CONTACT INFORMATION

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Piscataway, NJ 08854
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Phone: (714) 271 - 9500

EMPLOYMENT

Rutgers University – New Brunswick

Position: Mathematical and Physical Sciences Ascending Postdoctoral Research Fellow — 2021 - present

Sponsoring Scientist: Dr. Juan Bonachela

Rutgers University – New Brunswick

Position: Hill Assistant Professor — 2019 - 2021

Supervisor: Dr. Konstantin Mischaikow

EDUCATION

University of California, Davis

Ph.D., Applied Mathematics — 2012 - 2019

Thesis: Persistence of Single and Multispecies Systems in the Face of Environmental Uncertainty

Adviser: Dr. Sebastian J. Schreiber

University of California, Berkeley

B.A., Pure Mathematics, Italian Studies — 2007 - 2012

UC Education Abroad Program - Bologna, Italy — 2012

PUBLICATIONS

W.S. Cuello, M. Gameiro, J. Bonachela, K. Mischaikow. "Widespread Ecological Networks and their Dynamical Signatures (WENDy)." In prep.

W.S. Cuello and S.J. Schreiber. "A Mathematical Framework for Multispecies Systems Undergoing Small Environmental Fluctuations." In prep.

W.S. Cuello, J.R. Gremer, A. Sih, P.C. Trimmer, D.L. Venable, and S.J. Schreiber. "Extinction Risk of Sonoran Desert Annuals Following Potential Changes in Precipitation Regimes." bioRxiv (2022).

P.H. Crowley, P.C. Trimmer, O. Spiegel, S.M. Ehlman, **W.S. Cuello**, and A. Sih. "Predicting habitat choice after rapid environmental change." The American Naturalist 193, no. 5 (2019): 619-632.

W.S. Cuello, J.R. Gremer, P.C. Trimmer, A. Sih, and S.J. Schreiber. "Predicting evolutionarily stable strategies from functional responses of Sonoran Desert annuals to precipitation." Proceedings of the Royal Society B 286, no. 1894 (2019): 20182613.

W.S. Cuello, T.A.T. Janes, J.M. Jessee, M.A. Venecek, M.E. Sawyer, C.R. Eklund, and M.V. Evans. "Physiologically based pharmacokinetic (PBPK) modeling of metabolic pathways of bromochloromethane in rats." Journal of toxicology 2012 (2012).

PROGRAMMING LANGUAGES

R, Rstudio

Programmed discrete-time stochastic models to track long-term population dynamics (e.g., predicting seed densities of Sonoran Desert Annuals using precipitation and seed-yield data).

Estimated unknown parameters of population models via statistical regressions. Used AIC modeling to identify life traits and functional responses to precipitation that drive plant species' population dynamics.

Used parallel computing and modified code for use on the cluster to keep track of multiple, large-scale simulations.

Python, Jupyter Notebook

Coded scripts for data manipulation (e.g., string parsing and data cleaning).

Analyzed long-term effects of species-to-species interactions via network analyses.

AWARDS & FELLOWSHIPS

Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowship ($100,000 per year; 3 years) — 2021 - present
Combinatorially modeling community dynamics and investigating how species' densities change as a function of their interactions.

NJ-NExT Fellow — 2021 - 2022
Professional development program for academic careers

William K. Schwarze Scholarship ($10,000) — Spr. 2017
Award for excellence in teaching and scholarship

UC Davis GGAM Departmental Fellowship — 2013, '14, '15, '17
Semester-long funding for graduate research

SEMINAR TALKS & RESEARCH PROGRAMS

Montana State University — Spr. 2022
Seminar Presentation – introducing Widespread Ecological Dynamics and their Dynamical Signatures (WENDy), i.e., combinatorial modeling of species' interactions and dynamics.

Tulane University, New Orleans, LA — Fal. 2019
Seminar Presentation – predicting long-term behavior and germination rates of Sonoran Desert annuals. Modeling species interactions with their environment via stochastic difference equations.

University of California, Davis, Davis, CA — Spr. 2019
MathBio Seminar – Thesis presentation and exit seminar.

Zuse Institute Berlin, Berlin, Germany — Sum. 2017
Graduate-Level Research in Industrial Projects for Students in Berlin (GRIPS)
Summer Research – Using convolutional neural networks to predict 3D facial structures from 2D facial images.

North Carolina State University, Raleigh, NC — Sum. 2011
Research Experience for Undergraduates (REU+)
Poster Conference – Using compartment modeling to determine the metabolism of bromochloromethane within rats.

OUTREACH & SERVICE

Rutgers University Research Experience for Undergraduates (REU)	Sum. 2020, '21
UC Davis Stem Cafe Tutor at the Women's Resources and Research Center (WRRC)	2014 - 2018
California State Summer School for Mathematics and Science (COSMOS) (UC Davis)	Sum. 2016
Co-organizer of UC Davis Qualifying Exam Workshop for Graduate Groups of Applied and Pure Mathematics	Win. 2016
California State Summer School for Mathematics and Science (COSMOS) (UC Davis)	Sum. 2015
Referee for Journal of Dynamics and Differential Equations	
Referee for Journal of Mathematical Biology	

CONFERENCES & WORKSHOPS ATTENDED

Rules of Life Workshop	Apr. 2022
Joint Mathematics Meetings JMM workshop – Mathematical Modelling Of Real-World Infectious Disease Epidemics	Apr. 2022
Computational Persistence Workshop – Purdue	Nov. 2021
NJ-Mathematical Association of America Meeting	Apr. 2021
NJ-NExT Fellows Workshop	Apr. 2021
Theoretical Ecology Seminar Series	2020 - 2021
UC Davis DataLab Introduction to Git Workshop	Dec. 2020
Banff International Research Station	May 2020
Nat'l Institute for Math and Bio Synthesis (NIMBioS) Math Modeling of Malaria Transmission by Mosquitoes	Apr. 2020
University of Delaware, Newark, Delaware Workshop on Topology: Identifying Order in Complex Systems	Nov. 2019

Centre de Recherches Mathématiques: Topological and Rigorous Computational Methods for High Dimensional Dynamics	Apr. 2019
MSRI Stochastic Partial Differential Equations	Jul. 2014
GGAM Mini-Conference	Jan. 2014
GGAM Mini-Conference	Jan. 2013

TEACHING

Rutgers University – New Brunswick (Lecturer)

Discrete and Probabilistic Models in Biology (Math 338)	Spr. 2021
Intro to Abstract Algebra I (Math 351)	Fal. 2020
Intro to Linear Algebra (Math 250)	Fal. 2020
Intro to Real Analysis I (Math 311)	Spr. 2020
Discrete and Probabilistic Models in Biology (Math 338)	Spr. 2020
Mathematical Statistics (Math 481)	Fal. 2019

University of California – Davis (TA and Lecturer)

2012 - 19

Precalculus (TA)
(Math 12)

Short Calculus (TA)
(Math 16B)

Calculus for Biologists (IOR, TA)
(Math 17A,B,C)

Calculus for Math and Engineering (TA)
(Math 21A,B,C,D)

History of Mathematics (TA)
(Math 111)

Ordinary Differential Equations (TA)
(Math 119A)

Mathematical Biology (TA)
(Math 124)

Real Analysis (TA)
(Math 125A)

Applied Mathematics (TA)
(Math 207C)

LETTER WRITERS

Juan Bonachela

Position: Assistant Professor (Dept. of Ecology, Evolution, and Natural Resources)

Institution: Rutgers University

Email: juan.bonachela@rutgers.edu

Jennifer Gremer

Position: Associate Professor (Dept. of Evolution and Ecology)

Institution: University of California – Davis

Email: jrgremer@ucdavis.edu

Timothy Lewis

Position: Professor (Dept. of Mathematics) (Teaching)

Institution: University of California – Davis

Email: tjlewis@math.ucdavis.edu

Konstantin Mischaikow

Position: Professor (Dept. of Mathematics)

Institution: Rutgers University

Email: mischaik@math.rutgers.edu

Sebastian Schreiber

Position: Professor (Dept. of Evolution and Ecology) (Thesis Advisor)

Institution: University of California – Davis

Email: sschreiber@ucdavis.edu

Andy Sih

Position: Professor (Dept. of Environmental Science & Policy)

Institution: University of California – Davis

Email: asih@ucdavis.edu