Qiliang Wu

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POSITIONS

2013-Present	VISITING ASSISTANT PROFESSOR Department of Mathematics, Michigan State University
2007-2013	INSTRUCTOR School of Mathematics, University of Minnesota

EDUCATION

2013	PH.D. IN MATHEMATICS, University of Minnesota *Advisor:* Arnd Scheel
2007	B.S. IN MATHEMATICS, University of Science and Technology of China(USTC)

AWARDS

❖ Early Career Travel Award, SIAM Conference on Application of Dynamical Systems, Snowbird, May 2015

❖ Best Poster Award, First International Conference on Dynamics of Differential Equations, Atlanta, March 2013

❖ Graduate Student Travel Grants, American Mathematical Society, March 2012

❖ Outstanding Student Scholarship (3 times), USTC, 2003-2007

❖ Guanghua Education Scholarship, USTC, Fall 2005

PUBLICATIONS

✍ K. Promislow, Q. Wu
Existence, bifurcation, and geometric evolution of quasi-bilayers in the multicomponent functionalized Cahn-Hilliard Equation.
J. Math. Biol., to appear. arXiv:1510.08467

✍ G. Jaramillo, A. Scheel, Q. Wu
The effect of impurities on striped phases.
Proc. Roy. Soc. Edinb., to appear. arXiv:1604.07786

✍ A. Scheel, Q. Wu
Diffusive stability of Turing patterns via normal forms.
J. Dyn. Diff. Eqns., **27**(2015), 1027-1076. (A special volume in memoriam Klaus Kirchgässner)

✍ K. Promislow, Q. Wu
Existence of pearled patterns in the planar Functionalized Cahn-Hilliard equation.
J. Differential Eqns., **259** (2015), 3298-3343.

✍ P. Xiao, Q. Wu, G. Henkelman
Basin constrained κ-dimer method for saddle point finding.
J. Chem. Phys., **141**, 164111(2014).

✍ J. Duncan, Q. Wu, K. Promislow, G. Henkelman
Biased gradient-squared descent saddle point finding method.
J. Chem. Phys., **140**, 194102(2014).

✍ A. Scheel, Q. Wu
Small-amplitude grain boundaries of arbitrary angle in the Swift-Hohenberg equation.
Z. Angew. Math. Mech., **94**(2014), 203-232

✍ M. Kotzagiannidis, J. Peterson, J. Redford, A. Scheel, Q. Wu
Stable pattern selection through invasion fronts in closed two-species reaction-diffusion systems.
*RIMS Kôkyûroku Bessatsu **B31**:Far-From-Equilibrium Dynamics*(2012), 79-92.

Preprints

✍ K. Promislow, Q. Wu
Compositional and geometric evolution of quasi-bilayers in the two-component functionalized Cahn-Hilliard equation with radially symmetric well.
Preprint. 18 pages.

✍ A. Scheel, Q. Wu
The effect of impurities on stripes in multi-dimensional extended domains.
Preprint. 20 pages.

✍ Z. Bezemek, K. Promislow, X. Wang, Q. Wu
Panic spreading in a lattice flocking model.
Preprint. 14 pages.

In preparation

✍ A. Doelman, K. Promislow, F. Veerman, Q. Wu
A two-component functionalized Cahn-Hilliard equation with generic pearling inhibition.
In preparation.

✍ Q. Wu
Asymmetric grain boundaries in the Swift-Hohenberg equation.
In preparation.

Mentoring

❖ *Co-mentor of the "running with clones" research group*
Students: Zachary Bezemek (Freshman, MSU), and Xilu Wang (Junior, Xian Jiaotong University).
Michigan State University, Spring, 2016.

❖ *Co-mentor of the gradient flow research group*
Students: Joshua Paavola (Freshman, MSU), Kenneth Plackowski (Senior, MSU) and Zhe Wang (Junior, Xian Jiaotong University).
Michigan State University, Spring, 2015.

❖ *REU Co-mentor*
Students: Madeleine Kotzagiannidis (Junior, UMN), Jeremiah Peterson (Freshman/Talented Youth program, Normandale) and Joseph Redford (Sophomore, UMN).
University of Minnesota, Summer, 2011.

Teaching

Michigan State University	❖ *Lecturer*

        ◇ MTH234, Multivariable Calculus (AP), Fall 2016.
        ◇ MTH421, Analysis II, Summer 2016.
        ◇ MTH234, Multivariable Calculus (AP), Spring 2016.
        ◇ MTH234, Multivariable Calculus (AP), Fall 2015.
        ◇ MTH235, Differential Equations, Fall 2014.
        ◇ MTH132, Calculus I, Spring 2014.

University of Minnesota   ❖ *Discussion Instructor* (recitation; office hours; grading)

        ◇ MATH3283W, Sequences, Series, and Foundations, Spring 2013.
        ◇ MATH3283W, Sequences, Series, and Foundations, Spring 2012.
        ◇ MATH1051, Precalculus I, Fall 2011.
        ◇ MATH1151, Precalculus II, Spring 2011.
        ◇ MATH1372, CSE Calculus II, Spring 2011.
        ◇ MATH2243, Linear Algebra and Differential Equations, Fall 2010.
        ◇ MATH1271, Calculus I, Spring 2010.
        ◇ MATH1271, Calculus I, Fall 2009.
        ◇ MATH1151, Precalculus II, Fall 2008.
        ◇ MATH1051, Precalculus I, Fall 2007.

    ❖ *Resource Instructor* (training first-year international teaching assistants)

        ◇ CSE: Talk, Summer 2011.
        ◇ IT: Talk, Summer 2009.

Invited Talks & Posters

❖ Compositional evolution of quasi-bilayers in the symmetric two-component FCH equation
    ◇ SIAM Conference on Applications of Dynamical Systems,
      Snowbird, UT, May 21-25, 2017.

❖ The Effect of Impurities on Striped Phases
    ◇ Forty-Fourth Annual Conference–Differential Equations and Dynamical Systems,
      Miami University, Oxford, OH, September 23-24, 2016.
    ◇ SIAM Conference on Nonlinear Waves and Coherent Structures,
      Philadelphia, PA, August 8-11, 2016.

❖ Pattern Formation in Amphiphilic Mixtures
    ◇ Special Colloquium,
      Miami University, Oxford, OH, January 11, 2016.

❖ Geometric evolution of quasi-bilayers in multicomponent functionalized Cahn-Hilliard equation
    ◇ SIAM Conference on Analysis of Partial Differential Equations,
      Paradise Valley, Scottsdale, AZ, December 7-10, 2015.
    ◇ Colloquium,
      Miami University, Oxford, OH, November 20, 2015.
    ◇ Workshop: Waves, Spectral Theory, and Application,
      Princeton University, NJ, September 10-11, 2015 (poster).

❖ Existence of pearled patterns in the planar functionalized Cahn-Hilliard equation
    ◇ KUMU Conference on PDE, Dynamical Systems, and Applications,
      University of Missouri, Columbia, MO, April 23-24, 2016 (Poster).

- ⬧ The Society for Mathematical Biology 2015 Annual Conference,
  Atlanta, GA, June 29 - July 3, 2015.
- ⬧ SIAM Conference on Applications of Dynamical Systems,
  Snowbird, UT, May 17-21, 2015.
- ⬧ First Annual Meeting of SIAM Central States Section,
  MUST, Rolla, MO, April 11-12, 2015.
- ⬧ AMS Central Spring Sectional Meeting,
  Michigan State University, East Lansing, MI, March 14-15, 2015.
- ⬧ Boston University/Keio Univeristy Workshop (Dynamical Systems),
  Boston University, Boston, MA, September 15-19, 2014.

❖ Math behind patterns: 1696 and 1952

- ⬧ Colloquium,
  Calvin College, Grand Rapids, MI, November 20, 2014.

❖ Saddle search: Attraction Basin Constrained Dimer and Biased Gradient Square Descent

- ⬧ Culminating Workshop of Materials for a Sustainable Energy Future,
  UCLA Conference Center, Lake Arrowhead, CA, December 8-13, 2013.

❖ Existence of pearling patterns in the 2D functionalized Cahn-Hilliard equation

- ⬧ Short Seminar Series,
  IPAM, UCLA, Los Angeles, CA, December 3, 2013.
- ⬧ SIAM Conference on Analysis of Partial Differential Equations,
  Hilton Lake Buena Vista, Orlando, FL, December 7-10, 2013.

❖ Small-amplitude grain boundaries with arbitrary angle in the Swift-Hohenberg equation

- ⬧ Analysis and Computation of Coherent Structures,
  IMA, University of Minnesota, Minneapolis, MN, May 28, 2013.
- ⬧ First Central Region Conference on Numerical Analysis and Dynamical Systems,
  University of Kansas, Lawrence, KS, May 3-5, 2013.

❖ Diffusive stability of Turing patterns via normal forms

- ⬧ IMA Workshop: Stochastic Modeling of Biological Processes,
  University of Minnesota, Minneapolis, MN, May 13-17, 2013 (poster).
- ⬧ First Central Region Conference on Numerical Analysis and Dynamical Systems,
  University of Kansas, Lawrence, KS, May 3-5, 2013 (poster).
- ⬧ First International Conference on Dynamics of Differential Equations,
  Georgia Institute of Technology, Atlanta, GA, March 16-20, 2013 (poster).
- ⬧ Dynamical System Lecture 19, Wu Wen-Tsun Key Laboratory of Mathematics,
  USTC, Hefei, Anhui, China, December 25, 2012.

❖ Grain boundaries in the Swift-Hohenberg equation (poster)

- ⬧ Dynamical Systems in Studies of Partial Differential Equations,
  IMA, Minneapolis, MN, September 24-28, 2012.
- ⬧ 2012 SIAM Annual Meeting,
  Minneapolis, MN, July 9-13, 2012.
- ⬧ SIAM Conference on Nonlinear Waves and Coherent Structures,
  University of Washington, Seattle, WA, June 13-16, 2012.
- ⬧ Progress and Problems in Dynamics,
  University of Houston, Houston, TX, May 14-16, 2012.

❖ Turing pattern: from nature to math

- ⬧ Math club seminar,
  University of Minnesota, Minneapolis, MN, April 26, 2012.

❖ Dynamics near Turing patterns in reaction-diffusion systems

SERVICE

❖ *Journal referee*

  ◇ Acta Applicandae Mathematicae
  ◇ Nonlearity
  ◇ Physica D
  ◇ SIAM Math Analysis

❖ *Minisymposium organizer*

  ◇ Existence, stability, and dynamics of patterns on multi-dimensional domains
    SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, 2017.
  ◇ Minisymposium on Nonlinear Waves: Dynamics and Stability
    AMS Central Spring Sectional Meeting, MSU, 2015.

OTHERS

❖ BIRS workshop: Analysis and Computation of Vector Functionalized Cahn Hilliard Equations and Application
  to Amphiphilic Materials
  Banff, Canada, July 12-19, 2015.

❖ IPAM long program: Materials for a Sustainable Energy Future
  Los Angeles, CA, September 9-December 13, 2013.

❖ MBI emphasis semester: Growth and Morphogenesis
  OSU, Columbus, OH, Spring 2017