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Education

Ph.D. Mathematics, University of Surrey, Guildford, England (2003)

Thesis: A Modified Equations Approach for Multi-Symplectic Integration Methods
Supervisor: Prof. Sebastian Reich

M.S. Mathematical and Computer Sciences, Colorado School of Mines, Golden, CO, (1999)

Thesis: Spinodal Decomposition for Spatially Discrete Cahn-Hilliard Equations
Adviser: Prof. Erik Van Vleck

B.S. Mathematics, Colorado Christian University, Lakewood, CO (1997)

Scholastic Honors List (1995 – 1996), Deans List (1996 – 1997), Summa Cum Laude

Academic Work Experience (All appointments are in mathematics departments.)

Associate Professor (with tenure), University of Central Florida (Aug. 2013 – Present)

- Associated faculty member of the Center for Research in Computer Vision (2012 – Present)

Guest Associate Professor, NTNU, Trondheim, Norway (Aug. 2015 – Dec. 2015)

Assistant Professor, University of Central Florida (Aug. 2007 – July 2013)

Visiting Assistant Professor, University of Iowa (Aug. 2005 – Jul. 2007)

Postdoctoral Fellow, McGill University, Montreal, Canada (Oct. 2003 – Sep. 2005)

- Traveling waves for lattice differential equations (working with Prof. Tony Humphries)

Research Assistant, Imperial College, London, UK (Oct. 2000 – May 2003)

Grants (Projects for undergraduate education and research are denoted by †.)

\$1,459,394 Education Grant, Co-PI 15% credit, (Apr 2021 - Mar 2026)

National Science Foundation, Noyce: Empowering STEM Teachers with Earned Doctorates

\$999,994[†] Basic Research Grant, Co-PI 20% credit, (Jan 2018 - Dec 2023)

National Science Foundation, S-STEM: Transfers Opportunities for Nurtured Growth

\$250,000[†] Applied Research Grant, Co-PI 45% credit, (Jun 2015 - Jun 2018)

National Science Foundation, IUSE: Growing as Adaptive Instructors in STEM

\$249,784[†] Applied Research Grant, Co-PI 10% credit, (Jul 2015 - Jun 2018)

National Science Foundation, IUSE: Coaching for Students with Disabilities

\$252,328 Research Equipment Grant, Co-PI 50% credit, (Jun 2012 - Jun 2014)

Army Research Office, DURIP: Collection and Analysis of Crowd Data

\$599,973[†] Training Grant, Co-PI 25% credit, (Jan 2010 - Dec 2014)

National Science Foundation, S-STEM: Scholarship Program for Students At-Risk

\$24,964 Research/Training Grant, PI 100% credit, (Aug 2009 - May 2010)

NASA Florida Space Grant Consortium, Simulating the Effects of Rocket Exhaust

\$1,200 Travel Grant, Zurich, Switzerland (July 2007)

International Congress on Industrial and Applied Mathematics

Peer Reviewed Publications (788 total citations according to Web of Science)

Students working under my supervision are denoted by ** for undergraduate and * for graduate.

1. B.E. Moore, E. Saitta, M. Gill, M.A. Dagley, J.J. Chini, X. Li, Impact on a University Mathematics Department from a Two-Year Professional Development Intervention for Calculus Instruction, *under review*, 2021.
2. B.E. Moore, Exponential integrators based on discrete gradients for linearly damped-driven Poisson systems, *Journal of Scientific Computing*, 87:56, 2021.
3. A. Bhatt* and B.E. Moore, Exponential Integrators Preserving Local Conservation Laws of PDEs with Time-Dependent Damping/Driving Forces, *Journal of Computational and Applied Mathematics*, 352:341-351, 2019.
4. M.A. Dagley, M. Gill, E. Saitta, B.E. Moore, J. Chini, and X. Li, Using Active Learning Strategies in Calculus to Improve Student Learning and Influence Mathematics Department Cultural Change, *Proceedings of the Interdisciplinary STEM Teaching and Learning Conference: Vol. 2*, Article 8, 2018.
5. A. Bhatt* and B.E. Moore, Structure Preserving Exponential Runge-Kutta Methods, *SIAM Journal of Scientific Computing*, 39(2):A593-A612, 2017.
6. B.E. Moore, Multi-Conformal-Symplectic PDEs and Discretizations, *Journal of Computational and Applied Mathematics*, 323:1-15, 2017.
7. E. Lydon* and B.E. Moore, Propagation Failure of Fronts in Discrete Inhomogeneous Media with a Sawtooth Nonlinearity, *Journal of Difference Equations and Applications*, 22(12):1930-1947, 2016.
8. F. McDonald, R.I. McLachlan, B.E. Moore, and G.R.W. Quispel, Traveling Wave Solutions of Multisymplectic Discretizations of Nonlinear Wave Equations, *Journal of Difference Equations and Applications*, 22(7):913-940, 2016.
9. A. Bhatt*, D. Floyd*, and B.E. Moore, Second Order Conformal Symplectic Schemes for Damped Hamiltonian Systems, *Journal of Scientific Computing*, 66(3):1234-1259, 2016.
10. B.E. Moore and J.M. Segal*, Stationary Bistable Pulses in Discrete Inhomogeneous Media, *Journal of Difference Equations and Applications*, 20(1):1-23, 2014.
11. B.E. Moore, L. Noreña**, and C. Schober, Conformal Conservation Laws and Geometric Integration for Damped Hamiltonian PDEs, *Journal of Computational Physics*, 232(1):214-233, 2013.
12. B. Solmaz*, B.E. Moore, and M. Shah, Identifying Behaviors in Crowded Scenes through Stability Analysis for Dynamical Systems, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 34(10):2064-2070, 2012.
13. A.R. Humphries, B.E. Moore, and E.S. Van Vleck, Front Solutions for Bistable Differential-Difference Equations with Inhomogeneous Diffusion, *SIAM Journal on Applied Mathematics*, 71(4):1374-1400, 2011.
14. B.E. Moore, S. Ali, R. Mehran, and M. Shah, Visual Crowd Surveillance through a Hydrodynamics Lens, *Communications of the ACM*, 54(12):64-73, 2011.
15. R. Mehran*, B.E. Moore, and M. Shah, A Streakline Representation of Flow in Crowded Scenes, *ECCV Lecture Notes in Computer Science*, 6313:439-452, 2010. (acceptance rate 22.3%)

16. S. Wu, B.E. Moore, and M. Shah, Chaotic Invariants of Lagrangian Particle Trajectories for Anomaly Detection in Crowded Scenes, *IEEE Computer Vision and Pattern Recognition*, 2054-2060, 2010. (acceptance rate 27.7%)
17. B.E. Moore, Conformal Multi-Symplectic Integration Methods for Forced-Damped Semi-Linear Wave Equations, *Mathematics and Computers in Simulation*, 80:20-28, 2009.
18. J. Frank, B.E. Moore, & S. Reich, Linear PDEs and Numerical Methods that Preserve a Multi-Symplectic Conservation Law, *SIAM Journal of Scientific Computing*, 28:260-277, 2006.
19. S. Maier-Paape, B.E. Moore, and E.S. Van Vleck, Spinodal Decomposition for Spatially Discrete Cahn-Hilliard Equations, *Dynamics of Continuous, Discrete and Impulsive Systems, Series A: Mathematical Analysis*, 12:529-554, 2005.
20. B.E. Moore and S. Reich, Multi-Symplectic Integration Methods for Hamiltonian PDEs, *Future Generation Computer Systems*, 19:395-402, 2003.
21. B.E. Moore and S. Reich, Backward Error Analysis for Multi-Symplectic Integrators, *Numerische Mathematik*, 95:625-652, 2003.

Invited University Colloquium Talks and Seminars

1. Structure-Preserving Exponential Integrators, Oregon State University, 2018
2. Traveling Waves for Lattice Equations, Colorado School of Mines, 2018
3. Structure-Preserving Exponential Integrators, University of Iowa, 2016
4. Structure-Preserving Exponential Integrators, Colorado School of Mines, 2016
5. Conformal Symplectic Integrators, Norwegian University of Science and Technology, 2015
6. Bistable Waves in Discrete Inhomogeneous Media, Florida Institute of Technology, 2013
7. Mathematical Models for Multiple Sclerosis, Stetson University, Florida, 2012
8. Visual Crowd Surveillance, West Virginia University, ACM Skype Guest Lecture, 2012
9. Standing Waves in Discrete Inhomogeneous Media, Massey University, New Zealand, 2010
10. Propagation Failure of Fronts in Discrete Inhomogeneous Media, University of Iowa, 2008
11. Bistable Waves in Discrete Inhomogeneous Media, McGill University, Canada, 2008
12. Backward Error Analysis for Multi-Symplectic Integrators, Univ. of Central Florida, 2007
13. Multi-symplectic Integration Methods, Colorado School of Mines, 2005
14. Multi-symplectic Integration Methods, McMaster University, Canada, 2005
15. Multi-symplectic Integration Methods, University of Kansas, 2005
16. Modified Equations Approach for Multi-Symplectic Integrators, University of Kansas, 2003

Invited Conference Seminars

1. Structure-Preserving Exponential Integrators with Application to Damped/Driven NLS Equations, AMS/MAA Joint Mathematics Meetings, Denver, 2020.
2. Structure-Preserving Exponential Integrators for Damped-Driven PDEs, Annual Meeting of the SIAM Central States Section, Colorado State University, 2017.
3. Structure-Preserving Exponential Integrators and Damped-Driven NLS, International Conference on Scientific Computing and Differential Equations, University of Bath, UK, 2017.
4. Structure-Preserving Exponential Integrators, 10th IMACS International Conf. on Nonlinear Evolution Equations and Wave Phenomena: Computation & Theory, Univ. of Georgia, 2017.

5. Traveling Waves for Fully Discrete Multi-Symplectic Equations, SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, 2016.
6. Structure-Preserving Algorithms for Perturbed Nonlinear Schrödinger Equations, 11th AIMS International Conference, Orlando, 2016.
7. Conservation Laws and Structure-Preserving Integration Methods for a Special Class of PDEs, 11th AIMS International Conference, Orlando, 2016.
8. Multi-Conformal-Symplectic Integration Methods, International Conference on Scientific Computing and Differential Equations, Potsdam, Germany, 2015.
9. Fronts and Pulses That Fail to Propagate in Discrete Inhomogeneous Media, Progress On Difference Equations, Covilha, Portugal, 2015
10. From Molecules to Mars and Back to the Everyday, Mu Alpha Theta National Convention, Orlando, Florida, 2014
11. Structure Preserving Methods for Damped Hamiltonian PDEs, 2nd International Workshop on Nonlinear and Modern Mathematical Physics, University of South Florida, 2013
12. Geometric Integration for Damped Hamiltonian PDEs, SIAM Conference on Nonlinear Waves and Coherent Structures, University of Washington, 2012
13. When Diffused Gas Causes Soil Failure, 2nd Workshop on Lunar and Martian Plume Effects, Kennedy Space Center, 2011
14. Solutions and Behavior of Lattice Differential Equations, Cha-Cha Days Workshop for Young Scientists, College of Charleston, 2010
15. Propagation Failure of Fronts in Discrete Inhomogeneous Media, 8th MSU-UAB Conf. on Differential Equations and Computational Simulations, Mississippi State Univ., 2009
16. Propagation Failure of Fronts in Discrete Inhomogeneous Media, 7th AIMS International Conf. on Dynamical Systems, Differential Equations and Applications, Univ. of Texas, 2008
17. Conformal Multi-Symplectic Integration Methods, NSF-CBMS Regional Research Conference on Numerical Methods for Nonlinear Elliptic Equations, University of Iowa, 2007
18. Bistable Waves for Differential-Difference Equations with Inhomogeneous Diffusion, Workshop on Lattice, Delay and Functional Differential Equations, McGill University, 2005

Contributed Conference Seminars

1. 9th AIMS Conf. Dynamical Systems, Differential Equations & Applications, Orlando, 2012
2. Int. Conf. Scientific Computation & Differential Equations, The Fields Institute, 2011
3. International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, 2007
4. International Conf. Scientific Computation & Differential Equations, Saint-Malo, France, 2007
5. IMACS Int. Conf. Nonlin. Evolution Equations & Wave Phenomena, Univ. of Georgia, 2007
6. SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2005
7. Int. Conf. Nonlin. Dynamics & Evolution Equations, Memorial Univ. of Newfoundland, 2004
8. X-th Numerical Analysis Summer School, University of Durham, UK, 2002
9. Mechanics and Symmetry in Europe Summer School, Peyresq, France, 2001
10. IX-th Numerical Analysis Summer School, University of Durham, UK, 2000

Conference Posters

1. 9th AIMS Conf. Dynamical Systems, Differential Equations & Applications, Orlando, 2012
2. SIAM Conf. on Nonlinear Waves and Coherent Structures, University of Washington, 2012

3. IMA Workshop on Numerical Solutions of PDE, University of Minnesota, 2010
4. 11th European Conference on Computer Vision, Hersonissos, Crete, Greece, 2010
5. Workshop on Computational Methods and Applied PDE, Iowa State University, 2005
6. Frontiers in Applied and Computational Mathematics, New Jersey Institute of Tech. 2005
7. Montreal Scientific Computing Days, Le Centre de Recherches Mathématiques, 2004
8. Young Mathematicians Conference in PDE & Dynamical Systems, The Fields Institute, 2004

Academic Awards and Honors

- Teaching Incentive Program Award (for excellence in teaching), U. of Central Florida (2021)
- Initiatives in STEM Fellowship (for advances in STEM education practice and research), University of Central Florida (Aug. 2014 – May 2015)
- Teaching Incentive Program Award (for excellence in teaching), U. of Central Florida (2014)
- Recognized by the Fraternity and Sorority Community as an outstanding professor (2006)
- CRM-ISM Postdoctoral Fellowship, McGill University (2003 – 2005)
- Overseas Research Student Award, scholarship (to pay international student fees) awarded by Universities UK for outstanding merit and research potential (1999 – 2002)
- Research Studentship, full tuition and stipend awarded for academic achievement, University of Surrey (1999 – 2002)
- Colorado Research Fellowship, full tuition and stipend awarded for academic excellence, Colorado School of Mines (1998 – 1999)
- Scholastic Excellence Award, scholarship, Colorado Christian University (1993 – 1997)
- Most Outstanding Student in Humanities & Science, scholarship for academic excellence, leadership and school participation, Colorado Christian University (1996)

Supervision of Research as Primary Advisor

Post-Doctoral Research

- Yuyue Qin (Feb. 2016 – Jan. 2017) Currently faculty at Chang'an University in China
Project: Structure-preserving algorithms for damped-driven NLS equations

Ph.D. Thesis

- Ashish Bhatt (May 2012 – Dec 2016) Post-grad placement: Post-doc University of Stuttgart
Project: Structure-preserving algorithms for damped Hamiltonian PDEs
Presentations: at SciCADE 2015, Potsdam, Germany; AIMS Int. Conf. 2016, Orlando, FL
Publications: in *SIAM Journal of Scientific Computing*; *Journal of Scientific Computing*; *Journal of Computational and Applied Mathematics*
Award: UCF Research Excellence Award 2015

Master of Science Thesis

- Elizabeth Lydon (May 2014 – Jun 2015) Post-grad placement: Eastern Florida State College
Project: Propagation failure in discrete inhomogeneous media with sawtooth nonlinearity
Presentations: SIAM CSE 2015, Salt Lake City; Graduate Research Forum 2015, UCF
Publication: Appeared in *Journal of Difference Equations and Applications*
Award: Provost's Merit Fellowship 2015

- Dwayne Floyd (Jan. 2013 – Nov. 2014) Post-grad placement: U.S. Department of Defense
Project: Linear stability analysis for second order conformal symplectic schemes
Publication: Appeared in *Journal of Scientific Computing*
Award: Best Master's Thesis in the Department of Mathematics 2015
- Kristina Kraakmo (Jan. 2011 – Nov. 2013) Post-grad placement: Valencia College
Project: Alternating direction implicit methods for simulating diffusion driven flow
Presentations: ChaCha Days, College of Charleston, 2010; IMA workshop, Minnesota, 2010
- Brian Brennan (Aug. 2009 – Jul. 2010) Post-grad placement: PhD at Baylor University
Project: Numerical computations for PDE models of rocket exhaust flow in soil
- Joe Segal (Jun. 2008 – Oct. 2009) Post-grad placement: software developer
Project: Propagation failure of FitzHugh-Nagumo waves in discrete media
Publication: Appeared in *Journal of Difference Equations and Applications*
Award: Best Master's Thesis in the Department of Mathematics 2009

Graduate Directed Research

- Johann Veras (Aug. 2010 – Dec. 2010) Post-grad placement: Lockheed Martin
Project: Numerical computation of wave speeds in discrete inhomogeneous media
- Ramin Mehran, (Jun. '09 – Aug. '10) Post-grad placement: Microsoft
Project: Streakline representations of fluid flow for crowded visual scenes
Publications: Appeared in *ECCV 2010* and *Communications of the ACM*
- Berkan Solmaz, (Jun. '09 – Apr. '10) Post-grad placement: Texas Instruments
Project: Using Jacobian matrices to identify crowd behaviors in video scenes
Publication: Appeared in *IEEE Transactions on Pattern Analysis and Machine Intelligence*
- Jonathan Fraine (Jan. 2009 – Apr. 2009) Post-grad placement: PhD at U. of Maryland
Project: Numerical computations for traveling waves in discrete inhomogeneous media

Undergraduate Directed Research

- Kimberly Swanson, Mathematics, Honors in the Major Thesis, UCF (May 2019 – Dec. 2019)
Project: Structure-Preserving Exponential R-K Methods: A Computational Comparison
Publication: In preparation for *Journal of Computational Dynamics*
- Juliana White, Mathematics, UCF (Jan. 2019 – Apr. 2019)
Project: Propagation failure of 2-dimensional discrete fronts
- Brooke Papa, Mathematics, UCF (May 2017 – Apr. 2018)
Project: Computing intervals of propagation failure for discrete fronts
Presentation: Showcase of Undergraduate Research, UCF 2018
- Jared Wasserman, Mathematics and Computer Science, UCF (Aug. 2013 – Dec. 2013)
Project: Numerical predictions of gradient catastrophe in the focusing NLS equation
- Cyndi Beltran, Miranda Craig, Leah Fortier, Nick Kaufman, Vanessa Lepe, Nick Mele, Chris Peterman, GAUSS Program UCF (May '12 – Aug. '12) Time series prediction in traffic scenes
Presentations: GAUSS Seminar Series
- Casey Van Buren, GAUSS program UCF (May 2011 – Dec. 2011)
Project: Action prediction in video sequences of vehicular traffic
Presentation: GAUSS Seminar Series

- Whitney Keith, Florida Space Grant Project (Jan. 2010 – Dec. 2010)
Project: Simulating the effects of rocket exhaust on soil cratering
Presentation: Showcase of Undergraduate Research, UCF 2010
Award: Astronaut Scholarship - Highest monetary award in U.S. for academic achievement
- Laura Noreña, GAUSS program UCF (May 2009 – Dec. 2010)
Project: Conformal multi-symplectic integration methods
Presentation: CSUMS Conference, St. Paul, Minnesota, 2009
Publication: Appeared in *Journal of Computational Physics*
- Nicole Lopez, Mathematics, UCF (May 2010 – Jul. 2010)
Project: Standing waves for a spatially discrete FitzHugh-Nagumo equation
- Jessica Long, Mathematics, University of Iowa (Jan. 2006 – Dec. 2006)
Project: Steady states for inhomogeneous bistable differential-difference equations
- Lory Ajamian, Mathematics, McGill University (May 2005 – Jul. 2005)
Project: Standing waves for spatially discrete Nagumo equations with differing nonlinearities
Presentations: Lattice, Delay, and Functional Differential Equations Seminar Series, McGill

Grant Related Undergraduate Education Activities

NSF funded S-STEM program (STRONG) (2018 – Present)

Enhanced support for transfer student success; [www.crcv.ucf.edu/nsf – projects/strong/](http://www.crcv.ucf.edu/nsf-projects/strong/)

- Coordinating faculty mentors and organizing group activities
- Supervising student selection and award disbursement, and monitoring student progress
- Mentoring students majoring in mathematics and computer engineering

NSF funded IUSE program (Math-GAINS) (2016 – 2018)

Transforming department culture: teaching practices and math education research

- Prepared teaching assessment tools and administered faculty surveys
- Coached 3 mathematics faculty and 5 graduate teaching assistants on adaptively applying evidence-based teaching practices in Calculus classes

NSF funded IUSE program (iCAN) (2017 – 2018)

Improving educational experiences of STEM students with disabilities

- Recruited and trained peer mentors

NSF funded S-STEM program (STATESS) (2009 – 2015)

Providing opportunity/support for high-need, at-risk STEM majors

- Coordinated faculty mentors for 66 students from 14 different STEM disciplines
- Supervised student selection and award disbursement, and monitored student progress
- Organized group activities, and mentored five mathematics students

NSF funded CSUMS program (GAUSS) (2009 – 2012)

Training mathematics majors in computational science; <http://crcv.ucf.edu/gauss/>

- Mentored students, supervised research, and taught advanced mathematics techniques

NSF funded STEP program (COMPASS) (2013 – 2018)

Recruiting undergraduates into STEM fields; <http://compass.ucf.edu/>

- Taught Calculus courses and regularly engaged students outside the classroom

NSF funded STEP program (EXCEL) (2008 – 2018)

- Establishing mathematical foundations of first-year undergrads;** <http://excel.ucf.edu/>
 - Taught Calculus courses and regularly engaged students outside the classroom

Other Student and Junior Faculty Mentoring

- 1 National Merit Scholar (2008 – 2009)
- 10 Instructors: class observations and coaching on teaching/assessment (2014 – Present)
- 1 Tenure-Track Assistant Professor (2017 – Present)

Courses Taught (* denotes graduate course development)

University of Central Florida (Aug. 2007 – Present)

- Intermediate Algebra (MAC 1033) Fall 2019
 Special Programs: Global class designed for a diverse population of international students
 Web Enhancements: Use of an adaptive learning platform
- Calculus I (MAC 2311) Fall: 2007, 2008, 2010, 2012–2014, 2016; Spring: 2012–2014, 2018
 Special Programs: EXCEL classes in '08 and '10 designed to increase student success rate.
 Large Lectures: Between 200 and 450 students with multiple GTAs to supervise in 2012–2018.
 Web Enhancements: WebAssign and MyLabsPlus for assignments and interactive figures.
 Course coordinator: organized 4 faculty and 10 GTAs for over 900 students each semester.
- Honors Calculus I (MAC 2311H) Fall 2018 (2 sections), Spring 2019, 2020
- Calculus II (MAC 2312) Spring: 2009, 2011, 2015, 2017
 Special Programs: EXCEL classes designed to increase student success rate.
 Web Enhancements: WebAssign for student assignments.
- Honors Calculus II (MAC 2312H) Spring 2019
- Calculus III (MAC 2313) Fall 2017, EXCEL class designed to increase student success.
- Honors Calculus III (MAC 2313H) Fall 2020, Spring 2021
- Differential Equations (MAP 2302) Spring 2010, Fall 2011
- Matrix and Linear Algebra (MAS 3105) Spring 2020
- Introduction to Partial Differential Equations (MAP 4341) Fall 2019
- Numerical Methods for Computational Science (MAP 4384) Fall 2021
- Applied Numerical Mathematics* (MAP 6385) Spring: 2008, 2009, 2012, 2013, 2014, 2017
- Scientific Computing* (MAT 5712) Fall: 2007, 2008, 2011, 2012, 2013, 2016
 Web Enhancements: Video capture 2011 – 2016; *All* course content available on-line.
- Independent Studies: Numerical Methods for PDEs, Summer 2009; Simulating Hamiltonian Dynamics, Spring 2012; Geometric Integration, Spring 2017; Deep Learning, Fall 2017; Stability of Numerical Integrators, Fall 2020

Norwegian University of Science and Technology (NTNU) (Fall 2015)

- Numerical Solution of Time Dependent Differential Equations* (MA8404)

University of Iowa (Aug. 2005 – May 2007)

- Theory of Arithmetic (22M:012), Linear Algebra (22M:033), Differential Equations (22M:034), Elementary Numerical Analysis (22M:072), Simulating Hamiltonian Dynamics* (22M:321)

McGill University (Jan. 2004 – Dec. 2004)

- Intermediate Calculus (MATH 262), Advanced Calculus (MATH 265)

Service on Student Thesis and Project Committees at UCF

Ph.D. Theses

- Ranses Alfonso Rodriguez, Mathematics, Inverse problems of calculus of variations, 2021
- Matthew Russo, Mathematics, Lax integrable variable-coefficient PDEs, 2016
- Maria Strawn, Mathematics, Modeling rogue waves in deep water, 2016
- Akbar Wizin, Physics, Dusty disk dynamics and terrestrial planet formation, 2016
- Laura Seward, Physics, Low velocity impact of rigid bodies on granular beds, 2014
- Subhabrata Bhattacharys, Computer Vision, Recognition of complex events in video, 2013
- Curtis Groves, Mechanical Eng., Computational fluid dynamics uncertainty analysis, 2013
- Kishore Reddy, Computer Vision, Action recognition using spatio-temporal volumes, 2012
- Ramin Mehran, Computer Vision, Streakline representations of fluid flow for crowds, 2012
- Berkan Solmaz, Computer Vision, Jacobian matrices to identify crowd behaviors, 2012

Master of Science Theses

- William Hilton, Mathematics, Investigations of the Kudryashov generalized KdV, 2018
- Daniel Marulanda, Mathematics, Approximations and exact discrete solitons, 2016
- Jill Dickerson, Mathematics, Curvelets and the Radon transform for imaging, 2013
- Dimitry Popov, Mathematics, Iteratively re-weighted least squares minimization, 2011

Honors in the Major Theses

- Jeffery Jorges, Physics, Studies on Planet Formation, 2016
- David Thomas, Computer Vision, Recognition of Predicted Time Series, 2010

Engineering Senior Design Projects

- Katlin Joachim, Austin Keller, Reid Neureuther, and Daniel Yoder; Magic mirror, 2017
- Efrain Cruz, Loubens DeCamp, Luis Narvaez, and Brian Thomas; Robotic air hockey, 2014
- Marc Bianco, Andrew Boyles, Chris Echanique, and Garrett Lee; Autopilot cooler, 2013
- Keith Walls, Imran Ali, and Travis Comer; Portable wind and solar energy generation, 2012

Service and Leadership on Department, College, and University Committees

- Department of Mathematics: Computing Committee (2007 – Present), Faculty Search Committee (2013 & 2018), Math Education Committee (2017 – 2019), Calculus Committee (2016 – Present), Undergraduate Curriculum Committee (2016-2017), Recruitment Committee (2015), Calculus Textbook Selection Committee (2013), Promotion and Tenure Committee (2016 – Present)
- Center for Research in Computer Vision: Faculty Search Committee (2018 – Present)
- College of Science: Scholarship Committee (2013 – 2015), Technology Advisory Committee (2017 – Present)

In-House Seminars

1. Journey talk, UCF EXCEL STEM Seminar, 2021
2. All problems are eigenvalue problems?, UCF Collegiate Mathematical Society Seminar, 2019
3. Propagation Failure of Traveling Waves in Lattice Equations, UCF Analysis Seminar, 2016
4. Math and Work, UCF Initiatives in STEM Camp Connect Seminar, 2016
5. Discrete Dynamics: As Models or Methods, Math Colloquium at UCF, 2012
6. Dynamical Systems to Visually Interpret Crowd Behavior, UCF GAUSS Seminar, 2012
7. Tools of Fluid Mechanics for Interpreting Crowd Behavior, Fluids Seminar at UCF, 2011
8. Visual Crowd Surveillance, GAUSS Seminar at UCF, 2011
9. Using Math to Understand Multiple Sclerosis, Math Day at UCF, 2007
10. Bistable Waves in Discrete Inhomogeneous Media, Math Colloquium at UCF, 2007
11. A Modified Equations Approach for Multi-Symplectic Integrators, McGill University, 2003
12. A Modified Equations Approach for Multi-Symplectic Integrators, University of Surrey, 2003
13. Symplectic Numerical Integration, Imperial College, 2003
14. Multi-Symplectic Integration Methods for Hamiltonian PDEs, University of Surrey, 2002
15. Backward Error Analysis for Multi-Symplectic Integrators, Imperial College, 2001

Referee for Academic Journal Articles (Numbers indicate the number of articles reviewed.)

- *Advances in Computational Mathematics* (3)
- *Applied Mathematics and Computation* (2)
- *Calcolo* (1)
- *Communications in Nonlinear Science and Numerical Simulation* (3)
- *Computers and Mathematics with Applications* (1)
- *Computer Physics Communications* (1)
- *EuroPhysics Letters* (1)
- *Journal of Computational and Applied Mathematics* (7)
- *Journal of Computational Physics* (2)
- *Journal of Difference Equations and Applications* (3)
- *Journal of Geometric Mechanics* (2)
- *Mathematics and Computers in Simulation* (3)
- *Numerical Methods for Partial Differential Equations* (1)
- *Physics Letters* (1)
- *Proceedings of the Royal Society A* (1)
- *SIAM Journal on Scientific Computing* (4)

Other Professional and Leadership Activities

- Active participant in STEM education research seminar and reading group (2016 – Present)
- Presentations for recruiting local high school students into math at UCF (2012 – Present)
- Supervisor of Graduate Teaching Assistants (2008 – Present)
- Faculty adviser for student organization Reformed University Fellowship (2008 – 2012)
- Reviewer for book proposals (2008, 2014)
- Active participant in the McGill applied mathematics working seminar (2003 – 2005)
- Member of the Association of Computational Mathematics (1998 – 1999)