



# Quantum & Kinetic Problems: Modeling, Analysis, Numerics & Applications

*Partially supported by  
Centre for Advanced 2D Materials [CA2DM]*

Forum 1: Nonlinear PDEs and Related Topics  
(26 - 30 December 2019)

## ORGANIZING COMMITTEE

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National University of Singapore

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Université Pierre et Marie Curie and  
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Lorenzo Pareschi  
University of Ferrara

Henrik Jönsson  
University of Cambridge

Zhouping Xin  
The Chinese University of Hong Kong

**Venue:**  
**IMS Auditorium**

**Admission is free**

3 Prince George's Park Singapore 118402  
[ims.nus.edu.sg](http://ims.nus.edu.sg)

# Quantum and Kinetic Problems: Modeling, Analysis, Numerics and Applications

## Forum 1: Nonlinear PDEs and Related Topics

(26 - 30 December 2019)

Venue:

IMS Auditorium, 3 Prince George's Park Singapore 118402  
27 Dec: PM Session: Seminar Room 1 (#04-06) , Block S17, Level 4,  
10 Lower Kent Ridge Road, Singapore 119076

### Thursday, 26 Dec 2019

Time	Title	Speaker
0830 - 0845	Registration	
0845 - 0850	Welcome by local organizer	
0850	Chair: Weizhu Bao, National University of Singapore, Singapore	
0850 - 0930	Non-existence of finite energy solution to compressible Navier-Stokes equations	Hailiang Li Capital Normal University, China
0930 - 1010	Global small solutions for heat conductive compressible Navier-Stokes equations with vacuum	Jinkai Li South China Normal University, China
1010 - 1040	Group Photo & Coffee Break	
1040 - 1120	Stability of non-smooth solitons to integrable systems	Changzheng Qu Ningbo University, China
1120 - 1200	Existence and asymptotic behavior of positive solutions for a class of quasilinear Schrödinger equations with parameters	Yinbin Deng Central China Normal University, China
1200 - 1400	Lunch Reception at IMS	
1400	Chair: Zhouping Xin, The Chinese University of Hong Kong, Hong Kong	
1400 - 1440	Smooth transonic flows in de Laval nozzles	Chunpeng Wang Jilin University, China
1440 - 1520	Some recent results on incompressible flows with helical symmetry	Dongjuan Niu Capital Normal University, China
1520 - 1550	Coffee Break	
1550 - 1630	Local well-posedness of 3-d Full-Navier-Stokes equations with degenerated viscosity and far field vacuum	Qin Duan Shenzhen University, China
1630 - 1710	Rigorous derivation of non-isentropic Low Mach number Navier-Stokes equations in bounded domains	Yaobin Ou Renmin University of China, China

Friday, 27 Dec 2019		
Time	Title	Speaker
0840 - 0850	Registration	
0850	Chair: Wei Jiang, Wuhan University, China	
0850 - 0930	Topology optimization, theory, numerical methods and applications	Xiaoping Wang Hong Kong University of Science and Technology, Hong Kong
0930 - 1010	Invariant preserving discontinuous Galerkin methods for nonlinear wave equations	Yinhua Xia University of Science and Technology of China, China
1010 - 1040	Coffee Break	
1040 - 1120	Continuous weak solutions of Boussinesq equations	Liqun Zhang Chinese Academy of Sciences, China
1120 - 1200	Enhanced dissipation and transition threshold for the 3-D Poiseuille flow in a channel	Shijin Ding China Normal University, China
1200 - 1400	Lunch Break	
1400	An Afternoon of Activities at Department of Mathematics, NUS Venue: Seminar Room 1 (#04-06) , Block S17, Level 4, 10 Lower Kent Ridge Road, Singapore 119076	
1400	Chair: Xiaoping Wang, Hong Kong University of Science and Technology, Hong Kong	
1400 - 1440	Convection in a coupled free-flow porous media flow system	Xiaoming Wang Southern University of Science and Technology, China
1440 - 1520	On the vanishing viscosity limit for a 3-D system arising from the Keller-Segel model	Wenqing Xu California State University, Long Beach, USA
1520 - 1550	Coffee Break	
1550 - 1630	Radially symmetric stationary waves for the exterior problem of multidimensional Burgers equation	Huijiang Zhao Wuhan University, China
1630 - 1710	Verification of Prandtl boundary layer expansion for the steady electrically conducting fluids with a moving physical boundary	Feng Xie Shanghai Jiaotong University, China
1800 - 2100	Conference dinner (By invitation)	

Monday, 30 Dec 2019		
Time	Title	Speaker
0840 - 0850	Registration	
0850	Chair: Qinglin Tang, Sichuan University, China	
0850 - 0930	The optimal global regularity regularity for elliptic equations which is degenerate or singular on the boundary	Huai-Yu Jian Tsinghua University, China
0930 - 1010	On the growth and nodal sets of solutions to some elliptic equations	Xiaoping Yang Nanjing University, China
1010 - 1040	Coffee Break	
1040 - 1120	Data-driven multiscale modeling of cell fate dynamics	Qing Nie University of California, Irvine, USA
1120 - 1200	Global weak solutions to the three-dimensional compressible non-Newtonian fluid	Zhenhua Guo Northwest University, China
1200 - 1400	Lunch Break	
1400	Chair: Huai-Yu Jian, Tsinghua University, China	
1400 - 1440	Analysis on steady compressible Euler system with both fixed and free boundaries	Chunjing Xie Shanghai Jiao Tong University, China
1440 - 1520	Some progress in Leray's problem	Yun Wang Soochow University, China
1520 - 1550	Coffee Break	
1550 - 1630	Global existence of weak solutions to the barotropic compressible Navier-Stokes flows with degenerate viscosities	Jing Li Nanchang University and Academia Sinica, China
1630 - 1710	Subsonic and sonic jet flows	Zhouping Xin The Chinese University of Hong Kong, Hong Kong
1710 - 1715	Closing Remark	