

JOSEPH GHILARDUCCI O’ROURKE

CURRICULUM VITAE

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RESEARCH INTERESTS

Interior dynamics in planetary bodies made of metal, rock, and ice
Histories of planetary magnetic fields generated by dynamos
Applying Solar System discoveries to exoplanet characterization
Mission and instrument development for spacecraft exploration

EDUCATION

2017 Ph.D. in Planetary Science, California Institute of Technology
2014 M.S. in Planetary Science, California Institute of Technology
2012 B.S. in Astronomy & Physics and Geology & Geophysics, Yale University

UNIVERSITY APPOINTMENTS

2020–Present Assistant Professor, Arizona State University
2017–2019 SESE Exploration Postdoctoral Fellow, Arizona State University
2017 Postdoctoral Scholar in Planetary Science, California Institute of Technology
2012–2016 Graduate Research Fellow, California Institute of Technology

SELECTED AWARDS, HONORS, & FELLOWSHIPS

2016 Outstanding Student Presentation Award, AGU Planetary Science
2016 Graduate Research Award, AGU Study of Earth’s Deep Interior
2016 Antarctica Service Medal, National Science Foundation
2013 Hertz Foundation Fellowship Finalist
2013–2016 NSF Graduate Research Fellowship
2012 Beckwith Prize for excellence in astronomy; Belknap Prize for excellence in geological studies; Bateman Science Prize for academic excellence; Hammer Prize for excellent presentation of the senior thesis, Yale University
2011 Penfield Prize for proficiency in mineralogy, Yale University

KEY PUBLICATIONS (FIRST-AUTHOR OR STUDENT-LED)

2021 Blaske, C. H. and J. G. O’Rourke, “Energetic requirements for dynamos in the metallic cores of super-Earth and super-Venus exoplanets,” *Journal of Geophysical Research: Planets*, 126, 7, e2020JE006739, doi:10.1029/2020JE006739.
2021 Borrelli, M. E., J. G. O’Rourke, S. E. Smrekar, C. M. Ostberg, “A global survey of lithospheric flexure at steep-sided domical volcanoes on Venus reveals intermediate elastic thicknesses,” *Journal of Geophysical Research: Planets*, 126, 7, e2020JE006756, doi:10.1029/2020JE006756.

- 2020 O'Rourke, J. G., "Venus: A thick basal magma ocean may exist today," *Geophysical Research Letters*, e2019GL08612, doi:10.1029/2019GL086126.
- 2019 O'Rourke, J. G., and S.-H. Shim, "Suppressing the Martian dynamo with hydrogenation of the core by hydrated silicates," *Journal of Geophysical Research: Planets*, doi: 10.1029/2019JE005950.
- 2019 O'Rourke, J. G., J. Buz, R. R. Fu, and R. J. Lillis, "Detectability of remanent magnetism in the crust of Venus," *Geophysical Research Letters*, doi:10.1029/2019GL082725.
- 2018 O'Rourke, J. G., C. Gillmann, and P. Tackley, "Prospects for an ancient dynamo and modern crustal remanent magnetism on Venus," *Earth and Planetary Science Letters*, 502, 46–56, doi:10.1016/j.epsl.2018.08.055.
- 2018 O'Rourke, J. G., and S. E. Smrekar, "Signatures of lithospheric flexure and elevated heat flow in stereo topography at coronae on Venus," *Journal of Geophysical Research: Planets*, 123, 369-389, doi:10.1002/2017JE005358.
- 2017 O'Rourke, J. G., J. Korenaga, and D. J. Stevenson, "Thermal evolution of Earth with magnesium precipitation in the core," *Earth and Planetary Science Letters*, 458, 263-272 doi:10.1016/j.epsl.2016.10.057.
- 2016 O'Rourke, J. G., and D. J. Stevenson, "Powering Earth's dynamo with magnesium precipitation from the core," *Nature*, 529, 387-389, doi:10.1038/nature16495.
- 2015 O'Rourke, J. G., and J. Korenaga, "Thermal evolution of Venus with argon degassing," *Icarus*, 260, 128-140, doi:10.1016/j.icarus.2015.07.009.
- 2014 O'Rourke, J. G., A. S. Wolf, and B. L. Ehlmann, "Venus: Interpreting the spatial distribution of volcanically modified craters," *Geophysical Research Letters*, 41, 8252-8260, doi:10.1002/2014GL062121.
- 2014 O'Rourke, J. G., H. A. Knutson, et al., "Warm *Spitzer* and Palomar near-IR secondary eclipse photometry of two hot Jupiters: WASP-48b and HAT-P-23b," *The Astrophysical Journal*, 781, 109, doi:10.1088/0004-637X/781/2/109.
- 2014 O'Rourke, J. G., and D. J. Stevenson, "Stability of ice/rock mixtures with application to a partially differentiated Titan," *Icarus*, 227, 67-77, doi:10.1016/j.icarus.2013.09.010.
- 2012 O'Rourke, J. G., and J. Korenaga, "Terrestrial planet evolution in the stagnant-lid regime: Size effects and the formation of self-destabilizing crust," *Icarus*, 221, 1043-1060, doi:10.1016/j.icarus.2012.10.015.

SELECTED PROFESSIONAL SERVICE

- 2021–Present Unlearning Racism in Geoscience (URGE), ASU SESE Pod, Co-Lead
- 2020–Present National Academies, Planetary Science and Astrobiology Decadal Survey 2023–2032, Panel on Venus
- 2017–2021 NASA VEXAG Steering Committee and Early Career Scholars Group, "Scientific Goals, Objectives, & Investigations" Working Group Co-Chair

PROFESSIONAL SOCIETY MEMBERSHIPS

- 2009–Onwards American Geophysical Union
- 2013–Onwards American Astronomical Society