

Pasadena, CA
USA

CURRICULUM VITAE

of
Marshall John Styczinski

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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*, in press, 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 revision, 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. J. H. Roberts, W. B. McKinnon, C. Elder, J. B. Biersteker, D. Young, R. S. Park, F. Nimmo, S. M. Howell, J. C. Castillo-Rogez, M. L. Cable, M. Kivelson, P. Tortora, T. B. McCord, A. J. Dombard, E. Mazarico, G. Tobie, C. R. Glein, C. Ernst, N. Wolfenbarger, J. D. Lawrence, S. D. Vance, W. S. Kiefer, H. Hussmann, H. C. F. C. Hay, K. M. Soderlund, E. M. Spiers, L. C. Quick, M. Hedman, K. Khurana, C. J. Cochrane, C. A. Raymond, **M. J. Styczinski**, L. Roth, B. P. Weiss, X. Jia, P. Withers, K. Scanlan, G. Steinbrügge, A. Genova, J. N. Abrahams, K. Retherford, M. T. Bland, P. O. Hayne, A. Rymer, D. M. Schroeder, C. Paty, J. I. Lunine, R. T. Pappalardo, D. A. Senske, H. Korth, M. N. Villarreal, E. J. Leonard, C. D. Harris, J. H. Westlake, C. Chivers, J. Saur, and the Interior Thematic Working Group. Integrated interior science with Europa Clipper. *Space Science Reviews*, under review, 2023.
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*, in press, 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