

Professional Appointments

High Meadows Environmental Institute, Postdoctoral Research Affiliate Princeton University, USA Mentors: Simon Levin and Jonathan Levine	2024–present
Research Affiliate, Nature Conservation Foundation–Snow Leopard Trust, India	2018–2019

Education

PhD in Biology, Stanford University, USA Adviser: Shripad Tuljapurkar Dissertation: <i>Dynamics at Multiple Scales: Sites, Individuals, and Populations.</i>	2019–2024
MS in Mathematics, Shiv Nadar University, India	2015–2017
BSc, St. Stephen's College, University of Delhi, India	2012–2015

Research Interests

Theoretical ecology; stochastic population and community dynamics; demography, ecological stability, and transient dynamics; socio-ecological systems.

Publications

Manuscripts in Review and Preprints

13. [Life history traits predict the contribution of transient dynamics to variation in population growth.](#) Lin, Hung-wei, Hernández, Christina M., **Jaggi, Harman**, Zuo, Wenyun, Tuljapurkar, Shripad D., Salguero-Gómez, Roberto (2026). *bioRxiv*
12. [Snow leopard-mediated apparent competition between wild ungulates and domestic livestock in the Trans-Himalaya.](#) Bajaj, D., Khanyari, M., **Jaggi, Harman**, Chhering, T., Chunit, K., Gurmet, K., Thinley, T., Thuktan, T., Tobge, R., Sharma, D., Mishra, C., Sharma, R. K., and Suryawanshi, K. (2026). *bioRxiv*; in review (*Journal of Applied Ecology*)
11. [Noise and determinism in Trinidadian guppy population dynamics.](#) **Jaggi, Harman**, Bassar, R., Travis, J., Nabeel, A., Reznick, D., and Levin, S. (2026). *bioRxiv*; in review (*PNAS*)
10. [A robust method for quantifying the contribution of transient dynamics to variation in population growth rate.](#) Hernández, C. M. *, **Jaggi, Harman** *, Cant, J., Zuo, W., Tuljapurkar, S., and Salguero-Gómez, R. (2026). *EcoEvoRxiv*; in review (*Ecological Modelling*)

*Equal contribution.

Peer-Reviewed Publications

9. [Transient dynamics and nonlinear fitness: A matrix approach to pulse and press perturbation.](#) **Jaggi, Harman**, Tuljapurkar, S., Zuo, W., Gascoigne, S. J. L., Kajin, M., and Salguero-Gómez, R. (2026). *Ecology*, 107(6), e70433.

8. [Second-order elasticities for ecology and evolution: Unravelling nonlinear fitness responses to perturbations.](#) Kajin, M., Tuljapurkar, S. D., Zuo, W., **Jaggi, Harman**, Gascoigne, S. J. L., and Salguero-Gómez, R. (2026). *Ecology*, in press.
7. [Biocultural vulnerability of traditional crops in the Indian Trans-Himalaya.](#) **Jaggi, Harman**, Anand, A., Solari, K. A., Echeverri, A., Tobge, R., Tsewang, T., Suryawanshi, K., and Tuljapurkar, S. D. (2025). *Science Advances*, 11(33), eadu6611.
6. [Generalizing the theory to include age and stage.](#) Tuljapurkar, S., **Jaggi, Harman**, and Zuo, W. (2025). In *Encyclopedia of Evolutionary Biology*, 2nd edition.
5. [Structured demographic buffering: A framework to explore the environmental components and demographic mechanisms underlying demographic buffering.](#) Gascoigne, S. J. L., Kajin, M., Tuljapurkar, S. D., Silva Santos, G., Compagnoni, A., Steiner, U. K., Vinton, A. C., **Jaggi, Harman**, Sepil, I., and Salguero-Gómez, R. (2025). *Ecology Letters*, 28(2), e70066.
4. [Density dependence shapes life-history trade-offs in a food-limited population.](#) **Jaggi, Harman**, Zuo, W., Kentie, R., Gaillard, J.-M., Coulson, T., and Tuljapurkar, S. (2024). *Ecology Letters*, 27(11), e14551.
3. [Temporal variability can promote migration between habitats.](#) **Jaggi, Harman**, Steinsaltz, D., and Tuljapurkar, S. (2024). *Theoretical Population Biology*, 158, 195–205.
2. [Reproductive dispersion and damping time scale with life-history speed.](#) Jiang, S. *, **Jaggi, Harman** *, Zuo, W., Oli, M. K., Coulson, T., Gaillard, J.-M., and Tuljapurkar, S. (2022). *Ecology Letters*, 25(9), 1999–2008.
1. [Estimating snow leopard and prey populations at large spatial scales.](#) Suryawanshi, K., Reddy, A., Sharma, M., Khanyari, M., Bijoor, A., Rathore, D., **Jaggi, Harman**, et al. (2021). *Ecological Solutions and Evidence*, 2(4), e12115.

Manuscript in Preparation

[Gadgil's theory and models in ecology.](#) Srivastav, A., **Jaggi, Harman**, and Tuljapurkar, S. (2026). In preparation.

Fellowships, Grants, and Awards

Sustainability Science Award , <i>Ecological Society of America</i>	2026
For <i>Biocultural vulnerability of traditional crops in the Indian Trans-Himalaya</i> .	
HMEI Postdoctoral Fellowship , <i>High Meadows Environmental Institute, Princeton University</i> .	2024–2026
Samuel Karlin Prize in Mathematical Biology , <i>Stanford University</i> .	2024
Bing-Ehrlich Fellowship in Environmental Science and Conservation , <i>Stanford University</i> .	2023–2024
Graduate Student Research Fund, \$7,000 , <i>Stanford King Center on Global Development</i> .	2023–2024
Sustainability Accelerator Grant, \$80,000 , <i>Stanford University</i>	2022–2023
Team award with PI S. Tuljapurkar and G. Daily.	
SCCS Cambridge Internship Scholarship , <i>University of St Andrews, Scotland, UK</i> .	2018
JENESYS 2.0 Fellowship , <i>Government of Japan</i> .	2015
S. N. Bhatt Memorial Excellence Fellowship , <i>International Centre for Theoretical Sciences–TIFR, India</i> .	2015
Summer Research Fellowship , <i>Indian Academy of Sciences</i> .	2014

Travel Support

Banff International Research Station–Pacific Institute for the Mathematical Sciences Travel Award , <i>CAD 700</i>	2026
Society for Modeling and Theory in Population Biology Travel Award , <i>\$1,500</i>	2026

Early Career Excellence Travel Award, \$500, Gordon Research Conference on Predictive Ecology.	2023
Theoretical Ecology Section Registration Grant, Ecological Society of America	2021
Full Bursary, Student Conference on Conservation Science, University of Cambridge, UK.	2018

Invited Talks and Seminars

Santa Fe Institute, Santa Fe, New Mexico, USA.	Oct. 2026
Ecology and Evolutionary Biology Department Seminar, Princeton University, USA.	Oct. 2026
Departmental Seminar, Department of Biological Sciences, University of Calgary, Canada.	Sep. 2026
Mathematical Biology Seminar, University of Alberta, Canada.	Sep. 2026
Online Seminar, International Initiative for Theoretical Ecology	May 2026
Online seminar, Midwest Mathematical Biology Seminar	Mar. 2026
Rutgers Ecology and Evolution Seminar Series, Rutgers University, USA.	Feb. 2026
Centre for Ecological Sciences Seminar Series, Indian Institute of Science, India.	Feb. 2026
Nature Conservation Foundation, Bengaluru, India.	Feb. 2026
Stockholm Resilience Centre Brown Bag Seminar, Stockholm University, Sweden.	Jan. 2026
Department of Wildlife Ecology and Conservation, University of Florida, USA.	Oct. 2025
CEREAL Seminar, Princeton University, USA.	Sep. 2025
Superposition Fremont STEAM Week, California, USA.	Aug. 2023
Departmental seminar, Integrative Biology, University of Texas, Austin, Texas, USA	Mar. 2021
Species Interactions Workshop, University of California, Santa Cruz and Stanford University.	Dec. 2020

Conference Presentations

Ecological Society of America Annual Meeting, Salt Lake City, USA.	Jul. 2026
Society for Modeling and Theory in Population Biology Conference, ICERM, Brown University, USA.	Jun. 2026
Ecological Society of America Annual Meeting, Baltimore, USA.	Aug. 2025
Ecological Society of America Annual Meeting, Long Beach, USA.	Aug. 2024
International Congress for Conservation Biology, Kigali, Rwanda.	Jul. 2023
Association for Tropical Biology & Conservation Annual Meeting, Cartagena, Colombia.	Jul. 2022

Workshops

Invited Participant, Transient dynamics workshop, Banff International Research Station, Canada.	Mar. 2027
Invited Participant, Stochastic Modeling for the Resilience of Healthy Ecosystems, Banff International Research Station, Canada.	Sep. 2026
Invited Instructor, Integral Projection Models Workshop, National Centre for Biological Sciences, India.	Feb. 2026
Discussion Leader, Gordon Research Conference on Predator–Prey Interactions, Barga, Italy.	Jan. 2026
Participant, Micro-Working Group, Santa Fe Institute, New Mexico, USA.	Mar. 2025

Teaching and Training

Courses

Instructor, BIOS 416: Matrix Methods and Applications in Biology , <i>Stanford University</i> .	2024
Teaching Assistant, Introduction to Ecology (BIO 81) , <i>Stanford University</i> .	2020, 2021
Teaching Assistant, Introduction to Mathematical Methods for Engineers , <i>Shiv Nadar University, India</i> .	2015–2017

Student Mentoring

Rishi Gurjar — High school student.
Mariam Ehlwady — Undergraduate thesis student, Princeton University.
Seoyon Kim — HMEI summer intern, Princeton University.

Organizing and Short Courses

Co-organizer , <i>Multi-scale Biological Adaptation to Environmental Variability</i> , <i>National Institute for Theory and Mathematics in Biology, Chicago, USA</i> .	Nov. 2026
Participant , <i>Stochastic Population Dynamics Summer School</i> , <i>Texas A&M University, College Station, USA</i> .	Jun. 2026
Instructor, Matrix Methods in Ecology and Conservation , <i>Ecological Society of America Annual Meeting, Long Beach, California</i>	Aug. 2024
Instructor, Matrix Methods in Ecology and Conservation , <i>International Congress for Conservation Biology, Kigali, Rwanda</i>	Jul. 2023
Conservation Teaching and Learning Studio Certificate , <i>Network of Conservation Educators and Practitioners, American Museum of Natural History</i>	2022

Professional Service

Editorial and Reviewing

Co-Editor , <i>Journal of Theoretical Biology</i> special issue honoring Madhav Gadgil	2026
Panel Member , <i>PNAS Journal Club</i>	2025–present
Reviewer , <i>PNAS</i> , <i>Ecology Letters</i> , <i>Global Change Biology</i> , <i>Journal of Applied Ecology</i> , <i>The American Naturalist</i> , <i>Ecology</i> , <i>Theoretical Population Biology</i> , <i>Mathematical Biosciences</i> , <i>Population Ecology</i> , <i>Oikos</i> , <i>Theoretical Ecology</i>	Ongoing

Leadership and Community Service

Organizer , <i>Theoretical Ecology Journal Club, Princeton University</i>	2025–present
Organizer , <i>Conversation Hour, Princeton University</i>	2025–present
Student Liaison , <i>Theoretical Ecology Section, Ecological Society of America</i>	2023–2024
Vice President , <i>Stanford Birdwatching Society</i>	2021–2022
Writer , <i>Mechanism Design for Social Good</i>	2020–2022

Technical Skills and Languages

Programming: R, Python, C++, $\text{\LaTeX}$.
Quantitative Methods: Stochastic processes, matrix population models, dynamical systems, time-series analysis, and statistical modeling.
Languages: Punjabi (native), English (fluent), Hindi (fluent).