Personal Data

Address:	Department of Mathematics and Statistics San Diego State University 5500 Campanile Drive San Diego, CA, 92182
E-mail:	ccurtis@mail.sdsu.edu
Research:	Data Science, Dynamical Systems, Machine Learning, Applied Mathematics.
Date of Birth:	08/29/1981
Citizenship:	United States of America

Education

PhD in Applied Mathematics, University of Washington, 2009.

- Thesis: Exact and Approximate Methods for Computing the Spectral Stability of Traveling Wave Solutions.
- Advisor: Bernard Deconinck.

B.S. in Applied Mathematics, Illinois Institute of Technology, 2003.

B.S. in Physics, Illinois Institute of Technology, 2003.

Employment History

Current Position

Associate Professor, Department of Mathematics and Statistics, San Diego State University, from 2019

Assistant Professor, Department of Mathematics and Statistics, San Diego State University, 2013-2019

Previous Employment

Research Associate, Department of Applied Mathematics, University of Colorado, from June 2012 to June 2013.

Instructor, Department of Applied Mathematics, University of Colorado, from August 2009 to May 2012.

NSF VIGRE Research Fellow, Department of Applied Mathematics, University of Washington, 2006-2009.

Teaching Assistant, Department of Applied Mathematics, University of Washington, 2003-2006.

Awards

ONR Summer Faculty Fellowship, 2022, 2023

SDSU GREW Fellow, 2016.

PIC Math Program Awardee, 2015.

Boeing Excellence in Research Award, 2008.

Professional Growth

In Print/Accepted Refereed Journal Articles

26. **CW Curtis**, DJ Alford-Lago, E. Bollt, A. Tuma, Machine learning enhanced Hankel dynamic-mode decomposition , Chaos, 33:083133, 14 pp., 2023

25. DJ Alford-Lago, **CW Curtis**, AT Ihler, KA Zawdie, Scale-Separated Dynamic Mode Decomposition and Ionospheric Forecasting, Radio Science, 58:e2022RS007637, 20 pp., 2023

24. DJ Alford-Lago, **CW Curtis**, AT Ihler, O Issan, Deep Learning Enhanced Dynamic Mode Decomposition, Chaos, 32:033116, 14 pp., 2022

23. **C.W. Curtis** and M.A. Porter, Detection of Functional Communities in Networks of Randomly Coupled Oscillators Using the Dynamic-Mode Decomposition, Physical Review E, 104:044305, 12 pp., 2021

22. **C.W. Curtis** and D.J. Alford-Lago, Dynamic-Mode Decomposition and Optimal Prediction, Physical Review E, 103:012201, 10 pp., 2021

21. **C.W. Curtis** and M. Murphy, Evolution of Spectral Distributions in Deep-Water Constant Vorticity Flows, Water Waves, 2:361-380, 20 pp., 2020

20. J. D. Carter, **C.W. Curtis**, and H. Kalisch, Particle Trajectories in Nonlinear Schrödinger Models, Water Waves, 2:31-57, 27 pp., 2020

19. **C.W. Curtis** and H. Kalisch, Interaction of a Free Surface with a Vortex Patch, Wave Motion, 90, 32-50, 2019

18. **C.W. Curtis**, R. Carretero–Gonzalez, M. Polimeno, Characterizing Coherent Structures in Bose–Einstein Condensates through Dynamic-Mode Decomposition, Physical Review E, 99:062215, 2019

17. **C.W. Curtis**, J. D. Carter, and H. Kalisch, Particle Paths in Nonlinear Schrödinger Models in the Presence of Linear Shear Currents, Journal of Fluid Mechanics, 855, 29 pp., 2018

16. K.L. Oliveras and **C.W. Curtis**, Nonlinear Traveling Internal Waves in Depth-Varying Currents, Journal of Fluid Mechanics, 856, 27 pp., 2018

15. **C.W. Curtis** and H. Kalisch, Vortex Dynamics in Nonlinear Free Surface Flows, Physics of Fluids, 29:032101, 15 pp., 2017.

14. **C.W. Curtis**, K. L. Oliveras, and T. Morrison, Shallow waves in density stratified, bilinear shear currents. European Journal of Mechanics: B/Fluids, 61:100–111, 12 pp., 2017.

13. **C.W. Curtis** and S.S.P. Shen, Three-dimensional surface water waves governed by the forced Benney–Luke equation, Studies in Applied Mathematics, 135:447–465, 21 pp., 2015.

12. M.J. Ablowitz, **C.W. Curtis**, and Y. Ma, Adiabatic dynamics of edge waves in photonic graphene, 2D Materials, 2:024003, 15 pp., 2015.

11. **C.W. Curtis** and Y. Zhu, Dynamics in $\mathcal{PT}$-symmetric honeycomb lattices with nonlinearity, Studies in Applied Mathematics, 135:139-170, 32 pp., 2015.

10. M.J. Ablowitz, **C.W. Curtis**, and Y. Ma, Linear and nonlinear traveling edge waves in optical honeycomb lattices, Physical Review A, 90:023813, 8 pp., 2014.

9. **C.W. Curtis** and M.J. Ablowitz, On the existence of real spectra in $\mathcal{PT}$-symmetric honeycomb optical lattices, Journal of Physics A: Mathematical and Theoretical, 47:225205, 22 pp., 2014.

8. M.J. Ablowitz and **C.W. Curtis**, Conservation laws and non-decaying solutions for the Benney–Luke equation, Proceedings of the Royal Society A, 469:20120690, 16 pp., 2013.

7. M.J. Ablowitz, **C.W. Curtis**, and Y. Zhu, Localized nonlinear edge states in honeycomb lattices, Physical Review A, 88:013850, 8 pp., 2013.

6. **C.W. Curtis** and D.M. Bortz, Propagation of fronts in the Fisher-Kolmogorov equation with spatially varying diffusion, Physical Review E, 86:066108, 8 pp., 2012.

5. M. Ablowitz, **C.W. Curtis**, and Y. Zhu, On tight binding approximations in optical lattices, Studies in Applied Mathematics, 129:362-388, 27 pp., 2012.

4. **C.W. Curtis**, On nonlocal Gross-Pitaevskii equations with periodic potentials, Journal of Mathematical Physics, 53:073709, 26 pp., 2012.

3. M.J. Ablowitz and **C.W. Curtis**, On the evolution of perturbations to solutions of the Kadomtsev-Petviashvilli equation using the Benney-Luke equation, Journal of Physics A: Mathematical and Theoretical, 44:195202, 17 pp., 2011.

2. M. Chen, **C.W. Curtis**, B. Deconinck, C. W. Lee, and N. V. Nguyen, Spectral stability of stationary solutions of a Boussinesq system describing long waves in dispersive media, SIAM Journal on Applied Dynamical Systems, 9:999-1018, 20 pp., 2010.

1. **C.W. Curtis** and B. Deconinck, On the convergence of Hill's method, Mathematics of Computation, 79:169-187, 19 pp., 2010.

In Print: Peer Reviewed Abstracts

1. D Alford-Lago, C Cutis, A Ihler, Deep Learning Dynamic Mode Decomposition For Ionospheric Prediction, 44th COSPAR Scientific Assembly, July 16-24, 2022.

2. Brandon Himmel, L. Kuznetsova, and **C.W. Curtis**, Designing nanolayered metamaterials with hyperbolic dispersion, presented at the Frontiers in Optics/Laser Science Conference, Tucson, Arizona, USA, October 19-23, 2014.

Grants

ONR MADSCI Award - Mathematical Data Sciences in the Ionosphere. $98,398, 2022-Present. Co-PI with Jay Lago.

NSF DMS Award - Nonlinear Waves and Vorticity in Ocean Flows. $99,706, 2017-2020. Co-PI with Prof. Katie Oliveras of Seattle University.

San Diego Research Foundation UGP Award, $7192, 2014-2015. PI.

Invited Lectures and Workshops

APS Fluid Dynamics, Washington DC, 2023 (D.J. Lago presented)

Nonlinear Ocean Waves Invited Workshop, Shonan Village Research Center, Japan, 2023

Applied Mathematics Seminar, University of New Mexico, 2023

Code 32 Project Reports, NRL, 2023

Applied Mathematics Seminar, University of New Mexico, 2023

CSU JMM Conference, 2022

SIAM Conference on Nonlinear Waves and Coherent Structures, 2022. (Virtual)

Mechanical Engineering Department Seminar, Jacobs School of Engineering, UCSD, 2022.

IMACS Conference on Nonlinear Evolution Equations and Wave Pheneomena, 2022.

Clarkson University Mathematics Seminar, 2022

Seminar on Nonlinear Water Waves, Ibaraki University, Japan, 2022. (Virtual)

AMS Western Sectional Meeting, 2021

University of Washington, Kutz Research Group, 2020

International Congress of Industrial and Applied Mathematics, 2019.

Vortex dynamics in science, nature and technology, IUTAM, 2019.

University of Washington, Department of Applied Mathematics, 50th Anniversary, 2019.

IMACS Conference on Nonlinear Evolution Equations and Wave Pheneomena, 2019.

AIMS Conference on Dynamical Systems, 2018.

CBMS Workshop on Solving Problems in Multiply Connected Domains, 2018.

SIAM Conference on Nonlinear Waves and Coherent Structures, 2018.

Recent Advances in Nonlinear Waves, 2017.

ICERM Session on Water Waves, 2017.

IMACS Conference on Nonlinear Evolution Equations and Wave Pheneomena, 2017.

American Mathematical Society Fall Western Sectional Meeting, 2016.

SIAM Conference on Nonlinear Waves and Coherent Structures, 2016.

AIMS Conference on Dynamical Systems, 2016.

BIRS Workshop on Coherent Structures in PDES and Their Applications, 2016.

AMS Joint Mathematics Meeting, 2016.

IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, 2015.

Dept. of Mathematics Colloquium, Claremont Graduate School, 2015.

Mathematical Methods Seminar, University of Washington, 2014.

American Mathematical Society Spring Central Sectional Meeting, 2014.

Photonics Group, SPAWAR, 2014.

Dept. of Mathematics Seminar, University of Missouri, 2013.

Dept. of Mathematics Seminar, University of Central Florida, 2013.

Dept. of Mathematics Seminar, University of Oklahoma, 2013.

American Mathematical Society Spring Western Sectional Meeting, 2013.

IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, 2013.

The Third International Conference: Nonlinear Waves, Theory and Applications, 2013.

SIAM Conference on Analysis of Partial Differential Equations, 2013.

SDSU Mathematics Seminar, 2013, Computational Sciences Seminar, 2013.

American Mathematical Society Spring Central Sectional Meeting, 2012.

SIAM Conference on Nonlinear Waves and Coherent Structures, 2012.

NEEDS Conference, 2012.

Differential Equations Seminar, Dept. of Mathematics, North Carolina State University, 2012.

Dept. of Applied Mathematics Seminar, University of California Merced, 2012.

Dept. of Mathematics Colloquium, University of Colorado at Colorado Springs, 2011.

BIRS Workshop on Multidimensional Localized Patterns in Dissipative Systems, 2011.

SIAM Conference on Nonlinear Waves and Coherent Structures, 2010.

IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, 2009.

American Mathematical Society Fall Eastern Sectional Meeting, 2009.

AIMS Conference on Dynamical Systems, Differential Equations and Applications, 2008.

SIAM Conference on Nonlinear Waves and Coherent Structures, 2008.

American Mathematical Society Fall Western Sectional Meeting, 2008.

IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, 2007.

Teaching Effectiveness

Courses Taught at San Diego State University

MATH 151: Calculus II (Coordinator F:2021-Sp:2024), Sp:2021,F:2021.

MATH 242: Mathematical Programming, F:2016,Sp:2017,F:2017.

MATH 330: Advanced Calculus, Sp:2019,Sp:2020,Sp:2023.

MATH 337: Elementary Differential Equations, Sp:2021.

MATH 340: Mathematical Programming, F:2018, F:2022, Sp:2023

MATH 496: Industrial Projects in Mathematics, Sp:2016.

MATH 537: Ordinary Differential Equations, F:2013,F:2014,F:2018,F:2023.

MATH 538: Discrete Dynamical Systems and Chaos, F:2015,F:2017.

MATH 541: Numerical Methods, Sp:2014, Sp:2015, F:2015, Sp:2016, Sp:2017.

MATH 596: Mathematical Data Science, F:2023

MATH 638: Dynamical Systems and Chaos, Sp:2018, Sp:2019.

MATH 639: Nonlinear Waves, Sp:2016,Sp:2018,Sp:2020.

Courses Taught at the University of Colorado

APPM 1350: Calculus I for Engineers, F:2009, F:2010.

APPM 2350: Calculus III for Engineers, Sp:2010, F:2010, Sp:2011, F:2011, Sp:2012, F:2012.

APPM 2360: Intro. to Ordinary Differential Equations with Linear Algebra, Sp:2010, Sp:2011.

APPM 3310: Matrix Methods and Applications, F:2011, Sp:2012.

APPM 4360: Methods in Applied Mathematics: Complex Variables and Applications, Sp:2013.

Courses Taught at the University of Washington

AMATH 351: Intro. to Differential Equations and Applications, Sp:2008.

AMATH 353: Fourier Analysis and Partial Differential Equations, F:2008.

AMATH 383: Intro. to Continuous Mathematical Modeling, Su:2006, W:2007.

Student Thesis Supervised

Stefan Cline, started 2021, completed 2023.

Michael Juybari-Johnson, started 2021, completed 2023.

Joseph Diaz (MS, SDSU), started 2020, completed 2022.

Nathaniel Reynolds (MS, SDSU), started 2020, completed 2022.

Andrew Tuma (MS, SDSU), started 2020, completed 2022.

Robert Simpson (MS, SDSU), started 2019, completed 2021.

Charles Conners (MS, SDSU), started 2018, completed 2020.

Ryan Li (MS, SDSU), started 2018, completed 2020.

Maurice Umukoro (MS, SDSU), started 2018, completed 2020.

Kristina Stuckey (MS, SDSU), startted 2018, completed 2020.

Matteo Polimeno (MS, SDSU), started 2017, completed 2019.

Eunji Yoo (MS, SDSU), started 2014, completed 2017.

Jordyn Moscoso (MS, SDSU), started 2014, completed 2016.

Robert DeMonte (MS, SDSU), started 2014, completed 2017.

Undergraduate Research Activity

Supervised research activities of undergraduates Opal Issan and Joseph Diaz with support from DMS Grant throughout 2020 and into 2021.

Supervised team of five students for REU project in Summer of 2017. This resulted in a final project and a student presentation at the Joint Mathematics Meeting in 2018.

Supervised Theresa Morrison. This resulted in one publication and several presentations including one at the Joint Mathematics Meeting in 2016.

Supervised MAA PIC sponsored course for 11 students in Spring of 2016. This resulted in several final projects and a student presentation at the SIAM Annual Meeting in 2016.

Service

Service for the Profession

Reviewer for Physica D, Studies in Applied Mathematics, Quarterly Journal of Mechanics and Applied Mathematics, Communications in Mathematical Sciences, Applied Mathematics and Computation, Proceedings of the Royal Society A, European Journal of Mechanics: B/Fluids, SIAM Journal of Mathematical Analysis, SIAM Journal of Applied Mathematics, Advances in Differential Equations, Mathematics and Computers in Simulation, Journal of Nonlinear Science, European Physical Journal Plus

Co-organizer for "Mathematical Problems in Ocean Wave Modeling and Fluid Mechanics" Session at Joint Mathematics Meeting, 2018.

Co-organizer for "Graphene Lattices: Phenomena and Analysis" Session at 9th IMACS Conference, 2015.

Co-organizer for "Nonlinear Waves and Integrable Systems" Session at AMS Western Section Meeting, 2013.

Co-organizer for "Water Waves" Session at 8th IMACS Conference, 2013.

Editor for AMS Contemporary Mathematics Volume "Nonlinear Wave Equations", 2015.

Thesis Committees On Which Served

Tomaso Buvoli (MS, CU Boulder), James Turtle (PhD, SDSU), Julia Rossi (PhD, SDSU), Carlos Prieto (PhD, SDSU), Jake Talley (PhD, SDSU), Nicholas Fisher (MS, SDSU), Jose Anibal Cruz Villarreal (MS, SDSU), Carla Bacco (MS, SDSU), James Mullinix (PhD, SDSU)

Service for the Department

Mathematical Data Science Search, 2022-2023

Calculus Task Force, 2022-2023

Harmonic Analysis Search, 2013-2014

Calculus Reform Task Force, 2015

Computational Mathematics Search, 2017-2018

Outreach, 2013-2014

Colloquium, 2014-2015, 2015-2016, 2017-2018

Curriculum, 2014-2015

Outreach and Internships, 2015-2016