Sean D. Nixon

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Education

- Ph.D. Applied Mathematics, University of Colorado at Boulder, 2011

- B.S. Mathematics, University of Central Florida, 2005

Research Experience

Department of Mathematics, State University of New York, Geneseo

- Visiting Assistant Professor, 2016 - Present

Department of Mathematics and Statistics, University of Vermont

- Postdoctoral Associate, Jianke Yang, 2011 - 2016

Zhou Pei-Yuan Center for Applied Mathematics, Tsinghua University

- Visiting Researcher, Yi Zhu, Summer 2013

Department of Applied Mathematics, University of Colorado at Boulder

- Research Assistant, Mark Ablowitz, 2008 - 2011

- Computational and Optical Sensing and Imaging (COSI) Fellow, 2009 - 2011

Department of Mathematics, University of Central Florida

- Undergraduate Researcher, David Kaup and Ziad Musslimani, Spring 2004 - Spring 2005.

Teaching Experience

State University of New York, Geneseo

- Instructor, Calculus I, Fall 2016

University of Vermont

- Instructor, Fundamentals of Calculus I (Two semester Calc 1 sequence.), Fall 2011, Fall 2015

- Instructor, Calculus I, Spring 2013, Spring 2014, Fall 2014

University of Colorado at Boulder

- Teaching Assistant, Calculus 3 for Engineers Fall 2005.

- Teaching Assistant, Differential Equations with Linear Algebra, Spring 2006 - Spring 2008

- Lead Teaching Assistant, Department of Applied Mathematics, 2006 - 2007

- Instructor, Differential Equations with Linear Algebra, Summer 2007

- Lab Coordinator, Differential Equations with Linear Algebra, Fall 2007

Journal Publications

[Total Citations: 384]

- **Asymptotic analysis of pulse dynamics in mode-locked lasers**, M. J. Ablowitz, T. P. Horikis, S. D. Nixon, and Y. Zhu, *Studies in Applied Mathematics*, **122**, 411425 (2009). [Citations: 17]

- **Conical diffraction in honeycomb lattices**, M. J. Ablowitz, S. D. Nixon, and Y. Zhu, *Physical Review A*, **79:5**, 053830, (2009). [Citations: 71]

- **Soliton strings and interactions in mode-locked lasers**, M. J. Ablowitz and T. P. Horikis, and S. D. Nixon, *Optics Communications*, **282:20**, 4127 - 4135, (2009). [Citations: 13]

- **Perturbations of dark solitons**, M. J. Ablowitz, S. D. Nixon, T. P. Horikis, and D. J. Frantzeskakis, *Proceeding of the Royal Society A* **467**, 2597, (2011). [Citations: 34]

- **Nonlinear wave dynamics: From lasers to fluids**, M. J. Ablowitz, T. Haut, T. P. Horikis, S. D. Nixon, and Y. Zhu, *Discrete and Continuous Dynamical Systems - Series S* **4:5** (2011). [Citations: 0]

- **Dark solitons in mode-locked lasers**, M. J. Ablowitz, T. P. Horikis, S. D. Nixon, and D. J. Frantzeskakis, *Optics Letters* **36(6)**, 793-5 (2011). [Citations: 21]

- **Stability analysis for solitons in $\mathcal{PT}$-symmetric optical lattices**, S. D. Nixon, L. Ge, and J. Yang, *Physical Review A* **85**, 023822, (2012). [Citations: 160]

- **Nonlinear dynamics of wave packets in $\mathcal{PT}$-symmetric optical lattices near the phase transition point**, S. D. Nixon, Y. Zhu, and J. Yang, *Optics Letters* **37**, 4874-4876 (2012). [Citations: 16]

- **Dark solitons of the power-energy saturation model: application to mode-locked lasers**, M. J. Ablowitz, S. D. Nixon, T. P. Horikis, and D. J. Frantzeskakis, *Journal of Physics A: Mathematical Theory* **46** 095201 (2013). [Citations: 9]

- **Exponential asymptotics for line solitons in two-dimensional periodic potentials** S. D. Nixon, T.R. Akylas, and J. Yang, *Studies in Applied Mathematics* **131**, 149-178 (2013). [Citations: 1]

- **Pyramid diffraction in two-dimensional $\mathcal{PT}$-symmetric optical lattices**, S. D. Nixon and J. Yang, *Optics Letters* **38**, 1933-1935 (2013). [Citations: 10]

- **Exponential asymptotics for solitons in PT-symmetric periodic potentials**, S. D. Nixon, T.R. Akylas, and J. Yang, *Studies in Applied Mathematics* **133(4)**, 373-397 (2014). [Citations: 4]

- **Stable Utility Design for Distributed Resource Allocation**, R. Gopalakrishnan, S. D. Nixon, and J. R. Marden, *Decision and Control (CDC), 2014 IEEE 53rd Annual Conference on*, 1161-1166 (2014). [Citations: 3]

- **Light propagation in periodically modulated complex waveguides**, S. D. Nixon and J. Yang, *Physical Review A* **91(3)**, 033807 (2014). [Citations: 8]

- **Bifurcation of soliton families from linear modes in non-$\mathcal{PT}$-symmetric complex potentials**, S. D. Nixon and J. Yang, *Studies in Applied Mathematics* **136**, 459-483 (2016). [Citations: 3]

- **All-real spectra in optical systems with arbitrary gain and loss distributions**, S. D. Nixon and J. Yang, *Physical Review A* **93**, 031802(R) (2016). [Citations: 9]

- **Nonlinear wave dynamics near phase transition in PT-symmetric localized potentials**, S. D. Nixon and J. Yang, *Physica D: Nonlinear Phenomena* (arXiv:1506.04445 [nlin.PS], (2015). [Citations: 4]

- **Nonlinear light behaviors near phase transition in non-parity-time-symmetric complex waveguides**, S. D. Nixon and J. Yang, *Optics Letters* **41** (12), 2747-2750, (2016). [Citations: 0]

- **Stability of soliton families in nonlinear Schroedinger equations with non-parity-time-symmetric complex potentials**, J. Yang and S. D. Nixon, *Nixon Physics Letters A* 380 3803-3809 (2016). [Citations: 1]

Manuscripts in Progress

- **Fully 2D exponential asymptotics for solitons in periodic potentials** S. D. Nixon, T.R. Akylas and J. Yang (In preparation)

- **Exponential asymptotics for coupled mode equations** S. D. Nixon, T.R. Akylas and J. Yang (In preparation)

Invited Talks and Seminars

- **Crowdy's Extension of the Schawrz-Christoffel Mapping to Multiply Connected Domains**

  Nonlinear Waves Seminar, Department of Applied Mathematics, University of Colorado, Boulder, February 2007

- **Analysis of Solitons and Soliton Interactions in Mode-Locked Lasers**

  SIAM Annual Meeting, Denver, CO, July 2009

- **Race and Emergent Behavior in Blizzard?s World of Warcraft**

  International Conference on the Fantastic in the Arts, Orlando, March 2010

- **Analysis of Solitons and Soliton Interactions in Mode-Locked Lasers**

  Computational Optical Sensing and Imaging Seminar, Electrical Engineering Department, University of Colorado, Boulder, April 2010

- **Analysis of Dark and Bright Solitons in Mode-Locked Lasers**

  SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, PA, August 2010

- **Game Theoretic Principles Underlying the Starcraft 2 Game Play and Narrative**

  International Conference on the Fantastic in the Arts, Orlando, March 2012

- **Perturbations of Dark Solitons**

  Frontiers in Applied and Computational Mathematics, Newark, NJ, May 2012

- **Stability Analysis of Solitons in $\mathcal{PT}$ Symmetric Lattices** (Poster)

  Conference on Lasers and Electro-Optics, San Jose, CA, May 2012

- **Stability Analysis of Solitons in $\mathcal{PT}$ Symmetric Lattices**

  SIAM Conference on Nonlinear Waves and Coherent Structures, Seattle, WA, June 2012

- **Nonlinear dynamics of wave packets in $\mathcal{PT}$-symmetric optical systems**

  The Third International Conference: Nonlinear Waves-Theory and Applications, Beijing, China, June 2013

- **Nonlinear dynamics of wave packets in $\mathcal{PT}$-symmetric optical systems**

  Beijing Information Science and Technology University, Beijing, China, June 2013

- **A Meta-Game Theory of Thrones**

  International Conference on the Fantastic in the Arts, Orlando, March 2014

- **$\mathcal{PT}$-symmetric optical systems**

  Rensselaer Polytechnic Institute, New York, March 2015

- **Overthing It: The unnecessary application of advanced mathematics to popular culture**

  SUNY Geneseo, New York, October 2016

Miscellaneous

- Technical Officer on the Executive Board for the International Association for the Fantastic in the Arts from 2009-Present.

  The IAFA runs a conference every year on Science Fiction and Fantasy in Books, TV, Film, Video Game, etc., as well as running the Journal on the Fantastic in the Arts and administering several awards in the field of Science Fiction and Fantasy literature.

- Guest columnist for OverthinkingIt.com

  OverthinkingIt.com is a website that applies ideas from philosophy, literary theory, law, physics and elsewhere to the popular culture. On OverthinkingIt.com, I've written articles using topics like the Pixar's Inside Out and the Marvel Cinematic Universe to illustrate ideas from mathematics.

  For more see: www.sdnixon.com/creative/oti

- Faculty Advisor for PRISM (Pursuing Rewards In the Study of Mathematics) 2016-2017.

  Recognizes and supports interest and achievement in mathematics. PRISM also encourages academic and social interaction between students and faculty.