

Institute for Mathematical Sciences	
Organizers	Overview
Activities	Registration
Participants	Media

Workshop 1: Recent Progress and Challenge in Quantum and Kinetic Problems

(30 September - 4 October 2019)

Partially supported by Centre for Advanced 2D Materials (CA2DM)

Venue: IMS Auditorium

 PDF Abstracts 

Monday, 30 Sep 2019		
Time	Title	Speaker
09:00am - 09:10am	Registration	
09:10am - 09:15am	Opening Remarks	
09:15am	Chair: Weizhu Bao, National University of Singapore, Singapore	
09:15am - 10:00am	Nonlinear dissipative photonics with spin-orbit coupling	Boris Malomed Tel Aviv University, Israel
10:00am - 10:45am	Nonequilibrium dynamical mean-field theory and hidden phases of quantum matter	Martin Eckstein Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
10:45am - 11:15am	Coffee Break	
11:15am - 12:00pm	Correlated topological states with interfaces and disorder	Walter Hofstetter Goethe University Frankfurt AM Main, Germany

Time	Title	Speaker
12:00pm - 01:30pm	Lunch Break	
01:30pm	Chair: Chao Yang, Berkeley Lab Computing Sciences, University of California, USA	
01:30pm - 02:15pm	Random batch methods for interacting particle systems and its applications in consensus-based high dimensional global optimization in machine learning (Video)	Shi Jin Shanghai Jiao Tong University, China
02:15pm - 03:00pm	A bi-fidelity method for multiscale kinetic equations with random parameters: computation and error analysis	Liu Liu The University of Texas at Austin, USA
03:00pm - 03:30pm	Coffee Break	
03:30pm - 04:15pm	Some properties and numerical aspects of fractional Schrödinger equations	Xavier Antoine Université de Lorraine, France
04:15pm - 05:00pm	Fast convolution-type nonlocal potential solvers in nonlinear Schrödinger equation and lightning simulation	Yong Zhang Tianjin University, China

Tuesday, 01 Oct 2019		
Time	Title	Speaker
09:00am - 09:15am	Registration	
09:15am	Chair: Boris Malomed, Tel Aviv University, Israel	
09:15am - 10:00am	Deriving order parameter from the reduced density matrix (PDF) (Video)	Hai-Qing Lin Beijing Computational Science Research Center, China

Time	Title	Speaker
10:00am - 10:45am	Polynomial and rational approximation for electronic structure theory (PDF)	Simon Tobias Etter National University of Singapore, Singapore
10:45am - 11:15am	Group Photo & Coffee Break	
11:15am - 12:00pm	Algorithms for computing eigenvalues of quantum spin chains	Chao Yang Berkeley Lab Computing Sciences, University of California, USA
12:00pm - 01:30pm	Lunch Break	
01:30pm	Chair: Xavier Antoine, Université de Lorraine, France	
01:30pm - 02:15pm	Analysis of convergence of Schwarz waveform relaxation methods for the Schroedinger equation (PDF) (Video)	Emmanuel Lorin Carleton University, Canada
02:15pm - 03:00pm	Computational quantum mechanics in phase space (PDF)	Sihong Shao Peking University, China
03:00pm - 03:30pm	Coffee Break	
03:30pm - 04:15pm	Highly-oscillatory evolution equations with time-varying vanishing frequency: asymptotics and numerics	Mohammed Lemou Université de Rennes 1, France
04:15pm - 05:00pm	Multiscale methods and analysis for the Dirac/nonlinear Dirac equation (PDF)	Jia Yin National University of Singapore, Singapore

Wednesday, 02 Oct 2019

Time	Title	Speaker

Time	Title	Speaker
09:00am - 09:15am	Registration	
09:15am	Chair: Shi Jin, Shanghai Jiao Tong University, China	
09:15am - 10:00am	High friction limits from Euler flows to gradient flows (PDF)	Athanasios Tzavaras King Abdullah University of Science and Technology, Saudi Arabia
10:00am - 10:45am	On hyperbolicity and convergence of Grad's moment method (PDF)	Zhenning Cai National University of Singapore, Singapore
10:45am - 11:15am	Coffee Break	
11:15am - 12:00pm	Averaging for Vlasov and Vlasov-Poisson equations (PDF) (Video)	Florian Méhats Université de Rennes 1, France
12:00pm - 01:30pm	Lunch Reception at IMS	

Thursday, 03 Oct 2019

Time	Title	Speaker
09:00am - 09:15am	Registration	
09:15am	Chair: Athanasios Tzavaras, King Abdullah University of Science and Technology, Saudi Arabia	
09:15am - 10:00am	Fermi's Golden Rule and H^1 Scattering for Nonlinear Klein-Gordon Equations with Metastable States (PDF)	Xinliang An National University of Singapore, Singapore
10:00am - 10:45am	The Cauchy problem for the quantum hydrodynamics system and the stability of weak solutions (PDF)	Paolo Antonelli Gran Sasso Science Institute, Italy

Time	Title	Speaker
10:45am - 11:15am	Coffee Break	
11:15am - 12:00pm	On a kinetic Elo rating model for players with dynamical strength (PDF)	Bertram Düring University of Sussex, UK
12:00pm - 01:30pm	Lunch Break	
01:30pm	Chair: Hai-Qing Lin, Beijing Computational Science Research Center, China	
01:30pm - 02:15pm	Trapped Bose-Einstein condensates with attractive s-wave interaction	Su Yi Chinese Academy of Sciences, China
02:15pm - 03:00pm	Gibbs equilibrium for Gross-Pitaevskii equation (PDF)	Reika Fukuizumi Tohoku University, Japan
03:00pm - 03:30pm	Coffee Break	
03:30pm - 04:15pm	Angular momentum radiation by a benzene molecule (PDF) (Video)	Jian-Sheng Wang National University of Singapore, Singapore
04:15pm - 05:00pm	On-demand topological matter by periodic driving	Jiangbin Gong National University of Singapore, Singapore
05:45pm - 09:00pm	Conference Dinner Venue: Prive Grill, The University Club, Shaw Foundation Alumni House, #04-02, 11 Kent Ridge Drive, Singapore 119244	

Friday, 04 Oct 2019

Time	Title	Speaker
09:00am - 09:15am	Registration	

Time	Title	Speaker
09:15am	Chair: Weizhu Bao, National University of Singapore, Singapore	
09:15am - 10:00am	Ground states of spinor Bose-Einstein condensates (PDF)	Yongyong Cai Beijing Computational Science Research Center, China
10:00am - 10:45am	Emergent behaviors of the Schrödinger-Lohe model for quantum synchronization	Dohyun Kim National Institute for Mathematical Sciences, Korea
10:45am - 11:15am	Coffee Break	
11:15am - 12:00pm	Quantized vortex stability and dynamics in superfluidity and superconductivity (PDF) (Video)	Weizhu Bao National University of Singapore, Singapore
12:00pm - 12:05pm	Closing Remarks	