wave packets”

Thursday, March 27	Mathematical and numerical methods for complex quantum systems
9:10 – 9:30	COFFEE
9:30 - 10:10	Weizhu Bao (National University of Singapore) "Multiscale methods and analysis for the nonlinear Klein-Gordon equation in the nonrelativistic limit regime"
10:15 - 10:45	COFFEE BREAK
10:45 - 11:25	Olivier Pinaud (Colorado State University) "On the moment problem for quantum hydrodynamics"
11:30 - 12:10	Tucker Carrington (Queen's University) "Solving the Schroedinger equation using Smolyak interpolants"
12:15 - 14:00	LUNCH BREAK
14:00 – 14:40	Dionisios Margetis (University of Maryland) "Bose-Einstein Condensation: Recent progress and challenges"
14:45 - 15:25	Kay Kirkpatrick (University of Illinois at Urbana-Champaign) "Bose Einstein condensation, the nonlinear Schrodinger equation, and a central limit theorem"
15:30 - 16:00	COFFEE BREAK
16:00 - 16:40	Florian Mehats (University of Rennes) "Dimension reduction for anisotropic Bose-Einstein condensates in the strong interaction regime"
16:45 - 17:10	Yongyong Cai (Purdue University) "Dipolar Gross-Pitaevskii equation in lower dimensions"
19:00	Conference Dinner

Friday, March 28	Mathematical and numerical methods for complex quantum systems
9:10 – 9:30	COFFEE
9:30 - 10:10	Clemens Heitzinger (Arizona State University) "Transport equations for confined structures derived from the Boltzmann equation"
10:15 - 10:45	COFFEE BREAK
10:45 - 11:25	Carlos García-Cervera (University of California Santa Barbara) "Spin-polarized transport in ferromagnetic multilayers"
11:30 - 11:55	Jingrun Chen (University of California Santa Barbara) "Towards a unified macroscopic description of exciton diffusion in organic semiconductors"
12:00 – 12:25	Jose Morales Escalante (The University of Texas at Austin) "Discontinuous Galerkin (DG) Methods for Full Band Boltzmann - Poisson (BP) models of Electronic Transport in Semiconductors using Empirical Pseudopotential Methods (EPM)"
12:30	Lunch and Free Afternoon

Saturday, March 29	Mathematical and numerical methods for complex quantum systems
9:10 – 9:30	COFFEE
9:30 - 10:10	Eric Cances (Ecole des Ponts and INRIA) "Numerical methods for nonlinear eigenvalue problems arising in quantum physics and chemistry"
10:15 - 10:45	COFFEE
10:45 - 11:25	Lin Lin (Lawrence Berkeley National Laboratory) "A posteriori error estimates for discontinuous Galerkin methods using non-polynomial basis functions with applications to Kohn-Sham density functional theory calculation"
11:30 - 11:55	Yingwei Wang (Purdue University) "Efficient spectral Galerkin methods for electronic structure calculations"
12:00 - 14:00	LUNCH BREAK
14:00 – 14:40	Caroline Lasse (Technische Universität München) "Computational semiclassics"
14:45 - 15:25	Tomoki Ohsawa (University of Michigan-Dearborn) "The Geometry and Symmetry of Semiclassical Wave Packet Dynamics"
15:30 - 16:00	COFFEE BREAK
16:00 - 16:25	Leland Jefferis (University of Wisconsin - Madison) "Computing high frequency solutions of symmetric hyperbolic systems with polarized waves"
16:30 - 16:55	Maksym Pryporov (Iowa State University) "Gaussian Beam Methods For Symmetric Strongly Hyperbolic Systems"

Sunday, March 30	Mathematical and numerical methods for complex quantum systems
9:10 – 9:30	COFFEE
9:30 - 10:10	Jianfeng Lu (Duke University) "Orbital free density functional theory of out-of-plane charge screening in graphene"
10:15 - 10:45	COFFEE BREAK
10:45 - 11:25	Paul Zimmerman (University of Michigan) "Chemical Dimensions of Quantum Dynamics"
11:30 - 12:10	Haobin Wang (New Mexico State University) "The Multilayer Multiconfiguration Time-Dependent Hartree Theory"
12:15 – 12:30	CLOSING REMARKS