

CONTACT INFORMATION Associate Professor of Mathematics  
Gonzaga University  
*Office:* Bollier 217  
*Office phone:* (509) 313-5510  
*E-mail:* stover@gonzaga.edu  
*ORCID:* 0000-0001-7664-2569

CITIZENSHIP USA

RESEARCH INTERESTS Probability Theory and Stochastic Processes  
Theoretical Ecology: Demographic heterogeneity, dispersal  
Mathematical modeling (deterministic and stochastic)  
Interacting particle systems and stochastic spatial models, contact process  
Stochastic domination/ordering, attractiveness, monotonicity  
Simulation and sampling techniques, MCMC, perfect sampling

EDUCATION **The University of Arizona**, Tucson, Arizona USA

Ph.D., Applied Mathematics, May 2008

- Dissertation Title: A Stochastic Spatial Model for Invasive Plants and a General Theory of Monotonicity for Interaction Map Particle Systems
- Advisor: Joseph C. Watkins, Professor of Mathematics, University of Arizona
- Area of Study: Stochastic processes, Interacting particle systems, Simulation and sampling techniques, Ecological modeling
- Graduate mathematics courses taken:
 

Principles of Analysis	Functional Analysis
Methods of Applied Mathematics	Probability Theory
Numerical Analysis	Stochastic Processes
Dynamical Systems and Chaos	Applied Complex Analysis
Perturbation Methods	Pattern Formation
Partial Differential Equations	Experimental Design
Theoretical Statistics	
- Science courses taken:
 

Quantum Mechanics	Theoretical Ecology
Experimental Physics Laboratory	Ecology
- Education courses taken:
 

Sustaining Partnerships in K-12 Science
Teaching Science and Mathematics Through Inquiry

**The University of Texas**, Austin, Texas USA

B.S., Mathematics, May 2001

- Mathematics courses taken:
 

Calculus	Real Analysis I & II
Differential Equations	Abstract Algebra I
Linear Algebra	Mathematical Modeling in Biology
Number Theory	Mathematical Statistics
Probability	Methods of Applied Math
Partial Differential Equations	Vector Calculus
- Science courses taken:
 

Classical Mechanics	Botany
Electromagnetism	Microbiology
Astronomy	Ecology
- Non-science courses taken, selected:
 

Philosophy of Language	French
Buddhism and Jainism in Ancient India	Religion and Society

**Gonzaga University**, Spokane, Washington

Title: Associate Professor of Mathematics (tenure-track)

**September 2020 to present**

Title: Assistant Professor of Mathematics (tenure-track)

**August 2018 to August 2020**

**Lyon College**, Batesville, Arkansas

Title: Assistant Professor of Mathematics (tenure-track)

**August 2013 to May 2018**

- Research: Theoretical ecology, stochastic processes.
- Taught math courses of all levels.
- Service: Curriculum committee chair, Convocation committee chair, student advising, faculty advisor to Chi Beta Phi science honorary society, speaking in philosophy courses and a variety of public forums, extensive departmental and college level service
- Outreach: Upward Bound Math Science, APPLE Project Upward Bound

**The University of California**, Earth Research Institute, Santa Barbara, California

Title: Assistant Specialist

**August 2009 to July 2013**

- Research: Using theoretical ecological models (deterministic and stochastic) to examine the impact of individual variability on population dynamics.
- Methods: Stochastic spatial models, Ordinary and partial differential equations, Integro-difference equations.  
Funded by NSF research grant.
- Co-wrote a successfully funded NSF grant

**The University of Canterbury**, Christchurch, New Zealand

Title: Postdoctoral Fellow

**September 2008 to August 2009**

- Research: Used models to study the effects of green waste dumping on plant invasions.
- Methods: Stochastic spatial models, partial and ordinary differential equations.  
Funded by the New Zealand Department of Conservation.
- Course Taught: ENCI 303 - Engineering decision making (statistics)

**The University of Arizona**, Tucson, Arizona

Graduate Student, Interdisciplinary Program in Applied Mathematics

**August 2001 to August 2008**

*Teaching Associate*

**January 2008 to June 2008**

*VIGRE Fellow*

**June 2007 to January 2008**

*CATTS Fellow*

**June 2006 to June 2007**

*Teaching Associate*

**August 2005 to June 2006**

*Teaching Assistant*

**August 2002 to June 2005**

*VIGRE Fellow*

**August 2001 to August 2002**

**The University of Texas**, Austin, Texas

Undergraduate Student, Mathematics

**August 1998 to May 2001**

- Grader: calculus
- Work Study at J.J. Pickle Research Center Wind Tunnel Lab  
*Built digital 3D model of wind tunnel facility*

**Gonzaga University**, Spokane, Washington

Math 490 - Directed Reading: Topics in Actuarial Science (1 student), Sp22

Math 423 - Stochastic Processes, Sp21, Sp23 (upcoming)

Math 422 - Mathematical Statistics, Sp20

Math 421 - Probability Theory, Fa19 (2 sections), Fa21, Fa22 (current)

Math 414 - Real Analysis II, Sp21

Math 413 - Real Analysis I, Fa20

Math 321 - Statistics for Experimentlists, Fa18, Sp19, Su19, Sp20 (2), Sp21, Sp22

Math 259 - Calculus-Analytic Geometry III, Sp19, Fa21 (2), Sp22, Fa22/Sp23 (x3, current & upcoming)  
Math 258 - Calculus-Analytic Geometry II, Fa18 (2)  
Math 147 - Precalculus, Fa19  
Math 103 - Excursions in Mathematics, Fa20 (2)

**Lyon College**, Batesville, Arkansas

MTH 450 - IS: Topology (independent study, 1 student), S18  
MTH 450 - IS: Mathematical Modeling (independent study, 1 student), S16  
MTH 445 - ST: Applied Mathematics, F16  
MTH 440 - Advanced Calculus I (real analysis), S14, S18  
MTH 360 - Probability and Statistics, S15, S17  
MTH 380 - Modern Geometry, F13  
MTH 330 - Linear Algebra, F15  
MTH 300 - Differential Equations, S14, S15, S16, S17, S18  
MTH 230 - Calculus III, F14, F15, F16, F17  
MTH 220 - Calculus II, S15  
MTH 210 - Calculus I, F13, F14  
MTH 110 - Elementary Functions (pre-calculus), F13, S14, F14, F15, S16, F16, S17, F17 (2)  
MTH 105 - Math for Liberal Arts (quantitative literacy), F15, S16, F16, S18  
MTH 101 - College Algebra, F17  
COR 100 - Year One (freshman seminar course), F14, F15, F16, F17

**University of Canterbury**, Christchurch, New Zealand

ENCI 303 - Engineering Decision Making, April-June 2009

**University of Arizona**, Tucson, Arizona

Math 160 - Basic Statistics, Spring 2008  
Math 125 - Calculus I, Fall 2005  
Math 115A - Business Mathematics I, Spring 2006  
Math 113 - Elements of Calculus, Spring 2005, Summer 2005  
Math 110 - College Algebra, Fall 2002, Spring 2003, Fall 2003, Spring 2004, Fall 2004

ADVISING  
EXPERIENCE

**Gonzaga University**

5 current formal advisees: 1 Math maj., 4 Applied Math maj.  
8 previous advisees graduated, 3 previous advisees changed majors  
Written numerous reference letters for graduate school, internships, jobs (approx. 57 letters for 13 students over 4 years)  
Advised students on career pathways and general life advice/discussions

**Lyon College**

Freshman student advising (advised ~ 40 freshmen over 5 years)

- Taught 1 credit semester-long core course 4 times
- Participated in orientation activities and service projects
- Advised students on adjusting to college life
- Advised students on course schedules and choosing majors
- Much experience with first generation and first time-full time students
- Worked closely with many students through many personal and academic issues

Mathematics major advising (advised ~ 20 math majors over 5 years)

- Advised students on mathematics careers
- Advised students on 4 year academic plan
- Coordinated with other academic programs for double-majors, and pre-professional programs
- Wrote numerous reference letters for graduate school, grants, and summer REU applications (approx. 67 letters for 13 students over 5 years)

STUDENT  
RESEARCH  
PROJECTS

**Gonzaga University**

*Geometric Brownian Motion Bitcoin Model*, Austin Biondi, 2021-2022  
*Markov chain models for mean global surface temperature*, Allison Hayes, 2019-2020, 2022

**Lyon College**

*Delay Differential Equations for Population Modeling*, Nathaniel (Jordan) Covey, 2016  
*Predator-Prey Models with Harvesting*, Jacob Perkins, 2016  
*Differential Equations as Physical Models*, Morgan Webb and Jacob Perkins, 2016  
*Disease Survival in a Branching Process Model*, Hope Woods, 2015  
*Species Heterogeneity in the Lotka-Volterra Competition Model*, Wesley Perkins, 2014  
*Heterogeneous Susceptibility in the SIR Population Model*, Hope Woods, 2014

INSTITUTIONAL  
SERVICE

**Gonzaga University**, Spokane, Washington

Lead role in creation of new Statistics academic program (minor and concentration), Sp 2021 - Sp 2022  
Academic Council Assessment Committee, Fall 2020-present  
Lead role in creation of new Actuarial Science academic program, 2019-2021  
Created new course: Math 423 Stochastic Processes  
Created new course: Math 221 Applied Statistics  
Mathematics core assessment committee, member, Fall 2018-present, chair Fall 2019-present  
Applied mathematics committee, member, Fall 2018-present  
Mathematics tenure-track hiring committee, member, 2019-2020  
Mathematics tenure-track hiring committee, member, 2018-2019  
One hour per week in mathematics tutoring lab  
Represented Mathematics department at recruitment events (GEL)  
Faculty advisor to Actuarial Science Club, Student Rotary Club

**Lyon College**, Batesville, Arkansas

Curriculum Committee, member fall 2014-spring 2017  
Chair, fall 2015-spring 2017

- Rewrote college governance policy on curricular proposal process
- Made new curricular proposal forms (completely digitized the process)
- Lead the committee through several major program restructuring proposals

Convocation Committee, member fall 2014-spring 2017  
Chair, fall 2015-spring 2017

Faculty Search Committee  
Served on search committees for Psychology, French, Math, and Computer Science

Taught Year One Freshman Core Course (4 semesters)  
Lead students on service project  
Help students adjust to college life

Academic Advising  
Advising of both freshman undeclared students and math majors (~50 advisees over 5 years)

Miscellaneous service, select, too much to list everything  
Speaking in philosophy and religion classes  
Demonstrate sitar in music classes and at public events  
Various student recruitment events

OUTREACH  
EXPERIENCE

Teaching and volunteer service for Federally funded TRIO programs.

APPLE Project Upward Bound, Lyon College (Summer 2014, 2017)

- Developed and delivered course: Math & Ecology
- Curriculum: Mathematical models of ecological processes

Upward Bound Math Science, Lyon College

- Taught Math ACT Preparation Course (Summer 2014, 2015, 2016, 2017)
- Taught scientific research group: Math Modeling & Ecology (Summer 2015)
- Taught scientific research group: Science of Sound (Summer 2016)
- Volunteer work in a number of capacities

CATTS fellowship, June 2006 - June 2007.

*Collaboration to Advance Teaching Technology and Science*

Worked closely with K-12 teachers and students, curriculum development, lecturing, student supervision in classroom and on field trips.

- Worked in high school classrooms developing math and science curriculum and lecturing
- Supervised students in the classroom and on field trips
- Judged science fair projects at several schools
- Interacted closely with minority and under-represented students

Native American Summer Institute, May-June 2006.

- A joint endeavor of the Pascua Yaqui Tribe, Wa:k O'odham Community, & The University of Arizona, Summer math camp
- Worked closely with Hispanic and Native American students, activity development and tutoring, student supervision in classroom and on field trips.
- Designed activities and worked as a tutor and supervisor, Participated in field trips and student projects, interacted closely with underrepresented students

- SUBMITTED MANUSCRIPT Stover, J.P. (2022), *Stochastic domination for hidden Markov chains and multirate point processes with application to the contact process in a multitype random environment*, Submitted for peer-review to: Annals of Probability.
- PEER-REVIEWED PUBLICATIONS Stover, J.P. (2022), *Bounds via spectral radius-preserving row sum expansions*, Electronic Journal of Linear Algebra 38:367–376 DOI: 10.13001/ela.2022.6981
- Stover, J.P. (2020), *A stochastic comparison result for the multitype contact process with unequal death rates*, Statistics & Probability Letters, 162:108763, DOI: 10.1016/j.spl.2020.108763
- Kendall, B.E., Fox, G.A. & Stover, J.P. (2018), *Boldness-aggression syndromes can reduce population density: behavior and demographic heterogeneity*, Behavioral Ecology, 29(1):31–41, DOI: 10.1093/beheco/ax068 (4 citations)
- Stover, J.P., Kendall, B.E. & Nisbet, R.M. (2014), *Consequences of dispersal heterogeneity for population spread and persistence in the face of advection*, Bulletin of Mathematical Biology, 76(11):2681–2710, DOI: 10.1007/s11538-014-0014-z (7 citations)
- Stover, J.P., Kendall, B.E. & Fox, G.A. (2012), *Demographic heterogeneity impacts density-dependent population dynamics*, Theoretical Ecology, 5(2):297–309. DOI: 10.1007/s12080-011-0129-x (41 citations)
- OTHER SCHOLARSHIP Stover, J. (2010), *Attractive n-type contact processes*, arXiv: 1006.5723 [math.PR] (4 citations)
- CONFERENCE PROCEEDINGS Paul De Palma, Leon Antonio Garcia-Camargo, Jeb Kilfoyle, Mark Vandam, Joseph Stover (2021) *Speech tested for Zipfian fit using rigorous statistical techniques*, Proceedings of the Linguistic Society of America, Vol 6, No 1, DOI:10.3765/plsa.v6i1.4975
- Timmins, S.M., James, A., Stover, J., & Plank, M. (2010), *Is garden waste dumping really a problem?*, 17th Australasian Weeds Conference Papers and Proceedings, p.455–458  
URL: <http://caws.org.nz/old-site/awc/2010/awc201014551.pdf>
- SELECTED PRESENTATIONS *Simulation of Random Processes on Graphs: Reconstructing the Entire State Space as a Single Graph*, February 29, 2020. Data Science and Image Analysis Conference of the Pacific Northwest, Washington State University, Pullman, WA.
- Demographic heterogeneity and how it impacts population dynamics*, February 14, 2020. Biology seminar, Gonzaga University, Spokane, WA.
- Individual heterogeneity and its impact on ecological population dynamics*, October 2020. Short oral presentation. SIAM conference, invited talk, UCLA, Seattle, WA.
- Attractiveness, coupling, and interacting particles*, May 2019. Spokane regional mathematics colloquium, Gonzaga University, Spokane, WA.
- Multitype contact process with unequal death rates*, March 2019. Short oral presentation and poster shown. Interacting particle systems, statistical physics, and related topics conference, UCLA, Los Angeles, CA.
- Demographic Heterogeneity, Behavioral Syndromes, & Population Dynamics*, October 2017. Lyon College Faculty Colloquium, Batesville, AR.
- Effects of demographic and competitive heterogeneity on species coexistence*, October 2012. Invited talk. Western sectional meeting, American Mathematical Society, Tucson, AZ.
- Heterogeneity in dispersal and the spread of populations*, August 2012. The Ecological Society of America Conference, Portland, Oregon.
- Demographic Heterogeneity Impacts Density-Dependent Population Dynamics*, August 2010. The Ecological Society of America Conference, Pittsburgh, Pennsylvania.
- Exact Sampling for Interacting Particle Systems*, February 2010. Department of Statistics and Applied Probability Seminar Series, University of California, Santa Barbara, California.
- Stochastic Spatial Models within an Ecological Framework*, January 2010. Theoretical Ecology Seminar Series, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, California.
- Interacting Particle Systems and Exact Sampling*, April 2009. Department of Mathematics Seminar Series, University of Canterbury, Christchurch, New Zealand.

*Contact Processes: Stochastic Spatial Competition Models*, December 2008. Australia and New Zealand Math Conference 2008, University of Canterbury, Christchurch, New Zealand.

*Garden Waste Dumping and the Spread of Weeds*, September 2008. New Zealand Ecological Society Conference 2008, Unitec, Auckland, New Zealand.

*Attractive  $n$ -Type Contact Processes*, Summer 2008. Cornell Summer Probability School, Department of Mathematics, Cornell University, Ithaca, New York.

*A Monotone, Multi-Particle Contact Process for Plant Invasions*, Summer 2007. Poster shown. The Ecological Society of America and the Society for Ecological Restoration Joint Meeting, San Jose, California.

*A Multi-Particle, Monotone Contact Process for Invasive Species*, Spring 2007. Los Alamos Days Conference, University of Arizona, Tucson, Arizona.

REFEREE SERVICE *American Naturalist* (2021)

*Aletheia—The Alpha Chi Journal of Undergraduate Scholarship* (2015)

*Journal of Mathematical Biology* (2013)

*Oikos* (2012)

*Electronic Journal of Probability* (2010)

PROFESSIONAL MEMBERSHIPS Institute of Mathematical Statistics (IMS), 2019, 2022

Bernoulli Society for Mathematical Statistics and Probability, 2019, 2022

Society for Industrial and Applied Mathematics (SIAM), 2022

Ecological Society of America (ESA), 2007, 2010, 2012

GRANTS National Science Foundation: Population and community ecology program,  
Title: *Demographic heterogeneity in landscapes and communities*,  
January 2011. Funded \$260,000.

SCHOLARSHIPS, AWARDS The University of Arizona

- VIGRE Graduate Fellowship, 2001, 2007
- CATTs Fellowship, 2006

The University of Texas

- Ray Fisher Memorial Scholarship, 1999

HOBBIES Hiking, rock climbing, camping; guitar/bass; sitar/tabla; gardening; cooking; philosophy and science

LANGUAGES English (native speaker), French (reading proficient), Mandarin Chinese (HSK level 3)

COMPUTER/TECHNICAL SKILLS Mathematics Software: MATLAB, R, Maple, Mathematica, MiniTab, Excel

MATLAB experience: stochastic processes, Markov Chain Monte Carlo sampling methods, linear algebra, partial and ordinary differential equations, statistics, visualization, GUI

R experience: basic statistics and data analysis, stochastic process simulation, predictive analytics, classification and regression trees, support vector machines, analysis of variance, meta-analysis, R Markdown

Programming languages: MATLAB/Octave (advanced), R (advanced), Java (Android API & AOSP, add-supported app created & submitted to Google Play Store), C++, Javascript, Actionscript

Markup languages: L<sup>A</sup>T<sub>E</sub>X, R Markdown, HTML, CSS

Operating Systems: Microsoft Windows, Mac OS, Linux & Unix

Multiple applications for digital media (graphical & sound) processing, including:  
Adobe Audition & Photoshop, Autodesk 3D Studio

Experience with Android programming environment, GIT

REFERENCES Available upon request