Mathew A. Johnson – Curriculum Vitae

CONTACT INFORMATION

Department of Mathematics
University of Kansas
1460 Jawhawk Blvd
Lawrence, Kansas 66045

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E-mail: matjohn@ku.edu
Webpage: `https://matjohn.ku.edu`

EDUCATION

University of Illinois at Urbana-Champaign
Ph.D, Mathematics, 2009
Thesis Adviser: Jared C. Bronski
Thesis Title: "On the Stability of Periodic Solutions to Nonlinear Dispersive Equations"

Ball State University
B.S. in Mathematics with Minor in Physics, 2005

PROFESSIONAL EXPERIENCE

University of Kansas, Department of Mathematics
Professor (2021-Present)
Associate Professor (2016 - 2021)
Assistant Professor (2011 - 2016)

Indiana University, Department of Mathematics
NSF Postdoctoral Fellow / Max Zorn Postdoctoral Fellow (2009 - 2011)
Postdoctoral Advisor: Kevin Zumbrun

University of Illinois at Urbana-Champaign, Department of Mathematics
Graduate Research / Teaching Assistant (2006-2009)

ADMINISTRATIVE EXPERIENCE

University of Kansas, Department of Mathematics
Department Chair (2023 - Present)
Interim Department Chair (2022 - 2023)
Associate Department Chair & Director of Undergraduate Studies (2020 - 2022)
Director of Graduate Admissions (2017-2020)

FUNDED GRANTS

8/25-7/28, NSF-DMS 2510069, "Wave Modulation & Stability in Applied Mathematics" ($220,000)

2024, NSF Conference Proposal (2024 KUMUNU-ISU PDE Conference, NSF-2349508), joint with Dionyssis Mantzavinos ($23,031)

9/21-8/25, NSF-DMS 2108749, "Modulations of Periodic Waves in Applied Mathematics" ($198,000)

2020-2025, Simons Foundation Collaboration Grants number 71402 ($42,000). Withdrawn in 2021 due to funded NSF grant.

2018, NSF Conference Proposal (2018 KUMUNU PDE Conference, NSF-DMS 1753332), joint with Milena Stanislavova ($17,704)

2017, IMA Participating Institution Conference Proposal, joint with Milena Stanislavova, Yuri Latushkin (MU), and Carmen Chicone (MU), George Avalos (UNL) and Daniel Toundykov (UNL). , ($3000).

7/16-6/20, NSF-DMS 1614785, "Existence, Stability, and Dynamics of Nonlinear Waves" ($174,996)

2015, NSF Conference proposal (2015 KUMU PDE Conference, NSF-DMS 1500607), joint with Milena Stanislavova ($15,500).

2014, IMA Participating Institution Conference Proposal, joint with Milena Stanislavova, Yuri Latushkin (MU), and Carmen Chicone (MU) ($4500).

9/12-8/16, NSF-DMS 1211183, "Stability of Nonlinear Waves in Dissipative and Dispersive PDE" ($99,999).

2012, University of Kansas New Faculty General Research Fund 2302278, "Stability Analysis of Periodic Roll Waves" ($8000).

MANAGED GRANTS

11/22-8/26, NSF-DMS 2054735, "Stochastic Calculus of Variations and Limit Theorems" ($272,401). Note: Became PI after previous PI (Prof. David Nualart) retired from KU. Funds reallocated to research/graduate student support.

AWARDS AND HONORS

2022-2023 KU Senior Administrative Fellow

2020 G. Baley Price Award for Outstanding Teaching of Graduate Mathematics (awarded by the graduate students of KU Department of Mathematics).

2016 Don and Pat Morrison Foundation Teaching Award (awarded by KU Department of Mathematics in recognition of exemplary teaching and an ongoing active research program)

2015 Outstanding Honors Class Award (awarded by KU Honors Program)

2015 SIAG/APDE (SIAM Activity Group on Analysis of PDE) Prize[1]
- Awarded every two years to the authors of the most outstanding paper, as determined by the prize committee, on the topic of PDE's published in English in a peer-reviewed journal within the four calendar years preceding the year of the award.

2014 G. Baley Price Award for Outstanding Teaching of Graduate Mathematics (awarded by the graduate students of KU Department of Mathematics).

NSF Mathematical Sciences Postdoctoral Research Fellowship, June 2009 - July 2011.

University of Illinois "Incomplete List of Teachers Rated Excellent By Their Students": Fall 2008, Fall 2007 (Rated Exceptional), Fall 2006.

Research Activities

RESEARCH INTERESTS

Existence, dynamics, and stability of nonlinear waves in partial differential equations arising from mathematical physics and applications. Spectral theory for differential operators.

PUBLICATIONS

Peer Reviewed:

55. Brett Ehrman, M. Johnson, Stéphane Lafortune, *Modulational Instability of Small Amplitude Periodic Traveling Waves in the Novikov Equation*, Journal of Mathematical Physics, **66**: 9, 2025.

54. M. Johnson and Jeffrey Oregero, *Modulational Stability of Wave Trains in the Camassa-Holm Equation*, Journal of Differential Equations, **446**: 113627, 2025.

53. Bhavna, M. Johnson, and Ashish Pandey, *Modulational Instability in the Ostrovsky Equation and Related Models*, SIAM Journal on Mathematical Analysis, **56**: 6, 2024.

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[1]The award is listed as "prestigious" by the National Academies of Sciences, Engineering and Medicine. The organization describes itself as the "nation's pre-eminent source of high-quality, objective advice on science, engineering and health matters."

52. Brett Ehrman, M. Johnson and Stéphane Lafortune, *Orbital Stability of Smooth Solitary Waves in the Novikov Equation*, Journal of Nonlinear Science, **34**: 116, 2024.

51. Mariana Haragus, M. Johnson, Wesley R. Perkins and Björn de Rijk, *Nonlinear Subharmonic Dynamics of Spectrally Stable Lugiato-Lefever Periodic Waves*, Communications in Mathematical Physics, **405**: 227, 2024.

50. Brett Ehrman and M. Johnson, *Orbital Stability of Periodic Traveling Waves in the b-Camassa-Holm Equation*, Physica D, **461**: 134105, 2024.

49. Mariana Haragus, M. Johnson, Wesley R. Perkins and Björn de Rijk, *Nonlinear Modulational Dynamics of Spectrally Stable Lugiato-Lefever Periodic Waves*, Annales de l'Institut Henri Poincare - Analyse non lineaire, **40**: 769-802, 2023.

48. M. Johnson and Wesley R. Perkins, *Subharmonic Dynamics of Wave Trains in the Korteweg-de Vries / Kuramoto-Sivashinsky Equation*, Studies in Applied Math, **148**: 1274-1302, 2022.

47. M. Johnson, Tien Troung, and Miles H. Wheeler, *Solitary Waves in a Whitham Equation with Small Surface Tension*, Studies in Applied Math, **148**: 773-812, 2022.

46. Katelyn P. Leisman, Jared C. Bronski, M. Johnson and Robert Marangell, *Stability of Traveling Wave Solutions of Nonlinear Dispersive Equations of NLS Type*, Archive for Rational Mechanics and Analysis, **240**: 927-969, 2021.

45. M. Johnson and Wesley R. Perkins, *Subharmonic Dynamics of Wave Trains in Reaction Diffusion Systems*, Physica D, **422**: 132891, 2021.

44. Mariana Haragus, M. Johnson, and Wesley R. Perkins, *Linear Modulational and Subharmonic Dynamics of Spectrally Stable Lugiato-Lefever Periodic Waves*, Journal of Differential Equations, **280**: 315-354, 2021.

43. M. Johnson and J. Douglas Wright, *Generalized Solitary Waves in a Capillary-Gravity Whitham Equation*, Studies in Applied Mathematics **144**: 102-130, 2020.

42. M. Johnson and Wesley R. Perkins, *Modulational Instability of Viscous Fluid Conduit Periodic Waves*, SIAM Journal on Mathematical Analysis **52**: 277-305, 2020.

41. M. Johnson, Gregory Lyng, and Connor Smith, *On the Dynamics of Traveling Fronts Arising in Nanoscale Pattern Formation*, Physica D **401**: 16pp, 2020.

40. Mats Ehrnström, M. Johnson, Ola Isaac Hogasen Mahlen, and Filippo Remonato, *On the Bifurcation Diagram of the Capillary-Gravity Whitham Equation*, Water Waves **1**, 275-313, 2019.

39. Kyle M. Claassen and M. Johnson, *Nondegeneracy and Stability of Antiperiodic Bound States for Fractional Nonlinear Schrödinger Equations*, Journal of Differential Equations **266**: 5664-5712, 2019.

38. Mats Ehrnström, M. Johnson, and Kyle M. Claassen, *Existence of a Highest Wave in a Fully Dispersive Two-Way Shallow Water Model*, Archive for Rational Mechanics and Analysis, **231**: 1635-1673, 2019.

37. M. Johnson, Pascal Noble, L. Miguel Rodrigues, Zhao Yang, and Kevin Zumbrun, *Spectral Stability of Inviscid Roll Waves*, Communications in Mathematical Physics **367**:265-316, 2019.

36. Kyle M. Claassen and M. Johnson, *Numerical Bifurcation and Spectral Stability of Wavetrains in Bidirectional Whitham Models*, Studies in Applied Mathematics **141**: 205–246, 2018.

35. Vera Mikyoung Hur, M. Johnson, and Jeremy L. Martin, *Oscillation of Eigenfunctions via the Combinatorics of Noncrossing Partitions*, Discrete Analysis **13**: 20pp, 2017.

34. Blake Barker, M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Note on the Stability of Viscous Roll-Waves*, Comptes Rendus Mécanique, **345**: 125-129, 2017.

33. Blake Barker, M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Stability of Viscous St. Venant Roll-Waves: From Onset to the Infinite-Froude Number Limit*, Journal of Nonlinear Science, **27**: 285-342, 2017.

32. Jared C. Bronski, Vera Mikyoung Hur and M. Johnson, *Modulational Instability in Equations of KdV Type*, New Approaches in Nonlinear Waves, 83-133, Lecture Notes in Physics, **908**, Springer, Cham, 2016.

31. Vera Mikyoung Hur and M. Johnson, *Modulational Instability in the Whitham Equation with Surface Tension and Vorticity*, Nonlinear Analysis: Theory, Methods & Applications, **129**: 104-118, 2015.

30. Vera Mikyoung Hur and M. Johnson, *Stability of Periodic Traveling Waves for Nonlinear Dispersive Equations*, SIAM Journal on Mathematical Analysis, **47** no. 5: 3528-3554, 2015.

29. M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Spectral Stability of Periodic Wave Trains of the Korteweg-de Vries/Kuramoto-Sivashinsky Equation in the Korteweg-de Vries Limit*, Transactions of the AMS, **367** no. 3: 2159-2212, 2015.

28. Vera Mikyoung Hur and M. Johnson, *Modulational Instability in the Whitham Equation for Water Waves*, Studies in Applied Mathematics, **134** no. 1: 120-143, 2015.

27. M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Behavior of Periodic Solutions of Viscous Conservation Laws Under Localized and Nonlocalized Perturbations*, Inventiones mathematicae, **197** no. 1: 115-213, 2014.

26. Jared C. Bronski, M. Johnson, and Todd Kapitula, *An Instability Index Theory for Quadratic Pencils and Applications*, Communications in Mathematical Physics, **327** no. 2: 521-550, 2014.

25. M. Johnson, *Stability of Small Periodic Waves in Fractional KdV Type Equations*, SIAM Journal on Mathematical Analysis, **45** no. 5: 2597-3228, 2013.

24. Blake Barker, M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Nonlinear Modulational Stability of Periodic Traveling-Wave Solutions of the Generalized Kuramoto-Sivashinsky Equation*, Physica D, **258** no. 1: 11-46, 2013.

23. M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Non-Localized Modulation of Periodic Reaction Diffusion Waves: The Whitham Equation*, Archive for Rational Mechanics and Analysis, **207** no. 2: 669-692, 2013.

22. M. Johnson, Pascal Noble, L. Miguel Rodrigues, and Kevin Zumbrun, *Non-Localized Modulation of Periodic Reaction Diffusion Waves: Nonlinear Stability*, Archive for Rational Mechanics and Analysis, **207** no. 2: 693-715, 2013.

21. M. Johnson and Kevin Zumbrun, *Convergence of Hill's Method for Nonselfadjoint Operators*, SIAM Journal on Numerical Analysis, **50** no. 1: 64-78, 2012.

20. Blake Barker, M. Johnson, L.Miguel Rodrigues, and Kevin Zumbrun, *Stability of Periodic Kuramoto-Sivashinsky Waves*, Applied Mathematics Letters, **25** no. 5: 824-829, 2012.

19. Blake Barker, M. Johnson, L.Miguel Rodrigues, and Kevin Zumbrun, *Metastability of solitary roll wave solutions of the St. Venant equations with viscosity*, Physica D, **240** no. 16: 1289-1310, 2011.

18. Jared C. Bronski, M. Johnson, and Todd Kapitula, *An Index Theorem for the Stability of Periodic Traveling Waves of KdV Type*, Proceedings of the Royal Society of Edinburgh: Series A, **141** Issue 6: 1141-1173, 2011.

17. M. Johnson and Kevin Zumbrun, *Nonlinear Stability of Periodic Traveling Wave Solutions of Viscous Conservation Laws in Dimensions One and Two* , SIAM Journal on Applied Dynamical Systems, **10** no. 1: 189–211, 2011.

16. M. Johnson, Kevin Zumbrun, and Pascal Noble, *Nonlinear Stability of Viscous Roll Waves*, SIAM Journal on Mathematical Analysis, **43** no. 2: 557–611, 2011.

15. M. Johnson and Kevin Zumbrun, *Nonlinear Stability of Spatially-Periodic Traveling-Wave Solutions of Systems of Reaction Diffusion Equations* , Annales de l'Institut Henri Poincare - Analyse non lineaire, **28** Issue 4: 471-483, 2011.

14. Blake Barker, M. Johnson, Pascal Noble, L.Miguel Rodrigues, and Kevin Zumbrun, *Whitham Averaged Equations and Modulational Stability of Periodic Traveling Waves of a Hyperbolic-Parabolic Balance Law*, Journes quations aux drives partielles, exp. no. 3: 24 pg, 2010.

13. M. Johnson and Kevin Zumbrun, *Transverse Instability of Periodic Traveling Waves in the Generalized Kadomtsev-Petviashvili Equation*, SIAM Journal on Mathematical Analysis, **42** no. 6: 2681-2702, 2010.

12. M. Johnson, Kevin Zumbrun, and Jared C. Bronski, *On the Modulation Equations and Stability of Periodic GKdV Waves via Bloch Decompositions*, Physica D, **239**: 2057-2065, 2010.

11. M. Johnson, *On the Stability of Periodic Solutions of the Generalized Benjamin-Bona-Mahony Equation*, Physica D, **239** no. 19: 1892-1908, 2010.

10. M. Johnson and Kevin Zumbrun, *Nonlinear Stability of Periodic Traveling Wave Solutions of Systems of Viscous Conservation Laws in the Generic Case*, Journal of Differential Equations, **249** no. 5: 1213-1240, 2010.

9. M. Johnson and Kevin Zumbrun, *Rigorous Justification of the Whitham Modulation Equations for the Generalized Korteweg-de Vries Equation*, Studies in Applied Mathematics, **125** no. 1: 69-89, 2010.

8. M. Johnson, *The Transverse Instability of Periodic Waves in Zakharov-Kuznetsov Type Equations*, Studies in Applied Mathematics, **124** no. 4: 323-345, 2010.

7. Jared C. Bronski and M. Johnson, *The Modulational Instability for a Generalized Korteweg-de Vries Equation*, Archive for Rational Mechanics and Analysis, **197** no. 2: 357-400, 2010.

6. M. Johnson, *Nonlinear Stability of Periodic Traveling Wave Solutions of the Generalized Korteweg-de Vries Equation*, SIAM Journal on Mathematical Analysis, **41** no. 5: 1921–1947, 2009.

5. Jared C. Bronski and M. Johnson, *Krein Signatures for the Faddeev-Tahktajan Eigenvalue Problem*, Communications in Mathematical Physics, **288** no. 3: 821–846, 2009.

Thesis:

4. M. Johnson, *On the Stability of Periodic Solutions to Nonlinear Dispersive Equations*, Thesis, University of Illinois at Urbana-Champaign, 2009.

Undergraduate:

3. Nicholas Christian and M. Johnson, *Non-Destructive Testing of Thermal Resistances for a Single Inclusion in a 2-Dimensional Domain*, Rose-Hulman Institute of Technology Undergraduate Math Journal, Vol. 6, Issue 1, 2005, 31 pages.

2. Nicholas Christian and M. Johnson, *Non-Destructive Testing of Thermal Resistances for a Single Inclusion in a 2-Dimensional Domain* (Shortened version of the full technical report), Ball State University Undergraduate Mathematics Exchange, Vol. 2, No. 2, Fall 2004, 9 pages.

1. M. Johnson, *Quantum Mechanics in Quantum Computing*, Ball State University Undergraduate Mathematics Exchange, Vol. 1, No. 1, Fall 2003, 8 pages.

PREPRINTS

6. Simon Deng, M. Johnson and Stéphane Lafortune, *Asymptotic Stability of Smooth 1-Solitons in the Novikov Equation*, in preparation.

5. M. Johnson and Jeffrey Oregero, *Spectral Validation of Whitham's Modulation Theory for the Toda Lattice*, in preparation.

4. Simon Deng, M. Johnson and Stéphane Lafortune, *Asymptotic Stability of Smooth 1-Solitons for the Degasperis-Procesi Equation*, in preparation.

3. M. Johnson and Wesley R. Perkins, *Uniform Subharmonic Dynamics of Periodic Waves in Viscous Conservation Laws*, in preparation.

2. M. Johnson, Pascal Noble, and L. Miguel Rodrigues, *Stability of Roll-Waves in the Vanishing Viscosity Limit*, in preparation.

1. M. Johnson, Jeffrey Oregero and Wesley Perkins, *On the Modulation of Wave Trains in the Ostrovsky Equation*, submitted (2025).

INVITED TALKS AND CONFERENCE PRESENTATIONS

2025 SIAM Conference on Analysis of Partial Differential Equations, November 17-20, 2025

Joint Alabama-Florida Conference on Differential Equations, Dynamical Systems and Applications, May 20-22, 2025.

Waves 2025, The 13th International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, April 14-16, 2025.

AMS Joint Mathematics Meeting, January 8-11, 2025.

2024 SIAM Conference on Nonlinear Waves and Coherent Structures, June 23-27, 2024.

SIAM Texas-Louisiana Sectional Meeting, University of Louisiana, Lafayette, November 3-5, 2023.

AMS Central Sectional Meeting, Creighton University, October 7-8, 2023

University of Missouri, Differential Equations Seminar, October 13, 2022.

Nonlinear Waves and Coherent Structures Online Seminar, April 19, 2022.

Conference on Mathematics of Wave Phenomena, Karlsruhe, Germany, February 14-18, 2022.

PDE Seminar, University of Cincinnati, November 9, 2021.

AMS Fall Central Sectional Meeting, Creighton University, Omaha, NE, October 9-10, 2021.

SIAM Annual Meeting, July 19-23, 2021.

SIAM Conference on Dynamical Systems, May 23-27, 2021.

MU-MST Joint Analysis Seminar, April 9, 2021.

University of Missouri, Differential Equations Seminar, Nov. 14, 2019.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, April 17-19, 2019.

Norwegian University of Science and Technology, Differential Equations and Numerical Analysis Seminar, December 4, 2018.

Mathematical Physics and Harmonic Analysis Seminar, Texas A&M, October 19, 2018.

Fluid Dynamics and Dispersive Equations Workshop, Centre for Mathematical Sciences, Lund University, Sweden, June 25-29, 2018.

2018 SIAM Conference on Nonlinear Waves and Coherent Structures, June 11-14, 2018.

Spring Central AMS Section Meeting, March 17-18, 2018.

Main Lecturer & Mentor for Participating School in Stability of Nonlinear Waves, KAIST, Daejeon, Korea, August 21-25, 2017.

Casa Mathemática Oaxaca Workshop, "Geometrical Methods, non Self-Adjoint Spectral Problems, and Stability of Periodic Structures, June 18-23, 2017.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 29 - April 01, 2017.

Spring Southeastern AMS Sectional Meeting, March 10-12, 2017.

SIAM Central States Sectional Meeting, September 30 - October 2, 2016.

2016 SIAM Conference on Nonlinear Waves and Coherent Structures, August 8-11, 2016.

Indiana University Mathematics Colloquium, April 22, 2016.

AMS Joint Meetings, January 6-9, 2016.

Analysis Seminar, University of Wyoming, November 12, 2015.

Equidiff 2015 at the University of Lyon 1 (France), July 6-10, 2015 (2 talks)

Norwegian University of Science and Technology, Differential Equations and Numerical Analysis Seminar, June 18, 2015.

Workshop on Longtime Behavior of Nonlinear Waves at Bielefeld University (Germany), June 8-12, 2015.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, April 1-4, 2015.

2015 AMS Central Spring Sectional Meeting, Michigan State University, March 14-15, 2015.

74th Midwest PDE Conference, University of Illinois at Urbana-Champaign, October 18-19, 2014.

2014 SIAM Conference on Nonlinear Waves and Coherent Structures, August 11-14, 2014 (2 talks).

University of Toulouse (France), talk in Partial Differential Equations Seminar, June 10, 2014.

KU Physics and Astromony Seminar, April 21, 2014.

2014 AMS Southeastern Spring Sectional Meeting, March 21-23, 2014.

University of Missouri, Differential Equations Seminar, October 17, 2013.

The Central Region Conference on Numerical Analysis and Dynamical Systems, May 3-5, 2013.

University of Washington, Mathematical Methods in Applied Mathematics Seminar, April 30, 2013.

2013 AMS Spring Western Sectional Meeting, April 13-14, 2013.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 25-28, 2013.

2012 SIAM Conference on Nonlinear Waves and Coherent Structures, June 13-15, 2012.

2012 AMS Spring Central Section Meeting, March 30 – April 1, 2012.

University of Illinois at Urbana-Champaign, Harmonic Analysis and Differential Equations Seminar, February 17, 2012.

2011 SIAM Conference on Analysis of Partial Differential Equations, November 14-17, 2011.

Banff International Research Station Workshop, "Localized Multi-Dimensional Patterns in Dissipative Systems: Theory, Modeling, and Experiments," July 2011.

2011 SIAM Conference on Applications of Dynamical Systems, May 22-26, 2011.

IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, April 04-07, 2011.

University of Kansas, Colloquium, January 25, 2011.

University of Pittsburgh, Colloquium, January 11, 2011.

66th Midwest Partial Differential Equations Seminar, November 13-14, 2010.

2010 SIAM Conference on Nonlinear Waves and Coherent Structures, August 19, 2010.

2010 SIAM Conference on Nonlinear Waves and Coherent Structures, August 18, 2010.

Indiana University PDE Seminar, November 30, 2009.

Ball State University Faculty Colloquium, November 19, 2009.

Indiana University PDE Seminar, September 21, 2009.

IMA Summer School on Nonlinear Conservation Laws and Applications (poster presentation), July

13-31, 2009.

2009 AMS Spring Central Sectional Meeting, March 27-29 2009, University of Illinois at Urbana-Champaign.

The XIXth International Workshop on Operator Theory and its Applications, July 22-26 2008, College of William and Mary.

32nd SIAM Southeastern-Atlantic Section Conference (SIAM-SEAS 2008) March 14-15 2008, University of Central Florida, Orlando.

UIUC Analysis Seminar, March 6, 2008.

Talks at KU
Computational and Applied Mathematics Seminar: September '11, September '12, October '13, April '14, November '14, October '15, October '16, September '18, October '19.

Workshop Participation
Casa Mathemática Oaxaca Workshop, "Geometrical Methods, non Self-Adjoint Spectral Problems, and Stability of Periodic Structures, June 18-23, 2017.

Bielefeld University (Germany), "Longtime Behavior of Nonlinear Waves", June 8-12 2015.

Banff International Research Station Workshop, "Localized Multi-Dimensional Patterns in Dissipative Systems: Theory, Modeling, and Experiments," July 2011.

Institute for Mathematical Sciences (IMA) Summer School, "Nonlinear Conservation Laws and Applications," July 2009.

Teaching & Advising Activities

Teaching Experience
University of Kansas, Instructor
- Graduate Reading Courses:

  - Introduction to Stability Theory (Summer 2014, with Kyle Claassen).
  - Topics in Stability Theory (Summer 2012, with Seungly Oh).

- Math 996, Topics in the Theory of Partial Differential Equations (Spring 2012).

- Math 951, Advanced PDE II (Spring 2014, 2016, 2020, 2024).

- Math 950, Advanced PDE I (Fall 2017).

- Math 851, Topics in Dynamics Systems (Spring 2015, 2021).

- Math 850, Dynamical Systems and Ordinary Differential Equations (Fall 2012).

- Math 765, Mathematical Analysis I (Fall 2019, 2021).

- Undergraduate Reading Courses:

  - Mathematical Modeling in the Medical Sciences (Spring 2020, with Jordan Bramble, co-taught with Dionyssis Mantzavinos).
  - Mathematical Methods in Applied Mathematics (Spring 2015, with Sam Wester).

- Math 650, Nonlinear Dynamical Systems (Fall 2016, 2020, 2022).

- Math 648, Calculus of Variations (Spring 2013).

- Math 647, Applied Partial Differential Equations (Fall 2014, 2015, Spring 2019, 2022).

- Math 500, Intermediate Analysis (Fall 2014, Spring 2018).

- Math 320, Elementary Differential Equations (Fall 2011, 2013).

- Math 221, Applied Differential Equations, Honors (Fall 2013, 2015).
- Math 127, Calculus III (Spring 2017, 2023, Fall 2024).

Indiana University, Instructor
- Multivariable Calculus (Spring 2011)
- Partial Differential Equations II (Fall 2010 – Graduate)
- Real Analysis 1 (Fall 2009)

University of Illinois at Urbana-Champaign, Graduate Teaching Assistant
- Multivariable Calculus – Merrit Workshop (Fall 2008)
- Business Calculus (Fall 2007)
- Calculus 1 (Fall 2006)

POSTDOCTORAL ADVISING
- Jeffrey Oregero, 2023 - Present.

GRADUATE STUDENT ADVISING
Ph.D. Advisor
- Simon Deng, 2024-Present.
- Brett Ehrman, Graduated 2025.
  - Thesis Title: Stability of Nonlinear Waves in Some Camassa-Holm Type Equations.
  - First Job: Assistant Professor of Mathematics at Sterling College, Sterling, KS.
- Wesley Perkins, Graduated 2021.
  - Thesis Title: Modulational and Subharmonic Dynamics of Periodic Waves.
  - First Job: C.C. Hsiung Visiting Assistant Professor at Lehigh University.
- Connor Smith, Graduated 2019.
  - Thesis Title: Dynamics of Essentially Unstable Solitary Waves.
  - First Job: Data Scientist, Lowe's Companies, Moorsevile, NC.
- Kyle Claassen, Graduated 2018.
  - Thesis Title: Stability of Periodic Waves in Nonlocal Dispersive Equations.
  - First Job: Assistant Professor of Mathematics at Rose Hulman Institute of Technology, Terre Haute, IN.

M.A. Advisor
- Skylar Allen, Graduated Summer 2023. Took job with Prime Pensions in Florham Park, NJ.
  - Thesis Title: Some Existence Results for Boundary Value Problems for Elliptic PDE.
- Claire Bodemann, Graduated Fall 2021. Took job as Mathematics Instructor for eStem Public Charter Schools in central Arkansas.
  - Thesis Title: Stability of Solitary Waves for the Generalized Korteweg-de Vries Equation.
- Paul Goodwin. Graduated 2019, continued to Ph.D. at Missouri University of Science & Technology.
  - Thesis Title: Beyond the Fourier Transform: On the Inverse Scattering Transform and the Fokas Method.
- Uyen Le. Graduated Spring 2017, continued to Ph.D. at McMaster University.
  - Thesis Title: Existence of Nonlinear Waves in Water Wave Models.

- Joel Klipfel. Graduated Summer 2015, continued to Ph.D. at University of Kentucky.
    - Thesis Title: Orbital Stability of Ground State Solutions to the Nonlinear Schrodinger Equation.

UNDERGRADUATE STUDENT ADVISING
Departmental Honors Project Advisor
- Asher Supernaw. Graduated 2020, continued to Mathematics Ph.D. program at UM, Amherst.
- Trevor Scheopner. Graduated 2018, continued to Physics Ph.D. program at UCLA.
- Sam Wester. Graduated 2016, continued to Mathematics Ph.D. program at UIUC.

Department, College, State and Professional Service

SELECTED DEPARTMENTAL SERVICE (UNIVERSITY OF KANSAS)
- Department Chair, 2023-Present.
- Interim Department Chair, 2022-2023.
- Associate Chair & Director of Undergraduate Studies, 2020-2022.
- Teaching Faculty Evaluation Committee, Chair, 2020-2022.
- Math Teaching Mentor Committee, Chair, 2020-2022.
- Math Teaching Awards Committee, Chair, 2020-2022.
- Transfer Credit Evaluation Committee, Chair, 2020-2022.
- Member, Bylaws Committee, 2019-2020.
- Director of Graduate Admissions, 2017-2020.
- Member, Executive Committee, Spring 2017-Spring 2019.
- Member, Graduate Committee, 2017-2020.
- Member, Hiring Committee in Probability & Statistics, 2016-2017.
- Member, Self Study Committee, 2015-2016.
- Member, Foundation and Distinguished Professor Search Committee, 2014.
- Coach, Kansas Collegiate Math Competition Team, 2014-2015.
- Undergraduate Studies Upper Division Committee, 2013-2017.
- Coach, KU Putnam Team, 2012-2017.
- Member, Center for Teaching Excellence Ambassador, 2012-2020.
- Assistant Coach, KU Putnam Team, 2011- 2012.
- Assistant Coach, KU Team Competiting in 2012 Kansas Collegiate Mathematics Competition.
- Member, Colloquium Committee, 2011-2013
- Member, VAP Search Committee, 2012.
- Member, Engineering Liaison Committee, 2011-12.

COLLEGE/UNIVERSITY SERVICE

- Member, KU Council of Academic Leaders, 2025-Present.
- Member, KU Pathways Committee[2], 2024-Present.
- Member, Faculty Senate, 2023-2024.
- Member, Teaching Professor Ad Hoc Committee (convened by Provost Office), 2023.
- Member, KU Research Go Proposal Reviewer, Spring 2023.
- Member, Syllabus Repository Workgroup, 2022-2023.
- Member, Academic Support Workgroup, 2022-2023.
- Member, Ad Hoc Steering Committee, Data Science Certificate for Undergraduates, 2022-Present.
- Member, Physical Sciences GRF Committee, Spring 2022.
- Member, Committee on Undergraduate Studies and Advising (CUSA), Spring 2017-Spring 2020.
- Consultant to KU Theatre production of *Proof*, Fall 2014.

STATE SERVICE (KANSAS)

- Kansas Board of Regents, Math Course Placement Measures Committee, 2023–2024.
- KU Math Representative, Kansas Core Outcomes Group, 2020–2023.
- Officer of Kansas Section of Mathematical Association of America, Competition Co-coordinator, 2013-2020.
- Mathematics Teaching Award Committee for KS-MAA, 2015–2016.

PROFESSIONAL SERVICE

Conference Organizing

- Scientific Program Committee, 13th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, April 14-16, 2025.
- Co-Organizer (with Yannan Shen), AMS 2025 Spring Central Sectional Meeting, University of Kansas, March 29-30, 2025.
- Co-Organizer (with Jared C. Bronski (UIUC)), Special Session on "Dynamics and Stability of Nonlinear Waves" at the AMS Central Section Meeting, Lawrence, KS, March 2025
- Co-Organizer (with George Avalos (UNL), Dionyssis Mantzavinos (KU) and Sam Walsh (MU)), 8th Annual KUMUNU-ISU PDE Conference on Dynamical Systems, PDE and Applications, University of Kansas, April 6-7, 2024.
- Co-Organizer (with George Avalos (UNL), Pelin Guven Geredeli (ISU), Yuri Latushkin, (MU), Dionyssis Mantzavinos (KU) and Sam Walsh (MU)), 7th Annual KUMUNU-ISU PDE Conference on Dynamical Systems, PDE and Applications, Iowa State University, April 22-23, 2023. Sponsored by NSF.
- Co-organizer (with Robert Marangell (Sydney), Tom Carty (Bradley), Jared C. Bronski (UIUC) and Alim Sukhtayev (Miami)), Special Session on "Hamiltonian methods in the stability of nonlinear waves," the Twelfth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 30 - April 1, 2022.
- Scientific Committee, 12th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 30 - April 1, 2022.

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[2]Tasked with implementation of Math and English Pathways at KU, as mandated by the Kansas Board of Regents.

- Co-Organizer (with Milena Stanislavova (KU), Yuri Latushkin (MU), Samuel Walsh (MU), George Avalos (UNL) Paula Egging (UNL), and Pelin Guven Geredeli (ISU)), 6th Annual KUMUNU-ISU PDE Conference on Dynamical Systems, PDE and Applications, University of Kansas April 25-26, 2020. Sponsored by NSF. (Due to COVID-19 Pandemic, rescheduled for October 3-4, 2020).

- Co-Organizer (with Milena Stanislavova (KU), Carmen Chicone (MU), Yuri Latushkin (MU), Samuel Walsh (MU), and George Avalos (UNL)), 5th Annual KUMUNU-PDE Conference on Dynamical Systems, PDE and Applications, University of Kansas April 27-28, 2019. Sponsored by NSF.

- Co-Chair (with Todd Kapitula) for 2018 SIAM Conference on Nonlinear Waves and Coherent Structures, June 4-11, 2018.

- Co-Organizer (with Milena Stanislavova (KU), Carmen Chicone (MU), Yuri Latushkin (MU), Samuel Walsh (MU), and George Avalos (UNL)), 4th Annual KUMUNU-PDE Conference on Dynamical Systems, PDE and Applications, University of Kansas April 21-22, 2018. Sponsored by NSF.

- Co-Organizer (with Milena Stanislavova (KU), Carmen Chicone (MU), Yuri Latushkin (MU), Samuel Walsh (MU), George Avalos (UNL) and Daniel Toundykov (UNL)), 3rd Annual KUMUNU-PDE Conference on Dynamical Systems, PDE and Applications, University of Nebraska, Lincoln, April 21-23, 2017. Sponsored by NSF.

- Scientific Program Committee, 10th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, March 29 - April 1, 2017.

- Co-organizer (with Milena Stanislavova, Carmen Chicone (MU), Yuri Latushkin (MU), and Samuel Walsh (MU)), 2nd Annual KUMU Conference on Dynamical Systems, PDE and Applications, University of Missouri, April 23-24, 2016.

- Co-organizer (with Milena Stanislavova, Carmen Chicone (MU), and Yuri Latushkin (MU)), KUMU Conference on Dynamical Systems, PDE and Applications, University of Kansas, April 18-19 2015.

- Co-organizer (with Yuri Latushkin (MU) and Alim Sukhtayev (Texas A&M)), Special Session on "Spectral Methods in Stability of Traveling Waves," the Ninth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, University of Georgia, Athens, GA, April 1-April 4, 2015

- Co-organizer (with Robert Marangell, University of Sydney and Chris Jones, University of North Carolina at Chapel Hill), Special Session on "Geometric Methods in the Dynamics and Stability Analysis of Nonlinear Waves," SIAM Conference on Nonlinear Waves and Coherent Structures, Seattle, WA June 2012.

- Co-organizer (with Myunghyun Oh, University of Kansas), Special Session on "Dynamics and Stability of Nonlinear Waves," AMS Central Section Meeting, Lawrence, KS March 2012.

Refereeing
- Referee for Communications in Mathematical Physics, Water Waves, Journal of Nonlinear Waves, Nonlinearity, SIAM Journal on Mathematical Analysis, SIAM Journal on Applied Dynamical Systems, SIAM Journal on Applied Mathematics, Studies in Applied Mathematics, Journal of Differential Equations, Philosophical Transactions A, Physica D, Journal of Nonlinear Science, Physics Letters A, Journal of Dynamics and Differential Equations, Journal of Mathematical Physics, Fields Institute Communications, Discrete and Continuous Dynamical Systems – Series S, Journal of Computational and Applied Mathematics, Indiana University Mathematics Journal, Mathematics in Computers and Simulation.

Competition Judging
- Oral Competition Judge, 2009 Illinois Council of Teachers of Mathematics (ICTM) State Math Contest Finals, May 2009.

Committee Work at Other Institutions
- Member, Organizing Committee for the Graduate Student Preview Day at the University of Illinois at Urbana-Champaign, 2007-2008.