Jennifer Paige

jpaige@ucdavis.edu • jennifernpaige.github.io

Education

Ph.D. in Applied Mathematics 2022–2027 (*Expected*)
- University of California, Davis, advised by Alan Hastings
- DOE Computational Sciences Graduate Fellow, 2023–2027
- NSF National Research Traineeship: Sustainable Oceans Trainee, Cohort 5

M.S. in Applied Mathematics 2024
- University of California, Davis

B.A. in Mathematics & Educational Studies 2018–2022
- Swarthmore College, Pennsylvania

Papers

Publications

- *Submitted:* **Paige, J.**, Patterson, D., & Hastings, A. (2026). *Towards a unified framework for multiple stable states in ecological systems.* Preprint: arXiv:2605.05966
- Bhaskar, D., MacDonald, K., Thomas, D., Zhao, S., You, K., **Paige, J.,** Aizenbud, Y., Adelstein, I., & Krishnaswamy, S. (2022). *Diffusion-based methods for estimating curvature in data.* ICLR 2022 Workshop on Geometrical and Topological Representation Learning. openreview.net/pdf
- Renninger, K. A., Elias, Ruth. C., Kamiya, M. J., **Paige, J. N.,** & Youngblood, R. A. (2024). *PD supporting CS and math integration: implications of teacher interest and confidence for workshop design.* Computer Science Education, 35(1), 93–122. doi.org/10.1080/08993408.2024.2433334.

Technical Reports

- Davis, Diana et al. (2020). *Assessing Congressional Districting in Maine and New Hampshire.* arXiv e-print. arXiv:2011.06555v1.
- **Paige, Jennifer Nicole.** (2020). *Using Differential Forms to Find Symmetries in the Noh Problem for an Ideal Gas in a Spherical System* [White paper]. Los Alamos National Laboratory. LA-UR-20-20859.

Presentations & Workshops

Invited Talks & Seminars

- *Upcoming:* **Paige, J.**, Greiner, A., Hastings, A. "A spatial understanding of coral dynamics with bistability." Invited speaker for Society of Mathematical Biology (SMB) Annual Meeting, Graz, Vienna, 16 Jul. 2026.
- **Paige, J.**, Greiner, A., Hastings, A. "Using networks to model complexity in marine ecological systems." University of Iowa Mathematical Biology Seminar (virtual), 4 May 2026.
- **Paige, J.**, Hastings, A. "A spatial understanding of coral dynamics under multiple stressors." Invited speaker at Joint Mathematics Meeting, Seattle Convention Center, 8 Jan. 2025.
- **Paige, J.** et al. "Machine learning for optimal tuning of the Simple Cloud-Resolving Earth Atmosphere Model (SCREAM)." Student Run Research Seminar, University of California, Davis, 7 May 2025.

Contributed Talks

- *Upcoming:* **Paige, J.**, Greiner, A., Hastings, A. "A spatial understanding of coral dynamics with bistability." Contributed speaker for Society of Industrial and Applied Mathematics (SIAM)

Annual Meeting, Cleveland, Ohio, 8 Jul. 2026.

- **Paige, J.** et al. "Machine learning for optimal tuning of the Simple Cloud-Resolving Earth Atmosphere Model (SCREAM)." Contributed speaker at SIAM Northern and Central California Sectional Conference, Lawrence Berkeley National Laboratory, 27 Oct. 2025.
- **Paige, J.** "A spatial understanding of coral dynamics under multiple stressors." Sustainable Oceans Annual Symposium, University of California, Davis, 4 Oct. 2024.
- **Paige, J.**, MacDonald, K., Thomas, D., Zhao, S. "Towards robust curvature computation in point clouds." University of Connecticut's REU Vir(tu)al Conference. 29 Jul. 2021.

Workshops & Schools

- Simons Laufer Mathematical Institute Mathematics of Sea Ice and Polar Ecosystems summer school student, Fairbanks, Alaska, Jun. 2025.
- Santa Fe Institute: Complexity Summer School student, Sète, France, Oct. 2024.
- Lead co-organizer for The Future of California Fisheries: Range Shifts and a Changing Ocean workshop, University of California, Davis, 7 Jun. 2024.
- Host of Coastal and Marine Sciences Institute salon with Dr. Ariel Greiner, 30 Jan. 2026.
- Invited participant at Geometric and Topological Methods in Data Science Conference, ICERM, Dec. 2021.

Posters

- **Paige, J**. et al. "Machine learning for the optimized tuning of the Simple Cloud-Resolving Earth Atmosphere Model (SCREAM)." Poster at Livermore National Laboratory, 31 Jul. 2025.
- **Paige, J**. et al. "Machine learning for the optimized tuning of the Simple Cloud-Resolving Earth Atmosphere Model (SCREAM)." Poster at Computational Sciences Graduate Fellowship Annual Review, 16 Jul. 2025.
- **Paige, J**. & Hastings, A. "A spatial understanding of coral dynamics under multiple stressors." Poster at Computational Sciences Graduate Fellowship Annual Review, 16 Jul. 2024.

Awards & Fellowships

- Department of Energy Computational Graduate Studies Fellowship – tuition and stipend for 4 years 2023–27
- National Science Foundation Sustainable Oceans National Research Traineeship – tuition and stipend for 1 year 2022–23
- Hazel B. Jacoby Fellowship – $2,000 2025
- Society of Mathematical Biology, Landahl travel grant – $750 Jul. 2026
- Graduate Student Association Spring travel grant – $500 Jan. 2025
- Math Department Spring travel grant – $500 Jan. 2025
- SIAM Northern/Central California travel award – $500 Oct. 2025

Employment & Research Experience

- **Graduate Research Student at Lawrence Livermore National Lab** 2024–present
  - Developing machine learning surrogate models for the optimal parameterization of the Simple Cloud-Resolving Earth Atmosphere Model (SCREAM)
  - Performing simulation runs of the Energy Exascale Earth System Model (E3SM)
  - Working with interdisciplinary researchers to deliver collaborative research outcomes
- **Graduate Research Student at Cawthron Institute, New Zealand** 2023
  - Developed mathematical models related to optimizing spatial marine management and risk

assessment, through application of particle tracking software Oceantracker
  - Assisted in fieldwork focused on seagrass transplanting and meadow restoration
- **Yale SUMRY Research Experience for Undergraduates student**: Diffusion Geometry & Topology group 2021
  - Worked to harness geometric information, specifically curvature, about point clouds to inform data analysis methods such as topological data analysis
- **Educational Psychology Research Student at Swarthmore College** 2019–20
  - Studied how to improve Bootstrap program (teacher training program for the integration of math and computer science into classrooms) across the country through survey data analysis
- **Biology Undergraduate Research Student at Swarthmore College** 2021–22
  - Studied aging and genetic diversity in asexually reproducing planaria worms through the analysis of reproductive data
  - Monitored and imaged a population of *Schmidtea mediterranea*
- **Gerrymandering Research Experience for Undergraduates student** 2020
  - Used random walks and polygon maps to study the level of gerrymandering present in states
  - Gained experience with Markov chain Monte Carlo algorithms
- **Research Intern at Los Alamos National Laboratory** 2016–20
  Theoretical Physics (XTD-PRI) (2018–20)
  - Analytically solved hydrodynamic mechanics and symmetry analysis problems

  Computational Earth and Environmental Sciences (EES-16) (2016–18)
  - Developed soil heat transfer model in Python and Fortran and visualizations in ParaView
  - Analyzed moisture sensitivity of fire simulator (FIRETEC)
  - Assisted in the development of advanced turbulence equations for small-scale perturbations

Teaching and Educational Experience

- **Teaching Assistant, Mathematics Department, U.C. Davis** Fall 2025
  - Ran weekly discussion sections with students, hosted weekly office hours, performed grading duties for a graduate-level dynamical systems course
- **Directed Reading Instructor, Mathematics Department, U.C. Davis** Spring 2026
  - Co-taught weekly seminars for a class of undergraduate participants
  - Created and presented lectures, assigned readings, and created and instructed hands-on written or coding activities for students
- **Certificate of Completion of Seminar on College Teaching** Fall 2025
  - Participated in a 10-week seminar to develop educational techniques and theory and prepare to teach effectively
  - Presented mini-lectures for feedback and improvement
- **Clinician, Mathematics Department, Swarthmore College** Fall 2021–Spring 2022
  - Assisted all levels of courses by hosting weekly help sessions
- **Peer Assistant, Mathematics Department, Swarthmore College** Fall 2020
  - Assisted introductory calculus classes through in-class aid and weekly office hours
- **Grader, Mathematics Department, Swarthmore College** Spring 2021
  - Graded for undergraduate Differential Equations course

Leadership & Community Engagement

- National Conference for Undergraduate Research abstract reviewer 2026
- Graduate Student Association travel award reviewer Winter 2025
- Graduate Group in Applied Mathematics Graduate Student Representative 2025–26
- Volunteer for SACNAS (Society for Advancing Chicanos/Hispanics & Native Americans in Science) 2024–25
  - Graduate school application mentor, elementary school science volunteer, Virtual Dinner with a Scientist panelist
- Co-leader of Gender Minority in Mathematics Community Picnics 2023–24
- Graduate Program Collective, Applied Mathematics Student Representative 2023
- Heinrich W. Brinkmann Mathematics Prize recipient 2022
  - for outstanding performance in the field and exemplary services to the Swarthmore Mathematics Department
- Board member of Swarthmore Gender Minorities in Math & Statistics 2020–22
- Math and Statistics Student Advisory Council member 2021–22
- Mathematics tutor for Chester Dare 2 Soar program 2019