Theo Gibbs

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Education

Present September 2019	**Princeton University**, Princeton, NJ USA *PhD Candidate and NSF GRF in Quantitative and Computational Biology (QCB)* Advisers: Jonathan Levine and Simon Levin | GPA: 3.925 / 4.000 Research Interests: higher-order interactions, species coexistence.
April 2021 September 2019	**Princeton University**, Princeton, NJ USA *MA in Quantitative and Computational Biology (QCB)*
June 2018 September 2014	**University of Chicago**, Chicago, IL USA *BS in Mathematics with Honors* | GPA: 3.77 / 4.00

Publications

Preprints

→ **Gibbs, T.**, Gellner, G., Levin, S., McCann, K., Hastings, A. & Levine, J. Can higher–order interactions resolve the species coexistence paradox? bioRxiv (2023).

Published

→ **Gibbs, T.**, Levin, S. & Levine, J. Coexistence in diverse communities with higher-order interactions. *Proceedings of the National Academy of Sciences* (2022).

→ **Gibbs, T.**, Zhang, Y., Miller, Z. & O'Dwyer, J. Stability criteria for the consumption and exchange of essential resources. *PLoS Computational Biology* (2022).

→ Yamamichi, M., **Gibbs, T.**, & Levine, J. Integrating eco-evolutionary dynamics and modern coexistence theory. *Ecology Letters* (2022).

→ Levine, J., Levine, J., **Gibbs, T.** & Pacala, S. Competition for water and species coexistence in phenologically structured annual plant communities. *Ecology Letters* (2022).

→ D'Andrea, R.*, **Gibbs, T.*** & O'Dwyer, J. Emergent neutrality in consumer-resource dynamics. *PLoS Computational Biology* (2020). (* denotes equal contribution).

→ **Gibbs, T.**, Grilli, J., Rogers, T., & Allesina, S. Effect of population abundances on the stability of large random ecosystems. *Physical Review E* (2018).

Professional Experience

Research Experience

Present September 2019	**Lewis-Sigler Institute for Integrative Genomics, Princeton University** *PhD student in the labs of Professors Jonathan Levine and Simon Levin*
August 2019 August 2018	**Department of Plant Biology, University of Illinois at Urbana-Champaign** *Full-time research assistant in the lab of Professor James O'Dwyer*
July 2018 July 2016	**Department of Ecology & Evolution, University of Chicago** *Undergraduate research assistant in the lab of Professor Stefano Allesina*

Mentoring and Teaching Experience

December 2023 — September 2023	**Assistant in Instruction, Princeton University** *Taught Mathematical Methods in Biology and Medicine with Professor Corina Tarnita*
Present — June 2023	**Undergraduate Research Mentoring, Princeton University** *Supervised research project for a BS student at Georgia Tech on spatial higher-order interactions*
September 2022 — June 2022	**Undergraduate Research Mentoring, Princeton University** *Supervised summer project for a BS-MS student at IISER Pune on spatial higher-order interactions*
September 2022 2022 — February 2020	**Undergraduate Research Mentoring, University of Illinois at Urbana-Champaign** *Supervised research experience for sophomore Yifan Zhang which resulted in a co-authored paper*
June 2022 — January 2022	**Assistant in Instruction, Princeton University** *Lead weekly precepts and graded quizzes and homework for the class Theoretical Ecology*
March 2017 — September 2016	**College Core Tutor, University of Chicago** *Tutored students in math classes up to and including analysis*
June 2016 — September 2015	**MATH 151-152-153 VCA, University of Chicago** *Teaching assistant for a yearlong calculus sequence*

Honors and Awards

August 2023	Honorable mention for the 2023 ESA Outstanding paper award in theoretical ecology
May 2023	Mary and Randall Hack '69 Graduate Award for Water and the Environment
March 2023	QCB Nominee for University-Wide Honorific Fellowship
April 2021	NSF Graduate Research Fellow
May 2020	AAAS/Science Program for Excellence in Science
September 2019	Institute Scholars Award in Quantitative and Computational Biology
June 2018	The Dean's List Every Quarter at the University of Chicago
June 2018	General Honors at the University of Chicago
June 2018	Honors in Mathematics at the University of Chicago
March 2018	Fulbright US Student Research Award Semifinalist

Outreach and Service

Present March 2023	**Graduate Student Representative on the QCB Climate Committee, Princeton University** *Met regularly with administrators, postdocs and faculty to improve the climate in QCB* Supervised different activities, including climate surveys and the open house Recruited graduate student volunteers to work on various climate-related initiatives
Present September 2021	**QCB Peer Mentor, Princeton University** *Co-organized and participated in QCB Peer Mentor Program* Assigned peer mentors to first-year students and supervised program Met with first-year QCB graduate students to offer advice on rotations, choosing advisers and graduate life
Present October 2020	**Access, Diversity and Inclusion Outreach Student Ambassador, Princeton University** *Recruited students from under-represented backgrounds with the ADI team at Princeton* Annual participant in the Ivy + Graduate School Fair to recruit prospective students from Puerto Rico Annual panelist in the Prospective PhD Preview – the university-wide diversity and inclusion recruitment event
Present August 2020	**QCB Virtual Open House, Princeton University** *Organized the first (and now annual) virtual QCB open house with a team of graduate students* Created to recruit applicants from non-traditional and under-represented backgrounds Set up a faculty panel and graduate student discussion room for participants' questions
May 2021 January 2021	**Theoretical Ecology Lab Tea Organizer, Princeton University** *Organized the Theoretical Ecology Lab Tea weekly seminar series* Recruited graduate students, postdocs and professors at Princeton and elsewhere to give a weekly seminar Scheduled meetings, introduced speakers and facilitated a half-hour discussion after each talk
June 2021 May 2020	**Princeton Online Tutoring Network, Princeton University** *Provided free tutoring assistance to under-served K-12 students in the local community* Tutored middle and high school math virtually during the COVID-19 pandemic Created lesson plans and curricula for Algebra 1 and 2

Talks and Seminars

Invited

→ Colloquium in the Department of Mathematics and Statistics at TCNJ, November 14, 2023. Ewing, USA.

→ Talk in the minisymposium "Hypernetworks and their dynamics in theory and applications" at ICIAM 2023, August 24, 2023. Tokyo, Japan.

→ Talk in the D'Andrea group at SUNY Stony Brook, July 18, 2022. Stony Brook, USA.

Contributed

→ Contributed talk in the Modeling: Communities, Disturbance, Succession section at ESA, August 9, 2023. Portland, USA.

→ Seminar at Theoretical Ecology Lab Tea at Princeton University, April 19, 2023. Princeton, USA.

→ QCB Graduate Student Colloquium at Princeton University, April 12, 2023. Princeton, USA.

→ Contributed Talk to the Ecological Dynamics session of the APS March Meeting, March 7, 2023. Las Vegas, USA.

→ Contributed talk in the Theoretical and Computational Ecology section at BES Edinburgh, December 19, 2022. Edinburgh, Scotland.

→ Contributed talk in the Modeling section at ESA/CSEE, August 16, 2022. Montreal, Canada.

→ Seminar at Theoretical Ecology Lab Tea at Princeton University, March 30, 2022. Princeton, USA.

→ Contributed Talk to the Ecological and Evolutionary Dynamics session of the APS March Meeting, March 16, 2022. Chicago, USA.

→ QCB Graduate Student Colloquium at Princeton University, March 2, 2022. Princeton, USA.

→ Seminar at Theoretical Ecology Lab Tea at Princeton University, October 6, 2021. Princeton, USA.

→ QCB Graduate Student Colloquium at Princeton University, April 7, 2021. Princeton, USA.

→ Seminar at Theoretical Ecology Lab Tea at Princeton University, June 24, 2020. Princeton, USA.

→ Lightning Talk at Towards an Integration of Diverse Concepts in Community Ecology at the University of Tokyo, October 5th, 2019. Tokyo, Japan.

→ Contributed Talk in the Ecology Session at NetSci 2018, June 13 - 15, 2018. Paris, France.

→ Poster at the Chicago Area Undergraduate Research Symposium 2018, April 15, 2018. Chicago, USA.

→ Poster at the Chicago Midstates Research Symposium in Physical Sciences, November 3-4, 2017. Chicago, USA.

→ Poster at the UChicago Undergraduate Research Symposium, October 6, 2017. Chicago, USA.

Reviewer

PNAS, PloS Computational Biology, Communications Biology, American Naturalist, Physical Review E, Scientific Reports, Ecology Letters, Theoretical Ecology.

Programming Skills

R, Python, C, LaTeX & Git.

Relevant Coursework

Statistical Mechanics of Biological Networks	Method and Logic in Quantitative Biology
Introduction to Genomics and Computational Molecular Biology	Stochastic Processes in Continuous Time: Ecology and Epidemiology
Dynamical Systems with Applications	Markov Chains, Martingales, and Brownian Motion
Phase Transitions and the Renormalization Group	Basic Theory of Ordinary Differential Equations