Curriculum Vitae — Lina Ma

Contact Information

203 McAllister Building
Department of Mathematics
The Pennsylvania State University
State College, PA

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Experience

Research Associate Penn State University — Aug 2014 -present

Education

Ph.D. Applied Mathematics — Aug 2014
with specialization in Computational Science and Engineering — Purdue University
Advisor: Jie Shen

M.S. Computational Finance — May 2013
Purdue University

B.S. Mathematics — Jul 2007
Scientific and Engineering Computing — Peking University

Research

Research Interests

Scientific Computing and Numerical analysis

Spectral Methods

Electromagnetic and Acoustic Scattering

Solar-like Interface Dynamo with rotation profile

Vector spherical harmonics and application to the Primitive Equations of the Atmosphere

Computational fluid dynamics and modeling

Molecular dynamics

Numerical method in PDE

PUBLICATIONS

[1] L. Ma, J. Shen, and L. Wang. *Spectral Approximation of Time-Harmonic Maxwell Equations in Three-Dimensional Exterior Domains*, Inter. J. Numer. Anal. Model. 12:366-383, 2015.

[2] L. Hu, L. Ma, and S. Jie. *Efficient Spectral-Galerkin Method and Analysis for Elliptic PDEs with Non-Local Boundary Conditions*, To appear in J. Sci. Comp.

[3] L. Ma, R. Chen, X. Yang, and Z. Hui. *Numerical Approximations for Allen-Cahn Type Phase Field Model of Two-Phase Incompressible Fluids with Moving Contact Lines*, to appear in Comm. in Comp. Phy.

[4] L. Ma, J. Shen, and L. Wang. *Wavenumber Explicit Analysis of Spectral-Galkerin Methods for Time-Harmonic Maxwell Equations in Exterior Domains*, submitted.

[5] L. Ma, X. Li, and C. Liu *The Derivation and Approximation of Coarse-grained Dynamics from Langevin Dynamics*, submitted; arXiv:1605.04886 [math.NA], 2016.

[6] L. Ma, X. Li, and C. Liu. *FDT-Consistent Approximation of the Langevin Dynamics Model*, submitted.

[7] L. Ma, X. Li, and C. Liu. *From Generalized Langevin Equations to Brownian Dynamics and Embedded Brownian Dynamics*, submit soon

[8] C. Ting, L.Ma and J. Shen. *Spectral methods for a 3D Spherical Dynamo Equation*, submit soon

[9] L. Ma X. Li, and C. Liu. *The reduction of Langevin Dynamics, Galerkin projection and its implementations*, preprint

IN PREPARATION

1. C. Liu, L. Ma and J. Shen. *Phase-field approach for dynamic boundary conditions*
2. L. Ma, X. Li, and C. Liu. *Multiple time-stepping method for implicit solvent model*
3. L. Ma, J. Shen and S. Wang. *Spectral Approximation for the Primitive Equations of the Atmosphere*

WORKSHOP

IdeaLab 2014: Program for Early Career Researchers, *Toward a more realistic model of ciliated and flagellated organisms*, ICERM, Aug 11-15, 2014

IMA Annual program year workshop: *Numerical Solutions of Partial Differential Equations: Novel Discretization Techniques*, Minnesota, Nov 1-5, 2010

IMA PI Summer Graduate Student Program: *The Mathematics of Inverse Problem*, Delaware, June 15- Jul 3, 2009

Optimization Methods and Applications by Professor Groetschel Martin, Institution of Applied Mathematics, Chinese Academy of Sciences Sep, 2006

CONFERENCE PRESENTATIONS/ INVITED TALKS

"Numerical methods for 3D dynamo model"
NASA-NJIT Workshop in Computational Heliophysics, NASA Ames, Jan 2016

"Efficient Spectral Methods for Partial Differential Equations in Spherical Domain"
Workshop on Transport of Ionic Particles in Biological Environments, Fields Institute, Jul 2014

"Fast and High Order method with applications to spherical region"
CSE/CLS Seminar, Purdue University, Mar 2014

"Spectral Method on Spherical domain"
Complex fluid seminar, Penn State University, Feb 2014

"Spectral Method for a 3D Spherical Interface Dynamo Equation"
Joint Mathematics Meetings, Baltimore, Maryland, Jan 2014

"3D Maxwell Equations on Exterior domain and multi-layer extension"
special session of the mathematics of computation: Differential Equations, Linear Algebra, and Applications II, Joint Mathematics Meetings, 1086-65-2497, San Diego, CA Jan 2013

"Transformed Field Expansion for 3D Maxwell Equations"
International Conference on Interdisciplinary Applied Mathematics & Computational Mathematics, Zhejiang, China, Jun 2011

POSTER

"Dimension Reduction of Langevin Dynamics"
IMA workshop on Mathematics of Biological Charge Transport: Molecules and Beyond. Minneapolis, Jul, 2015

Teaching

Recognition

Excellence in Teaching Award 2012-13

Teaching History

Research Associate

- *Introduction to Numerical Analysis* — Spring 2016
- *Ordinary and Partial Differential Equations* (Honor/Regular) — Fall 2015
- *Plane Analytic Geometry and Calculas III* — Spr 2015
- *Ordinary and Partial Differential Equations* (Honor Section) — Fall 2014

Teaching Assistant

- Course Instructor, *Introductory Analysis II* — Fall 2011
- Course Instructor, *Introductory Analysis II* — Spr 2011
- Recitation (math major), *Plane Analytic Geometry and Calculus II* — Spr 2010
- Course Instructor, *Algebra And Trigonometry I* — Fall 2009
- Recitation, *Plane Analytic Geometry and Calculus II* — Fall 2008
- Recitation, *Plane Analytic Geometry and Calculus II* — Spr 2008
- Recitation, *Plane Analytic Geometry and Calculas III* — Fall 2007

Personal Tutor — Fall 2001- Spr 2002

Professional Training

College Teaching Workshop Series I — Fall 2013
Center for Instructional Excellence — Purdue University

GTA training seminar — Fall 2007
Math Department — Purdue University

Selected topics

- Encouraging Active Learning
- Teach your own class
- Micro-teaching session in Algebra & Applied Calculus

Others

Membership

Purdue Quantitative Finance Club
American Mathematical Society
Association for Women in Mathematics

Service and Awards

Volunteer for Big Brothers Big Sisters of Greater Lafayette, 2013

2012-13 Excellence in Teaching Award, Spr 2013

Graduate Representative in Mathematics Department, Purdue University, Fall 2009-Spr 2010

Representative for Math Department in College of Science Graduate Student Council, Purdue University, Spring 2009-

Leader in student organization group for year of 2003 in School of Mathematical Sciences, Peking University, Fall 2004-Jul 2007

Excellence Graduate Award, by School of Mathematical Sciences, Peking University, 2007

Jiangzehan Mathematical Modeling competition, First Prize, Peking University, 2006

Social Work Awards, by School of Mathematical Sciences, Peking University, 2006

Member of Recruitment Committee for Jiangsu Province, Peking University, 2004-2007

Skills

Computer Programming:

- Fortran, Matlab, Excel, C, C++, Python