Computation, Analysis & Applications of PDEs with Nonlocal and Singular Operators

Workshop II

(25, 28 Feb–4 Mar 2022)

*Registration is required for this program.

Venue

Virtual: The details and link will be sent to you before the program commences after registration has been processed.

ORGANIZING COMMITTEE

Co-Chairs

Jie Shen
Purdue University

Li-Lian Wang
Nanyang Technological University

Members

Mark Ainsworth
Brown University

Weizhu Bao
National University of Singapore

For more information: Click here

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All times are indicated in GMT+8.
For time zones conversion: Click Here

GMT Time Reference				
Greenwich Mean Time United Kingdom (GMT+0)	Canada USA (GMT -5)*	France Germany (GMT +1)	India (GMT +5:30)	China Singapore (GMT +8)
0100	2000	0200	0630	0900
0240	2140	0340	0810	1040
0730	0230	0830	1300	1530
0910	0410	1010	1440	1710
***(GMT -5) is the day before the stated date of the morning talks (GMT+8).**				

Friday, 25 February 2022		
Time (GMT +8)	**Title**	**Speaker**
1550	Session Chair: Li-Lian Wang (Nanyang Technological University)	
1550–1615	Improved error bounds of the Strang splitting method for the highly oscillatory fractional nonlinear Schrödinger equation	Yue Feng National University of Singapore, Singapore
1615–1640	A new SAV approach for general dissipative systems	Fukeng Huang National University of Singapore, Singapore
1640–1705	Dissipation functionals and energy stability of numerical schemes for the time-fractional Allen-Cahn/Cahn-Hilliard equations	Boyi Wang National University of Singapore, Singapore

Monday, 28 February 2022		
Time (GMT +8)	**Title**	**Speaker**
1520–1530	Opening Remarks	
1530	Session Chair: Weizhu Bao (National University of Singapore)	
1530–1615	Electronic transport in materials: the singularity of graphene	Eric Cances Ecole des Ponts ParisTech, France
1615–1700	Numerical solver for the Boltzmann equation with self-adaptive collision operators	Zhenning Cai National University of Singapore, Singapore
1700	Group Photo	ZOOM Online
1700–1710	Break	
1710–1755	Computing equilibrium distributions with power law interactions	Sheehan Olver Imperial College London, UK
1755–1840	An efficient numerical method to compute the ground state of rotating dipolar Bose-Einstein Condensates	Qinglin Tang Sichuan University, China

Tuesday, 1 March 2022		
Time (GMT +8)	**Title**	**Speaker**
0900	Session Chair: Li-Lian Wang (Nanyang Technological University)	
0900–0945	Efficient space-time methods for a class of time dependent problems with applications to nonlocal and singular problems	Jie Shen Purdue University, USA
0945–1030	How to define energy dissipations for time-fractional phase-field equations	Jiang Yang Southern University of Science and Technology, China
1030–1040	Break	
1040–1125	Monte Carlo PINN: deep learning approaches for fractional PDEs	Tao Zhou The State Key Laboratory of Scientific and Engineering Computing (LSEC), China
1125–1210	PINNs for solving forward and inverse problems governed by stochasticfractional PDEs	Ling Guo Shanghai Normal University, China
1210–1530	Lunch Break	
1530	Session Chair: Bangti Jin (University College London)	

Tuesday, 1 March 2022		
Time (GMT +8)	**Title**	**Speaker**
1530–1615	Weighted analytic regularity for the integral fractional Laplacian in polygons and application to hp-FEM	J. Markus Melenk Technische Universit¨at Wien, Austria
1615–1700	Approximation of the spectral fractional Laplace-Beltrami operator and its application to Gaussian fields on surfaces	Wenyu Lei Scuola Internazionale Superiore di Studi Avanzati, Italy
1700–1710	Break	
1710–1755	Novel spectral methods for Schrödinger equations with inverse-power potentials	Huiyuan Li Institute of Software Chinese Academy of Sciences, China
1755–1840	An efficient 6-D deterministic solver for the Wigner-Coulomb dynamics	Sihong Shao Peking University, China

Wednesday, 2 March 2022		
Time (GMT +8)	**Title**	**Speaker**
0900	Session Chair: Jie Shen (Purdue University)	
0900–0945	Energy-preserving high-order difference methods for nonlocal wave equations	Dong Liang York University, Canada
0945–1030	Finite element analysis and simulation for wave propagation in the Cole-Cole medium	Jichun Li University of Nevada, Las Vegas, USA
1030–1040	Break	
1040–1125	Compartment models with non-local operators and related stochastic processes	Christopher Angstmann UNSW Sydney, Australia
1125–1210	Numerical methods for computing ground states of spinor Bose-Einstein condensates	Yongyong Cai Beijing Normal University, China
1210–1840	Free Discussion	Gather.town

Thursday, 3 March 2022		
Time (GMT +8)	**Title**	**Speaker**
0900	Session Chair: Mark Ainsworth (Brown University)	
0900–0945	Regularity and approximation of fractional quasi-linear operators on Lipschitz domains	Juan Pablo Borthagaray Universidad de la República del Uruguay, Uruguay
0945–1030	Periodic minimizers of a ternary nonlocal isoperimetric problem	Chong Wang Washington and Lee University, USA

Thursday, 3 March 2022		
Time (GMT +8)	**Title**	**Speaker**
1030–1040	Break	
1040–1125	Numerical methods for nonlocal problems with the fractional Laplacian	Yanzhi Zhang Missouri University of Science and Technology, USA
1125–1210	Towards high-order methods for fractional advection-diffusion-reaction equations in smooth domains	Zhongqiang Zhang Worcester Polytechnic Institute, USA
1210–1530	Lunch Break	
1530	Session Chair: Mejdi Azaiez (Bienvenue à Bordeaux INP)	
1530–1615	Numerical aspects of the infinite state representation of fractional differential operators	Kai Diethelm University of Applied Sciences Würzburg-Schweinfurt - FHWS, Germany
1615–1700	Logarithmic asymptotics: analysis and computation	Changpin Li Shanghai University, China
1700–1710	Break	
1710–1755	Discovering the subdiffusion model in an unknown medium	Bangti Jin University College London, UK
1755–1840	Inverse potential problem for fractional subdiffusion from terminal observation	Zhi Zhou The Hong Kong Polytechnic University, Hong Kong, China

Friday, 4 March 2022		
Time (GMT +8)	**Title**	**Speaker**
0900	Session Chair: Chuanju Xu (Xiamen University)	
0900–0945	Nonlocal subgrid-scale modeling for turbulent flows	Mohsen Zayernouri Michigan State University, USA
0945–1030	Variational principle based method for image processing	Zhongyi Huang Tsinghua University, China
1030–1040	Break	
1040–1125	A universal method for solving elliptic PDEs with singular boundary data on non-smooth domains	Shidong Jiang Flatiron Institute, Simons Foundation, USA
1125–1210	Fast multipole method in layered media	Bo Wang Hunan Normal University, China
1210–1530	Lunch Break	

Friday, 4 March 2022		
Time (GMT +8)	**Title**	**Speaker**
1530	Session Chair: Huiyuan Li (Institute of Software Chinese Academy of Sciences)	
1530–1615	Regularization methods for inverse problems of the sub-diffusion equation	Chuanju Xu Xiamen University, China
1615–1700	Fast implementation of FEMs for nonlocal models in multiple dimensions	Changtao Sheng Shanghai University of Finance and Economics, China
1700–1710	Break	
1710–1755	High order approximation for Müntz and Müntz-logarithmic polynomials using empirical interpolation method	Mejdi Azaiez Bienvenue à Bordeaux INP, France