

Zachary R. Miller
1101 E 57th St, Chicago, IL 60637

Email: zachmiller@uchicago.edu
Web: zacharyrmiller.netlify.com

EDUCATION

University of Chicago

Ph.D. candidate in Ecology and Evolution
Advisor: Stefano Allesina

Chicago, IL
Sept. 2017 – Present

Yale University

B.S. *magna cum laude* in Ecology and Evolutionary Biology (with distinction) &
Applied Mathematics
Advisors: Oswald Schmitz and David Vasseur

New Haven, CT
May 2017

PUBLICATIONS

(* equal contribution)

Z.R. Miller, and S. Allesina. *Metapopulations with habitat modification*. In review. Pre-print (bioRxiv):
<https://doi.org/10.1101/2021.05.27.446046>

C.A. Serván, J.A. Capitán, **Z.R. Miller**, and S. Allesina. *Effects of phylogeny on coexistence in model communities*. Pre-print (bioRxiv): <https://doi.org/10.1101/2020.09.04.283507>

D.S. Maynard, **Z.R. Miller**, and S. Allesina. *Predicting coexistence in experimental ecological communities*. *Nature Ecology & Evolution*, 4 (2020). DOI: 10.1038/s41559-019-1059-z.

Z.R. Miller. *Digest: Does sexual conflict complicate a trade-off between fecundity and survival?*. *Evolution* (2019). DOI: 10.1111/evo.13855

A.J. Mossman*, K.E. Culhane*, **Z.R. Miller***, K.M. Brock*, P. Pafilis, and C.M. Donihue. *Natrix natrix (LINNAEUS, 1758) found on the small islet of Tigani (Central Cyclades, Greece)*. *Herpetozoa*, 29 (2016).

PROFESSIONAL EXPERIENCE

RESEARCH POSITIONS:

Yale University, School of Forestry and Environmental Studies
NSF-REU Research Assistant with Oswald Schmitz

New Haven, CT
May 2016 – Sept. 2016

University of Delaware, College of Earth, Ocean, and Environment
NSF-REU Research Assistant with Adam Marsh

Lewes, DE
June 2015 – Aug. 2015

Yale University, Department of Ecology and Evolutionary Biology
Field Assistant with Oswald Schmitz and Colin Donihue

Naxos, Greece
June 2014 – Aug. 2014

Lehigh University, Department of Mechanical Engineering and Mechanics
Research Assistant with John Coulter

Bethlehem, PA
June 2013 – Aug. 2013

Kutztown University, Department of Biology
Field Assistant with William Towne

Kutztown, PA
June 2013 – Aug. 2013

OTHER EXPERIENCE:

Yale University, Department of Mathematics
Course Grader for linear algebra and multivariable calculus

New Haven, CT
Sept. 2014 – May 2016

Yale University Press, Sciences and Medicine Division
Editorial Intern supporting acquisitions editors

New Haven, CT
Sept. 2013 – Oct. 2014

TALKS AND PRESENTATIONS

(* presenter; † invited talk)

†**Z.R. Miller***. *Coupled metapopulation dynamics with patch memory and modification*. Princeton University Theoretical Ecology Lab Tea. Virtual seminar. 3 February 2021.

Z.R. Miller*, C.A. Serván, P. Lemos-Costa, A. Skwara, and S. Allesina. *Testing the predictive value of phylogeny for community productivity*. Ecological Society of America (ESA) Annual Meeting. Virtual conference. 3 August 2020. Video: https://zacharyrmiller.netlify.app/talk/esa_2020/video

Z.R. Miller*, D.S. Maynard, and S. Allesina. *Predicting coexistence in experimental ecological communities*. Ecological Society of America (ESA) Annual Meeting. Louisville, KY. 13 August 2019. Slides: <https://doi.org/10.7490/f1000research.1117379.1>

†**Z.R. Miller***. *Modeling complex networks as intersection graphs*. UChicago Neuroscience Theory Club. Chicago, IL. 26 April 2019.

†**Z.R. Miller***. *Elemental cycling, physiological stress, and ecosystem functioning: Confronting a stoichiometrically-explicit model with data*. Yale Ecology and Evolutionary Biology Senior Symposium. New Haven, CT. 2 May 2017.

Z.R. Miller*. *Meltdown averted?: Re-examining “migrational meltdown” in a two-patch model with genotype-dependent dispersal*. Saybrook College Mellon Forum. New Haven, CT. 29 March 2017.

J.W. Rogers*, M.E. Casey, **Z.R. Miller**, S.S. Jedlicka, and J.P. Coulter. *Micromanufacturing of consistent micro petri dish biointerfaces to guide stem cell mechanotransduction*. Society of Plastics Engineers ANTEC Conference. Las Vegas, NV. 28 - 30 April 2014.

TEACHING

Computing Skills for Biologists , Teaching Assistant Supported students with programming exercises and delivered guest lecture on advanced programming practices. (Graduate).	University of Chicago Winter 2020
Principles of Population Genetics , Teaching Assistant Led weekly paper discussions and review sessions. Provided supplemental instruction for computational and mathematical topics. (Graduate).	University of Chicago Winter 2019
Fundamentals of Biological Data Analysis , Teaching Assistant Worked closely with students in project-based course. Developed and presented guest lectures on scientific visualization and PCA. (Undergraduate)	University of Chicago Fall 2018
Statistics Theory and Methods , Peer Tutor Lead weekly study groups with Biology PhD students taking statistics coursework. Review and reinforce concepts and skills from lecture.	University of Chicago Fall 2019 – Present
Software Carpentry , Workshop Instructor Lead workshops on programming basics (R-based), version control, and Unix shell. Collaborate with instructor team to design workshop content.	University of Chicago Aug. 2019 – Present
Quantitative Biology Bootcamp , Course Assistant Supported week-long intensive course for new PhD students. Lectured on population genetics and R programming.	University of Chicago Sept. 2019
Linear Algebra Tutorial , Lecturer Led linear algebra tutorial for Winter School on Quantitative Systems Biology hosted by The Abdus Salam International Centre for Theoretical Physics.	ICTP (virtual) Dec. 2020

FELLOWSHIPS AND AWARDS

NSF Graduate Research Fellowship (GRFP) – \$102 000 DGE-1746045	2019 – 2024
Edgar J. Boell Prize “Awarded annually to a senior for excellence in biology” (Yale University)	2017
NSF Research Experiences for Undergraduates (REU) – \$6000 Supplement to DEB-1354762 (Yale University)	2016
NSF Research Experiences for Undergraduates (REU) – \$5500 REU site OCE-1460963 (University of Delaware)	2015
Yale College Summer Environmental Fellowship – \$1500	2014
Yale College Freshman Summer Research Fellowship – \$3400	2014

PROFESSIONAL SERVICE

Reviewer

PLOS Computational Biology, Methods in Ecology and Evolution, New Phytologist, Journal of Mathematical Biology, Ecography, Oikos

Student Seminar Chair, Department of Ecology and Evolution
Organize and host weekly student research seminars; organize selection of student-invited seminar speakers. Chicago, IL
June 2020 – Present

Student Representative, Graduate Admissions Committee
Evaluated applications for PhD program. Interviewed top candidates. Chicago, IL
Solicited, summarized, and presented student input for admissions decisions. Nov. 2018 – Mar. 2019

Co-president, Yale Ecology and Evolutionary Biology Undergraduates Society
Organized department outreach events, field trips, and social activities. New Haven, CT
June 2016 – May 2017

OUTREACH

Volunteer Tutor, Strive Tutoring (2018-2019) and Tutoring Chicago (2020)
Provided one-on-one instruction and support to local K-12 students, with emphasis on math and science. Chicago, IL
Jan. 2018 – June 2021

Exam Writer and Grader, UChicago Science Olympiad
Assisted undergraduate Science Olympiad chapter in writing and grading ecology and herpetology exams for high school invitational. Chicago, IL
Jan. 2018 – Jan. 2019

Staff Writer, Yale Scientific Magazine
Authored articles on scientific research for a general audience. A selection of articles available at <http://www.yalescientific.org/author/zacharymiller/>. New Haven, CT
Sept. 2013 – May 2016

Event Volunteer, Resonance
Guided visiting high school students through events and tours on Yale’s campus. New Haven, CT
Led student discussions on academic interests, goals, and research opportunities. Sept. 2014 – Dec. 2016

Event Volunteer, Science on Saturdays
Conducted science demonstrations and hands-on activities for local K-8 students. New Haven, CT
Sept. 2013 – May 2015

COMPUTATIONAL SKILLS

Languages: R (expert); Python, Java, MATLAB (proficient); C (limited)

Other programs: L^AT_EX, Git, Mathematica

Relevant coursework: Design and Analysis of Algorithms, Approximation Algorithms, Machine Learning for Biology, Optimization Techniques

OTHER SKILLS AND QUALIFICATIONS

Language: English (native), Spanish (limited working proficiency)

Field research skills: Capture, handling, and care of live animals; Plant transects and identification; Mark-recapture; Certified small boat operator (NASBLA / Delaware)

Selected coursework: Networks in Ecology and Evolution, Stochastic Processes, Information Theory, Modern Combinatorics (random graphs and matrices), Dynamics of Ecological Systems, Ordinary and Partial Differential Equations, Linear Algebra and Matrix Theory