

# 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.
- Machine learning, Neural network
- Numerical methods for kinetic equations
- Multiscale Computational Methods
- Model and dimension reduction methods
- Numerical methods for uncertainty quantification
- Numerical methods for problems with singularities
- Post-processing techniques
- Numerical methods for fractional differential equations

## Publications

- 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.
- 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.

- 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 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.
- 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, 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.
- Z. Chen and C. D. Hauck, *Multiscale convergence properties for spectral approximations of a model kinetic equation*, Mathematics of Computation, 88 (2019), pp. 2257-2293.
- M. P. Laiu, Z. Chen, C. K. Garrett, and C. D. Hauck, *A Fast Implicit Solver For Semiconductor Models in one space dimension*, Journal of Computational Physics (2020): 109567.
- L. Mu and Z. Chen, *A New WENO Weak Galerkin Finite Element Method for Time Dependent Hyperbolic Equations*, Applied Numerical Mathematics (2020), 159: 106-124.
- L. Lyu and Z. Chen, *Local discontinuous Galerkin methods with novel basis for fractional diffusion equations with non-smooth solutions*, submitted (2020).

## Selected presentations

- Seminar talk: Applied Math Seminar, Florida International University, October 28, 2020.
- Seminar talk: PDE and Applied Math Seminar, University of California Riverside, October 21, 2020.
- Seminar talk: Applied Mathematics Seminar, Department of Mathematics, University of Georgia, September 23, 2020.
- Invited talk: Conference on Computational Mathematics and Applications (CCMA 2019), University of Nevada Las Vegas, Las Vegas, NV, October 25-27, 2019.
- Seminar talk: Applied Math Seminar, Department of Mathematical Sciences, University of Massachusetts Lowell, October 3, 2019.
- Seminar talk: Numerical Methods Seminar, Department of Mathematical Sciences, Worcester Polytechnic Institute, September 26, 2019.
- Conference talk: The North American High Order Methods Conference (NAHOMCon), San Diego State University, San Diego, CA, June 2-5, 2019.
- Invited talk: 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, July 15-19, 2019. (cancelled due to Covid.)
- Invited talk: Annual Meeting of the Canadian Society of Applied and Industrial Mathematics (CAIMS 2019), Whistler, British Columbia, Canada, June 9-13, 2019. (cancelled due to Covid.)
- 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
- Poster: 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
- 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

- Second Joint SIAM/CAIMS Annual Meeting (AN20), July 6 - 17, 2020.
- Virtual Northeastern Regional Student Conference of Society for Experimental Conference, hosted by University of Massachusetts Dartmouth on June 22, 2020.
- AACR Virtual Annual Meeting II, June 22-24, 2020.
- Recent Progress in Nonlocal Modeling, Analysis, and Computation, the Department of Mathematics & SUSTech International Center for Mathematics at Southern University of Science and Technology, and Tianyuan Mathematical Center in Southeast China, June 14-18, 2020.
- ICERM workshop: Computational Statistics and Data-Driven Models, Apr 20-24, 2020
- ICERM workshop: Algorithms for Dimension and Complexity Reduction, Mar 23-27, 2020
- ICERM workshop: Mathematics of Reduced Order Models, Feb 17-21, 2020
- Zoom webseminar, Shu group USA seminar, Spring 2020 – present.
- Online edX course MITx: 6.00.1x Introduction to Computer Science and Programming Using Python, Jun. 26 - Aug. 7, 2019
- 22nd Eastern Gravity Meeting, University of Massachusetts Dartmouth, Dartmouth, MA, May 31-June 1, 2019
- High Performance Computing (HPC) day, University of Massachusetts Lowell, Lowell, MA, May 21, 2019
- Summit for Women in STEM, Wheaton College, Norton, MA, April 6, 2019
- 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

## **Long-term and short-term visits**

- ICERM 2020 spring semester program: Model and dimension reduction in uncertain and dynamic systems (Jan 27 - May 1, 2020)
- Princeton Plasma Physics Laboratory (Sep 28 – 30, 2016)
- Brown University (Summer 2015)