

Nathan J. McGregor

University of California, Santa Cruz
Department of Earth and Planetary Sciences
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Education

University of California, Santa Cruz

Ph.D., Earth and Planetary Sciences, 2027

Certificates: Pedagogical Leadership; Equity-Minded Mentoring; Equitable Course Design

Boise State University

B.S., Physics and Astrophysics, 2021

B.A., Political Science, 2012

Minors: Applied Mathematics; Criminal Justice

Employment

University of California, Santa Cruz, Earth and Planetary Sciences

Advisors: Profs. Francis Nimmo and Myriam Telus

Graduate Student Researcher, 2021–2027

Teaching Assistant, 2022–2027

Boise State University, Physics

Advisor: Prof. Daryl Macomb

Undergraduate Student Researcher, 2019–2021, 2011–2012

Teaching Assistant, 2019–2021

Lab Instructor, 2019–2021

University of Hawai‘i at Mānoa, Oceanography

Advisor: Prof. Angelos Hannides

Undergraduate Student Researcher, 2012–2013

Publications

4. **McGregor, N. J.**, Nimmo, F., Hyodo, R., & Genda, H. (In prep). Thermochemical and isotopic evolution of Phobos-forming debris across giant-impact scenarios. *Icarus*.
3. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Lourenço, D. L. (In review). Rates of true polar wander on Venus driven by mantle convection. *J. Geophys. Res. Planets*
2. **McGregor, N. J.**, Thompson, M. A., Telus, M., Schaefer, L., Elling, M., and Trodden, M. (In review). Linking the atmospheric and bulk compositions of rocky exoplanets: Constraints from meteorite outgassing analyses. *Nature Astronomy*.
1. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Plattner, A. M., and Conrad, J. W. (2025). Probing the viscosity of Venus’s mantle from dynamic topography at Baltis Vallis. *J. Geophys. Res. Planets*, 130, e2024JE008581. <https://doi.org/10.1029/2024JE008581>.

Teaching

Instructor, University of California, Santa Cruz (5 courses)

EART 165/268 History and Geochemistry of the Solar System, Spring 2027

ASTR 16 Astrobiology: Life in the Universe, Fall 2026

EART 203 Introductory Teaching Seminar, Fall 2026

ASTR 3 Introductory Astronomy: Planetary Systems, Summer 2026

EART 5 California Geology, Summer 2026

Teaching Assistant, University of California, Santa Cruz (4 courses)

EART 111 Mathematics in the Earth Sciences, Fall 2025

EART 160 Planetary Science, Fall 2024

EART 111 Mathematics in the Earth Sciences, Fall 2023

EART 111 Mathematics in the Earth Sciences, Fall 2022

Lab Instructor, Boise State University (7 courses)

PHYS 212L Physics II with Calculus, Summer 2021

PHYS 105 Stars and Cosmology (2 sections), Spring 2021

PHYS 101 Introduction to Physics, Fall 2020

PHYS 111 General Physics I, Summer 2020

PHYS 111 General Physics I, Spring 2020

PHYS 112 General Physics II, Fall 2019

Teaching Assistant, Boise State University (7 courses)

PHYS 341 Classical Mechanics, Spring 2021

PHYS 111 General Physics I, Spring 2020

PHYS 111 General Physics I, Fall 2019

MATH 170 Calculus I, Fall 2013

MATH 175 Calculus II, Summer 2012

MATH 170 Calculus I, Spring 2012

MATH 170 Calculus I, Fall 2011

Undergraduate Students Advised

Kayla Kuehmann, UCSC, 2026–2027

Matteo Pedri, UCSC, 2026–2027

Mia Trodden, UCSC, 2023–2024 (currently a Ph.D. student at Purdue University)

Matraca Elling, Stony Brook University, Lamat REU Program, 2022–2023, 2025–2026 (currently a Postbaccalaureate Researcher at NASA Goddard Space Flight Center)

Malcolm Seemann, UCSC, 2022–2024

Funding and Awards

Quarterly Presidential Dissertation-Year Fellowship, 2027, \$18,000

Kathryn D. Sullivan Research Impact Award in Earth and Marine Sciences, 2026, \$20,000

Graduate Pedagogy Fellowship, 2026, \$2,000

ARCS Foundation Fellowship, 2025–2026, \$13,333

Regent's Fellowship, 2025–2026, \$7,560

Venus Exploration Analysis Group (VEXAG) Meeting Travel Award, 2025, \$2,000

Best Presentation, Physical and Biological Sciences Division, 2025 UCSC Graduate Symposium, \$250

Rita Olsen Pister Endowed Scholarship, Women's Club, 2025, \$1,000

STARRS Re-entry Scholarship, 2025, \$1,000

Japan Society for the Promotion of Science (JSPS) Summer Fellowship, 2024, \$5,000

SOKENDAI Japan International Internship, 2023, \$3,000

Venus as a System Conference Travel Award, 2023, \$1,200

Culturally Inclusive Planetary Engagement Workshop, 2023, \$500

Regent's Fellowship, 2021–2023, \$24,000

Inclusive Leadership Fellowship, 2020–2021, \$8,850

Higher Education Research Council Fellowship, 2020, \$3,000

Social Impact Fellowship, 2014, \$4,000

Student Research Initiative Fellowship, 2014, \$2,000

22. Kuehmann, K.*, **McGregor, N. J.**, Telus, M., and Schaefer, L. (2026). Metallic iron controls on outgassing from heated EH3 and EL3 enstatite chondrites: Implications for rocky exoplanet atmospheres. American Geophysical Union Fall Meeting.
21. Kuehmann, K.*, **McGregor, N. J.**, Telus, M., and Schaefer, L. (2026). Metallic iron controls on outgassing from heated enstatite chondrites: Implications for rocky exoplanet atmospheres. Bay Area Planetary Science Conference.
20. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Lourenço, D. L. (2026). Rates of true polar wander on Venus driven by mantle convection. Lunar and Planetary Science Conference.
19. **McGregor, N. J.**, Thompson, M. A., Telus, M., and Schaefer, L. (2026). Linking planetary bulk composition and secondary atmospheres through novel meteorite outgassing experiments. Rocky Worlds 4.
18. **McGregor, N. J.**, Thompson, M. A., Telus, M., and Schaefer, L. (2025). Linking rocky exoplanetary atmospheres and interiors through meteorite outgassing experiments. American Geophysical Union Fall Meeting.
17. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Lourenço, D. L. (2025). True polar wander of Venus. American Geophysical Union Fall Meeting.
16. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Lourenço, D. L. (2025). Rates of true polar wander on Venus driven by mantle convection. Venus Exploration and Analysis Group (VEXAG) Meeting.
15. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Lourenço, D. L. (2025). Rates of true polar wander on Venus driven by mantle convection. Bay Area Planetary Science Conference.
14. **McGregor, N. J.** (2025). What meteorites tell us about planets around other stars. UCSC Graduate Research Symposium.
13. **McGregor, N. J.**, Thompson, M. A., Telus, M., and Schaefer, L. (2024). Meteorite outgassing experiments as a tool for linking the atmospheric and bulk compositions of rocky planets. 56th Annual Division for Planetary Sciences Meeting.
12. **McGregor, N. J.**, Thompson, M. A., Telus, M., and Fortney, J. (2023). Chondritic meteorite outgassing experiments: A novel technique to constrain the early atmospheric composition of terrestrial planets. American Geophysical Union Fall Meeting.
11. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Plattner, A. & Conrad, J. W. (2023). Dynamic topography of Baltis Vallis reveals low viscosity of the Venusian mantle. American Geophysical Union Fall Meeting. #3145.
10. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Plattner, A. & Conrad, J. W. (2023). Dynamic topography of Baltis Vallis reveals low viscosity of the Venusian mantle. Venus as a System Conference.
9. Trodden, M.*, Elling, M.*, **McGregor, N. J.**, Thompson, M. A., and Telus, M. (2023). Chondritic meteorite outgassing experiments: A novel technique to constrain the early atmospheric composition of terrestrial planets. Bay Area Planetary Sciences Conference.
8. **McGregor, N. J.**, Thompson, M. A., Kirk, J., Telus, M., and Nimmo, F. (2023). Constraining accretional volatile depletion with meteorite outgassing experiments. The Meteoritical Society Meeting.
7. **McGregor, N. J.** (2023). Evidence for a heat-pipe Venus. UCSC Graduate Research Symposium.
6. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Plattner, A., and Conrad, J. W. (2023). Constraining Venus' convection regime using Baltis Vallis topography. European

Geosciences Union General Assembly.

5. **McGregor, N. J.**, Nimmo, F., Gillmann, C., Golabek, G. J., Plattner, A., and Conrad, J. W. (2023). Constraining Venus' convection regime using Baltis Vallis topography. Lunar and Planetary Science Conference.
4. Calderon, T.*, Jorge-Chavez, F.*, **McGregor, N. J.**, & Telus, M. (2022). Investigating Mn rims of chondrule meteorites. UCSC Research Experiences for Undergraduates Program on Sustainable Materials.
3. **McGregor, N. J.** & Macomb, D. (2020). Photometric monitoring of MRK 501: A model for measuring the optical variability of BL Lacs. Idaho Conference on Undergraduate Research.
2. **McGregor, N. J.** & Macomb, D. (2020). Photometric monitoring of MRK 501: A model for measuring the optical variability of BL Lacs. Boise State University Research Showcase.
1. **McGregor, N. J.** & Macomb, D. (2012). Identifying X-ray sources in Local Group galaxies using Fourier analysis of time series data. Boise State University Undergraduate Research and Scholarship Conference.

Service and Outreach

Science Graduate Advisory Council, UCSC Science Division, Graduate Representative, 2025–2026
Alumni Advisory Council, UCSC EPS Department, Graduate Representative, 2025–2026
Geophysics and Planetary Physics Seminar, UCSC EPS Department, Coordinator, 2025
Planetary Group Meeting, UCSC EPS Department, Coordinator, 2025
Faculty Meetings, UCSC EPS Department, Graduate Representative, 2025
Project for Inmate Education, Santa Cruz County Main Jail, Instructor, College Algebra, 2025
Committee on Teaching, UCSC Academic Senate, Graduate Representative, 2024–2027
NASA Community College Network, Subject Matter Expert, 2023–2026
UCSC GradPath Mentorship Program, Women in Science and Engineering, Mentor, 2023–2024
Committee on Diversity, Equity, and Inclusion, UCSC Academic Senate, Graduate Representative, 2022–2024
Santa Cruz Queer Youth Task Force and Safe Schools Project, STEM Coordinator, 2022–2024
Cosmochemistry Reading Group, UCSC EPS Department, Organizer, 2022–2023
Astrobiology Reading Group, UCSC EPS Department, Organizer, 2022–2023
Undergraduate Mentorship Program, UCSC EPS Department, Mentor, 2022–2024
Diversity, Equity, and Inclusion Committee, UCSC EPS Department, Member, 2021–2024
Geoscientists Encouraging Openness and Diversity in the Earth Sciences, UCSC EPS Department, Leadership Board Member, 2021–2023
STEM Camp, Sacajawea Elementary School, Volunteer, 2021
STEM Camp, Caldwell High School, Volunteer, 2021
Third Thursday Astronomy Series, Boise State Physics Department, Volunteer, 2021
Idaho State Correctional Institution Inmate Education, Volunteer, 2020
First Friday Astronomy Series, Boise State Physics Department, Volunteer, 2019–2021

Professional Development

Supporting All Students in the Geosciences Professional Development Program, San Jose State University Science Education Program, 2026–2027
Graduate Pedagogy Fellowship, UCSC, 2026
Equity-Minded Mentoring in Higher Education: Fostering Inclusive Research and Learning Environments, UCSC, 2026
Equitable Course Design for Graduate Student Instructors, UCSC, 2026
Supporting All Students in the Geosciences Professional Development Program, San Jose State

University Science Education Program, 2025–2026
 Equity-Based Holistic Admissions in Graduate Education, 2024
 Recent Developments and Applications in Earth and Planetary Sciences of Electron Probe
 Microanalysis, Agricultural University of Athens, 2023
 Culturally Inclusive Planetary Engagement Workshop, Planetary Resources and Content Heroes
 (ReaCH), NASA Science Mission Directorate Science Activation Program, 2023
 Advancing IDEA in Planetary Science Workshop, Lunar and Planetary Institute, 2022
 STEM Pedagogy Seminar, Boise State University Advising and Academic Support Center, 2019–2020
 STEM Pedagogy Seminar, Boise State University Advising and Academic Support Center, 2011–2012

Professional Activities

Venus Exploration Analysis Group (VEXAG) Steering Committee, Scribe, 2024–2027
 VEXAG Working Groups: Inclusion, Diversity, Equity, and Access; Venus as an Analog for Terrestrial
 Exoplanets; Venus Mapping, 2024
 VEXAG 2024 Scientific Organizing Committee, 2024
 AAS DPS 2024 Scientific Organizing Committee, 2024
 The Bulletin of the American Astronomical Society (BAAS), Celebrating the Wonder of Science in
 the Shadow, Editor, 2024
 Bay Area Planetary Science Conference Organizing Committee, Member, 2023
 NASA Proposal Review Panel, 2022
 NASA Proposal Writing and Evaluation Academy, 2020

Invited Talks

Probing the viscosity of Venus’s mantle from dynamic topography at Baltis Vallis, Organization for
 Venus Early-Career Networking, 2025
 The return to Venus: What we’ve learned and what’s next, Yakima Valley College, 2025
 What meteorites tell us about planets around other stars, Yakima Valley College, 2025
 Linking rocky exoplanetary interiors and atmospheres through meteorite outgassing, Department of
 Earth and Planetary Sciences Alumni Webinar Series, UCSC, 2025
 What meteorites tell us about rocky exoplanetary atmospheres, Space Cafe Tokyo, 2024
 Pride in space: Queer astronauts and the 2023 solar eclipse, Central California Queer Youth Summit,
 2023
 Pride in STEM: LGBTQ+ youth changing the world through STEM, Central California Queer Youth
 Summit, 2022
 Graduate Student Panel, Idaho Conference on Undergraduate Research, 2022
 OSIRIS-REx Mission, Boise State University, 2021
 Lunar eclipses, Boise State University, 2021