

Yang Yang

Michigan Technological University
Department of Mathematical Science
Fisher Hall, Room 319
1400 Townsend Drive,
Houghton, MI 49931-1295
<http://www.math.mtu.edu/~yyang7>

Phone: (906) 487-3039
Email: yyang7@mtu.edu

Employment

Michigan Technological University:
Associate Professor: 2017.8-Now.

Michigan Technological University:
Assistant Professor: 2013.8-2017.8.

Education

Brown University, Providence ,RI, USA
Ph.D. in Applied Mathematics, May 2013.
Advisor: Professor Chi-Wang Shu

Brown University, Providence ,RI, USA
M.S. in Applied Mathematics, May 2011.

University of Science and Technology of China, Hefei, Anhui, China
B.S. in Mathematics and Applied Mathematics, July 2009.

Research Interests

Discontinuous Galerkin methods for partial differential equations with blow-up solutions

Numerical simulations in oil recovery

Superconvergence of discontinuous Galerkin methods and its applications

Numerical cosmology

Publications

1. Waixiang Cao, Chi-Wang Shu, **Yang Yang** and Zhimin Zhang, *Superconvergence of discontinuous Galerkin method for nonlinear hyperbolic equations*, submitted to *SIAM Journal on Numerical Analysis*.
2. Li Guo, Hengguang Li and **Yang Yang**, *Interior estimates of semidiscrete finite element methods for parabolic problems with distributional data*, submitted to *BIT Numerical Mathematics*.
3. Hui Guo, Fan Yu, Nattaporn Chuenjarern and **Yang Yang**, *Conservative local discontinuous Galerkin method for compressible miscible displacements in porous media*, submitted to *Journal of Scientific Computing*.

4. Hui Guo and **Yang Yang**, *Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media*, submitted to *SIAM Journal on Scientific Computing*.
5. Li Guo and **Yang Yang**, *Superconvergence of discontinuous Galerkin methods for hyperbolic equations with singular initial data*, *International Journal of Numerical Analysis and Modeling*, accepted.
6. Xingjie Li, Chi-Wang Shu and **Yang Yang**, *Positivity-preserving local discontinuous Galerkin methods for Chemotaxis model*, *Journal of Scientific Computing*, accepted.
7. Hui Guo, Fan Yu and **Yang Yang**, *Local discontinuous Galerkin method for incompressible miscible displacement problem in porous media*, *Journal of Scientific Computing*, 71 (2017), 615-633..
8. Waixiang Cao, Dongfang Li, **Yang Yang** and Zhimin Zhang, *Superconvergence of discontinuous Galerkin methods based on upwind-biased fluxes for 1D linear hyperbolic equations*, *ESAIM: Mathematical Modelling and Numerical Analysis*, 51 (2017), 467-486.
9. Tong Qin, Chi-Wang Shu and **Yang Yang**, *Bound-preserving discontinuous Galerkin methods for relativistic hydrodynamics*, *Journal of Computational Physics*, 315 (2016), 323-347.
10. Waixiang Cao, Chi-Wang Shu, **Yang Yang** and Zhimin Zhang, *Superconvergence of discontinuous Galerkin methods for hyperbolic equations in two space dimensions*, *SIAM Journal on Numerical Analysis*, 53 (2015), 1651-1671.
11. Li Guo and **Yang Yang**, *Positivity-preserving local discontinuous Galerkin methods for parabolic equations with blow-up solutions*, *Journal of Computational Physics*, 289 (2015), 181-195.
12. **Yang Yang** and Chi-Wang Shu, *Analysis of optimal superconvergence of local discontinuous Galerkin method for one-dimensional linear parabolic equations*, *Journal of Computational Mathematics*, 33 (2015), 323-340.
13. Xiong Meng, Chi-Wang Shu and **Yang Yang**, *Superconvergence of discontinuous Galerkin methods for time-dependent partial differential equations*, *Scientia Sinica Mathematica*, 45 (2015), 1041-1060.
14. Xuan Zhao, **Yang Yang** and Charles Seyler, *A positivity-preserving semi-implicit discontinuous Galerkin scheme for solving extended magnetohydrodynamics equations*, *Journal of Computational Physics*, 278 (2014), 400-415.
15. Hui Guo, Qinghua Zhang and **Yang Yang**, *A combined mixed finite element method and local discontinuous Galerkin method for miscible displacement problem in porous media*, *Science China Mathematics*, 57 (2014), 2301-2320.
16. Xia Ji, Jiguang Sun and **Yang Yang**, *Optimal penalty parameter for C^0 IPDG*, *Applied Mathematics Letters*, 37 (2014), 112-117.
17. Jiajia Niu, Liancun Zheng, **Yang Yang** and Chi-Wang Shu *Chebyshev spectral method for unsteady axisymmetric mixed convection heat transfer of power law fluid over a cylinder with variable transport properties*, *International Journal of Numerical Analysis and Modeling*, 11 (2014), 525-540.
18. **Yang Yang**, Dongming Wei and Chi-Wang Shu, *Discontinuous Galerkin method for Krause's consensus models and pressureless Euler equations*, *Journal of Computational Physics*, 252 (2013), 109-127.
19. **Yang Yang**, Ishani Roy, Chi-Wang Shu and Li-Zhi Fang, *Angular distribution of Ly α resonant photons emergent from optically thick medium*, *The Astrophysical Journal*, 772 (2013), 3(10).
20. **Yang Yang** and Chi-Wang Shu, *Discontinuous Galerkin method for hyperbolic equations involving δ -singularities: negative-order norm error estimates and applications*, *Numerische Mathematik*, 124 (2013), 753-781.

21. **Yang Yang** and Chi-Wang Shu, *Analysis of optimal superconvergence of discontinuous Galerkin method for linear hyperbolic equations*, SIAM Journal on Numerical Analysis, 50 (2012), 110-3133.
22. **Yang Yang**, Ishani Roy, Chi-Wang Shu and Li-Zhi Fang, *Effect of dust on Ly α photon transfer in optically thick halo*, The Astrophysical Journal, 739 (2011), 91(11).

Selected Recent Colloquia, Seminars and Talks

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at China University of Petroleum, May 31-June 5, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at University of Science and Technology of China, May 21-23, 2017.

Invited talk: Local discontinuous Galerkin method for KS chemotaxis model, Seminar at Nanjing University of Posts and Telecommunications, May 14-17, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at Nanjing University, May 14-17, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at Zhejiang University, May 4-6, 2017.

Invited talk: Local discontinuous Galerkin method for KS chemotaxis model, Seminar at the university at Buffalo, SUNY, April 17-19, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at Iowa State University, April 9-11, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at Ohio State University, April 5-7, 2017.

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at Beijing Institute of Technology, Beijing, China, December 27-28, 2016.

The Third International Workshop on Development and Application of High-Order Numerical Methods, Hefei, Anhui, China, December 16-19, 2016.

Presentation: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media.

AMS Fall Western Sectional Meeting, University of Denver, Denver, CO, October 8-9, 2016.

Presentation: Superconvergence of discontinuous Galerkin methods for hyperbolic equations.

The 2nd Annual Meeting of SIAM Central States Section, University of Arkansas at Little Rock, Little Rock, AR, September 30-October 2, 2016.

Presentation: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media

Invited talk: Bound-preserving discontinuous Galerkin method for compressible miscible displacement problem in porous media, Seminar at University of North Carolina at Charlotte, August 22-24, 2016.

International Conference on Computational Mathematics and Inverse Problems, Michigan Tech, Houghton, MI, August 15-19, 2016.

Presentation: Discontinuous Galerkin methods for KS chemotaxis models.

Invited talk: Discontinuous Galerkin methods for KS chemotaxis models, Seminar at Institute of Applied Physics and Computational Mathematics, Aug 7-9, 2016.

The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Hyatt Regency Orlando, Orlando, FL, July 1-5, 2016.

Presentation: Discontinuous Galerkin methods for KS chemotaxis models.

10th International Conference on Scientific Computing and Applications (ICSCA 2016), Fields Institute, Toronto ON, CA, June 6-10, 2016.

Presentation: Discontinuous Galerkin methods for KS chemotaxis models.

Invited talk: Discontinuous Galerkin methods for hyperbolic equations involving δ -singularities, Seminar at Ocean University of China, May 20-23, 2016.

Invited talk: Superconvergence of discontinuous Galerkin methods for hyperbolic equations, Seminar at Nanjing University, May 16-19, 2016.

Invited talk: Superconvergence of discontinuous Galerkin methods for hyperbolic equations, Seminar at China University of Petroleum, May 3-9, 2016.

Finite Element Circus, Umass Dartmouth, North Dartmouth, MA, October 16-17, 2015.

Presentation: LDG methods for KS Chemotaxis model.

Invited talk: Discontinuous Galerkin methods for hyperbolic equations involving delta-singularities, Seminar at Wayne State University, October 4-6, 2015.

8th International Congress on Industrial and Applied Mathematics, National convention center, Beijing, China, August 10-14, 2015.

Presentation: Discontinuous Galerkin method for parabolic equations with blow-up solutions

Presentation: Superconvergence of Discontinuous Galerkin methods for hyperbolic equations in two space dimensions.

Invited talk: Discontinuous Galerkin methods for pressureless Euler equations and relativistic hydrodynamics, Seminar at Chinese Academy of Sciences, July 21, 2015.

Invited talk: Discontinuous Galerkin methods for pressureless Euler equations and relativistic hydrodynamics, Seminar in the Department of Mathematics at China University of Petroleum, Jun 17-25, 2015.

Invited talk: Discontinuous Galerkin methods for hyperbolic equations involving delta-singularities, Seminar in the Department of Mathematics at Nankai University, Jun 12, 2015

Invited talk: Discontinuous Galerkin methods for pressureless Euler equations and relativistic hydrodynamics, Seminar at Institute of Applied Physics and Computational Mathematics, June 5, 2015.

BIRS Workshop 15w5134 Higher Order Numerical Methods for Evolutionary PDEs: Applied Mathematics Meets Astrophysical Applications, Banff International Research station, Banff, Alberta, Canada, May 10-14, 2015.

Presentation: Discontinuous Galerkin methods for pressureless Euler equations and relativistic hydrodynamics.

Finite Element Circus, George Mason University, Fairfax, VA, March 27-28, 2015.

Presentation: Positivity-preserving local discontinuous Galerkin methods for parabolic equations with blow-up solutions.

2015 SIAM Conference on Computational Science and Engineering, Convention center, Salt Lake City, March 14-18, 2015.

Presentation: Superconvergence of discontinuous Galerkin method in two space dimensions.

Invited talk: Superconvergence of Discontinuous Galerkin methods for linear hyperbolic equations, Seminar in the Department of Mathematics at UMass Dartmouth, November 14, 2014.

Finite Element Circus, IMA, Minneapolis, Minnesota, October 24-25, 2014.

Presentation: Superconvergence for discontinuous Galerkin methods for linear hyperbolic equations in two space dimensions.

Invited talk: Discontinuous Galerkin methods for partial differential equations with blow-up solutions, Seminar in the Institute of Applied Physics and Computation Mathematics, July 21, 2014.

Invited talk: Superconvergence of discontinuous Galerkin methods for hyperbolic equations in one space dimension, Seminar in the Department of Mathematics at Nanjing University, June 8, 2014.

Invited talk: Discontinuous Galerkin methods for partial differential equations with blow-up solutions, Seminar in the Department of Mathematics at Sooutheast University, June 5, 2014.

Invited talk: Superconvergence of discontinuous Galerkin methods for hyperbolic equations in one space dimension, Seminar in the Department of Mathematics at Xiamen University, May 30, 2014.

Invited talk: Discontinuous Galerkin methods for partial differential equations with blow-up solutions, Seminar in the Department of Mathematics at China University of Petroleum, May 17, 2014.

Invited talk: Discontinuous Galerkin methods for partial differential equations with blow-up solutions, Seminar in the Department of Mathematics at University of Science and Technology of China, May 14, 2014.

Invited talk: Discontinuous Galerkin methods for partial differential equations with blow-up solutions, Seminar in the Department of Mathematics at Rensselaer Polytechnic Institute, April 14, 2014.

2013 SIAM Conference on Analysis of Partial Differential Equations, Hilton Orlando Lake Buena Vista, Lake Buena Vista, Florida, December 7-10, 2013.

Presentation: Analysis of Optimal Superconvergence of Discontinuous Galerkin method.

Invited talk: Superconvergence of discontinuous Galerkin method for hyperbolic equations, Seminar in the Division of Applied Mathematics at Brown University, November 22, 2013.

Copper Country Workshop on Numerical Analysis and Inverse Problems, Michigan Technological University, Houghton, Michigan, August 12-14, 2013.

Presentation: Discontinuous Galerkin methods for hyperbolic equations involving δ -singularities.

2013 SIAM Conference on Computational Science and Engineering, the Westin Boston Waterfront, Boston, MA, February 25 - March 1, 2013.

Presentation: Discontinuous Galerkin methods for hyperbolic equations involving δ -singularities.

Joint Mathematics Meetings, San Diego Convention Center, San Diego, CA, January 9-12, 2013.

Presentation: Discontinuous Galerkin methods for hyperbolic equations involving δ -singularities.

3rd New York Conference on Applied Mathematics, Rensselaer Polytechnic Institute, Troy, NY, October 13, 2012.

Poster presentation: Angular distribution of $Ly\alpha$ resonant photons emergent from optically thick medium.

International Conference on Mathematical Modeling, Analysis and Computation, Xiamen University, Xiamen, China, July 21-25, 2012.

Presentation: Superconvergence of discontinuous Galerkin method for linear hyperbolic equations in one space dimension.

Midwest Numerical Analysis Days 2012, University of Notre Dame, Notre Dame, IN, May 12-13, 2012.

Presentation: Angular distribution of $Ly\alpha$ resonant photons emergent from optically thick medium.

2012 New England Numerical Analysis Day, UMass Amherst, Amherst, MA, April 21, 2012.

Presentation: Discontinuous Galerkin methods for hyperbolic equations involving δ -singularities.

Applied Math Days 2012, Rensselaer Polytechnic Institute, Troy, NY, March 19-20, 2012.

Presentation: Error estimate for discontinuous Galerkin method for linear hyperbolic equations with discontinuous initial data.

Teaching Experience

MA5501–Theoretical Numerical Analysis, Fall 2017

MA3160–Multivariable Calculus with Technology, Fall 2017

MA5565–Partial Differential Equations, Spring 2017

MA4620–Numerical Methods for Partial Differential Equations, Fall 2016

MA3160–Multivariable Calculus with Technology, Fall 2016

MA5524–Numerical Analysis, Spring 2016

MA5401–Real Analysis, Fall 2015

MA1160–Calculus with Technology I, Fall 2015

MA6600–Discontinuous Galerkin methods, Spring 2015

MA3160–Multivariable Calculus with Technology, Fall 2014

MA5524–Functional Analysis, Spring 2014

MA1161–Calculus Plus with Technology I, Fall 2013

Tutor for Math Recourse Center, 2010.9-2013.5

Teaching consultant for Sheridan Center, Brown University, 2011.9-2012.5

Certificate IV, Sheridan Center for Teaching and Learning, 2011.9-2012.5

Certificate I, Sheridan Center for Teaching and Learning, 2010.9-2011.5

Teaching Assistant

Real Analysis, fall 2010

Hilbert Spaces and Their Applications, spring 2011

Awards and Honors

Michigan Technological University

Outstanding Teaching Award, Lecture/Assistant Professor Level, April 2017

REF-SCG Award (\$7500)

New World Mathematics Award, Honorable Mention of PhD Thesis

SIAM Early Career Travel Award, 2015 (\$2000)

Outstanding Research Award, Junior Level, April 2014, 2016

Brown University

Dunmu Ji Award, May 2013

The Simon Ostrach Fellowship Award 2012-13

University of Massachusetts Amherst

New England Numerical Analysis Day Poster Competition Award, April 2012

University of Science and Technology of China

Outstanding Student Scholarship (Grade 1), 2007, 2008

Samsung Scholarship, 2007

Outstanding Student Scholarship (Grade 2), 2006

Services

Organizer and faculty advisor of SIAM student chapter at MTU

Minisymposium organizer of the The 11th AIMS Conference on Dynamical Systems, July 1-5, 2016
Differential Equations and Applications, July 1-5, 2016.

Minisymposium organizer of SIAM conference on Computational Science and Engineering, March 14-18, 2015.