Scott A. McKinley

Curriculum Vitae (February 1, 2021)

Research Interests

Stochastic processes and Bayesian model selection, especially with application to movement and encounters among individual agents in biological systems. Microrheology, Intracellular Transport, Mucosal Immunology, Movement Ecology; Qualitative Behavior of Stochastic Differential Equations.

Appointments

2016–	**Associate Professor**, Tulane University, Department of Mathematics..
2015–2016	**Assistant Professor**, Tulane University, Department of Mathematics.
2010–2015	**Assistant Professor**, University of Florida, Department of Mathematics.
Spring 2012	**Long-term Visitor**, Mathematical Biosciences Institute, Columbus, OH.
2009–2010	**Postdoctoral Associate**, Statistical and Applied Mathematical Sciences Institute, Durham NC.
2006-2009	**Assistant Research Professor**, Duke University, Department of Mathematics. Postdoctoral Mentor: Jonathan C Mattingly

Education

June, 2006	**Doctor of Philosophy**, The Ohio State University, Mathematics. "Fluctuating Hydrodynamics of Semi-Flexible Polymers in Dilute Solution." Advisor: Peter D. March
June, 2002	**Master of Science**, The Ohio State University, Mathematics.
May, 1998	**Bachelor of Science**, Tulane University, Mathematics.

Awards and Grants

Oct 2020 – Oct 2022	*"Develop Malliavin estimators for the particle sensitivity analysis of Monte Carlo simulations of the Boltzmann and Fokker-Planck equations"* Sandia National Laboratory, $130,000 (Tulane portion) PI with Richard Lehoucq and Stephen Bond, Sandia National Laboratory
Oct 2019 – Oct 2020	*"Develop Malliavin estimators for the particle sensitivity analysis of Monte Carlo simulations of the Boltzmann and Fokker-Planck equations"* Sandia National Laboratory, $40,000 (Tulane portion) PI with Richard Lehoucq and Stephen Bond, Sandia National Laboratory

May 2019 – April 2022	*"Dynamic marine landscapes: Feedbacks and spatial patterns of corals and their symbionts"* NSF-OCE, $403,370 (Tulane portion) PI with Adrian Stier, UC-SB; Craig Osenberg, University of Georgia; Elizabeth Hamman, Eastern Carolina
July 2018 – May 2023	*"NSF-Simons Research Center: Southeast Center for Mathematics and Biology"* NSF-DMS and the Simons Foundation, $543,126. (Tulane portion) Senior personnel with PIs Christine Heitsch and Hang Lu, Georgia Tech, and in collaboration with other senior personnel at University of Florida, University of South Florida, Clemson University, Duke University, and Oak Ridge National Laboratory.
Sep 2016 – Aug 2020	*"Bridging Understanding of Motor-Cargo Transport from Artificial to Cellular Systems"* NIH-NIGMS, $297,642 (Tulane Portion) PI with John Fricks, Arizona State; Will Hancock, Penn State; and Peter Kramer, Rensselaer Polytechnic
Sep 2014 – Aug 2017	*"Diffusion of Foreign Particles in Complex Fluids"* NSF-DMS, $125,750 (Tulane/UF portion) PI with Christel Hohenegger, University of Utah
Jan 2014 – Aug 2015	*"The Stochastics of Movement Ecology"* PI, Army Research Office, $176,317
March 2015	*"Third University of Florida SIAM Gators Conference"* NSF-DMS, $15,300 Co-PI with Bill Hager, Maia Martcheva, and Yunmei Chen, University of Florida
Sep 2012 – Aug 2014	*Stochastic Phenomena in Small-Scale Biology."* PI, Simons Foundation Collaboration Grant, $35,000
Spring 2012	*"Early Career Award"* Mathematical Biosciences Institute, Columbus, OH

Scholarly Articles

Published

(p) indicates postdoctoral mentee; (g) PhD student advisee; (u) undergraduate advisee

(33) *Topological data analysis approaches to uncovering the timing of ring structure onset in filamentous networks*
Maria-Veronica Ciocanel (p), Riley Juenemann, Adriana T Dawes **Scott A McKinley**.
Bulletin of Mathemetical Biology Vol 83 No 21 (2021)

(32) *Renewal Reward Perspective on Linear Switching Diffusion Systems in Models of Intracellular Transport*
Maria-Veronica Ciocanel (p), John Fricks, Peter R. Kramer, **Scott A McKinley**.
Bulletin of Mathematical Biology Vol 82, No 126, (2020)

(31) *The Generalized Langevin Equation With Power-Law Memory in a Nonlinear Potential Well*
Nathan Glatt-Holtz, David P Herzog, **Scott A McKinley**, and Hung D Nguyen (g)
Nonlinearity, Vol 33, No 6, pgs 2820-2852 (2020)

(30) *Antibody-Mediated Immobilization of Virions in Mucus*
Melanie A Jensen (g), Ying-Tiung Wang, Samuel K Lai, M Gregory Forest and **Scott A McKinley**.
Bulletin of Mathematical Biology. Vol 50, No 5, pgs 4069-4099. (2019)

(29) *Anomalous Diffusion and the Generalized Langevin Equation*
Scott A McKinley and Hung D Nguyen (g).
SIAM Journal on Mathematical Analysis. Vol 50, No 5, pgs 5119-5160. (2018)

(28) *Reconstructing Complex Fluid Properties from the Behavior of Fluctuating Immersed Particles*
Christel Hohenegger and **Scott A McKinley**
SIAM Journal on Applied Mathematics. Vol 78 No 4, pgs 2200-2226 (2018)

(27) *Assessing the Impact of Electrostatic Drag on Processive Molecular Motor Transport*
J Darby Smith (g) and **Scott A McKinley**
Bulletin of Mathematical Biology. Vol 80 No 8, pgs 2088-2123. (2018)

(26) *Continuum Approximation of Invasion Probabilities*
Rebecca K Borchering (g) and **Scott A McKinley**
Multiscale Modeling and Simulation. Vol 16 No 2, pgs 551-582. (2018)

(25) *ZMapp Reinforces the Airway Mucosal Barrier Against Ebola Virus*
Bing Yang, Alison Schaefer, Ying-Ying Wang, Justin McCallen, Phoebe Lee, Jay M Newby, Harendra Arora, Priya A Kumar, Larry Zeitlin, Kevin J Whaley, **Scott A McKinley**, William A Fischer II, Dimple Harit, Samuel K Lai.
Journal of Infectious Diseases. Vol 218 No 6, pgs 901-910. (2018)

(24) *Landscape configuration drives persistent spatial patterns of occupant distributions*
Elizabeth A Hamman (g), **Scott A McKinley**, Adrien C Stier, Craig W Osenberg.
Theoretical Ecology. Vol 11 No 1 pgs 111-127. (2018)

(23) *Geometric ergodicity of two-dimensional Hamiltonian systems with a Lennard-Jones-like repulsive potential*
Ben Cooke, David P Herzog, Jonathan C Mattingly, **Scott A McKinley**, Scott C Schmidler.
Communications in Mathematical Sciences. Vol 15 No 7, pgs 1987-2025 (2017)

(22) *Resource-driven encounters among consumers and implications for the spread of infectious disease.*
Rebecca K Borchering (g), Steven E Bellan, Jason M Floyd (g), Juliet RC Pulliam, and **Scott A McKinley**.
The Journal of the Royal Society – Interface. Vol 14 No 135: 20170555. (2017)

(21) *Fluid-particle dynamics for passive tracers advected by a thermally fluctuating viscoelastic medium*
Christel Hohenegger and **Scott A McKinley**
Journal of Computational Physics. Vol 340 pgs 688-711. (2017)

(20) *The Evolutionary Trade-off between Stem Cell Niche Size, Aging, and Tumorigenesis*
Vincent L Cannataro (g), **Scott A McKinley**, and Colette M St Mary.
Evolutionary Applications. Vol 10 No 6, pgs 590-602. (2017)

(19) *Model comparison for single particle tracking in biological fluids.*
Martin Lysy, Natesh S. Pillai, David B. Hill, M. Gregory Forest, John Mellnik, Paula Vasquez and **Scott A McKinley**.
Journal of the American Statistical Association. Vol 111 No 56 (2016)

(18) *Maximum Likelihood Estimation for Single Particle, Passive Microrheology Data with Drift*
John Mellnik, Martin Lysy, Paula Vasquez, Natesh Pillai, David B Hill, Jeremy A Cribb, **Scott A McKinley** and M Gregory Forest.
Journal of Rheology. Vol 60 No 379 (2016)

(17) *The Implications of Small Stem Cell Niche Sizes and the Distribution of Fitness Effects of New Mutations in Aging and Tumorigenesis*
Vincent L Cannataro (g), **Scott A McKinley** and Colette St Mary.
Evolutionary Applications. 9 (4) pgs 565-582. (2016)

(16) *Using computational modeling to optimize the design of antibodies that trap viruses in mucus*
Timothy Wessler, Alex Chen, **Scott A McKinley**, Richard Cone, M Gregory Forest and Samuel K Lai.
ACS Infectious Disease Vol 2 No 1, pgs 82-92 (2016)

(15) *Minimizing biases associated with tracking analysis of submicron particles in heterogeneous biological fluids*
Ying-Ying Wang, Kenetta L Nunn, Dimple Harit, **Scott A McKinley**, and Samuel K Lai.
Journal of Controlled Release Vol 220, Part A, pgs 37-43 (2015)

(14) *Modeling of Virion Collisions in Cervicovaginal Mucus Reveals Limits on Agglutination as the Protective Mechanism of Secretory Immunoglobulin A*
Alex Chen, **Scott A McKinley**, Feng Shi, Simi Wang, Peter Mucha, Dimple Harit, M Gregory Forest, and Samuel K Lai.
PLoS ONE 10(7): e0131351. (2015)

(13) *Hidden semi-Markov models reveal multiphasic movement of the endangered Florida panther*
Madelon Van de Kerk, David P Onorato, Marc A Criffield, Benjamin M Bolker, Benjamin C Augustine, **Scott A McKinley** and Madan K Oli.
Journal of Animal Ecology. Vol 84, No 2, pgs 576-585 (2015)

(12) *Micro-heterogeneity metrics for diffusion in soft matter.*
John Mellnik, Paula A Vazquez, **Scott A McKinley**, Jacob Witten, David B Hill, M Gregory Forest.
Soft Matter. Vol 10 (39) 7781-7796 (2014)

(11) *Modeling Neutralization Kinetics of HIV by Broadly Neutralizing Monoclonal Antibodies in Genital Secretions Coating the Cervicovaginal Mucosa*
Scott A McKinley, Alex Chen, Feng Shi, Simi Wang, Peter J. Mucha, M. Gregory Forest and Samuel K. Lai
PLoS ONE. 9(6): e100598. (2014)

(10) *A flexible simulation platform to quantify and manage emergency department crowding.*
Joshua E Hurwitz (g), Jo Ann Lee, Kenneth K Lopiano, **Scott A McKinley**, James Keesling and Joseph A Tyndall.
BMC Medical Informatics and Decision Making. Vol 15 No 50 (2014)

(9) *"Transient antibody-mucin interactions produce a dynamic molecular shield against viral invasion."*
Alex Chen, **Scott A McKinley**, Simi Wang, Feng Shi, Peter J. Mucha, M. Gregory Forest, Samuel K. Lai.
Biophysical Journal. 106 (9) 2028 − 2036 (2014)

(8) *A Biophysical Basis for Mucus Solids Concentration as a Candidate Biomarker for Airways Disease.*
David B Hill, Paula A Vasquez, John Mellnik, **Scott A McKinley**, Aaron Vose, Frank Mu, Ashley G Henderson, Scott H Donaldson, Neil E Alexis, Richard C Boucher and M Gregory Forest.
PLoS ONE, 9(2), e87681. doi:10.1371/journal.pone.0087681 (2014).

(7) *Sensory Information and Encounter Rates of Interacting Species*
Andrew M Hein (g), **Scott A McKinley**
PLOS Computational Biology 9(8): e1003178 (2013).

(6) *Geometric Ergodicity of a Bead-Spring System Forced by a Stochastic Stokes fluid.*
Jonathan C Mattingly, **Scott A McKinley**, Natesh Pillai.
Stochastic Processes and Their Applications Vol 122 No 12 3953-3979 (2012)

(5) *Sensing and Decision-Making in Random Search.*
Andrew M Hein (g), **Scott A McKinley**
Proceedings of the National Academy of Sciences. Vol 109, No 30, pgs 12070-12074 (2012).

(4) *Statistical Challenges in Microrheology*
Gustavo Didier, **Scott A McKinley**, David B Hill, John Fricks.
Journal of Time-Series Analysis. Vol 33, pages 724–743 (2012).

(3) *Asymptotic Analysis of Microtubule-Based Intracellular Transport.*
Scott A McKinley, Avanti Athreya, John Fricks, Peter R. Kramer.
Journal of Theoretical Biology. Vol 305, July 21, 2012 pages 54-69 (2012).

(2) *"A Stochastic Compartmental Model for Fast Axonal Transport."*
Lea Popovic, **Scott A McKinley**, Michael C Reed
SIAM Journal on Applied Mathematics, Vol 71 No 4 pages 1531-1556 (2011).

(1) *Transient Anomalous Diffusion of Tracer Particles in Soft Matter.*
Scott A McKinley, M Gregory Forest, Lingxing Yao.
Journal of Rheology, Vol 53 No 6 (2009).

Submitted Articles and Technical Reports

2020   *Particle Sensitivity Analyses*
Stephen D Bond, Brian C Franke, Richard B Lehoucq, and **Scott A McKinley**
SAND2020-9871

2020   *On the Hölder Regularity of a Linear Stochastic Partial-Integro-Differential Equation with Memory*
Scott A McKinley and Hung D Nguyen (g).
Submitted.

2020   *Leaf Economics of Early- and Late-Successional Plants*
Jeremy Lichstein, Brandon Peterson (u), Jessica Langebrake, and **Scott A McKinley**.
Submitted and in first revision.

2011   *Anomalous Diffusion of Distinguished Particles in Bead-Spring Systems.*
Scott A McKinley, `arXiv:0911.4293`

Patent

2020   *Methods, systems, and computer readable media for data analysis and inference of particle diffusion in target materials and target material simulants*
M Gregory Forest, John W Mellnik, Paula A Vazquez, David B Hill, and **Scott A McKinley**.
US Patent Number 10679755

Academic Advising

Postdocs Mentored

2019 – present   **Keisha Cook**, Tulane University, Mathematics.
Modeling and Bayesian Model Selection for Single Particle Tracking.

2019 – present   **Elizabeth Hamman**, Tulane University, Mathematics.
Dynamic marine landscapes – feedbacks and spatial patterns of corals and coral-associated fishes and invertebrates.

2017 – 2020   **Swati Patel**, Tulane University, Mathematics.
Models for Evolution and Cryptic Genetic Variation.
Post-mentorship position: Assistant Professor, Mathematics, Oregon State University

2017 – 2020   **Veronica Ciocanel**, Mathematical Biosciences Institute.
Models for Intracellular Transport.
Co-mentored with Adriana Dawes, Ohio State, Mathematics.
Post-mentorship position: Assistant Professor, Mathematics, Duke University

Ph.D. Students

2016 – 2019   **Melanie A Jensen**, Tulane University, Mathematics.
Inference of Biophysical States of Microparticles from Particle Tracking Data.
Post-graduate position: Research Scientist, Schlumberger, Cambridge, MA.

2015 – 2019   **Lukasz Sikora**, Tulane University, Mathematics.
Subdiffusion Through Switching

2016 – 2019   **J Darby Smith**, University of Florida, Mathematics.
An Analysis and Exploration of Molecular Motor Protein Models
Postdoc: Postdoctoral researcher at Sandia National Laboratory, Center for Computing Research

2016 – 2019   **Yunqi Zhao**, Tulane University, Mathematics.
The Effect of Spatial Structure on Persistence of Stem Cell Populations
Post-graduate position: Biostatistician at Brightech International, Somerset, NJ.

2014 – 2018   **Hung D. Nguyen**, Tulane University, Mathematics.
Anomalous Diffusion and the Generalized Langevin Equation
Postdoc: Iowa State (Mathematics), 2018-2019; UCLA (Mathematics), 2019-present

2012 – 2018   **Lianne M Allen-Jacobson**, University of Florida, Biology.
"Life in a Colony: Growth, Morphology, and Metabolic Scaling"
Co-advised with Craig W Osenberg
Postdoc: USDA (Agricultural Research Service), 2018-present.

2013 – 2017   **Rebecca K Borchering**, University of Florida, Mathematics.
"Population Thresholds and Disease Ecology"
Co-advised with Juliet RC Pulliam, Florida, Biology.
Postdoc: Florida (Biology), 2017-18; Georgia (Ecology), 2018-20; Penn State (Biology), 2020-present.

2012 – 2017   **Elizabeth A Hamman**, University of Georgia, Ecology.
"Multi-scale Patterning of Corals and Their Symbionts"
Co-advised with Craig W Osenberg, Georgia, Ecology
Postdoc: Eastern Carolina (Biology), 2017-19; Tulane University (Math).

2012 – 2016   **Vincent L Cannataro**, University of Florida, Biology.
The Influence of Tissue Architecture on Somatic Tissue Evolution, Homeostasis, Aging, and Cancer
Co-advised with Collette M St Mary, Florida, Biology
Postdoc: Yale (Biostatistics), 2016-19
Asst Prof: Emmanuel College, Biology

2011 – 2014   **Jake M Ferguson**, University of Florida, Biology.
Stochastic Models for the Growth Rate of Animal Populations
Co-advised with Jose-Miguel Ponciano, Florida, Biology
Postdoc: NIMBioS, 2014-16; Idaho (Biology), 2016-17; Minnesota (Biology), 2017-18.
Asst Prof: Univ of Hawai'i-Manoa, 2019-present.

2010 – 2013   **Andrew M Hein**, University of Florida, Biology.
New Models of Animal Movement
Co-advised with Jamie Gillooly, Florida, Biology
Postdoc: James S McDonell Postdoctoral Fellow, Princeton (EEB), 2013-16.
Research Scientist: NOAA, 2016-present; UC-Santa Cruz (Institute of Marine Sciences), 2017-present.

PhD Committee Service

TULANE, MATHEMATICS: Safak Ozden; Lin Li; Zhe Qu; Li Guan; Benjamin Cooper Boniece; Pingfei Li; Tri Ngo Soodeh Asma Azizi; Aleksandra Gorzycka. TULANE, BIOINNOVATION: Alexej Gossman. ARIZONA STATE, MATHEMATICAL AND STATISTICAL SCIENCES: Lauren Crow (external member); UC-MERCED, APPLIED MATHEMATICS: Shayna Bennett; BROWN, APPLIED MATHEMATICS: Veronica Ciocanel (external member). FLORIDA, MATHEMATICS: Hayriye Gulbudak; Juan Torres; Aziza Jefferson; Omar Saucedo; Evan Milliken; FLORIDA, BIOLOGY: Rosana Zenil-Ferguson (external member). FLORIDA, PHYSICS: Gabriel Dilanji (external member)

Select Undergraduate Research Partners

2017 – present **Riley Juenemann**, Tulane University, Mathematics and Computer Science.
Developing a suite of first-pass statistical measures and supervised machine learning algorithms for categorizing microparticle movement patterns in live cells.

2016 – 2017 **Hayden Houser**, Tulane University, Mathematics and Chemical Engineering.
Reading course in branching processes and senior project: *Modeling the establishment and growth of stem cell populations using an age-dependent branching process*

2015 – 2016 **Gabriella Runnells**, Tulane University, Mathematics and Economics.
Studied the role of imperfect information in the rise and fall of "boomlet" presidential candidates.

2013 – 2015 **Brandon Peterson**, University of Florida, Digital Arts and Math.
University Scholars Program fellowship recipient.
Studied the allocation of biomass tissue in trees that are early and late settlers to new territory.
Co-advised with Jeremy Lichstein and Jessica Langebrake, Florida Biology.

2013 – 2015 **Daniel Romero**, University of Florida, Mathematics.
University Scholars Program fellowship recipient.
Studied the optimal allocation of binding sites on the surface of virions (from the virion's point-of-view).

2013 – 2014 **Minjia Zhong**, Buchholz High School, Gainesville, FL.
Studied the problem of greedy predators with perfect sensing: they eat themselves to death!

2011 – 2012 **Shoshana Levi**, University of Florida, Biology.
University Scholars Program fellowship recipient.
Studied the curious sex lives of anoles: *A model of genomic imprinting for resolving intralocus sexual conflict.*

2011 – 2012 **Chi Zhang**, University of Florida, Mathematics.
Senior thesis: *Reinforced Random Walks as a model for trailblazing*

2008 – 2009 **Alexis Cook**, Duke University, Mathematics.
Mellon Mays Fellowship: Studied the top eigenvalues of random tri-diagonal matrices.

Further undergraduate research collaborations

Financially supported summer research: Sian Grosskopf (co-advised with Swati Patel (p)), Aleksander Bahat.

Other research initiatives: Abigail Zion (primary advisor, Keisha Cook (p)), Sophia Natale-Short (primary advisor, Elizabeth Hamman (p)), James Hyman, Bowen Liu, Yi Tang (Tulane); Amanda Reynolds, Andrea Adams, Diego Rojas (Florida); Brian Choi (Duke).

Tulane Mathematics Senior Seminar advising: Courtline Naquin, Mitchell Falcon, Griffin Sandler, Hayden Houser, Cheyenne Swanson.

Tulane Senior Thesis Reader: Jake Ward (Political Science), Tadeo Ramirez (Biology), Ciaran Buckley (Economics).

Classroom Instruction

Graduate Courses

– *Introduction to Stochastic Processes.*
  Tulane, Fall 2016, 17; UF Spring 2014, Duke Fall 2006, 08

– *Probability with Measure Theory I & II.* UF 2012-13, 2014 - 15.

– *Stochastic Calculus.* Tulane, Spring 2017; Duke, Spring 2010.

– *Applied Math I & II.* Tulane 2018, 19.

– *Bayesian Inference and Markov Chain Monte Carlo Methods.* Tulane Spring 2018

Undergraduate Courses

– *Freshmen Honor's Colloquium: Lies, Damned Lies, and Data Science*
  Tulane, Fall 2017, 18

– *Elementary Probability.* Tulane, Fall 2015; Duke, Spring 2009.

– *Introduction to Statistical Learning* Tulane, Spring 2016

– *Statistics for Scientists.* Tulane, Fall 2018, Fall 2019

– *Mathematical Methods in Modeling Biology.* UF Spring 2011, 14.

– *Topics in Mathematical Biology: Random Walks in Biology.* UF Fall 2011, 12.

– *Elementary Differential Equations.*
  UF Fall 2011, 13; Duke Fall 2006, Spring 2007, 08, 09.

– *Introduction to Advanced Calculus.* UF Fall 2010

– *Honors Calculus II.* UF Fall 2010.

Professional Activities

Conference and Research Workshop Organization

Dec 2020 **Southeast Center for Mathematics and Biology Third Annual Symposium**, *Virtual Platform*, Organizing Committee.

June 2020	**SIAM Conference on Life Sciences**, *Garden Grove, CA (moved to a virtual platform)*, Organizing Committee.
May 2020	**Conference on New Developments in Probability**, *Tulane University*, Organizing Committee (Delayed to 2021 due to COVID-19).
May 2019	**SIAM Conference on Applications of Dynamical Systems**, *Salt Lake City, UT*, Organizing Committee.
Feb 2019, '20	**Particle Tracking Techniques In Live Cell Imaging**, *Tulane University*, Organizer with Christine Payne, Duke.
May 2017, '18, '19	**May Molecular Motors Meetings**, *Penn State University*, Organizer with Will Hancock, Penn State; John Fricks, Arizona State; Peter Kramer, Rensselaer Polytechnic Institute..
2011 – 2016	**Southeast Probability Conference**, *Duke University*, Organizing Committee.

Seminar and Minisymposium Organization

2015 – pres.	**Tulane Probability and Statistics Seminar**, Co-organizer with Gustavo Didier (2015-18) and Swati Patel (2018-present)..
July 2019	**International Conference on Industrial and Applied Mathematics**, *Valencia, Spain*, Minisymposium Co-Organizer with Peter R Kramer (RPI, Math). *Stochastic dynamics of biological cells and fluids*
2010 – 2015	**University of Florida Biomathematics Seminar**, Organizer.
2007 – 2009	**Duke University Probability Seminar**, Organizer.
–	**Other Minisymposia and Workshops**. May 2013: *Multiscale computation of fluctuating hydrodynamics and microscale mechanics*, SIAM Mathematical Methods in Material Sciences, Co-organizer Jun 2010: *Minisymposium on Molecular Motors*, SIAM Annual Meeting, Co-organizer. Apr 2010: SAMSI Workshop on *Stochastic Dynamics: Molecular Motors, Neuron Models, and Epidemics on Networks*, Organizing Committee Apr 2009: *Special Session on Stochastic Dynamics*, AMS Southeastern Section, Co-organizer. 2009: SAMSI Working Group on *Biological Stochastic Dynamics*, Co-organizer.

Department and University Service

2021 – pres.	**Quality Enhancement Plan**, Tulane, University. Member of the committee, 2021-
2018 – pres.	**Graduate Studies Coordinator**, Tulane, Mathematics Department. Coordinator, 2018-present, Member of the committee, 2015 – 2018
2017 – pres.	**Department Executive Committee**, *Member*, Tulane, Mathematics Department.
2016 – pres.	**Department Hiring Committees**, *Member*, Tulane, Mathematics Department. Member of the committee for eight searches.
2018 – pres.	**University Senate Committee on Information Technology**, *Chair*.
2018 – 2020	**University Senate At-Large Member**.
2017 – 2020	**University Senate Committee on Honorary Degrees**, *Member*.

2012 - 2015	**UF IGERT Council Member, Quantifying Spatial Ecology, Evolution and Environment**, University of Florida.

– **Further Hiring Committee Service**.
UF College of Liberal Arts and Sciences, UF Informatics Institute Hiring Committee (2013-14); UF Mathematics Department, Informatics Hiring Advisory Committee (2013-14); UF Mathematics Department, Mathematical Modeling of Disease Hiring Advisory Committee (2013-14)

Professional Service and Communication of Research

– Over 60 invited lectures at conferences, department seminars, and undergraduate workshops.

2019 – pres.	**Associate Editor**, Foundations of Data Science.
2006 – pres.	**Peer review**.

Annals of Probability; Annals of Applied Statistics; SIAM Journal on Analysis; SIAM Journal on Applied Mathemaitcs; Multiscale Methods and Computation; Communications in the Mathematical Sciences; American Naturalist; Nonlinear Science; Soft Matter; Journal of Statistical Physics; Physical Review E; Journal of Theoretical Biology; Journal of Optimization Theory and Applications; Ecological Modeling; Physica Letters A; BIT Numerical Mathematics; Stochastics and Dynamics; Frontiers in Microbiology

2010 – pres.	Member of the Society for Industrial and Applied Mathematics.

Recent Outreach

Fall 2019	**Workshop on Baseball Analytics**, Along with Michael Joyce (Tulane, Math), Worked with Major League Baseball Youth Academy and the Tulane Center for Sport to run an evening workshop on baseball analytics as a means of generating interest Statistics for high school students from underrepresented groups in New Orleans, LA..

Invited Seminars and Presentations

(i) indicates international travel; (u) undergraduate audience; (h) high school audience

Nov 2021	**(planned) Plenary lecture for AMS Southeastern Section**, Mobile, AL.
Jan 17, 2020	*Joint AMS/MAA Mathematical Meetings* Session on "Modeling and Data Analytic Techniques for Biological Systems." Virtual Conference, planned for Washington, DC.
Oct 5, 2020	*University of Alberta, Department of Mathematics* Biomathematics Seminar, Calgary, AB, Ca. (virtual presentation)
Jan 17, 2020	*Joint AMS/MAA Mathematical Meetings* AMS Special Session on Stochastic Differential Equations and Applications of Mathematical Biology, Denver, CO
Nov 2, 2019	*SIAM TX-LA Annual Meeting.* Session on "Modeling and Simulation of Dynamics in Biological and Complex Fluids," Dallas, TX
Jul 17, 2019	$^{(i)}$*International Conference on Industrial and Applied Mathematics.* Session on "Stochastic Dynamics of Biological Cells and Fluids." Valencia, Spain.

May 20, 2019   *SIAM Conference on Dynamical Systems.*
Session on "Stochastic Models in Biology." Snowbird, UT

Apr 1, 2019   *Rensselaer Polytechnic Institute. Department of Mathematical Sciences.*
Mathematical Sciences Colloquium. Troy, NY.

Mar 24, 2019   [h]*Invited Lecture for Honors Program recruits and parents.*
Tulane University Honors Recruitment Weekend, New Orleans, LA

Oct 6, 2018   *SIAM TX-LA Section Meeting.* Baton Rouge, LA

Oct 2, 2018   *Penn State University, Mathematics Department.*
Theoretical Biology Seminar. State College, PA

Mar 22, 2018   *College of William and Mary, Department of Mathematics.*
Mathematics Colloquium and EXTREEMS - QED Lecture. Williamsburg, VA

Mar 11, 2018   [h]*Invited Lecture for Honors Program recruits and parents.*
Tulane University Honors Recruitment Weekend, New Orleans, LA

Oct 26, 2017   [u]*Tulane University BEAST Research Night.*
"Biology Enthusiast's Association of Students at Tulane, New Orleans, LA

Jul 19, 2017   *Society of Mathematical Biology Annual Conference.*
Session on "Spatial Processes in Biology", Salt Lake City, UT

Jun 6, 2017   [i]*Conference on Probabilistic Perspectives in Nonlinear PDEs.*
International Center for Mathematical Sciences. Edinburgh, Scotland, UK.

May 21, 2017   *SIAM Conference on Dynamical Systems*
Session on "Stochastics in Biology." Snowbird, UT

Apr 5, 2017   *Brown University, Lefschetz Center for Dyanmical Systems.* Providence, RI

Mar 17, 2017   *Arizona State School of Statistical and Mathematical Sciences.*
Mathematical Biology Seminar Series, Tempe, AZ

Feb 8, 2017   *Claremont Center for the Mathematical Sciences Colloquium. Claremont, CA*

Nov 18, 2016   *University of Arizona, Mathematics Department*
Applied Math Colloquium, Tucson, AZ.

Nov 12, 2016   *University of Louisiana at Lafayette Roeling Conference*, Lafayette, LA

Oct 27, 2016   [h]*Tulane Lunch and Learn Series.*
NOLA College Prep High School, New Orleans, LA

Oct 8, 2016   *AMS Fall Western Section Meeting.*
Special Session on Nonlinear and Stochastic PDEs, Denver, CO.

Jul 4, 2016   *AIMS 11th Conference on Dynamical Systems, Differential Equations and Applications.* Session on "Randomness Meets Life", Orlando, FL

Jun 23, 2016   [i]*University of Cambridge, Isaac Newton Institute for Mathematical Sciences.*
Workshop: Spatially Distributed Stochastic Dynamical Systems in Biology Cambridge, UK

May 17, 2015	*SIAM Conference on Dynamical Systems.* Session on "Dynamics of High Dimensional Stochastic Models." Snowbird, UT.
Apr 4, 2015	*The Ninth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory.* Session on "Evolution equations in Mathematical Biology: Cellular and network processes. Atlanta GA.
Mar 22, 2015	*Brown University Workshop on Agent-Based Modeling.* Lefschetz Center for Dynamical Systems, Providence, RI.
Jan 28, 2015	*Tulane University Math Department Colloquium*, New Orleans, LA.
Nov 14, 2014	*Mathematical Biosciences Institute, The Ohio State University* Workshop on Axonal Transport and Neuronal Mechanics. Columbus, OH
Sep 30, 2014	*University of Tampa, Mathematics Department Seminar Series.* Tampa, FL
Aug 4, 2014	*SIAM Conference on Life Sciences* Mathematical Questions in Neuronal and Neural Network Dynamics. Charlotte, NC
Jul 29, 2014	*Banff International Research Station* Workshop on Statistics and Nonlinear Dynamics in Biology and Medicine. Banff, Alberta, CA
May 19, 2014	*Frontier Probability Days.* University of Arizona, Tucson, AZ
Apr 14, 2014	[u] *Seminar for ASSETS Scholars* Abraham Baldwin Agricultural College. Tifton, GA
Feb 7, 2014	*Duke University, Biomathematics Seminar.* Durham, NC
Jun 11, 2013	*SIAM Mathematical Methods in Material Sciences.* Philadelphia, PA
Apr 18, 2013	*Florida State University, Scientific Computing Seminar.* Tallahassee, FL
Mar 28, 2013	*Sandia National Laboratory.* Albuquerque, NM
Feb 20, 2013	*University of Virginia, Probability Seminar.* Charlottesville, VA
Jan 25, 2013	*University of Utah, Stochastics Seminar.* Salt Lake City, UT
Dec 9, 2012	*Canadian Mathematical Society Winter Meeting.* Probability and Biology Section. Montreal, Quebec, Ca.
Dec 4, 2012	*University of Wisconsin, Probability Seminar.* Madison, WI
Nov 14, 2012	*Duke University Mathematical Biology Colloquium.* Durham, NC
Oct 14, 2012	*AMS Southeast Sectional Meeting.* New Orleans, LA.
Jun 25, 2012	*Statistical and Applied Mathematical Sciences Institute.* Workshop on Nonlocal Continuum Models for Diffusion, Mechanics and other Applications. Durham, NC.
Jun 20, 2012	*Mathematical Biosciences Institute, The Ohio State University.* Joint MBI-NIMBioS-CAMBAM Graduate Workshop on Stochastics Applied to Biological Systems. Columbus, OH
May 18, 2012	*Duke University, Undergraduate Workshop in Mathematical Biology.* Durham, NC
May 14, 2012	*Southeast Probability Conference*, Durham, NC.
Apr 10, 2012	[u] *The Ohio State University, RUMBA: Undergraduate Seminar in Mathematical Biology.* Columbus, OH

Mar 27, 2012	*Mathematical Biosciences Institute, Postdoctoral Seminar* Columbus, OH.
Feb 9, 2012	*Mathematical Biosciences Institute, Workshop on Robustness in Biological Systems.* Columbus, OH
Nov 10, 2011	*University of Chicago, Scientific and Statistical Computing Seminar.* Chicago, IL
Oct 5, 2011	*Georgia Institute of Technology, Mathematical Biology and Ecology Seminar.* Atlanta
Jul 21, 2011	[i] *International Congress on Industrial and Applied Math.* Minisymposium on Microrheology, Vancouver, BC, Canada.
Jul 7, 2011	[i] *INFORMS Applied Probability Society Conference* "Session on Stochastic Networks in Biology." Stockholm, Sweden.
Apr 5, 2011	*IMACS: Nonlinear Evolution Equations & Wave Phenomena.* Athens, GA
Jan 7, 2011	*AMS Joint Mathematical Meeting.* Special Session on Stochastic Analysis, New Orleans, LA.
Jan 21, 2010	*University of North Carolina, Chapel Hill, Probability Seminar.* Chapel Hill, NC
Nov 18, 2010	*SAMSI Transition Workshop on Stochastic Dynamics,* Durham, NC.
Jul 13, 2010	*SIAM Conference on Life Sciences.* Minisymposium on Molecular Motors. Pittsburgh, PA.
Nov 2, 2009	*Louisiana State University, Applied Analysis and Probability Seminar.* Baton Rouge, LA
Aug 29, 2009	*University of North Carolina, Chapel Hill, Applied Mathematics Seminar* Chapel Hill, NC
Mar 31, 2009	*North Carolina State University, Probability and Random Dynamics Seminar, Raleigh, NC*
Nov 7, 2008	*University of Delaware, Probability Seminar.* Newark, DE
Oct 23, 2008	*Marquette University, Mathematics, Statistics and Computer Science Colloquium.* Milwaukee, WI