Stephen Pankavich, Professor

CONTACT INFORMATION	Applied Mathematics and Statistics Colorado School of Mines 1500 Illinois St. Golden, CO 80401	303.273.3584 pankavic@mines.edu http://inside.mines.edu/~pankavic

RESEARCH INTERESTS

Partial Differential Equations and Kinetic Theory, Chemical Transport & Reaction Dynamics in Porous Media, Multiscale Modeling and Simulation, Mathematical and Computational Virology, Mathematical Biology, Biophysics, & Epidemiology

EDUCATION

Department of Mathematical Sciences
Carnegie Mellon University (CMU)

Ph.D. in Mathematical Sciences, May 2005
- Dissertation Topic: The Vlasov-Poisson System with Infinite Mass and Energy
- Advisor: Jack Schaeffer

M.S. in Mathematical Sciences, May 2001

B.S. in Mathematical Sciences, May 2000
- Mellon College of Science Honors
- University Research Honors

EMPLOYMENT

Department of Applied Mathematics and Statistics
Colorado School of Mines (CSM)

Professor, 2023 - present
Associate Professor, 2017 - 2023
Director of Graduate Studies, 2017 - 2019
Assistant Professor, 2012 - 2017

Department of Mathematics
United States Naval Academy (USNA)

Assistant Professor, 2010 - 2012

Department of Mathematics
University of Texas at Arlington (UTA)

Assistant Professor, 2008 - 2010

Department of Mathematics
Indiana University (IU)

Zorn Postdoctoral Fellow, 2005 - 2008

PUBLICATIONS

Submitted

[1] C. Clarke and **S. Pankavich**, *Three-stage modeling of HIV Infection and Implications for Antiretroviral Therapy*, submitted.

[2] J. Ben-Artzi and **S. Pankavich**, *Modified Scattering of Solutions to the Relativistic Vlasov-Maxwell System Inside the Light Cone*, submitted

[3] D. Benson, N. Engdahl, M. Schmidt, L. Schauer, D. Bolster, and **S. Pankavich**, *Optimal parallelization of particle mass-transfer algorithms on shared memory machines* submitted.

[4] S. Terrab and **S. Pankavich**, *Global sensitivity analysis of plasma instabilities*, submitted.

[5] K. Martinez, **S. Pankavich**, G. Fairchild, A. Ziemen, A. Siraj, C. Manore, and S. Del Valle, *An unsupervised multi-objective feature selection method with applications to environmental and demographic data in Brazil*, submitted.

2023 (& in press)

[6] **S. Pankavich**, *Scattering and Asymptotic Behavior of Solutions to the Vlasov-Poisson system in High Dimension*, to appear in SIAM Journal on Mathematical Analysis.

[7] J. Ben-Artzi, B. Morisse, and **S. Pankavich**, *Asymptotic Growth and Decay of Two-dimensional Symmetric Plasmas*, to appear in Kinetic and Related Models.

[8] L. Schauer, M. Schmidt, N. Engdahl, **S. Pankavich**, D. Benson, and D. Bolster, *Parallelized Domain Decomposition for Multi-Dimensional Lagrangian Random Walk, Mass-Transfer Particle Tracking Schemes*, Geoscientific Model Development (2023) 16: 833-849.

2022

[9] K. Martinez, G. Brown, and **S. Pankavich**, *Spatially-heterogeneous embedded stochastic SEIR models for the 2014-2016 Ebola outbreak in West Africa*, Spatial and Spatio-temporal Epidemiology (2022) 41: 100505.

[10] **S. Pankavich**, *Asymptotic Dynamics of Dispersive, Collisionless Plasmas*, Communications in Mathematical Physics (2022) 391: 455-493.

[11] J. Ben-Artzi, **S. Pankavich**, and J. Zhang *A toy model for the relativistic Vlasov-Maxwell system*, Kinetic and Related Models (2022) 15: 341-354.

2021

[12] D. Benson, D. Bolster, M. Schmidt, and **S. Pankavich**, *Nonparametric, data-based kernel interpolation for particle-tracking simulations and kernel density estimation*, Advances in Water Resources (2021) 152: 103889.

[13] N. Tran, D. Benson, M. Schmidt, and **S. Pankavich**, *A Computational Information Criterion for Particle-tracking with Sparse or Noisy data*, Advances in Water Resources (2021) 151: 103893.

[14] **S. Pankavich**, *Exact Large-time Behavior of Spherically-Symmetric Plasmas*, SIAM Journal on Mathematical Analysis (2021) 53(4): 4474-4512.

2020

[15] M. Schmidt, **S. Pankavich**, A. Navarre-Sitchler, N. Engdahl, D. Bolster, and D. Benson, *Reactive Particle-tracking Solutions to a Benchmark Problem on Heavy Metal Cycling in Lake Sediments*, Journal of Contaminant Hydrology (2020) 234: 103642.

[16] M. Schmidt, D. Benson, **S. Pankavich**, N. Engdahl, and D. Bolster, *A Mass-transfer Particle-tracking Method for Simulating Transport with Discontinuous Diffusion Coefficients*, Advances in Water Resources (2020) 140: 103577.

[17] N. Neri, **S. Pankavich**, and D. Shutt, *Bistable dynamics and Hopf bifurcation in an early-stage model of HIV Infection*, Discrete and Continuous Dynamical Systems B (2020) 25(8): 2867-2893

[18] M. Schmidt, G. Sole-Mari, **S. Pankavich**, and D. Benson, *Entropy: The former trouble with particles*, Advances in Water Resources (2020) **137**: 103509.

[19] **S. Pankavich**, *Linear Vector Spaces & Applications*, Open Mines Collection (2020), https://hdl.handle.net/11124/174218.

2019

[20] J. Ben-Artzi, S. Calogero, and **S. Pankavich**, *Concentrating solutions of the relativistic Vlasov-Maxwell system*, Communications in Mathematical Sciences (2019) **17**(2): 377-392.

[21] G. Sole-Mari, M. Schmidt, **S. Pankavich**, and D. Benson *Numerical Equivalence Between SPH and Probabilistic Mass Transfer Methods for Lagrangian Simulation of Dispersion*, Advances in Water Resources (2019) **126**: 108-115.

[22] M. Schmidt, D. Benson, A. Sitchler, and **S. Pankavich**, *A Lagrangian method for reactive transport with sold-liquid interaction*, Journal of Computational Physics X (2019) **2**: 100021.

[23] D. Benson, **S. Pankavich**, and D. Bolster *On the separate treatment of mixing and spreading by the reactive-particle-tracking algorithm: An example of accurate upscaling of reactive Poiseuille flow*, Advances in Water Resources (2019) **123**: 40-53.

2018

[24] J. Ben-Artzi, S. Calogero, and **S. Pankavich**, *Arbitrarily large solutions of the Vlasov-Poisson system*, SIAM Journal on Mathematical Analysis (2018) **50** (4): 4311-4326.

[25] M. Schmidt, D. Benson, and **S. Pankavich**, *On the accuracy of random-walk particle-based mass-transfer algorithms*, Advances in Water Resources (2018) **117**: 115-119.

[26] S. Calogero and **S. Pankavich**, *On the spatially homogeneous and isotropic Einstein-Vlasov-Fokker-Planck system with cosmological scalar field*, Kinetic and Related Models (2018) **11**(5): 1063-1083.

[27] P. Diaz, P. Constantine, K. Kalmbach, E. Jones, and **S. Pankavich**, *A Modified SEIR Model for the Spread of Ebola in Western Africa and Metrics for Resource Allocation*, Applied Mathematics and Computation (2018) **324**: 141-155.

2017

[28] D. Shutt, C. Manore, **S. Pankavich**, A. Porter, and S. Del Valle, *Estimating the reproductive number, total outbreak size, and reporting rates for Zika epidemics in South and Central America*, Epidemics (2017) **21**: 63-79.

[29] **S. Pankavich** and J. Schaeffer, *Erratum to "Global Classical Solutions of the One and one-half dimensional Vlasov-Maxwell-Fokker-Planck system"*, Communications in Mathematical Sciences (2017) **15**: 1791-1799.

[30] M. Schmidt, **S. Pankavich**, and D. Benson, *A Kernel-based Lagrangian Method for Imperfectly-Mixed Chemical Reactions*, Journal of Computational Physics (2017) **336**: 288-307.

[31] **S. Pankavich** and T. Loudon, *Mathematical Analysis and Dynamic Active Subspaces for a Long-term model of HIV*, Mathematical Biosciences and Engineering (2017) **14**(3): 709-733.

2016

[32] S. Minkoff, W. Menasco, **S. Pankavich**, F. Santosa, and R. Laugesen, *Preparing Graduates for Careers in the Mathematical Sciences: NSF Programs Offer Unique Real-World Experience*, SIAM News (December 2016) 49 (9).

[33] R. Glassey, **S. Pankavich**, and J. Schaeffer, *Separated Characteristics and Global Solvability for the One and one half dimensional Vlasov Maxwell System*, Kinetic and Related Models (2016) **9**: 455-467.

[34] **S. Pankavich** and C. Parkinson, *Mathematical Analysis of an in-host Model of Viral Dynamics with Spatial Heterogeneity*, Discrete and Continuous Dynamical Systems B (2016) **21**(4): 1237-1257.

[35] **S. Pankavich** and J. Schaeffer, *Global Classical Solutions of the One and one-half dimensional Vlasov-Maxwell Fokker-Planck system*, Communications in Mathematical Sciences (2016) **14**(1): 209-232.

2015

[36] **S. Pankavich** and D. Shutt, *An in-host model of HIV incorporating Latent Infection and Viral Mutation*, Dynamical Systems, Differential Equations, and Applications, AIMS Proceedings 2015, pp. 913-922.

[37] **S. Pankavich**, *The Effects of Latent Infection on the Dynamics of HIV*, Differential Equations and Dynamical Systems (2015) 24: 1-23.

[38] **S. Pankavich** and N. Michalowski, *A Short Proof of Increased Parabolic Regularity*, Electronic Journal of Differential Equations (2015) **205**: 1-9.

[39] **S. Pankavich** and N. Michalowski, *Global Classical Solutions to the One and one-half dimensional relativistic Vlasov-Maxwell-Fokker-Planck system*, Kinetic and Related Models (2015) **8**: 169-199.

[40] **S. Pankavich** and P. Ortoleva, *A Review of Two Multiscale Methods for the Simulation of Macromolecular Assemblies: Multiscale Perturbation and Multiscale Factorization*, Computation (2015) **3**: 29-57.

[41] **S. Pankavich** and R. Swanson, *Principal Component Analysis: Resources for an Essential Application of Linear Algebra*, PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies (2015) **25** (5): 400-420.

2014

[42] S. Calogero, J. Felix, and **S. Pankavich**, *Spatially homogeneous solutions of the Vlasov-Nordström-Fokker-Planck system*, Journal of Differential Equations (2014) **257**: 3700-3729.

[43] **S. Pankavich** and R. Allen, *Instability of some Periodic BGK Waves for the Vlasov-Poisson system*, European Physical Journal D (2014) **68**: 363-370.

[44] **S. Pankavich** and C. Nguyen, *A One-dimensional Kinetic Model of Plasma Dynamics with a Hyperbolic Field*, Evolution Equations and Control Theory (2014) **3**: 681-698.

[45] E. Jones, P. Roemer, M. Raghupathi, and **S. Pankavich**, *Analysis and Simulation of the Three-Component Model of HIV Dynamics*, SIAM Undergraduate Research Online (2014) **7**: 89-106.

2013

[46] P. Ortoleva, A. Singharoy, and **S. Pankavich**, *Hierarchical Multiscale Modeling of Macromolecules and their Assemblies*, Soft Matter (2013) **9**: 4319-4335.

[47] **S. Pankavich** and P. Radu, *Nonlinear Instability of steady states in Parabolic and Hyperbolic Diffusion*, Evolution Equations and Control Theory (2013) **2**: 403-422.

2012

[48] **S. Pankavich** and P. Ortoleva, *Nanosystem Self-Assembly Pathways Discovered via All-Atom Multiscale Analysis*, Journal of Physical Chemistry B (2012) **116**: 8355-8362.

[49] **S. Pankavich**, *A Particle Method for a Collisionless Plasma with Infinite Mass*, Mathematics and Computers in Simulation (2012) **82**: 1278-1286.

2011

[50] D. Brewer and **S. Pankavich**, *Computational Methods for a One-dimensional Plasma Model with Transport Field*, SIAM Undergraduate Research Online (2011) **4**: 81-104.

2010

[51] **S. Pankavich** and P. Ortoleva, *Multiscaling for Systems with a Broad Continuum of Characteristic Lengths and Times: Structural Transitions in Nanocomposites*, Journal of Mathematical Physics (2010) **51**: 063303.
•Also featured in Advances in Nanotechnology Research and Application (2011).

[52] R. Glassey, **S. Pankavich**, and J. Schaeffer, *Time Decay for Solutions to One-dimensional Equations of Plasma Dynamics*, In Proceedings of the Brown University Conference on Nonlinear Wave Equations in Honor of Walter A. Strauss on his 70th Birthday, edited by Walter Freiberger, American Mathematical Society (2010).

[53] R. Glassey, **S. Pankavich**, and J. Schaeffer, *Large Time Behavior of the Relativistic Vlasov-Maxwell System in Low Space Dimension*, Differential and Integral Equations (2010) **23**: 61-77.

[54] R. Glassey, **S. Pankavich**, and J. Schaeffer, *Time Decay for Solutions to One-dimensional Equations of Plasma Dynamics*, Quarterly of Applied Mathematics (2010) **68**: 135-141.

2009

[55] Z. Shreif, **S. Pankavich**, and P. Ortoleva, *Liquid-crystal Transitions: A First-principles Multiscale Approach* Physical Review E (2009) **80**: 031703.

[56] R. Glassey, **S. Pankavich**, and J. Schaeffer, *On Long-time Behavior of Monocharged and Neutral Plasmas in "One and one-half Dimensions"* Kinetic & Related Models (2009) **2**: 465-488.

[57] **S. Pankavich**, Z. Shreif, Y. Miao, and P. Ortoleva, *Self-Assembly of Nanocomponents into Composite Structures: Derivation and Simulation of Langevin Equations*, Journal of Chemical Physics **130**: 194115 (2009).
•Also featured in Virtual Journal of Nanoscale Science and Technology **19** (2009).

[58] **S. Pankavich**, Z. Shreif, Y. Chen, and P. Ortoleva, *Multiscale Theory of Boson Droplets: Implications for Collective and Single-Particle Excitations*, Physical Review A (2009) **79**: 013628.

2008

[59] R. Glassey, **S. Pankavich**, and J. Schaeffer, *Decay in Time for a One-Dimensional, Two Component Plasma*, Mathematical Methods in the Applied Sciences (2008) **31**: 2115-2132.

[60] **S. Pankavich**, Y. Miao, J. Ortoleva, Z. Shreif, and P. Ortoleva, *Stochastic Dynamics of Bionanosystems: Multiscale Analysis and Specialized Ensembles*, Journal of Chemical Physics (2008) **128**: 234908.
•Also featured in Virtual Journal of Biological Physics Research **16** (2008) and Virtual Journal of Nanoscale Science and Technology **18** (2008).

[61] **S. Pankavich**, Z. Shreif, and P. Ortoleva, *Multiscaling in Classical Nanosystems: Derivation of Smoluchowski and Fokker-Planck Equations*, Physica A (2008) **387**: 4053-4069.

[62] **S. Pankavich**, *Explicit solutions of the One-Dimensional Vlasov-Poisson System with Infinite Mass*, Mathematical Methods in the Applied Sciences (2008) **31**: 375-389.

2007	[63] **S. Pankavich**, *Global Existence and Increased Spatial Decay for the Radial Vlasov-Poisson System with Steady Spatial Asymptotics* Transport Theory & Statistical Physics (2007) **36**: 531-562.
	[64] **S. Pankavich**, *Recent Trends in the Kinetic Theory of Plasma Physics*, International Conference on Trends and Challenges in Applied Mathematics (2007), Bucharest, Romania; Matrix Rom: 287-290.
	[65] **S. Pankavich**, *Local Existence for the One-Dimensional Vlasov-Poisson System with Infinite Mass*, Mathematical Methods in the Applied Sciences (2007) **30**: 529-548.
2006	[66] **S. Pankavich**, *Global Existence for the Three-Dimensional Vlasov-Poisson System with Steady Spatial Asymptotics*, Communications in Partial Differential Equations (2006) **31**: 349-370.

FELLOWSHIPS, HONORS & AWARDS

❑ W.M. Keck Mentorship Award (for mentorship of graduate students), Colorado School of Mines, 2021
❑ Visiting Professor, Chalmers University of Technology, Gothenburg, Sweden; funded by grant from Knut and Alice Wallenberg Foundation (with S. Calogero) 2019-2020
❑ Visiting Professor, Cardiff University, UK; funded by Research in Pairs grant (Scheme 4) from London Mathematical Society (with J. Ben-Artzi) 2019
❑ Colorado School of Mines Alumni Teaching Award, 2017
❑ Colorado Mathematics Award for Outstanding Service to Students, 2014-2015, 2015-2016, 2017-2018, 2018-2019
❑ Colorado School of Mines Outstanding Faculty Award, Department of Applied Mathematics and Statistics, 2014-2015
❑ MAA Preparation for Industrial Careers in Mathematical Sciences (PIC Math) Program Fellow, 2014-2015
❑ Finalist, Sixth Annual UTA Honors College Outstanding Faculty Award, 2009-2010
❑ Center for Undergraduate Research in Mathematics (CURM) Fellow, 2009-2010
❑ Professional Development Award, Office of Provost & Vice President for Academic Affairs, UTA, 2009-2010
❑ NSF VIGRE Graduate Fellowship, 2000-2004
❑ Student Leadership Award, Carnegie Mellon University, May 2000
❑ Andrew Carnegie Scholarship, Carnegie Mellon University, 1997-2000

GRANTS

1. PI, NSF Applied Mathematics Program, DMS-2107938 (2021-2024), $200,000
   Analytical and Numerical Methods in Collisionless Kinetic Theory

2. PI, NSF Applied Mathematics Program, DMS-1911145 (2019-2023), $336,942
   Novel Computational Methods for Imperfectly-Mixed Chemical Reactions

3. PI, NSF Applied Mathematics Program, DMS-1614586 (2016-2020), $233,775
   Well-posedness and Behavior of Solutions to Kinetic Equations

4. PI, NSF Enriched Doctoral Training Program, DMS-1551229 (2016-2020), $299,996
   FRAMEWORK: Front Range Applied Mathematics Exchanges and WORKshops
   ($600,000 total - joint with University of Wyoming)

5. PI, MAA Preparation for Industrial Careers in Mathematical Sciences (PIC Math) Grant (2014-2015), $7,500

6. PI, NSF Applied Mathematics Program, DMS-1211667 (2012-2015), $99,997
   Existence, Regularity, and Behavior of Solutions to Kinetic Equations

7. PI, US Naval Academy Research Council Grant, NARC 65-09 (2011-2013), $59,254
   Problems in Collisionless Kinetic Theory

8. PI, NSF Applied Mathematics Program, DMS-0908413 (2009-2013), $159,569
   Mathematical Problems in Collisionless Kinetic Theory

9. PI, Center for Undergraduate Research in Mathematics (CURM) mini-grant, subcontracted under NSF DMS 06-36648 (2009-2010), $19,850

10. PI, UTA Research Enhancement Grant (2009-2010), $10,000

11. PI, UTA Integrative Computational Sciences Grant (2008-2009), $5,000

12. Co-PI, NIH Center for Physics-Based Simulation of Biological Structures (SimBioS) Grant, subcontracted under NIH Grant U54 GM072970 (2007-2008), $50,000

GRADUATE
RESEARCH &
ADVISING

Colorado School of Mines

1. Grace Mattingly, PhD student (2022-)
   • NSF Graduate Research Fellowship (2022-2025)

2. Lucas Schauer, PhD student (2019-)
   • Collaborative Papers: Pubs. [3], [8]
   • Poster Award at Gordon Research Conference on *Flow and Transport in Permeable Media* (2022)

3. Kaitlyn Martinez, PhD student (2015-2020)
   • Current Position: Postdoctoral Fellow at Los Alamos National Laboratory
   • Collaborative Papers: Pubs. [5], [9]
   • NSF Graduate Research Fellowship (2017-2020)
   • Talks at ICMA VI (2017), BAMM (2017), CoDA (2020)
   • 2018 CSM GRADS Talk Award
   • 2020 Poster Award at CoDA
   • Thesis: *Understanding the Spatiotemporal Spread of Infectious Diseases Using Mathematical and Statistical Models and Methods Of Data Analytics*
   • Fall 2020 Rath Award (Most Impactful PhD thesis at Mines)
   • Internships: Theoretical Biology, Los Alamos National Lab (2018, 2019)

4. Michael Schmidt, Ph.D. (2015-2019)
   • Current Position: Senior Member of the Technical Staff at Sandia National Laboratories
   • Previous Positions: Postdoc at University of Notre Dame, Postdoc at Sandia
   • Collaborative Papers: Pubs. [15], [16], [18], [21], [22], [25], [30]
   • Thesis: *Lagrangian Methods for Modeling Transport, Mixing, and Geochemical Reactions*
   • Internships: National Wind Technology Center, National Renewable Energy Laboratory (2017, 2018)

5. Deborah Shutt, Ph.D. (2013-2017)
   • Current Position: Member of the Technical Staff at Los Alamos National Laboratory
   • Collaborative Papers: Pubs. [17], [28], [36]
   • Thesis: *Modeling, Analysis, and Simulation of Complex Disease Dynamics for HIV, Ebola, and Zika Virus*
   • Internship: Theoretical Biology, Los Alamos National Lab (2016)

6. Nhat Thanh Tran, M.S. student (2019-2020)
   • Thesis: *Entropic Criteria for Computational Models of Advection-Diffusion Equations*
   • Collaborative Paper: Pub. [13]
   • PhD Student at UC Irvine

7. Nathan Neri, M.S. (2014-2016)
   • Collaborative Paper: Pub. [17]
   • Thesis: *A Refined Model for the Acute Stage of HIV Infection*

8. Benjamin Sattelberg, M.S. (2015-2016)
   - Thesis: *Global Sensitivity Analysis for a Collisionless Plasma using Particle-in-Cell Methods*
   - PhD Student at Colorado State University (Computer Science)

9. Christian Parkinson, M.S. (2013-2015)
   - Collaborative Paper: Pub. [34]
   - Thesis: *In-host Modeling of the Spatial Dynamics of HIV*
   - Ph.D., UCLA (Data-driven PDEs)
   - Current Position: Postdoc at University of Arizona

10. Tyson Loudon, M.S. (2014-2015)
    - Collaborative Paper: Pub. [31]
    - Thesis: *Dynamic Active Subspaces for a Long-term model of HIV*
    - Ph.D., University of Minnesota (Computational Mathematics)
    - Current Position: Postdoc at Los Alamos National Laboratory

11. David Hickman, M.S. (2013-2014)
    - Thesis: *Particle Swarm Optimization for Energy Minimization of Molecular Systems*

University of Texas at Arlington

Jennifer Anderson, M.S. (2009-2010)
   - Thesis: *Classical Solutions of the Vlasov Equation with a Transport Field*
   - Ph.D., Texas A&M University (Several Complex Variables)

UNDERGRADUATE RESEARCH ADVISING

❑ **Colorado School of Mines**

1. Benjamin Longaker - *Global sensitivity analysis of unstable plasmas* (2022-)
   - CSM Undergraduate Research Fellowship (Fall 2022, Spring 2023)

2. Cameron Clarke - *Multiscale modeling and simulation of the in-host dynamics of HIV infection* (2021-2023)
   - CSM Undergraduate Research Fellowship (Fall 2021, Spring 2022, Fall 2022, Spring 2023)

3. Jacob Hofer - *Three stage modeling and anti-retroviral treatment strategies for in-host HIV dynamics* (2022)
   - CSM Undergraduate Research Fellowship (Fall 2022)

4. Roshan Klein-Seetharaman & Jacob Ellis -
   Multi-mutation Evolutionary Dynamics on Graphs (2020-2021)
   - Participants in CoorsTek Denver Metro Regional Science and Engineering Fair from Golden High School

5. John Corrette - *Global sensitivity metrics for Landau Damping* (2018-2019)
   - CSM Undergraduate Research Fellowship (Fall 2018, Spring 2019, Fall 2019)

6. Derrek Smith - *Sensitivity metrics for Particle-in-Cell simulations of plasma dynamics* (2015-2016)
   - CSM Undergraduate Research Fellowship (Fall 2015, Spring 2016)

7. PIC Math research group - *Metrics for Resource Allocation for the Ebola epidemic in Western Africa* (2014-2015)
   - Group - Paul Diaz, Eric Jones, Kelsey Kalmbach, Chelsea Sandridge
   - Collaborative Paper: Pub. [27]
   - Presented with the 2015 Janet Andersen Award for Undergraduate Research in Mathematical or Computational Biology by the MAA's BIO SIGMAA group

8. Eric Jones - *The effects of mutation and efficacy in HIV antiretroviral drug therapy* (2013-2015)

- Collaborative Paper: Pub. [45]
- CSM Undergraduate Research Fellowship (Spring 2013, Fall 2014, Spring 2014)

9. Kevin Rozmiarek - "Mathematical model of HIV dynamics in Gut-Associated Lymphoid Tissue" (2013-2014)
- CSM Undergraduate Research Fellowship (Spring 2014)

❑ **United States Naval Academy**

Peter Roemer - Trident Scholar Project (2011-2013)
- Title: *A study of the persistence of HIV in stochastic population models*
- Collaborative Paper - Pub. [45]

❑ **University of Texas at Arlington**

1. Charles Nguyen, CURM program, B.S. Honors Thesis; Pub. [44], 2009-2010

2. Dustin Brewer, CURM program; SIAM prize (2010); Pub. [50], 2009-2010

3. Robert Allen, CURM program; Pub. [43], 2009-2010

❑ **Indiana University**

Jamil Ortoleva (2007-2008)
- Multiscale Analysis of Bionanosystems (see Pub. [60])

INVITED LECTURES

2023
❑ Colorado Nonlinear Days, Colorado Springs, CO (Apr)
❑ Colloquium, University of Colorado at Colorado Springs (Apr)
❑ Colloquium, Applied Mathematics & Statistics, Colorado School of Mines (Mar)

2022
❑ Gordon Research Conference on *Flow and Transport in Permeable Media*, Les Diablerets, Switzerland (July)
❑ Colorado Nonlinear Day, Colorado Springs, CO (Apr)
❑ Center for Wave Phenomena (CWP) Seminar, Colorado School of Mines (Mar)

2020
❑ PDE Seminar (virtual), Chalmers Institute of Technology, Sweden (May)

2019
❑ Colloquium, Department of Applied Mathematics, University of Colorado, Boulder (Nov)
❑ Analysis Seminar, Cardiff University (Feb)
❑ PDE Seminar Series, 4 weekly talks, Cardiff University (Feb-Mar)
❑ PDE Seminar, Chalmers Institute of Technology, Sweden (July)

2018
❑ PDE Seminar, Pontifical Catholic University, Rio de Janeiro, Brazil (Apr)
❑ Undergraduate Math Club Seminar, CSM (Feb)
❑ AMS/MAA Joint Mathematics Meetings, San Diego, CA (Jan)

2017
❑ SIAM Conference on Analysis of PDE, Baltimore, MD (Dec)
❑ Society for Industrial and Applied Mathematics Central States Section Annual Conference, Colorado State University (Oct)
❑ PDE Seminar, Chalmers Institute of Technology, Sweden (June)
❑ Complex Dynamics Seminar, University of Colorado, Boulder (April)

□ AMS/MAA Joint Mathematics Meetings, Atlanta, GA - SIAM Minisymposium on Kinetic Theory (Jan)

2016
□ Society for Industrial and Applied Mathematics Conference on Applied Mathematics Education; Philadelphia, PA (Sep)
□ Eleventh AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, FL (July)
□ Mathematical Association of America Rocky Mountain Section Meeting, Colorado Mesa University (Apr)
□ Applied Math Seminar, Colorado State University (Mar)
□ AMS/MAA Joint Mathematics Meetings, Seattle, WA (Jan)

2015
□ Applied Math Seminar, Colorado State University (Nov)
□ Conference on the Cauchy Problem in Kinetic Theory, Imperial College London (Sept)
□ Colloquium, Computer Science Research Institute, Sandia National Laboratories (Aug)
□ PDE Seminar, Imperial College London (June)
□ Conference on Continuum Mechanics and PDEs, University of Nebraska, Lincoln (April)
□ Fourteenth New Mexico Analysis Seminar, New Mexico State University (March)
□ Applied Math Seminar and SIAM Graduate Student Colloquium, Colorado State University (March)
□ AMS Spring Sectional Meeting, Georgetown University (March)

2014
□ Colorado Nonlinear Day, Colorado Springs, CO (Nov)
□ Colloquium, Center for Nonlinear Studies, Los Alamos National Laboratory (Oct)
□ Tenth International AIMS Conference, Madrid, Spain - 2 sessions (July)
□ Boltzmann, Vlasov and Related Equations Workshop, Cartagena, Colombia (June)
□ KI-Net Collective Behavior: Macroscopic versus Kinetic Descriptions Conference, Imperial College, London (May)
□ AMS Spring Sectional Meeting, University of Tennessee, Knoxville (March)
□ Departmental Colloquium, New Mexico State University (Feb)
□ Colloquium, Department of Physics, CSM (Feb)

2013
□ Undergraduate Math Club Seminar, CSM (Nov.)
□ Biophysics Graduate Group, CSM (Nov.)
□ Applied Math Seminar, Colorado State University (Nov.)
□ Departmental Colloquium, University of Wyoming (Oct.)
□ IMA Workshop on Stochastic Modeling of Biological Processes (May)
□ Trident Scholar Conference, United States Naval Academy (April)
□ PDE Seminar, Trinity College Dublin (Feb)
□ AMS/MAA Joint Mathematics Meetings, San Diego, CA (Jan)

2012
□ Workshop on Relativistic Kinetic Theory, Wolfgang Pauli Institute, Vienna (Nov)
□ KI-Net Conference on Kinetic Social Dynamics, University of Maryland (Nov)
□ Colloquium, United States Naval Academy (Nov)
□ KI-Net Young Researcher's Conference, University of Wisconsin (Oct)
□ Graduate Student Orientation Talk, Colorado School of Mines (Aug)
□ Ninth AIMS Conference on Dynamical Systems and Differential Equations (July)
□ Departmental Colloquium, Colorado School of Mines (April)
□ Undergraduate Colloquium, Haverford College (Feb)
□ Departmental Colloquium, California State University Channel Islands (Feb)

- ❏ Undergraduate Colloquium, Carleton College (Jan)
- ❏ Departmental Colloquium, Loyola University Chicago (Jan)
- ❏ PDE/Applied Mathematics Seminar, United States Naval Academy (Jan-Feb)
- ❏ AMS/MAA Joint Mathematics Meetings, Boston, MA (Jan)

2011
- ❏ SIAM Conference on Analysis of PDE, San Diego, CA (Nov)
- ❏ AMS Fall Sectional Meeting, University of Utah (Oct)
- ❏ AMS Fall Sectional Meeting, University of Nebraska, Lincoln (Oct)
- ❏ PDE Seminar, University of Nebraska, Lincoln (Oct)
- ❏ ICERM Workshop on Vlasov Models in Kinetic Theory (Sept)
- ❏ Undergraduate Seminar, USNA (Aug)
- ❏ AMS/MAA Joint Mathematics Meetings, New Orleans, LA (Jan)

2010
- ❏ Basic Notions Seminar, USNA (Dec)
- ❏ Institute for Mathematical Sciences, National University of Singapore (Nov)
- ❏ Undergraduate Seminar, USNA, Topics in Mathematics (Nov/Dec)
- ❏ Frank Stones Research Lectureship, Texas Christian University (Oct)
- ❏ Isaac Newton Institute, Cambridge University, UK (Sep)
- ❏ MAA MathFest (with Undergraduate Research Group), Pittsburgh, PA (Aug)
- ❏ CURM Workshop (with Undergraduate Research Group), Provo, UT (March)
- ❏ Colloquium, Clemson University (March)
- ❏ Richard F. Barry Colloquium, Old Dominion University (Feb)
- ❏ Departmental Colloquium, United States Naval Academy (Feb)
- ❏ Departmental Colloquium, United States Air Force Institute of Technology (Feb)
- ❏ Departmental Colloquium, Santa Clara University (Feb)
- ❏ Departmental Colloquium, Fordham University (Feb)
- ❏ Departmental Colloquium, University of Central Florida (Feb)
- ❏ Departmental Colloquium, Miami (OH) University (Feb)
- ❏ Departmental Colloquium, College of Charleston (Jan)
- ❏ AMS/MAA Joint Mathematics Meetings, San Francisco, CA (Jan)

2009
- ❏ SIAM Conference on Analysis of PDE, Miami, FL (Dec)
- ❏ Colloquium, University of Nebraska, Lincoln (Nov)
- ❏ PDE Seminar, Georgia Institute of Technology (Sep)
- ❏ Departamento de Matemàtica Aplicada, Universidad de Granada, Spain (July)
- ❏ Workshop on Quantum and Kinetic Transport, IPAM (April)
- ❏ PDE Seminar, North Carolina State University (March)
- ❏ IMACS Conference on Nonlinear Evolution Equations, University of Georgia (March)

2008
- ❏ Workshop on Multiscale Analysis and Computation (poster), IMA (Nov)
- ❏ Dallas-Fort Worth Research Day, UTA (Oct)
- ❏ SIAM Life Sciences 2008 (poster), Montreal, Canada (Aug)
- ❏ AMS Spring Sectional Meeting, Indiana University (April)
- ❏ Undergraduate Math Club, Indiana University (April)
- ❏ Departmental Colloquium, College of Staten Island (CUNY) (March)
- ❏ Departmental Colloquium, Fairfield University (March)
- ❏ Departmental Colloquium, Swarthmore College (Feb)
- ❏ Departmental Colloquium, Queen's College (CUNY) (Feb)
- ❏ Departmental Colloquium, University of Texas at Arlington (Feb)
- ❏ Departmental Colloquium, University of Missouri at St. Louis (Feb)
- ❏ Departmental Colloquium, Xavier University (Jan)

2007	❑ Center for Cell and Virus Theory Seminar, Indiana University (Dec)
	❑ PDE Seminar, Mathematisches Institut, Universität Bayreuth, Germany (July)
	❑ International Conference on Theoretical, Computational, and Applied Mathematics, Bucharest, Romania (June)
	❑ PDE Seminar, Indiana University (April)
2006	❑ PDE Seminar, Indiana University (Oct)
2005	❑ Midwest PDE Seminar, University of Notre Dame (Dec)
	❑ AMS Fall Sectional Meeting, University of Nebraska, Lincoln (Oct)
	❑ PDE Seminar, Indiana University (Sep)
	❑ PDE Seminar, CMU (April)
	❑ Colloquium, Goucher College (Feb)
	❑ Undergraduate Colloquium, CMU (Jan)
Prior to 2005	❑ Center for Nonlinear Analysis Summer REU Colloquium, CMU (July 2001-2005)
	❑ NAM Mathfest XIV, Morehouse College (Oct 2004)
	❑ Colloquium, CMU (Oct 2004)
	❑ PDE Seminar, CMU (Mar 2004)
	❑ PDE Seminar, CMU (Oct 2002)
	❑ NAM Mathfest XI, Florida A&M University (Oct 2001)
	❑ Optimization Group Seminar, Sandia National Laboratories (Aug 2000)
	❑ Center for Nonlinear Analysis Undergraduate Research Seminar, CMU (July 1999)

PROFESSIONAL SERVICE & OUTREACH

- **Editorial Boards**
  1. AIMS Molecular Science
  2. SIAM Undergraduate Research Online (SIURO)

- **Conference Organizer**
  1. SIAM Central States Section 4th Annual Conference, University of Oklahoma, October 2018
  2. SIAM Central States Section 3rd Annual Conference, Colorado State University, October 2017
  3. SIAM Central States Section 2nd Annual Conference, University of Arkansas at Little Rock, October 2016
  4. International Conference on the Cauchy Problem in Kinetic Theory, Imperial College, London, September 2015
  5. SIAM Central States Section 1st Annual Conference, Missouri University of Science & Technology, April 2015
  6. Special Session on "Kinetic models - analysis, computation, and applications" at 2014 AIMS International Conference, July 2014
  7. SIAM Baltimore-Washington Fall 2013 Sectional Meeting
  8. SIAM Baltimore-Washington Summer 2013 Sectional Meeting
  9. SIAM Baltimore-Washington Spring 2013 Sectional Meeting
  10. SIAM Baltimore-Washington Fall 2012 Sectional Meeting
  11. SIAM Baltimore-Washington Summer 2012 Sectional Meeting
  12. SIAM Baltimore-Washington Spring 2012 Sectional Meeting

13. Special Session on "Nonlinear Hyperbolic Equations: Theoretical Advances and Applications" at SIAM Conference on Analysis of Partial Differential Equations, November 2011

14. SIAM Baltimore-Washington Fall 2011 Sectional Meeting

15. SIAM Baltimore-Washington Spring 2011 Sectional Meeting

16. SIAM Baltimore-Washington Fall 2010 Sectional Meeting

- **Panel/Proposal Reviewer**

  1. MAA Project NExT Panel on Applying for Promotion, 2022

  2. University of Arizona Panel (Virtual) on Research with Undergraduates, 2022

  3. AMS/SIAM Committees on Education Joint Panel Discussion: Broadening Research Experiences for Doctoral Students in the Mathematical Sciences, Joint Mathematics Meetings, 2017

  4. NSF Panel on Enriched Doctoral Training, Joint Mathematics Meetings, 2017

  5. National Science Foundation (US) Review Panel, 2017, 2020, 2021, 2022

  6. Swiss National Science Foundation, 2016, 2017, 2022

  7. CSM Fulbright Fellowship Applications, 2012, 2013

  8. CSM Marshall Fellowship Applications, 2012, 2013

  9. CSM Goldwater Fellowship Applications, 2012, 2013

  10. Center for Undergraduate Research in Mathematics (CURM), 2010

  11. Math in the City (MitC) Program, University of Nebraska-Lincoln, 2010

  12. Indiana University Department of Mathematics Panel on Entering the Academic Workforce, 2010

- **Selected Departmental/University/National Service**

  1. CSM Research Council (2022-)

  2. CSM Research Subcommittee on Research Lectures (2022-)

  3. CSM Research Subcommittee on High-Performance Computing (2022-)

  4. Mines Undergraduate Research Advisory Council (2022-)

  5. Quantitative Biosciences and Engineering (QBE) Graduate Program Committee (2021-)

  6. **Graduate Record Examinations (GRE) Mathematics Subject Exam Committee** (2020-)

  7. Awards Committee, Applied Mathematics and Statistics, CSM (2020-)

  8. Board of Student Media, CSM (2019-2021)

  9. Promotion and Tenure Committee, Applied Mathematics and Statistics, CSM (2017-)

  10. QBE Graduate Program Steering Committee (2016-2021)

  11. Teaching Postdoctoral Fellow Search Committee, Applied Mathematics and Statistics, CSM (2021-2022)

  12. CSM Faculty Grievance Committee, CSM (2015-2021)

  13. Graduate Committee, Applied Mathematics and Statistics, CSM (2013-2020)

  14. Applied Mathematics and Statistics Bylaws Committee (2019-2022)

15. QBE Undergraduate Major Program Development Committee (2019-2020)

16. **Director of Graduate Studies**, Applied Mathematics and Statistics, CSM (2017-2019)

17. CSM Graduate Council, AMS Representative (2017-2019)

18. Co-founder and Organizer of CSM Problem Solving Seminar, Applied Mathematics and Statistics, CSM (2013-2019)

19. Co-founder and Organizer of CSM Putnam Seminar, Applied Mathematics and Statistics, CSM (2012-2019, 2022)

20. Treasurer, SIAM Central States Section (2014-2019)

21. Computational and Applied Mathematics Hiring Committee, CSM (2017-2018)

22. CSM Faculty Steering Committee on Compensation (2017-2018)

23. Applied Mathematics and Statistics Department Head Hiring Committee, CSM (2015-2016)

24. Computational and Applied Mathematics Assistant Professor Hiring Committee, CSM (2014-2015)

25. Board of Student Publications, CSM (2013-2015)

26. **CSM Faculty Senate Representative** (2013-2014)

27. CSM Faculty Senate Subcommittee on Promotion, Tenure, and Faculty Mentorship (2013-2014)

28. Colloquium Coordinator, Applied Mathematics and Statistics, CSM (2012-2014)

29. Undergraduate Math Club, CSM (2013-2014)

30. Undergraduate Committee, Applied Mathematics and Statistics, CSM (2012-2013)

31. Computational and Applied Mathematics Hiring Committee, CSM (2012-2013)

32. Secretary, SIAM Washington-Baltimore Section (2011-2014)

33. Treasurer, SIAM Washington-Baltimore Section (2011-2014)

34. MD-DC-VA MAA Section NExT Fellow (2010-2012)

35. Organizer & Founder, PDE/Applied Mathematics Seminar, USNA (2011-2012)

36. Hiring Committee, Department of Mathematics, USNA (2010-2012)

37. Mathematical Association of America (MAA) Student Chapter Sponsor at UTA (2008-2010)

38. Mid-cities Math Circle Seminar Faculty (2009-2010)

39. UTA Putnam Seminar Organizer (2008, 2009)

40. UTA Calculus Bowl Organizer (2008-2010)

41. UTA Teaching Circles Member (2008-2010)

- **Graduate Committee Member/Advisor**

  1. Grace Mattingly - PhD Advisor, CSM, 2022-

  2. Lucas Schauer - PhD Advisor, CSM, 2019-

  3. Kaitlyn Martinez - PhD Advisor, CSM, 2015-2020

  4. Nhat Thanh Tran - MS Advisor, CSM, 2019-2020

5. Michael Schmidt - PhD Advisor, CSM, 2015-2019 (MS Advisor, 2018)

6. Deborah Shutt - PhD Advisor, CSM, 2013-2017

7. Nathan Neri - MS Advisor, CSM, 2014-2016

8. Benjamin Sattelberg - MS Advisor, CSM, 2015-2016

9. Tyson Loudon - MS Advisor, CSM, 2014-2015

10. Christian Parkinson - MS Advisor, CSM, 2013-2015

11. David Hickman - MS Advisor, CSM, 2013-2014

12. Shelby Stowe - PhD Committee, CSM, 2020 - (advisor: Cecilia Diniz Behn)

13. Soraya Terrab - PhD Committee, CSM, 2019 - (advisor: Jennifer Ryan)

14. David Montgomery - PhD Committee, CSM, 2019 - (advisor: Karin Leiderman)

15. Laura Albrecht - PhD Committee, CSM, 2018 - (advisors: Karin Leiderman & Doug Nychka)

16. Justin Garrish - PhD Committee, CSM, 2018 - (advisor: Cecilia Diniz Behn)

17. Luc Christians - PhD Committee, CSM, 2021 - (advisor: Alexander Pak, Quantitative Biosciences & Engineering)

18. Megan Shepherd - PhD Committee, CSM, 2021 - (advisor: Leslie Lamberson, Mechanical Engineering)

19. Patrick Hunt - PhD Committee, CSM, 2019 - (advisor: Chip Durfee, Physics)

20. Ross DeMott - MS Committee, CSM, 2022- (advisor: Alex Flournoy, Physics)

21. Jamie Madrigal - PhD Committee, CSM, 2019-2022 (advisor: Karin Leiderman)

22. Michael Kelley - PhD Committee, CSM, 2016-2022 (advisor: Karin Leiderman)

23. Kai Bartlette - PhD Committee, CSM, 2015-2020 (advisor: Cecilia Diniz Behn)

24. Nicholas Danes - PhD Committee, CSM, 2016-2019 (advisor: Karin Leiderman)

25. Nora Stack - PhD Committee, CSM, 2014-2019 (advisor: Cecilia Diniz Behn)

26. Jennifer Nealy - PhD Committee, CSM, 2013-2015 (advisor: Jon Collis)

27. Kai Bartlette - MS Committee, CSM, 2015-2017 (advisor: Cecilia Diniz Behn)

28. Nora Stack - MS Committee, CSM, 2014-2017 (advisor: Cecilia Diniz Behn)

29. Kelsey Kalmbach - MS Committee, CSM, 2014-2016 (advisor: Cecilia Diniz Behn)

30. Lucas Quintero - MS Committee, CSM, 2014-2016 (advisor: Paul Martin)

31. Alexander Charlesworth - MS Committee, CSM, 2014-2016 (advisor: Ganesh)

32. Jacqueline Simens - MS Committee, CSM, 2013-2015 (advisor: Cecilia Diniz Behn)

33. Dylan Denning - MS Committee, CSM, 2013-2015 (advisor: Paul Martin)

34. William McCollum - MS Committee, CSM, 2012-2014 (advisor: Paul Martin)

35. Greg Johnson - MS Committee, CSM, 2012-2013 (advisor: Paul Martin)

36. Patipan Saengduean - PhD Committee, CSM, 2017-2022 (advisor: Roel Snieder, Geophysics)

37. Bryant Robbins - PhD Committee, CSM, 2016-2022 (advisor: Vaughan Griffiths, CEE)

38. John Rose - PhD Committee, CSM, 2017-2021 (advisor: Chip Durfee, Physics)

39. Gurban Orujov - PhD Committee, CSM, 2017-2021 (advisor: Andrei Swidinsky, Geophysics)

40. Alex Wilhelm - PhD Committee, CSM, 2016-2021 (advisor: Chip Durfee, Physics)

41. Justin Anderson - PhD Committee, CSM, 2012-2020 (advisor: Lincoln Carr, Physics)

42. Mary Michael Forrester - PhD Committee, CSM, 2017-2020 (advisor: Reed Maxwell, Hydrology)

43. Diego Alcala - PhD Committee, CSM, 2014-2020 (advisor: Lincoln Carr, Physics)

44. Qiuwei Li - PhD Committee, CSM, 2014-2019 (advisor: Gongguo Tang, EECS)

45. Ilkay Eker - PhD Committee, CSM, 2014-2018 (advisor: Hossein Kazemi, Petroleum Engineering)

46. Amanda Meier - PhD Committee, CSM, 2012-2015 (advisor: Chip Durfee, Physics)

47. Jennifer Anderson - MS Defense, UTA, 2010 (chair & advisor)

48. Charles Nguyen - Honors B.S. Thesis Defense, UTA, 2010 (advisor)

49. Caixia (Ruby) Chen - PhD Qualifying Examination, UTA, 2010 (chair: Yue Liu)

50. Alicia Prieto Langarica - PhD Qualifying Examination, UTA, 2010 (chair: Hristo Kojouharov)

51. Stephen Salako - PhD Defense, UTA, 2009 (chair: Goujun Liao)

- **Faculty Judge**

  1. MathWorks Math Modeling Challenge (2012 - present); formerly Moody's M^3 Challenge

  2. Vanderhoof Elementary School Career Science Fair (2013)

  3. Annapolis Middle School Science Fair (2012)

  4. Undergraduate Research Poster Session, AMS/MAA Joint Meetings (2009-2016)

  5. UTA ACES Program, Graduate Student Presentations (2009, 2010)

  6. Indiana Women in Science Program (WISP) Research Conference (2007, 2008)

- **Referee/Reviewer:** Over 100 papers within more than 30 different journals

Colorado School of Mines (2012 - present)
- *Differential Equations* (MATH 225) - Fall 2015, Spring 2016, Fall 2016, Spring 2017, Summer 2018, Summer 2022, Summer 2023
- *Introduction to Scientific Computing* (MATH 307) - Summer 2015, Summer 2016
- *Linear Algebra* (MATH 332) - Fall 2013, Fall 2014, Fall 2019, Spring 2021
- *Applied Numerical Methods* (MATH 398) - Fall 2012, Spring 2013
- *Partial Differential Equations* (MATH 455) - Fall 2021, Spring 2022, Spring 2023
- *Capstone: Mathematical and Computational Modeling* (MATH 484) - Spring 2014, Spring 2015
- *Special Topics: Nonlinear Partial Differential Equations* (MATH 498) - Fall 2022
- *Putnam Seminar* (MATH 498) - Fall 2014
- *Linear Vector Spaces* (MATH 500) - Fall 2014, Fall 2017, Fall 2018, Fall 2020, Fall 2021, Fall 2022
- *Applied Mathematics I* (MATH 514) - Fall 2016, Fall 2017
- *Differential Equations and Dynamical Systems* (MATH 510) - Fall 2013
- *Special Topics: Nonlinear Partial Differential Equations* (MATH 598) - Fall 2022
- *Graduate Thesis & Research Credit* (MATH 707)

United States Naval Academy (2010-2012)
- *Calculus I* - Fall 2010
- *Introduction to Applied Mathematics* - Spring 2011, Spring 2012
- *Engineering Mathematics with Probability and Statistics* - Fall 2011
- *Senior Capstone - Introduction to Mathematical Finance* - Spring 2012
- *Advanced Topics in Mathematics* - Spring 2012
- *Trident Scholar Project* - Spring 2012

University of Texas at Arlington (2008-2010)
- *Honors Calculus I* - Fall 2009
- *Calculus II* - Fall 2008, Spring 2009
- *Calculus III* - Summer 2009
- *Putnam Seminar* (co-taught)
- *Special Topics in Mathematics* - Spring 2010
- *Undergraduate Research Experiences* - Spring 2010
- *Applied Mathematics I* (Grad) - Fall 2009
- *Applied Mathematics II* (Grad) - Spring 2010
- *Special Project in Mathematics Research* (Grad) - Fall 2009

Indiana University (2005 - 2008)
- *Brief Survey of Calculus I* - Fall 2007
- *Calculus I* - Fall 2005
- *Calculus II* - Spring 2006
- *Introduction to Probability and Statistics* - Summer 2006
- *Partial Differential Equations with Applications I* - Fall 2006
- *Partial Differential Equations with Applications II* - Spring 2007
- *Numerical Analysis II* - Spring 2008

Carnegie Mellon University (2001 - 2005)
- *Differential and Integral Calculus* - Fall 2004
- *Calculus I for Economics Students* - Summer 2003
- *Calculus in 3D* - Summer 2004

Colorado School of Mines

Spring 2015

1. Chelsea Sandridge, Eric Jones, Kelsey Kalmbach, Paul Diaz - "A Modified SEIR Model for the Spread of Ebola in Western Africa"
2. Jeffrey Young, Nhat Thanh Van Tran, Tyler Bank - "A Mathematical Model of Ripple Formation"
3. Corey Boettiger, Brian Gregg - "Effects of External Currents on Noble Heartbeat Model"
4. James Brown - "Traffic Modeling and the Human Component"
5. Dustin Burchett, Alyssa Mandarino - "Analysis and Computation of the Time-Dependent Webster's Horn Equation"
6. Nathaniel Keller, Matt Childers - "A Mathematical Approach to Sand Dune Evolution"
7. Andrew Glaws - "Differential Game Theory and Pedestrian Traffic"
8. Shawn Johnson, Ben Sattelberg - "Diffie-Hellman Key Exchange on the TI-MSP430F2618 Microprocessor"
9. April Snively, Thomas Luckett - "A Mathematical Approach on the Effect of Climate Change on Glacial Thickness"
10. Kerrek Stinson - "A One-dimensional Collocation Method for the Korteweg-De Vries Equation"
11. Sarah Verros - "Finite Difference Method for Modeling Seismic Wave Propagation"
12. Jacob Vigil - "The Makarere Model of Hepatitis E Virus Outbreaks"
13. Holly Wenham - "A Mathematical Model of Basal Cell Carcinoma"

Spring 2014

1. Samuel Harvanek, Logan Dean, Abigail Branch - "A Hepatitis B Infection Model with Logistic Hepatocyte Growth and Delay"
2. Alexander Charlesworth - "Electromagnetic Wave Scattering"
3. Lucas Quintero - "Modeling Shear Waves"
4. Andrew Cook - "Simulating Traffic Flow via the Aw-Rascle Model"
5. Nathan Neri - "A Spatial Model of HIV Transmission in Gut-Associated Lymphoid Tissue"
6. Caitlin McNeil, Beverly Smart - "The Epidemiology of Obesity"
7. Marisse Vista, Cassandra Baird - "Mutation Variance in a Bee Colony"
8. Mariah Murphy, Rebecca Ferguson, Anastasia Shpurik - "A Mathematical Model of Honeycomb Construction"
9. Troy Sorenson - "Reading a Digital Clock using Neural Networks and the Backpropagation Algorithm"

Spring 2012   **United States Naval Academy**

1. Peter Besser - "Options pricing with time-dependent interest rates"
2. Britt Campbell - "Monte carlo methods for options pricing"
3. Colleen Fallon - "Random walks and Brownian motion"
4. Kevin Flood - "Exotic Options"
5. Ross Hieatt - "The Black-Scholes options pricing model"
6. Maxwell Klein - "Optimal stopping for the American option"
7. Kelly Ranz - "Combination strategies used to minimize risk "
8. Christopher Ricks - "Investing in a volatile market"
9. Kameron Wright - "Credit default swaps"

PROFESSIONAL Society for Industrial and Applied Mathematics (SIAM)
MEMBERSHIPS   American Mathematical Society (AMS)
              National Alliance for Doctoral Studies in the Mathematical Sciences - Undergraduate
              Mentor & Graduate Mentor
              Pi Mu Epsilon (PME) - inducted 1998