

Pasadena, CA  
USA

✉ marshall.styczinski@bmsis.org  
🔗 [github.com/itsmoosh](https://github.com/itsmoosh)  
🆔 0000-0003-4048-5914

## CURRICULUM VITAE

of  
Marshall John Styczinski

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### PERSONAL

**Information:** US Citizen, born 1988 in Dublin, California.  
**Position:** Affiliate Research Scientist, Blue Marble Space Institute of Science.  
**Interests:** Magnetic sounding; astrobiology; open science; science communication and public outreach  
**Website:** <https://moosh.run>

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### 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)

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### HONORS AND AWARDS

**09/2021 – 08/2023** [NASA Postdoctoral Program](#) recipient  
**04/2019 – 08/2023** Europa Clipper [Science Team Affiliate](#)  
**05/2023** Panelist, NASA xD podcast “NASA Cross Divisional with Mobius Digital” — [Part I](#); [Part II](#)  
**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

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### SELECTED PRESENTATIONS

**12/2023 (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" ( <a href="#">link to slides</a> )
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	<a href="#">University of Washington PhD defense presentation</a> : "Magnetic sounding of icy moons"
08/2018	Colloquium speaker, University of Melbourne Astrophysics: "Constraining Asymmetry in Europa's Oceans"
12/2017	<a href="#">Pacific Science Center's "Science in the City" speaker series</a> : "Models of Europa and the Search for Life"
05/2016	Town Hall Theater's " <a href="#">UW Science Now</a> " speaker series ( <a href="#">link to recording</a> ): "Seeing the Light: Making Physics More Accessible"

### SCIENTIFIC PUBLICATIONS

1. 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.
2. L. Pou, M. P. Panning, **M. J. Styczinski**, M. Melwani Daswani, C. Nunn, and S. D. Vance. Tidal seismology in the silicate interior of Europa. *Planetary Science Journal*, submitted, 2023.
3. M. J. Schaible, N. Szeinbaum, G. O. Bozdog, L. Chou, N. Grefenstette, S. Colón-Santos, L. E. Rodriguez, **M. J. Styczinski**, J. L. Thweatt, Z. R. Todd, A. Vázquez-Salazar, A. Adams, M. N. Araújo, T. Altair, S. Borges, D. Burton, J. A. Campillo-Balderas, E. M. Cangi, T. Caro, E. Catalano, K. Chen, P. L. Conlin, Z. S. Cooper, T. M. Fisher, S. Mestre Fos, A. Garcia, D. M. Glaser, C. E. Harman, N. Y. Hermis, M. Hooks, K. Johnson-Finn, O. Lehmer, R. Hernández-Morales, K. H. G. Hughson, R. Jácome, T. Z. Jia, J. J. Marlow, J. McKaig, V. Mierzejewski, I. Mu noz Velasco, C. Nural, G. C. Oliver, P. I. Penev, C. Govinda Raj, T. P. Roche, M. C. Sabuda, G. A. Schaible, S. Sevgen, P. Sinhadc, L. H. Steller, K. Stelmach, J. Tarnas, F. Tavares, G. Trubl, M. Vidaurri, L. Vincent, J. M. Weber, M. M. Weng, R. L. Wilpischeki, and A. Young. Chapter 1: The Astrobiology Primer 3.0. In M. J. Schaible, N. Szeinbaum, and G. Tan, editors, *Astrobiology Primer 3.0 special issue*. In press, *Astrobiology*, 2023.
4. **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.
5. **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.
6. 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*, 219(81), 2023. DOI: [10.1007/s11214-023-01025-2](https://doi.org/10.1007/s11214-023-01025-2)
7. 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. DOI: [10.1029/2023GL104016](https://doi.org/10.1029/2023GL104016)
8. 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, 7(10), 2023. DOI: [10.1021/acsearthspacechem.3c00091](https://doi.org/10.1021/acsearthspacechem.3c00091)

9. 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. Papalardo, 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)
10. **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)
11. 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)
12. 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)
13. 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)
14. **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)
15. 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)
16. 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)
17. **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)
18. D. Pellett, A. Baldwin, G. Gallagher, D. Olson, and **M. J. Styczinski**. Radiation damage studies of materials and electronic devices using hadrons. *U.S. Department of Energy Office of Scientific and Technical Information Reports*, 2014. DOI: [10.2172/1132076](https://doi.org/10.2172/1132076)
19. 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)

#### OPEN-SOURCE SOFTWARE AND DATA RELEASES

1. **M. J. Styczinski** and D. Crichton. JPL cross-divisional Open Science and Data Management Plan template for ROSES-23, 2023. DOI: [10.5281/zenodo.8371336](https://doi.org/10.5281/zenodo.8371336)
2. **M. J. Styczinski**. itsmoosh/MoonMag: Field calculations up to degree 10 validated against PlanetMag, 2023.

DOI: [10.5281/zenodo.5002955](https://doi.org/10.5281/zenodo.5002955)

3. S. Vance, **M. J. Styczinski**, M. Melwani Daswani, A. G. Marusiak, M. Niesyt, A. S. Bryant, A. Lisitsyn, and K. Vega. *vancesteven/PlanetProfile: Parallel processing memory management updated for python 3.11*, 2023. DOI: [10.5281/zenodo.844130](https://doi.org/10.5281/zenodo.844130)
4. B. Journaux, J. M. Brown, P. Espinoza, **M. J. Styczinski**, E. Clinton, and T. Gordon. *Bjournaux/SeaFreeze: Updated package README and authorship info*, 2023. DOI: [10.5281/zenodo.3367729](https://doi.org/10.5281/zenodo.3367729)
5. **M. J. Styczinski**, S. Vance, and M. Melwani Daswani. *PlanetProfile default model outputs*, 2023. DOI: [10.5281/zenodo.7250785](https://doi.org/10.5281/zenodo.7250785)
6. **M. J. Styczinski**, S. Vance, and M. Melwani Daswani. *PlanetProfile Python version outputs compared to models of Vance et al. (2018)*, 2023. DOI: [10.5281/zenodo.7318029](https://doi.org/10.5281/zenodo.7318029)
7. A. Plattner and **M. J. Styczinski**. *NASA-Planetary-Science/GanymedeMagModels: Small changes in figures*, 2023. DOI: [10.5281/zenodo.7318029](https://doi.org/10.5281/zenodo.7318029)
8. C. J. Cochrane, **M. J. Styczinski**, and S. Vance. *Degree-1 magnetic excitation spectra for icy moons*, 2021. DOI: [10.5281/zenodo.5057571](https://doi.org/10.5281/zenodo.5057571)

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### 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  $\text{\LaTeX}$   
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

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### RESEARCH POSITIONS

**09/2023 – present** *Affiliate Research Scientist*, Blue Marble Space Institute of Science

Research focus: Magnetic sounding of icy ocean worlds  
Magnetic induction modeling and data analysis  
Geophysical modeling of planetary interior structure  
Laboratory analog studies for magnetic sounding

**09/2021 – 08/2023** *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,

Supervisor(s): assess radiation damage of magnets used in Linear Collider R&D (Pellett);  
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**

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**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