EDWIN DING

Associate Professor
Department of Mathematics, Physics, and Statistics
Azusa Pacific University

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TEACHING EXPERIENCE

Azusa Pacific University

2011 - Present Azusa, CA

- 400 level: Numerical Analysis; Advanced Topics in Mathematics
- 300 level: Partial Differential Equations; Dynamical Systems
- 200 level: Multivariable Calculus; Ordinary Differential Equations; Applied Linear Algebra
- 100 level: Calculus I & II; Sequences & Series; Applied Calculus I
- Precalculus, college algebra, and other developmental courses.

University of Washington

2006-2011 Seattle, WA

- As an Instructor: Beginning Scientific Computing; Fourier Analysis and Partial Differential Equations
- As a TA: Calculus of Variations (grad level); Applied Linear Algebra and Numerical Analysis

RESEARCH EXPERTISE

Nonlinear Waves; Solitons; Differential Equations; Dynamical Systems; Dimension Reduction Techniques; Scientific Computing

Undergraduate research projects mentored at APU:

- E. Gottry, *Analysis of the 2D complex Ginzburg-Landau Equation using Singular Value Decomposition*, 2020-2021
- M. Brown, C. Cain, and J. Whitfield, *Modeling Zika Virus Spread in Colombia Using Google Search Queries and Logistic Power Models*, 2017-2018. This project was in collaboration with the Los Alamos National Lab.
- K. Frank, *Discrete Solitons in Two-Dimensional Optical Lattice Embedded with PT-Symmetric Defects*, 2016
- Isaac Lee, *Dimension Reduction of Two-Dimensional Optical Solitons*, 2014-2015

ADMINISTRATIVE ROLES

- Mathematics assessment coordinator
- General education curriculum committee
- Undergraduate Standards and Policies Committee
- STEM research symposium planning committee
- Other hiring and student recruitment committees

PROGRAMMING SKILLS

MATLAB Mathematica

TOP 5 CLIFTON STRENGTHS

Consistency Harmony Deliberative Responsibility Discipline

EDUCATION

University of Washington

Ph.D. in Applied Mathematics (2011)

Dissertation: Modeling High-Energy Temporal and Spatial Mode-Locking

M.Sc. in Applied Mathematics (2008)

University of Hong Kong

B.Eng. in Mechanical Engineering (2006)

Thesis: Weakly Nonlinear and Weakly Dispersive Waves in Shallow Water

ACADEMIC HISTORY

Azusa Pacific University

Associate Professor (2016-Present)

Assistant Professor (2011-16)

University of Hong Kong

Visiting Researcher (Dec, 2011)

AWARDS & HONORS

Boeing Teaching Award (2011)
Department of Applied Mathematics
University of Washington

Runner-Up for Best Student Paper (2011)
Photonics West Conference

First Class Honor (2006)
University of Hong Kong

PUBLICATIONS

Undergraduate Research

1. E. Gottry and E. Ding, *Analysis of the 2D complex Ginzburg-Landau Equation using Singular Value Decomposition*, Virginia Journal of Business, Technology, and Science **1**, 1 (2021)

Invited Papers

1. K. W. Chow, E. Ding, B. A. Malomed, and A. Y. S. Tang, *Symmetric and Asymmetric Modes Supported by Dual Local Gain in Lossy Lattices*, Eur. Phys. J. Special Topics **223**, 63 (2014)
2. E. Ding and J. N. Kutz, *Operating Regimes and Performance Optimization in Mode-Locked Fiber Lasers*, Optics and Spectroscopy **111**, 166 (2011)

Refereed Journal Publications

1. E. Ding, H. N. Chan, K. W. Chow, K. Nakkeeran, and B. A. Malomed, *Exact States in Waveguides with Periodically Modulated Nonlinearity*, EPL **199**, 54002 (2017)
2. J. S. He, S. W. Xu, K. Porsezian, P. T. Dinda, D. Mihalache, B. A. Malomed, and E. Ding, *Handling Shocks and Rogue Waves in Optical Fibers*, Rom. J. Phys. **62**, 203 (2017)
3. H. N. Chan, E. Ding, D. J. Kedziora, R. H. J. Grimshaw, and K. W. Chow, *Rogue Waves for a Long Wave-Short Wave Resonance Model with Multiple Short Waves*, Nonlinear Dyn. **85**, 2827 (2016)
4. H. N. Chan, B. A. Malomed, K. W. Chow, and E. Ding, *Rogue Waves for a System of Coupled Derivative Nonlinear Schrödinger Equations*, Phys. Rev. E **93**, 012217 (2016)
5. E. Ding, A. Y. S. Tang, K. W. Chow, and B. A. Malomed, *Pinned Modes in Two-Dimensional Lossy Lattices with Local Gain and Nonlinearity*, Phil. Trans. R. Soc. A **372**, 20140018 (2014)
6. H. N. Chan, K. W. Chow, D. J. Kedziora, R. H. J. Grimshaw, and E. Ding, *Rogue Waves for a Derivative Nonlinear Schrödinger Model*, Phys. Rev. E **89**, 032914 (2014)
7. B. A. Malomed. E. Ding, K. W. Chow, and S. K. Lai, *Pinned Modes in Lossy Lattices with Local Gain and Nonlinearity*, Phys Rev. E **86**, 036608 (2012)
8. E. Ding, W. Renninger, F. W. Wise, Ph. Grelu, E. Shlizerman, and J. N. Kutz, *High-Energy Passive Mode-Locking of Fiber Lasers*, International Journal of Optics **2012**, 354156 (2012)
9. E. Shlizerman, E. Ding, M. O. Williams, and J. N. Kutz, *The Proper Orthogonal Decomposition for Dimensionality Reduction in Mode-Locked Lasers and Optical Systems*, International Journal of Optics **2012**, 831604 (2012)
10. F. Li, E. Ding, J. N. Kutz, and P. K. A. Wai, *Dual Transmission Filters for Enhanced Energy in Mode-Locked Fiber Lasers*, Opt. Express **19**, 23408 (2011)
11. E. Ding, Ph. Grelu, and J. N. Kutz, *Dissipative Soliton Resonance in a Passively Mode-Locked Fiber Laser*, Opt. Lett **36**, 1146 (2011)
12. E. Ding, K. Luh, and J. N. Kutz, *Stability Analysis of Cavity Solitons Governed by the Cubic-Quintic Ginzburg-Landau Equation*, J. Phys. B: At. Mol. Phys. **44**, 065401 (2011)
13. E. Ding, E. Shlizerman, and J. N. Kutz, *A Generalized Master Equation for High-Energy Passive Mode-Locking: The Sinusoidal Ginzburg-Landau Equation*, IEEE. J. Quantum Electron. **47**, 705 (2011)
14. E. Ding, S. Lefrancois, J. N. Kutz, and F. Wise, *Scaling Fiber Lasers to Large Mode-Area: An Investigation of Passive Mode-Locking Using Multi-Mode Fiber*, IEEE J. Quantum Electron. **47**, 597 (2011)
15. E. Ding, E. Shlizerman, and J. N. Kutz, *Modeling Multi-Pulsing Transition in Ring Cavity Lasers with Proper Orthogonal Decomposition*, Phys. Rev. A **82**, 023823 (2010)
16. E. Ding and J. N. Kutz, *Operating Regimes, Split-Step Modeling, and the Haus Master Mode-Locking Model*, J. Opt. Soc. Am. B **26**, 2290 (2009)
17. E. Ding and J. N. Kutz, *Stability Analysis of the Mode-Locking Dynamics in a Laser Cavity with a Passive Polarizer*, J. Opt. Soc. Am. B **26**, 1400 (2009)
18. K. W. Chow, R. H. J. Grimshaw, and E. Ding, *Interactions of Breathers and Solitons in the Extended Korteweg-de Vries Equation*, Wave Motion **43(2)**, 158 (2005)

PRESENTATIONS

Invited Presentations

1. A Low-Dimensional Description of the Multi-Pulsing Instability in a Mode-Locked Laser Cavity, Fullerton College, CA (2013)
2. Mathematics of Waves, California State University San Bernardino, CA (2013)
3. Methods for Achieving High-Energy Mode-Locking, University of Maryland Baltimore County, MD (2011)
4. Modeling High-Energy Mode-Locking, Hong Kong Polytechnic University, Hong Kong (2011)
5. Modeling High-Energy Temporal/Spatial Mode-Locking, Karlsruhe Institute of Technology, Germany (2011)
6. Modeling High-Energy Temporal/Spatial Mode-Locking, Max Planck Institute for the Science of Light, Germany (2011)
7. High-Energy Passive Mode-Locking with the Sinusoidal Ginzburg-Landau Equation, Universite de Bourgogne, France (2010)
8. Passive Mode-Locking Dynamics in Ring Cavity Lasers, Hong Kong Polytechnic University, Hong Kong (2009)

Conference Presentations

1. Principal Component Analysis of the Binzburg-Landau Equation, *SIAM Conference on Applications of Dynamical Systems*, 2011
2. High-Energy Passive Mode-Locking with the Sinusoidal Ginzburg-Landau Model, *Workshop on Wave Breaking and Global Solutions in the Short-Pulse Dispersive Equations*, 2011
3. Passive Mode-Locking Using Multi-Mode Fiber, *Photonics West*, 2011
4. Energy Enhancement in Mode-Locked Lasers Using Sinusoidal Transmission Funcitions for Saturable Absorption, *Photonics West*, 2011
5. Modeling Multi-Pulsing Transition in Ring Cavity Lasers with Proper Orthogonal Decomposition, *SIAM Conference on Nonlinear Waves and Coherent Structures*, 2010
6. Energy Enhancement in Mode-Locked Laser Cavities Using Multi-Mode Fiber Lasers, *Photonics West*, 2010
7. Operating Regimes and Performance Optimization of the Mode-Locking Dynamics of a Laser Cavity with Passive Polarizer, *Photonics West*, 2010
8. Verification of the Haus Master Mode-Locking Model, *Complex Phenomena in Nonlinear Physics*, 2009
9. Stability Analysis of the Mode-Locking Dynamics in a Laser Cavity with a Passive Polarizer, *SIAM Annual Meeting*, 2009
10. Mode-Locking Dynamics and Stability in a Laser Cavity with a Passive Polarizer, *Photonics North*, 2009
11. Interactions of Breathers and Solitons in the eKdV Model, *Annual Conference of Hong Kong Society of Theoretical and Applied Mechanics*, 2006