Zhichao Peng

CONTACT INFORMATION

Department of Mathematical Sciences
Michigan State University
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East Lansing, MI, 48824 USA

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https://zhichaopengmath.github.io

PROFESSIONAL EXPERIENCE

Department of Mathematics, Michigan State University, East Lansing, MI, USA

Research Associate, 08/2020-now.

EDUCATION

Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY, USA

Ph.D., Applied Mathematics, 08/2015-08/2020

- Advisor: Professor Fengyan Li

School of Mathematical Sciences, Peking University, Beijing, P.R.China

B.S. in Mathematics, 09/2011 - 07/2015

RESEARCH INTERESTS

- Finite element methods: discontinuous Galerkin (DG) method, discontinuous Petrov-Galerkin (DPG) method
- Numerical methods for kinetic equations, wave equations, electromagentics
- Structure preserving methods: asymptotic preserving, positivity preserving, energy stable
- Model order reduction

RESEARCH EXPERIENCE

08/2015 –05/2020 Student research assisstant
Advisor: Professor Fengyan Li
Rensselaer Polytechnic Institute

05/2019 –08/2019 Student Intern
Advisor: Dr. Xianzhu Tang
Los Alamos National Laboratory

PUBLICATIONS

- Refereed journal papers:
  - Z. Peng, M. Wang, F. Li, *A learning-based projection method for model order reduction of transport problems*, Journal of Computational and Applied Mathematics (accepted), 2022
  - Z. Peng, D. Appelö, *EM-WaveHoltz: A flexible frequency-domain method built from time-domain solvers*, IEEE Transactions on Antennas and Propagation, 2022
  - Z. Peng, Y. Chen, Y. Cheng, F. Li, *A reduced basis method for radiative transfer equation, Journal of Scientific Computing*, 2022, Vol. 91, 5
  - Z. Peng, F. Li, *Asymptotic preserving IMEX-DG-S schemes for linear kinetic transport equations based on Schur complement*, SIAM Journal on Scientific Computing, 2021, Vol. 43, No. 2, pp. A1194-A1220
  - Z. Peng, Y. Cheng, J.-M. Qiu, F. Li, *Stability-enhanced AP IMEX1-LDG method: energy-based stability and rigorous AP property*, SIAM Journal on Numerical Analysis, 2021, Vol. 59, No. 2, pp. 925-954

- Z. Peng, Q. Tang, X.-Z. Tang, *An adaptive discontinuous Petrov-Galerkin method for the Grad-Shafranov equation*, SIAM Journal on Scientific Computing, 2020, Vol. 42, No. 5, pp. B1227-B1249
- Z. Peng, Y. Cheng, J.-M. Qiu, F. Li, *Stability-enhanced AP IMEX-LDG schemes for linear kinetic transport equations under a diffusive scaling*, Journal of Computational Physics Volume 415, 15 August 2020, 109485
- Z. Peng, V. A. Bokil, Y. Cheng, F. Li, *Asymptotic and positivity preserving methods for Kerr-Debye model with Lorentz dispersion in one dimension*, Journal of Computational Physics, Volume 402, 1 February 2020, 109101

• Submitted:

- Z. Peng, D. Appelö, S. Liu, Universal AMG Accelerated Embedded Boundary Method Without Small Cell Stiffness, 2022

Presentations

• Invited talks

- ICERM Spring 20202 Reunion Event, ICERM, Providence, RI, USA, 05/2022
- Midwest Numerical Analysis Day, Ann Arbor, MI, USA, 05/2022
- Michigan State University CMSE Brown Bag seminar, East Lansing, MI, 02/2022 (virtual)
- Joint Numerical Analysis Seminar, at KTH Royal Institute of Technology and Stockholm University, Stockholm, Sweden, 01, 2022 (virtual)
- Workshop on Modeling and Numerical Simulation of Non-Equilibrium Processes Part Two, National University of Singapore, Singapore, 01/2022 (virtual)
- Department Seminar, Hunan University, Changsha, Hunan, China, 01/2022 (virtual)
- Numerical Analysis Seminar, University of Iowa, Iowa City, IA, USA,10/2021 (virtual)
- Seminar, Institute of Computational Mathematics, Chinese Academy of Sciences, Beijing, China, 03/2021 (virtual)
- Virtual 2021 SIAM Great Lakes Section Meeting, Oakland University, Rochester, MI, 04/2021 (virtual)
- RTG Seminar, Rensselaer Polytechnic Institute, Troy, NY, USA, 10/29/2019
- Applied Math Days, Rensselaer Polytechnic Institute, Troy, NY, USA, 04/05/2019 - 04/06/2019
- Seminar, School of Mathematical Sciences, Peking University, Beijing, China, 12/27/2018
- Seminar, School of Mathematical Sciences, University of Science and Technology of China, Heifei, China, 12/25/2018
- 2018 SIAM Annual Meeting, Oregon Convention Center, Portland, OR, USA, 07/09/2018 - 07/13/2018
- The 3rd Annual Meeting of SIAM Central States Section, Colorado State University, Fort Collins, CO, USA, 09/29/2017 - 10/01/2017

• Poster presentation

- The ICERM 2018 Topical Workshop: Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials, ICERM, Providence, RI, USA, 07/25/2018 - 07/29/2018

Professional travel

- Spring 2020 Reunion Event, ICERM, Providence, RI, USA, 05/23/2022-06/10/2022
- Model and Dimension Reduction in Uncertain and Dynamic Systems, ICERM, Providence, RI, USA 01/27/2020 - 05/01/2020
- Workshop on Modeling and Numerical Simulation of Non-Equilibrium Processes Part Two, National University of Singapore, Singapore, 01/17/2022-01/28/2022 (virtual)
- Frontiers in Applied and Computational Mathematics, ICERM, Providence, RI, USA, 01/04/2017- 01/06/2017

Teaching Experience

Fall, 2021	Mentering, Undergraduate Research, Michigan State Unviersity,
Spring, 2021	Instructor, MTH 314 - Matrix Algebra with Computational Applications, Michigan State University
Spring, 2021	Mentering, Undergraduate Research, Michigan State Unviersity,
Fall, 2020	Instructor, MTH 124 - Survey of Calculus I, Michigan State University
Fall, 2019	Teaching Assistant, MATH 2400 - Introduction to Differential Equations, Rensselaer Polytechnic Institute
Fall, 2018	Teaching Assistant, MATH 4090 - Foundation of Analysis, Rensselaer Polytechnic Institute
Fall, 2017	Teaching Assistant, MATH 4200 - Mathematical Analysis I, Rensselaer Polytechnic Institute
Fall, 2017	Teaching Assistant, MATH 4090 - Foundation of Analysis, Rensselaer Polytechnic Institute
Summer, 2016	Mentoring, Undergraduate Research, Rensselaer Polytechnic Institute

Honors and Awards

2020	The Joaquin B. Diaz Prize, Rensselaer Polytechnic Institute
2018	Founders Award of Excellence, Rensselaer Polytechnic Institute

Professional service

- Mini-Symposium organizing:
  - Recent Developments in Modeling and Computations of Kinetic Theory, SIAM Annual meeting, Pittsburgh, PA, USA, 07/2022
- Reviewers
  - *SIAM Journal on Scientific Computing*, *Journal of Applied Mathematics and Physics*, *SIAM Journal on Numerical Analysis* , *Journal of Scientific Computing*, *Journal of Computational Physics*

Relevant Skills

- Fortran, C, C++, Matlab, Python, Julia
- MPI, PETSC, MFEM, HYPRE, TensorFlow, NGSolve, Latex, Git
- English, Chinese