

Zheng Chen – Curriculum Vitae

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Education

- 2009-2014** Ph.D. in Applied Mathematics - Brown University
Adviser: Dr. Chi-Wang Shu
- 2009-2010** M. Sc in Applied Mathematics - Brown University
Adviser: Dr. Chi-Wang Shu
- 2005-2009** B.Sc. in Pure and Applied Mathematics - University of Science and Technology of China (USTC)
Adviser: Prof. Zuchi Chen

Employment History

- Sep. 2018 -** Department of Mathematics, University of Massachusetts Dartmouth, Dartmouth, MA, USA
Assistant Professor
- Jan. 2016 -** Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA
Aug. 2018 *Postdoc (Mentor: Dr. Cory Hauck)*
- Aug. 2014 -** Department of Mathematics, Iowa State University, Ames, Iowa, USA
Dec. 2015 *Postdoc (Mentor: Dr. Jue Yan)*

Research Interests

Numerical analysis, scientific computing, and applied mathematics, including but not limited to:

- High order numerical methods, including Discontinuous Galerkin finite element methods, Spectral methods, etc.
- Numerical methods for kinetic equations
- Multiscale Computational Methods
- Numerical methods for uncertainty quantification
- Numerical methods for problems with singularities
- Post-processing techniques
- Numerical methods for fractional differential equations

Research Experiences

- Sep. 2018 -** *Research*
- Present** Department of Mathematics, University of Massachusetts Dartmouth
- Multiscale convergence properties for spectral approximations of kinetic models
 - Hybrid methods for boundary layer problem of kinetic equations
 - Spectral post-processing methods for fractional differential equations

Jan. 2016 - *Postdoctoral Research*

Aug. 2018 Computer Science and Mathematics Division, Oak Ridge National Laboratory

- Multiscale convergence properties for spectral approximations of kinetic models
- Numerical schemes on stochastic partial differential equations
- Hybrid methods for boundary layer problem of kinetic equations
- Implicit Direct Discontinuous Galerkin methods

Aug. 2014 - *Postdoctoral Research*

Dec. 2015 Department of Mathematics, Iowa State University

- Direct Discontinuous Galerkin methods
- Maximum-principle-satisfying schemes
- Fast solver for kinetic equations
- Post-processing methods

Sep. 2010 - *Graduate Research*

Aug. 2014 Division of Applied Mathematics, Brown University

- Thesis: Recovering exponential accuracy for spectral methods on problems involving smooth functions with singularities

Jan. 2006 - *Undergraduate Research (Mentor: Dr. Xingye Yue)*

Jul. 2009 Department of Mathematics, USTC

- The Boundedness of Weak Solutions of Quasilinear Elliptical Equations
- Preconditioned Conjugate Gradient Method solving potential equations
- Leader of Software Engineering Team on "Book Rental System Programming"

Teaching Experiences

Instructor

Sep. 2018 - Now

University of Massachusetts Dartmouth, Dartmouth, MA

- Numerical Methods

Rotating Instructor for kinetic reading seminar

Feb. 2016 - Now

Oak Ridge National Laboratory, Oak Ridge, TN

- The Cauchy Problem in Kinetic Theory
- Numerical Methods for Conservation Laws

Instructor

Jan. 2015 - Dec. 2015

Iowa State University, Ames, IA

- Multivariable Calculus, regular section
- Multivariable Calculus, Honor class

Recitation lecturer

Aug. 2014 - Dec. 2014

Iowa State University, Ames, IA

- Multivariable Calculus, large sections

<i>Math Help Room Tutor</i> Iowa State University, Ames, IA	Aug. 2014 - Dec. 2014
<i>Math Resource Center Tutor</i> Brown University, Providence, RI	Sept. 2012 - May 2013
<i>Teaching Consultant</i> Sheridan Center, Brown University, Providence, RI TCs receive professional training in the development and application of peer observation and feedback skills, and in the development of leadership and discussion facilitation skills.	Sept. 2011 - May 2012
<i>Teaching Assistant</i> Division of Applied Mathematics, Brown University, Providence, RI	Sept. 2010 - May 2011
<ul style="list-style-type: none"> • <i>Essential Statistics</i>, Teaching Assistant and Recitation Instructor, Spring 2011 • <i>Intro. to Computational Linear Algebra</i>, Teaching Assistant, Fall 2010 	
<i>Sheridan Center Teaching Certificate Programs</i> Sheridan Center, Brown University, Providence, RI	Sept. 2010 - May 2012
<ul style="list-style-type: none"> • <i>Certificate I: Sheridan Teaching Seminar-Reflective Teaching</i>, Sept 2010 - May 2011 • <i>Certificate III: The Professional Development Seminar</i>, Sept. 2011 - May 2012 • <i>Certificate IV: The Teaching Consultant Program</i>, Sept. 2011 - May 2012 	

Publications

- Z. Chen and C. D. Hauck, *Multiscale convergence properties for spectral approximations of a model kinetic equation*, Mathematics of Computation, <https://arxiv.org/abs/1710.05500>, accepted (2018).
- Z. Chen, L. Liu and L. Mu, *DG-IMEX Stochastic Galerkin schemes for Linear Transport Equation with Random Inputs and Diffusive Scalings*, Journal of Scientific Computing (2017), 73(2), 566-592.
- H. Huang, Z. Chen, J. Li and J. Yan, *Direct discontinuous Galerkin method and its variations for second order elliptic equations*, Journal of Scientific Computing (2017), 70(2), 744-765.
- Z. Chen and J. Yan, *Third order Maximum-Principle-Satisfying Direct discontinuous Galerkin methods for time dependent convection diffusion equations on unstructured triangular meshes*, Journal of Computational Physics, v308(2016), pp.198-217.
- Y. Chen, Z. Chen, Y. Cheng, A. Gillman and F. Li, *Study of Discrete Scattering Operators for Some Linear Kinetic Models*, S. C. Brenner (Editor), In *Topics in Numerical Partial Differential Equations and Scientific Computing*, Vol.160, pp.99-136, Springer New York, 2016.
- Z. Chen and C.-W. Shu, *Recovering exponential accuracy in Fourier spectral methods involving piecewise smooth functions with unbounded derivative singularities*, Journal of Scientific Computing, v65(2015), pp.1145-1165.
- Z. Chen and C.-W. Shu, *Recovering exponential accuracy from collocation point values of smooth functions with end-point singularities*, Journal of Computational and Applied Mathematics, v265 (2014), pp.83-95.

Publications in preparation

- M. P. Laiu, Z. Chen, C. K. Garrett, and C. D. Hauck, *A Fast Implicit Solver For Semiconductor Models in one space dimension*
- Z. Chen and C. D. Hauck, *Super convergence of asymptotic approximation of linear kinetic transport equation with general initial conditions using P_N method*
- Z. Chen and C. D. Hauck, *boundary condition splitting methods for hybrid numerical methods on kinetic models*

Presentations

- Invited talk: 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, July 15-19, 2019.
- Invited talk: New England Numerical Analysis Day, Worcester Polytechnic Institute, Worcester, MA, April 13, 2019.
- Invited talk: International Conference On Spectral And High Order Methods (ICOSAHOM), Imperial College London, United Kingdom, July 9-13, 2018.
- Seminar talk: CSCAMM Seminar, University of Maryland, College Park, MD, November 1, 2017.
- Invited talk: 25th International Conference on Transport Theory, Monterey, CA, October 19, 2017.
- Invited talk: CAM Seminar, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN, October 12, 2017
- Invited talk: The 3rd Annual Meeting of SIAM Central States Section, Colorado State University, Fort Collins, CO, September 29 - October 1, 2017
- Invited talk: the SIAM-AWM Workshop, the 2017 SIAM Annual Meeting, Pittsburgh, PA, July 10-14 2017
- Invited talk: 2016 SIAM Annual Meeting, Boston, MA, July 11-15, 2016
- Invited talks: the 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, FL, July 1-5, 2016
- Invited talk: the 40th SIAM southeastern Atlantic Section conference, Athens, GA, March 12-13, 2016
- Seminar talk: CAM Seminar, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN, March 3, 2016.
- Seminar talk: UTK CAM seminar, Mathematics Department, The University of Tennessee, Knoxville, TN, March 2, 2016
- Seminar talk, Computational and Applied Mathematics Seminar, Department of Mathematics, Iowa State University, Ames, Iowa, November 19, 2015
- Seminar talk, CAM Seminar, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN, August 27, 2015
- AWM Workshop for Women Graduates Students and Recent PhDs, SIAM CSE 2015, Salt Lake City, UT, March 14-18, 2015
- Seminar talk, Computational and Applied Mathematics Seminar, Department of Mathematics, Iowa State University, Ames, Iowa, September 15, 2014
- Progress report: "Fast solvers for kinetic equations", IMA Special Workshop: WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical Partial Differential Equations and Scientific Computing, Minneapolis, MN, August 12-14, 2014
- "Fast solvers for kinetic equations", IMA Special Workshop: WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical Partial Differential Equations and Scientific Computing, Minneapolis, MN, August 12-14, 2014
- Seminar talk, Department of Imaging Physics, The University of Texas MD Anderson Cancer Center, Houston, TX, July 16, 2014.
- Seminar talk, Department of Mathematics, Michigan State University, East Lansing, MI, April 15, 2014.
- 2014 Joint Mathematics Meetings, Baltimore, MD, January 15-18, 2014
- SIAM Conference on Computational Science and Engineering, Boston, MA, March 1, 2013
- Applied Math Days, Troy, NY, March 31, 2012

Workshops and Other Conferences

- KI-Net Conference: Multiscale Computations for Kinetic and Related Problems, Department of Mathematics, North Carolina State University, Raleigh, NC, Nov. 7-10, 2018
- ICERM Topical Workshop: Celebrating 75 Years of Mathematics of Computation, ICERM, Providence, RI, Nov. 1-3, 2018
- ICERM Topical Workshop: Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials, ICERM, Providence, RI, June 25-29, 2018
- KI-Net Conference: Hypocoercivity and Sensitivity Analysis in Kinetic Equations and Uncertainty Quantification, Department of Mathematics, University of Wisconsin-Madison, Madison, WI, Oct. 2-5, 2017

- 5th Annual ORPA Research Symposium, Oak Ridge National Laboratory, Oak Ridge, TN, August 18, 2017
- SIAM Annual Meeting AWM Workshop, the 2017 SIAM Annual Meeting, Pittsburgh, PA, July 10-14 2017
- IMA Special Workshop: Recent Advances and Challenges in Discontinuous Galerkin Methods and Related Approaches workshop, Minneapolis, MN, June 29 - July 01, 2017
- AWM Workshop for Women Graduates Students and Recent PhDs, SIAM CSE 2015, Salt Lake City, UT, March 14-18, 2015
- IMA Special Workshop: Finite Element Circus, Minneapolis, MN, October 24-25, 2014
- IMA Special Workshop: Structure-Preserving Discretizations of Partial Differential Equations, Minneapolis, MN, October 22-24, 2014
- IMA Special Workshop: WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical Partial Differential Equations and Scientific Computing, Minneapolis, MN, August 12-14, 2014
- 3rd New York Conference on Applied Mathematics, Troy, NY, October 13, 2012
- New England Numerical Analysis Day 2011, North Dartmouth, MA, April 16, 2011

Academic Honors and Travel Grants

- ICERM workshop travel support at the ICERM Topical Workshop: Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials (2018)
- AWM workshop travel support at the 2017 SIAM Annual Meeting (2017)
- IMA workshop travel support for Recent Advances and Challenges in Discontinuous Galerkin Methods and Related Approaches workshop (2017)
- AWM workshop travel support at SIAM 2015 Conference on Computational Science (2015)
- Math Professional Development Travel funds of Iowa State University (2014, 2015)
- IMA workshop travel support for workshop on Structure-Preserving Discretizations of Partial Differential Equations (2014)
- IMA workshop travel support for workshop on WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical PDEs and Scientific Computing (2014)
- AMS Graduate Student Travel Grants to JMM (2014)
- Graduate School Conference Travel Grants of Brown University (2014)
- Fellowship, Brown University (2014)
- Graduate Student Fellowship, Brown University (2010)
- Outstanding Student Scholarship, USTC (2008)
- Mathematical Outstanding Student Scholarship, USTC (2007)
- Electromagnetism Essay Contest bronze medal, USTC (2007)
- Outstanding Student Scholarship, USTC (2006)
- Outstanding Freshman Scholarship, USTC (2005)

Service

- Organizer of mini symposiums in International Conference on Spectral and High Order Methods 2018
- Advising summer intern students at ORNL
- Reviewer for Journal Of Computational Physics
- Reviewer for SIAM Journal on Numerical Analysis
- Reviewer for Journal of Scientific Computing

Professional Memberships

- Society for Industrial and Applied Mathematics (SIAM)