

Pasadena, CA
USA

CURRICULUM VITAE

of
Marshall John Styczinski

✉ itsmoosh@gmail.com
🔗 github.com/itsmoosh
🆔 0000-0003-4048-5914

PERSONAL

Information: US Citizen, born 1988 in Dublin, California.

Position: NASA Postdoctoral Fellow at the Jet Propulsion Laboratory, California Institute of Technology.

Interests: Magnetic sounding; astrobiology; space exploration; science communication and public outreach

Website: <https://moosh.run>

EDUCATION

09/2012 – 08/2021 University of Washington

Degree conferred: Doctor of Philosophy, Physics

Significant works: “Analytical forward models for magnetic induction of asymmetric, icy ocean worlds with implications for spacecraft investigations” ([Doctoral dissertation](#), July 2021)

Degree conferred: Graduate Certificate, Astrobiology

Degree conferred: Master of Science, Physics

09/2006 – 06/2010 University of California, Davis

Degree conferred: Bachelor of Science with Highest Honors, Physics

Significant works: “On the Return of HP West: The Revival and Restoration of a Hewlett-Packard 5950A Photoelectron Spectrometer” ([Undergraduate honors thesis](#), May 2010)

HONORS AND AWARDS

09/2021 – present [NASA Postdoctoral Program](#) recipient

04/2019 – present Europa Clipper [Science Team Affiliate](#)

05/2023 Panelist, NASA Cross Divisional podcast “NASA xD in Conversation with Mobius Digital”

03/2023 Expert consultant, [Space.com article](#) “Europa Clipper: A guide to NASA’s new astrobiology mission”

01/2022 Expert consultant, [UW Astrobiology Program](#) “life detection mission” workshop

09/2018 – 08/2021 [NASA Earth and Space Science Fellowship](#) recipient

05/2020 – 08/2020 [JPL Planetary Science Summer School](#) participant

04/2019 – 09/2019 Visiting Scholar, University of Oregon Planetary Science Group

08/2018 – 09/2018 Visiting Scholar, University of Melbourne Astrophysics Group

06/2018 – 08/2018 [JPL Space Grant Summer Internship](#) participant

03/2017 – 08/2021 Science Communication Fellow, [Pacific Science Center](#)

06/2010 Bachelor of Science with Highest Honors from UC Davis

SELECTED PRESENTATIONS

10/2023 (proj) Colloquium speaker, California State University Fullerton:

“Magnetic sounding of icy moons with constraints from multiple investigations”

07/2023 Invited speaker, American Association of Physics Teachers Summer Meeting 2023:

“Doing Physics at NASA and Aggressively Rejecting a Gender Binary”

12/2022 Invited speaker, American Geophysical Union Fall Meeting 2021:

“Induced Magnetic Fields from Asymmetric Subsurface Oceans”

03/2023 Colloquium speaker, JPL Science Visitors Colloquium Program:

“SPD-41a and You: Key Points for SMD-funded Researchers and Mission Scientists”

	from NASA's New Open Science Policy"
06/2022	Colloquium speaker, JPL Science Visitors Colloquium Program: "Magnetic sounding of icy moons with constraints from multiple investigations"
05/2022	Colloquium speaker, JPL Icy worlds Collaboration and Exchange (ICE) seminar: "Magnetic sounding of icy moons with constraints from multiple investigations"
04/2022	Colloquium speaker, NASA Ames Exobiology Group: "Magnetic sounding of icy moons with constraints from multiple investigations"
07/2021	University of Washington PhD defense presentation : "Magnetic sounding of icy moons"
08/2018	Colloquium speaker, University of Melbourne Astrophysics: "Constraining Asymmetry in Europa's Oceans"
12/2017	Pacific Science Center's "Science in the City" speaker series : "Models of Europa and the Search for Life"
05/2016	Town Hall Theater's " UW Science Now " speaker series (link to recording): "Seeing the Light: Making Physics More Accessible"

SCIENTIFIC PUBLICATIONS

1. F. Petricca, A. Genova, J. C. Castillo-Rogez, **M. J. Styczinski**, C. J. Cochrane, and S. D. Vance. Characterization of icy moon hydrospheres through joint inversion of gravity and magnetic field measurements. *Geophysical Research Letters*, 50(17), 2023.
2. F. Petricca, J. C. Castillo-Rogez, A. Genova, M. Melwani Daswani, **M. J. Styczinski**, C. J. Cochrane, and S. D. Vance. Partial differentiation of Europa inferred from Galileo gravity data. *Nature Astronomy*, in revision, 2023.
3. B. H. Chua, E. Gloesener, M. Choukroun, T. Vu, M. Melwani Daswani, B. Journaux, **M. J. Styczinski**, and S. D. Vance. Low-temperature specific heat capacity of water–ammonia mixtures down to the eutectic. *ACS Earth and Space Chemistry*, in press, 2023.
4. S. D. Vance, K. L. Craft, E. Shock, B. E. Schmidt, J. I. Lunine, K. P. Hand, W. B. McKinnon, E. M. Spiers, C. Chivers, J. D. Lawrence, N. Wolfenbarger, E. J. Leonard, K. J. Robinson, **M. J. Styczinski**, D. M. Persaud, G. Steinbrügge, M. Yu. Zolotov, L. C. Quick, J. E. C. Scully, T. M. Becker, S. M. Howell, R. N. Clark, A. J. Dombard, C. R. Glein, O. Mousis, M. A. Sephton, J. C. Castillo-Rogez, F. Nimmo, A. S. McEwen, M. S. Gudipati, I. Jun, X. Jia, F. Postberg, K. M. Soderlund, and C. M. Elder. Investigating Europa's habitability with Europa Clipper. *Space Science Reviews*, under review, 2023.
5. James H. Roberts, William B. McKinnon, Catherine M. Elder, Gabriel Tobie, John B. Biersteker, Duncan Young, Ryan S. Park, Gregor Steinbrügge, Francis Nimmo, Samuel M. Howell, Julie C. Castillo-Rogez, Morgan L. Cable, Jacob N. Abrahams, Michael T. Bland, Chase Chivers, Corey J. Cochrane, Andrew J. Dombard, Carolyn Ernst, Antonio Genova, Christopher Gerekos, Christopher Glein, Camilla D. Harris, Hamish C. F. C. Hay, Paul O. Hayne, Matthew Hedman, Hauke Hussmann, Xianzhe Jia, Krishan Khurana, Walter S. Kiefer, Randolph Kirk, Margaret Kivelson, Justin Lawrence, Erin J. Leonard, Jonathan I. Lunine, Erwan Mazarico, Thomas B. McCord, Alfred McEwen, Carol Paty, Lynnae C. Quick, Carol A. Raymond, Kurt D. Retherford, Lorenz Roth, Abigail Rymer, Joachim Saur, Kirk Scanlan, Dustin M. Schroeder, David A. Senske, Wencheng Shao, Krista Soderlund, Elizabeth Spiers, **Marshall J. Styczinski**, Paolo Tortora, Steven D. Vance, Michaela N. Villarreal, Benjamin P. Weiss, Joseph H. Westlake, Paul Withers, Natalie Wolfenbarger, Bonnie Buratti, Haje Korth, Robert T. Pappalardo, and The Interior Thematic Working Group. Exploring the interior of Europa with the Europa Clipper. *Space Science Reviews*, 219(6):46, 2023. DOI: [10.1007/s11214-023-00990-y](https://doi.org/10.1007/s11214-023-00990-y)
6. **M. J. Styczinski**, S. D. Vance, and M. Melwani Daswani. *PlanetProfile*: self-consistent interior structure modeling for terrestrial bodies in python. *Earth and Space Science*, 10(8):e2022EA002748, 2023. DOI: [10.1029/2022EA002748](https://doi.org/10.1029/2022EA002748)
7. J. Becker, D. Z. Seligman, F. C. Adams, and **M. J. Styczinski**. The influence of tidal heating on the habitability of planets orbiting white dwarfs. *The Astrophysical Journal Letters*, 945(L24), 2023. DOI: [10.3847/2041-8213/acbe44](https://doi.org/10.3847/2041-8213/acbe44)

8. A. M. Plattner, C. L. Johnson, **M. J. Styczinski**, S. D. Vance, and A. C. Mills. On Ganymede's magnetic quadrupolar strength. *Planetary Science Journal*, 4(134), 2023. DOI: [10.3847/PSJ/acde7f](https://doi.org/10.3847/PSJ/acde7f)
9. A. Arredondo, A. Hodges, J. N. H. Abrahams, C. C. Bedford, B. D. Boatwright, J. Buz, C. Cantrall, J. Clark, A. Erwin, S. Krishnamoorthy, L. Magaña, R. M. McCabe, E. C. McIntosh, J. L. Noviello, M. Pellegrino, C. Ray, **M. J. Styczinski**, and P. Weigel. VALENTInE: A concept for a new frontiers-class long-duration in situ balloon-based aerobot mission to Venus. *Planetary Science Journal*, 3(7):152, 2022. DOI: [10.3847/psj/ac7324](https://doi.org/10.3847/psj/ac7324)
10. **M. J. Styczinski**, S. D. Vance, E. M. Harnett, and C. J. Cochrane. A perturbation method for evaluating the magnetic field induced from an arbitrary, asymmetric ocean world analytically. *Icarus*, 376:114840, 2022. DOI: [10.1016/j.icarus.2021.114840](https://doi.org/10.1016/j.icarus.2021.114840)
11. **M. J. Styczinski**, Z. S. Cooper, D. M. Glaser, O. Lehmer, V. Mierzejewski, and J. Tarnas. Chapter 7: Assessing habitability beyond earth. In M. J. Schaible, N. Szeinbaum, and G. Tan, editors, *Astrobiology Primer 3.0 special issue*. In press, *Astrobiology*, 2023.
12. **M. J. Styczinski**, D. M. Glaser, M. Hooks, T. Z. Jia, K. Johnson-Finn, G. A. Schaible, and M. J. Schaible. Chapter 11: Astrobiology education, engagement, and resources. In M. J. Schaible, N. Szeinbaum, and G. Tan, editors, *Astrobiology Primer 3.0 special issue*. In press, *Astrobiology*, 2023.
13. C. J. Cochrane, S. D. Vance, T. A. Nordheim, **M. J. Styczinski**, A. Masters, and L. H. Regoli. In search of sub-surface oceans within the uranian moons. *Journal of Geophysical Research: Planets*, 126(12):e2021JE006956, 2021. DOI: [10.1029/2021JE006956](https://doi.org/10.1029/2021JE006956)
14. S. D. Vance, **M. J. Styczinski**, B. G. Bills, C. J. Cochrane, K. M. Soderlund, N. Gómez-Pérez, and C. S. Paty. Magnetic induction responses of Jupiter's ocean moons including effects from adiabatic convection. *Journal of Geophysical Research: Planets*, 126(2):e2020JE006418, 2021. DOI: [10.1029/2020JE006418](https://doi.org/10.1029/2020JE006418)
15. **M. J. Styczinski** and E. M. Harnett. Induced magnetic moments from a nearly spherical ocean. *Icarus*, 354:114020, 2021. DOI: [10.1016/j.icarus.2020.114020](https://doi.org/10.1016/j.icarus.2020.114020)
16. G. T. Seidler, D. R. Mortensen, A. J. Remesnik, J. I. Pacold, N. A. Ball, N. Barry, **M. Styczinski**, and O. R. Hoidn. A laboratory-based hard x-ray monochromator for high-resolution x-ray emission spectroscopy and x-ray absorption near edge structure measurements. *Review of Scientific Instruments*, 85(11):113906, 2014. DOI: [10.1063/1.4901599](https://doi.org/10.1063/1.4901599)

PROFESSIONAL QUALIFICATIONS

Extensive experience with a wide variety of programming languages and systems, especially: [SPICE ephemeris software](#), [NASA PDS](#), UNIX & bash, Python, Matlab, Fortran, C++, IDL, and \LaTeX
 Open-source science, software, data, and project management with GitHub, Zenodo, PyPI packaging, and more
 6 years formal experience teaching university physics, including TA training and exam writing

RESEARCH POSITIONS

09/2021 – present *NASA Postdoctoral Program Fellow*, Jet Propulsion Laboratory, California Institute of Technology
 Research focus: Magnetic sounding of icy ocean worlds
 Magnetic induction modeling and data analysis
 Geophysical modeling of planetary interior structure
 Advisor: NASA Research Scientist Steven D. Vance

05/2018 – 08/2021 *Doctoral Candidate*, University of Washington
 Research focus: Magnetic sounding of icy moons, especially Europa
 Magnetospheric plasma modeling
 Advisor: Affiliate Professor Erika Harnett

09/2012 – 05/2018 *Graduate Student*, University of Washington
 Past research: Improving the efficiency of conceptual instruction in- and out-of-class

Student understanding of Gauss's law
Interdisciplinary learning in science courses
Advisor: Professors Paula R. L. Heron and Peter S. Shaffer

04/2011 – 07/2012 *Junior Specialist*, University of California, Davis

Duties: Design, build, test, and analyze cryogenic bubble detection experiment (Tripathi);
Develop and implement software for analyzing irradiated magnets,
assess radiation damage of magnets used in Linear Collider R&D (Pellett);

Supervisor(s): Professor S. Mani Tripathi, Professor Emeritus David Pellett

07/2010 – 04/2011 *Development Technician*, University of California, Davis

Duties: Restore, repair, and improve indium evaporative deposition system (Tripathi);
Construct sensitive Double Chooz neutrino detector in international team (Svoboda);
Train and mentor undergraduate laboratory assistants
with X-ray photoemission spectrometer (Fadley)

Supervisor(s): Professor S. Mani Tripathi, Professor Robert Svoboda, Distinguished Professor
Charles S. Fadley

05/2008 – 06/2010 *Undergraduate Research Assistant*, University of California, Davis

Duties: Restore and optimize X-ray photoemission spectrometer system, analyze Si/Mo
multilayer crystal native oxide properties

Supervisor(s): Distinguished Professor Charles S. Fadley

TEACHING EXPERIENCE

09/2012 – 06/2018 *Graduate Teaching Assistant*, University of Washington

Courses: Introductory physics tutorials and laboratories, advanced electromagnetism tutorials,
and introductory courses in astrobiology, planetary science, and space science

Structure: Sole or co-instructor leading discussions in 24–32 student classrooms

Note: Most terms as head TA, leading training sessions for other TAs, writing exams,
and course administration (including curriculum writing and revisions)

09/2012 – 06/2018 *Physics Study Center Staff*, University of Washington

Courses: Introductory and advanced physics

Structure: Individual homework and conceptual guidance

10/2007 – 06/2012 *Physics Club Volunteer Tutor*, University of California, Davis

Courses: Introductory physics and calculus

Structure: Individual homework and conceptual guidance