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CURRICULUM VITAE

of
Marshall John Styczinski

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

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:

05/2022	“Magnetic sounding of icy moons with constraints from multiple investigations” Colloquium speaker, JPL Icy worlds Collaboration and Exchange (ICE) seminar:
04/2022	“Magnetic sounding of icy moons with constraints from multiple investigations” Colloquium speaker, NASA Ames Exobiology Group:
07/2021	“Magnetic sounding of icy moons with constraints from multiple investigations” University of Washington PhD defense presentation
08/2018	“Magnetic sounding of icy moons” Colloquium speaker, University of Melbourne Astrophysics:
12/2017	“Constraining Asymmetry in Europa’s Oceans” Pacific Science Center’s “Science in the City”
05/2016	“Models of Europa and the Search for Life” 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*, under review, 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. **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: [10.1002/essoar.10512890.1](#)
5. 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](#)
6. 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*, in press, 2023.
7. 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. *PSJ*, 3(7):152, 2022. DOI: [10.3847/psj/ac7324](#)
8. **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](#)
9. **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.
10. **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.
11. C. J. Cochrane, S. D. Vance, T. A. Nordheim, **M. J. Styczinski**, A. Masters, and L. H. Regoli. In search of subsurface oceans within the uranian moons. *JGR: Planets*, 126(12):e2021JE006956, 2021. DOI: [10.1029/2021JE006956](#)
12. 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. *JGR: Planets*, in press, 2023.

ets, 126(2):e2020JE006418, 2021. DOI: [10.1029/2020JE006418](https://doi.org/10.1029/2020JE006418)

13. **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)
14. 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. *Rev. Sci. Instr.*, 85(11):113906, 2014. DOI: [10.1063/1.4901599](https://doi.org/10.1063/1.4901599)

PROFESSIONAL AFFILIATIONS

Affiliate, Europa Clipper Science Team
[University of Washington Astrobiology Program](#)
[American Geophysical Union](#)

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 Fellow*, JPL-Caltech

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