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Purdue University, West Lafayette   *Email:* shao92@purdue.edu
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Research Interests

Partial differential equations with applications to geometry
Analysis on non-compact manifolds including those with singularities
Geometric evolution equations
Regularity of elliptic and parabolic equations and systems
Degenerate and singular parabolic equations
Free boundary problems
Imaging Processing
Nematic liquid crystal
Harmonic heatflow

Education

Vanderbilt University
Ph.D., Mathematics, August 2010-June 2015
Thesis Advisors: Gieri Simonett

Courant Institute of Mathematical Sciences, New York University
M.S., Mathematics, September 2008-January 2010

Fudan University, China
B.S., Applied Mathematics and Actuary, September 2003-July 2007

Appointments

Purdue University
Golomb Visiting Assistant Professor, 2015-2018

Vanderbilt University,
Graduate Teaching Assistant, August 2010-May 2015

Publications

[1] *"Real analytic solutions to the Willmore flow"*. Ninth MSU-UAB Conference on Differential Equations and Computational Simulations. Electron. J. Diff. Eqns., Conf. **20**, pp. 151-164 (2013).

[2] *"Continuous maximal regularity on uniformly regular Riemannian manifolds"*. J. Evol. Equ. **1**, no. 14, 211-248 (2014). (Wth Gieri Simonett)

[3] *"A family of parameter-dependent diffeomorphisms acting on function spaces over a Riemannian manifold and applications to geometric flows"*. NoDEA Nonlinear Differential Equations Appl. **22**, no. 1, 45-85 (2015).

[4] *"Some remarks on uniformly regular Riemannian manifolds"*. Math. Nachr. **289**, no. 2-3, 232-242 (2016). (With Marcelo Disconzi and Gieri Simonett)

[5] *"On the regularity of the interface of a thermodynamically consistent two-phase Stefan problem"*. Interfaces Free Bound. **17**, no. 4, 555-600 (2015). (With Jan Prüss and Gieri Simonett)

[6] "*Singular parabolic equations of second order on manifolds with singularities*". J. Differential Equations **260**, no. 2, 1747-1800 (2016).

[7] "*Continuous maximal regularity on manifolds with singularities and its applications*". Evol. Equ. and Control Theory **5**, no. 2, 303-335 (2016).

[8] "*Wellposedness of a nonlocal nonlinear diffusion equation in image processing*". Nonlinear Analysis: Theory, Methods, and Applications, Vol. 150, 114-137 (2017). (With Patrick Guidotti)

WORK SUBMITTED OR IN PREPARATION

[S1] "*The Yamabe flow on incomplete manifolds*". Submitted. arXiv: 1506.07018.

[S2] "*Global solutions to the porous medium equations on singular manifolds*". Submitted. arXiv: 1606.01233.

[P1] "*Instantaneously regularized solutions to parabolic equations with interior degeneracy or singularity*". In preparation. (With Patrick Guidotti)

[P2] "*Boundary value problems on singular manifolds*". In preparation.

[P3] "*Heat flow of harmonic maps with weak anchoring boundary condition in dimension two*". In final stage of preparation. (With Tao Huang and Changyou Wang)

INVITED RESEARCH VISIT

Institut für Analysis, Leibniz Universität Hannover, Germany. September 26-October 3, 2015.

INVITED SEMINAR TALKS

"*PDE Seminar*", Indiana University, Bloomington, October 19, 2015.

"*PDE Seminar*", Purdue University, West Lafayette, April 2, 2015.

"*Analysis Seminar*", Binghamton University, Binghamton, November 5, 2014.

"*PDE and Differential Geometry Seminar*", University of Connecticut, Storrs, November 3, 2014.

"*Geometry-Topology Seminar*", University of Tennessee, Knoxville, October 6, 2014.

"*Nonlinear PDEs Seminar*", University of California, Irvine, September 30, 2014.

"*Analysis and Partial Differential Equations Seminar*", University of Kentucky, Lexington, March 11, 2014.

INVITED PRESENTATIONS AT CONFERENCES

"*International Conference on Evolution Equations*", Vanderbilt University, Nashville, May 16-20, 2015.

"*Fall Western AMS Sectional Meeting*", California State University, Fullerton, October 24-25, 2015.

"*Workshop on Analysis and PDE*", Leibniz Universität Hannover, Germany, September 29-October 1, 2015.

"*AMS Sectional Meeting, Spring Southeastern Sectional Meeting, Special Session on Nonlinear Operator Theory and Partial Differential Equations*", University of Alabama, Huntsville, March 29, 2015.

"*AMS Sectional Meeting, Spring Southeastern Sectional Meeting, Special Session on Recent Progress in Differential Equations*", University of Alabama, Huntsville, March 28 2015.

"*The 34th Southeastern Atlantic Regional Conference on Differential Equations*", Department of Mathematics, University of Memphis, October 11-12, 2014.

"*The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*", the Universidad Autónoma de Madrid, Madrid, Spain, July 07-July 11, 2014.

"*Maxwell-Stefan meets Navier-Stokes, Modeling and Analysis of Reactive Multi-Component Flows*", Martin-Luther Universität Halle-Wittenberg, Germany, March 31-April 2, 2014.

"*The 4th Ohio River Analysis Meeting*", University of Kentucky, Lexington, March 8-9, 2014.

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

"*The 33rd Southeastern-Atlantic Regional Conference on Differential Equations, 2013*", the University of Tennessee, Knoxville, September 21-22.

"*The 9th Mississippi State - UAB Conference on Differential Equations and Computational Simulations*", Mississippi State University, Starkville, October 4-6, 2012.

Departmental Seminar Talks

"*PDE Seminar*", Purdue University, West Lafayette, September 17, 2015.

"*Partial Differential Equations Seminar*", Vanderbilt University, Nashville, March 14, 2015.

"*Partial Differential Equations Seminar*", Vanderbilt University, August 29, 2014.

"*Partial Differential Equations Seminar*", Vanderbilt University, March 21, 2014.

"*Partial Differential Equations Seminar*", Vanderbilt University, October 4, 2013.

"*Partial Differential Equations Seminar*", Vanderbilt University, October 19, 2012.

Conferences and Workshops

"*International Conference on Evolution Equations*", Vanderbilt University, Nashville, May 16-20, 2015.

"*The 23rd Southern California Geometric Analysis Seminar*", University of California, Irvine, January 30-31, 2016.

"*Fall Western AMS Sectional Meeting*", California State University, Fullerton, October 24-25, 2015.

"*Workshop on Analysis and PDE*", Leibniz Universität Hannover, Germany, September 29-October 1, 2015.

"*AMS Sectional Meeting, Spring Southeastern Sectional Meeting*", University of Alabama, Huntsville, March 27-29, 2015.

"*Southeast Geometry Seminar XXV*", University of Tennessee, Knoxville, October 26, 2014.

"*The 7th Yamabe Memorial Symposium*", University of Minnesota, Twin cities, Minneapolis, October 17-19, 2014.

"*The 34th Southeastern Atlantic Regional Conference on Differential Equations*, Department of Mathematics, University of Memphis, October 11-12, 2014.

"*The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, the Universidad Autónoma de Madrid, Madrid, Spain, July 07-11, 2014.

"*The 17th Riviére-Fabes Symposium on Analysis and PDE*", University of Minnesota, Twin cities, Minneapolis, April 25-27, 2014.

"*The 29th Annual Geometry Festival*", Stony Brook University, Stony Brook, April 11-13, 2014.

"*Maxwell-Stefan meets Navier-Stokes, Modeling and Analysis of Reactive Multi-Component Flows*", Martin-Luther Universität Halle-Wittenberg, Germany, March 31-April 2, 2014.

"*The 4th Ohio River Analysis Meeting*", University of Kentucky, Lexington, March 8-9, 2014.

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

"*The 33rd Southeastern-Atlantic Regional Conference on Differential Equations*", the University of Tennessee, Knoxville, September 21-22, 2013.

"*The 9th Mississippi State - UAB Conference on Differential Equations and Computational Simulations*", Mississippi State University, Starkville, October 4-6, 2012.

"*The 15th Riviére-Fabes Symposium on Analysis and PDE*", University of Minnesota, Twin cities, Minneapolis, April 20-22, 2012.

"*The 36th Annual SIAM Southeastern Atlantic Section Conference*", University of Alabama, Huntsville, March 24-25, 2012.

Teaching Experience

Purdue University, West Lafayette (2015–present):
Instructor, MA26200, *Linear Algebra and Differential Equations*, Fall 2016.
Instructor, MA26500, *Linear Algebra*, Spring 2016.
Instructor, MA26200, *Linear Algebra and Differential Equations*, Fall 2015.

Vanderbilt University (2010-2015):
Teaching Assistant, MATH 196, *Diff Eq with Linear Algb*, Fall 2014.
Teaching Assistant, MATH 155B, *Accel Single-Var Calc II*, Spring 2014.
Teaching Assistant, MATH 155A, *Accel Single-Var Calc I*, Fall 2013.
Teaching Assistant, MATH 218, *Intro Prob/Math Stats*, Summer 2013.
Teaching Assistant, MATH 205B, *Multivar Calc/Linear Algb*, Spring 2013.
Teaching Assistant, MATH 205A, *Multivar Calc/Linear Algb*, Fall 2012.
Teaching Assistant, MATH 218, *Intro Prob/Math Stats*, Summer 2012.
Teaching Assistant, MATH 150B, *Single-Var Calc II*, Spring 2012.
Teaching Assistant, MATH 150A, *Single-Var Calc I*, Fall 2011.

Awards and Honors

Vanderbilt University Bjarni Jónsson Prize for Outstanding Research.
Assistantship-Scholarship, Department of Mathematics, Vanderbilt University, 2010-2015

Services

Referee for several mathematical journals.

Organizer (with Patrick Guidotti and Gieri Simonett), mini-symposium on Nonlinear Parabolic Equations and Applications, SIAM Conference on Analysis and Partial Differential Equations, Scottsdale, December 7-10, 2015.

References

Emeritus Prof. Herbert Amann
Institut für Mathematik, Universität Zürich,
Email: herbert.amann@math.uzh.ch

Prof. Patrick Guidotti
Vice Chair for Graduate Studies, Department of Mathematics, University of California Irvine
Email: gpatrick@math.uci.edu

Associate Prof. Paul Loya
Department of Mathematics, Binghamton University
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Distinguished Prof. Roger Temam
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Department of Mathematics, Purdue University
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Prof. Sai Kee Yeung
Department of Mathematics, Purdue University
Email: yeungs@purdue.edu

WORK EXPERIENCE

Accounting Internship, Hornby Electronic, May 2006-August 2006.

Manager Assistant, Shanghai Zunyou Genierobot Ltd.Co., November 2007-June 2008.