

Murti Nauth

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Updated: July 2026

I am interested in using in-situ spacecraft measurements to foster our understanding of the inner heliosphere. I have a wide network international collaborators, and I envision taking part in mission development, and leading the next generation of space scientists.

Education

Ph.D. - Earth and Planetary Science (Aug 2020 - May 2026)

University of California Berkeley (UCB), Berkeley, CA

M.S. - Physics (2018-2020)

Fisk University, Nashville, TN

B.A. - Astronomy, International Affairs, Economics (2012-2017)

University of Colorado Boulder, Boulder, CO

Relevant Skills

- Proficient in IDL and *Python* programming languages
- Engaging verbal science communicator, and technical writing prowess
- Excellent follow-through, time management, organization, and group facilitation

Research Experience

Los Alamos National Laboratory, Los Alamos, NM

Postdoctoral Researcher, starting Oct 2026

As part of the Interstellar Mapping and Acceleration Probe (IMAP) science team, I am identifying solar electron bursts at L1 to measure the evolution of the solar wind from the sun to 1 AU.

Space Sciences Laboratory, Berkeley, CA

Research Assistant, Aug 2020 - Jul 2026

I use data from the MAVEN mission to study the characteristics of the suprathermal electrons in the Martian magnetotail. We discovered evidence for an auroral potential structure at Mars that resembles the well-constrained field-aligned electrostatic potential structure observed at Earth during auroral events. We made the first-ever database of suprathermal electrons within the Martian magnetotail. Advisors: David Mitchell and Imke de Pater.

Vanderbilt University, Nashville, TN

Research Assistant, Aug 2018 - Aug 2020

I determined the clustering of massive binary-black hole mergers detectable by the forthcoming Laser Interferometer Space Antenna (LISA) mission using the *Illustris* large-scale cosmological simulation. Advisor: Kelly Holley-Bockelmann.

Laboratory for Atmospheric and Space Physics, Boulder, CO

Research Assistant, Dec 2016 - Aug 2018

Performed the first ever statistical analysis on the thermal electron ($<1\text{eV}$) population in the Martian magnetotail. The local magnetic topology and flaring direction played an important role in

determining the thermal electron structure; thermal electrons originating from the dayside (night-side) ionosphere were more likely to be observed outside the optical shadow (close to the planet). Advisors: Christopher Fowler and Laila Andersson.

Fellowships and Grants

- Research University Alliance Fellow (2024): \$2,000 to support my research exchange at the University of Michigan
- NASA Scope Travel Grant (2022): \$1,800 travel funding to attend AGU
- Future Investigators in NASA Earth and Space Science and Technology (FINESST) Research Grant (2021): \$135,000 to fund 3 years of research and tuition
- Robert P. Lin Fellowship (2020): \$15,000 summer research funding
- Fisk-Vanderbilt Bridge Fellow (2018-2020): 2 years of full graduate support

Publications

- **Nauth, M.**, Mitchell, D. L., Fowler, C. M., Lillis, R. J., Xu, S., de Pater, I. (2025). Magnetotail suprathermal electrons: what can 10 years of MAVEN data reveal about their drivers? *Journal of Geophysical Research: Space Physics* (submitted).
- Jolitz, R. D., Lee, C. O., Cessna, J., Jain, S., Howard, S., Lemmon, M., Sanchez-Cano, B., Ramstad, R., Hanley, K. G., **Nauth, M.**, et al. (2025). Mars on the Farside: Multipoint observations of an unusual space weather event in December 2023. *Journal of Geophysical Research: Geophysical Research Letters* (submitted).
- Lillis, R. J., Deighan, J., Chirakkil, K., Jain, S., Fillingim, M., Chaffin, M., **Nauth, M.**, et al. (2024). Sinuous aurora at Mars: A link to the tail current sheet? *Journal of Geophysical Research: Space Physics*, 129, e2024JA032477. <https://doi-org/10.1029/2024JA032477>
- **Nauth, M.**, Mitchell, D.L., Fowler, C.M., de Pater, I., Azari, A.R (2024). Evidence for a current system and potential structure in the Martian magnetotail. *Journal of Geophysical Research: Space Physics*, 129, e2023JA032305. <https://doi.org/10.1029/2023JA032305>
- **Nauth, M.**, Fowler, C. M., Andersson, L., DiBraccio, G. A., Xu, S., Weber, T., and Mitchell, D. (2021). The influence of magnetic field topology and orientation on the distribution of thermal electrons in the Martian magnetotail. *Journal of Geophysical Research: Space Physics*, 126, e2020JA028130. <https://doi.org/10.1029/2020JA028130>

Presentations

- M-Matisse Community Workshop (virtual, 2025)
- Center for Integrative Planetary Science seminar (invited, 2024), Berkeley, CA
- Martian Magnetotail Current System, Geospace Environment Modeling Workshop, Ft. Collins, CO (2024)
- University of Michigan Climate and Space Sciences and Engineering colloquium (invited, 2024), Ann Arbor, MI
- Accelerated Electrons Associated with Current Sheet Crossings in the Martian Magnetotail, AGU, Chicago, IL (2022)

Posters

- 10 Years of MAVEN Magnetotail Suprathermal Electron Observations, Planet Mars VI, Les Houches, France (2025)
- Statistical survey of suprathermal electrons in the Martian magnetotail: preliminary results on their spatial distribution, AGU, Washington DC (2024)
- Unraveling the Mysteries of Martian Aurora: Insights from Electron Dynamics, 10th International Conference on Mars, Pasadena, CA (2024)
- Martian Magnetotail Current System, Geospace Environment Modeling Workshop, Ft. Collins, CO (2024)
- MAVEN observations of multiple current sheet crossings in the magnetotail region, AGU, San Francisco, CA (2023)
- Case Study of Suprathermal Electrons in the Martian Wake, AGU (2021), New Orleans, LA
- Large-Scale Structure Measurements with Gravitational Waves: How biased are LISA sources? AAS, Seattle, WA(2019)
- Thermal Electron Density Structure of the Martian Tail, AGU, New Orleans, LA (2017)

Engagement and Leadership

- **Lead Graduate Student Instructor** (Spring 2026): Lead a group of graduate student instructors whose tasks are to create homework assignments, lead discussion sections, and act as a liaison between students and the professor.
- **Center for Integrative Planetary Science co-organizer** (2025-2026): Organize seminars with speakers from across the nation, and host the speakers.
- **MAVEN Reconnection Working Group Co-organizer** (2025-2026): Organize speakers and conduct meetings related to magnetic reconnection at Mars.
- **NASA SEES Research Mentor** I mentored a group of 5 high school students on an original research project during summer 2024. Their work was presented at the AGU 2024 meeting.
- **MAVEN Early Career Group Co-organizer** (2022-present): organize seminars, workshops, social events, and compile useful resources for early career researchers on the MAVEN team
- **Black Canyon of the Gunnison National Park Volunteer**, Gunnison, CO (Summer 2022): Performed a series of “porch talks” about life on Mars, as a volunteer ranger and participated in astronomy observing nights as a resident subject matter expert
- **Physical science Opportunities for Women in Education and Research (POWER) Mentor**, Berkeley, CA (academic year 2022): mentored a local community college student interested in pursuing a career in STEM, reviewed university applications, and helped the student find available resources