

CURRICULUM VITAE

Christopher R. Mankovich

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Research Interests

Planetary and stellar interiors, normal mode seismology, rotation, instabilities and mixing processes, planet formation and evolution.

Research Positions

Jet Propulsion Laboratory

JPL Postdoctoral Fellow	2025 – present
NASA Postdoctoral Program	2023 – 2025

California Institute of Technology

Postdoctoral Scholar Research Associate in Planetary Science	2019 – 2022
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University of California, Santa Cruz

NASA Earth and Space Science Fellow	2015 – 2018
Graduate Student Researcher	2013 – 2015

University of California, Santa Barbara

Junior Specialist	2013
Laboratory Assistant	2012

Education

University of California, Santa Cruz

PhD, Astronomy and Astrophysics	2019
<i>Thesis: “Interior Structure of the Gas Giants: Thermal evolution and normal mode seismology”</i>	
MSc, Astronomy and Astrophysics	2015

University of California, Santa Barbara

BS, Physics (minor in Mathematics)	2012
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Honors and Awards

Juno Mission Science Team Award, NASA Honors Awards	2020
NASA Earth & Space Science Fellowship for Planetary Science	2015, 2016, 2017
Whitford Prize, UCSC Department of Astronomy & Astrophysics	2015
Regents Fellowship, UCSC Department of Astronomy & Astrophysics	2013

Peer Review and Panel Service

AAS Journals, Publications
 NASA/ROSES
 Swiss National Science Foundation

Advising

Joseph A'Hearn, University of Idaho Ring seismology of Uranus and Neptune	2020-2022
Hima Aramona, Reed College Markov Chain Monte Carlo models for Uranus and Neptune's gravity fields and the role of stable stratification	2021
Robert Schroder, University of California Santa Cruz Inhibition of convection by water condensation in the atmospheres of Uranus and Neptune	2017-2021
Zafar Rustamkulov, University of California Santa Cruz Seismology of Jupiter and Saturn from Doppler imaging in reflected light	2017-2018

Outreach

Physics Tutor, Natural Sciences STEM Learning Center, Pasadena City College	2020-2022
Student Mentorship Pilot Program, Pasadena City College	2020-2022
Astronomy on Tap, Santa Cruz, California "Making waves: Cassini, Saturn's rings, and sounding the depths of a giant planet"	2018

Presentations

Symposia, Seminars, Workshops

AAS Division for Dynamical Astronomy, Georgia Tech	2025
Lunar and Planetary Science Conference, The Woodlands, TX	2025
UCLA Planetary Science Seminar	2025
56th AAS Division for Planetary Sciences Meeting, Boise, ID	2024
Europlanet Science Congress, Berlin	2024
University of Zürich Planetary Science Seminar	2024

American Geophysical Union Fall Meeting, San Francisco, CA	2023
Keck Institute for Space Studies	2023
“Determining the Interior Structure of Uranus - A Case Study for Leveraging Cross-Discipline Science to Answer Tough Questions”	
International Space Science Institute (Guest seminar)	2022
“A New View of Ring-Planet Interactions From Cassini’s Grand Finale”	
Dix Planetary Science Seminar, Caltech	2022
Juno Open Science Team Meeting, Caltech	2022
University of Maryland Astronomy Colloquium (Invited)	2021
NOIRLAB / Steward Observatory Colloquium (Invited)	2021
Instituto de Ciencias Físicas, UNAM Colloquium (Invited)	2021
American Geophysical Union Fall Meeting, Washington, DC (Invited)	2018
Session P049: The Interiors of Jupiter and Saturn in the Era of Juno and Cassini	
“Cassini Ring Seismology as a Probe of Saturn’s Rotation”	
Caltech GPS Planetary Science Seminar, Pasadena, California	2018
“Cassini Ring Seismology Probes Saturn’s Interior Rotation”	
50th AAS/Division for Planetary Sciences Meeting, Knoxville, Tennessee	2018
“Cassini Ring Seismology as a Probe of Saturn’s Rotation”	
The final Cassini Science Symposium, Boulder, Colorado	2018
“Ring seismology as a probe of Saturn’s rotation”	
Bay Area Exoplanets, Mountain View, California	2018
“Cassini Ring Seismology as a Probe of Saturn’s Interior”	
49th AAS/Division for Planetary Sciences Meeting, Provo, Utah	2017
“Saturn’s Internal Structure: A View through its Natural Seismograph”	
Joint Scientific Assembly of the International Association of Geodesy and the International Association of Seismology and Physics of the Earth’s Interior, Kobe, Japan	2017
“A Window into Giant Planet Structure using Saturn’s Natural Seismograph”	
Center for Integrative Planetary Science Seminar, Berkeley, California (Invited)	2016
“Dense matter, helium rain, and the evolution of Jupiter and Saturn”	
High Energy Density Laboratory Astrophysics, Menlo Park, California	2016
“Helium rain in Jupiter and Saturn: how ab initio predictions for H-He immiscibility affect our understanding of giant planet evolution”	
Bay Area Exoplanets, Mountain View, California	2016
“Bayesian evolution models for giant planets: helium rain and double-diffusive convection in Jupiter”	
48th AAS/Division for Planetary Sciences Meeting, Pasadena, California	2016
“Bayesian Thermal Evolution Models for Giant Planets: Helium rain and double-diffusive convection in Jupiter”	

Publications

Mankovich, C. R., Akins, A. B., Buccino, D., Helled, R., Parisi, M. 2026. Can radio occultations constrain Uranus or Neptune's internal rotation periods? *Planet. Sci. J.*, submitted

Parisi, M., Kim, S., Mankovich, C. R., Fuller, J., Friedson, A. J., Markham, S., and Hofstadter, M. 2026. A multiarc approach to detecting Uranus normal modes via Doppler tracking of a planetary orbiter. *Planet. Sci. J.*, in press

Mankovich, C. R., Parisi, M., Landau, D. F., Dewberry, J. W. 2025. Isolating the gravitational influence of Uranus's winds requires close passages inward of the rings. *Planet. Sci. J.* 6, 11

Friedson, A. J., Parisi, M., **Mankovich, C. R.**, Hofstadter, M. D., Akins, A. B. 2026. The prospects for gravitational seismology at Uranus with an orbiting spacecraft. *Planet. Sci. J.*, in press

Fuentes, J. R., **Mankovich, C. R.**, and Sur, A. 2025. An Energy Perspective of Core Erosion in Gas Giant Planets. *ApJ* 988, 2

Mankovich, C. R., Friedson, A. J., Parisi, M., Markham, S., Dewberry, J. W., Fuller, J., Hedman, M. M., Akins, A., and Hofstadter, M. D. 2025. Setting the Stage for Uranian Seismology from Rings and Radial Velocities. *Planet. Sci. J.* 6, 70

Parisi, M., Friedson, A. J., **Mankovich, C. R.**, Hofstadter, M. D., Akins, A., Karimi, R., and Landau, D. F. 2024. Uranus Orbiter and Probe: A Radio Science Investigation to Determine the Planet's Gravity Field, Depth of the Winds, and Tidal Deformations. *Planet. Sci. J.* 5, 5

Preising, M., French, M., **Mankovich, C.**, Soubiran, F., and Redmer, R. 2023. Material Properties of Saturn's Interior from Ab Initio Simulations. *ApJS* 269, 2

Mankovich, C. R., Dewberry, J. W., and Fuller, J. 2023. Saturn's Seismic Rotation Revisited. *Planet. Sci. J.* 4, 59

Dewberry, J. W., **Mankovich, C. R.**, and Fuller, J. 2022. Impacts of zonal winds on planetary oscillations and Saturn ring seismology. *MNRAS* 516, 1

Militzer, B., Hubbard, W. B., Wahl, S., Lunine, J. I., Galanti, E., Kaspi, Y., Miguel, Y., Guillot, T., Moore, K. M., Parisi, M., Connerney, J.E.P., Helled, R., Cao, H., **Mankovich, C.**, Stevenson, D. J., Park, R. S., Wong, M., Atreya, S. K. A., Anderson, J. and Bolton, S.J. 2022. Juno Spacecraft Measurements of Jupiter's Gravity Imply a Dilute Core. *Planet. Sci. J.* 3, 8

A'Hearn, J. A., Hedman, M. M., **Mankovich, C. R.**, Aramona, H., and Marley, M. S. 2022. Ring Seismology of the Ice Giants Uranus and Neptune. *Planet. Sci. J.* 3, 8

Durante, D., Guillot, T., Iess, L., Stevenson, D. J., **Mankovich, C. R.**, Markham, S., Galanti, E., Kaspi, Y., Zannoni, M., Gomez Casajus, L., Lari, G., Parisi, M., Buccino, D. R., Park, R. S., and Bolton, S. J. 2022. Juno spacecraft gravity measurements provide evidence for normal modes of Jupiter. *Nat. Comms.* 13, 4632.

Nettelmann, N., Movshovitz, N., Ni, D., Fortney, J. J., Galanti, E., Kaspi, Y., Helled, R., **Mankovich, C. R.** and Bolton, S. 2021. Theory of Figures to the Seventh Order and the Interiors of Jupiter and Saturn. *Planet. Sci. J.* 2, 6

Dewberry, J. W., **Mankovich, C. R.**, Fuller, J., Lai, D. and Xu, Wenrui 2021. Constraining Saturn's Interior with Ring Seismology: Effects of Differential Rotation and Stable Stratification. *Planet. Sci. J.* 2, 5

Mankovich, C. R. and Fuller, J. 2021. A diffuse core in Saturn revealed by ring seismology. *Nat. Astron.* 5, 1103-1109

Mankovich, C. R. 2020. Saturn's Rings as a Seismograph to Probe Saturn's Internal Structure. [AGU Adv. 1, 2](#)

Movshovitz, N., Fortney, J. J., **Mankovich, C.**, Thorngren, D., and Helled, Ravit 2020. Saturn's Probable Interior: An Exploration of Saturn's Potential Interior Density Structures. [ApJ 891, 2](#)

Mankovich, C. R. and Fortney, Jonathan J. 2020. Evidence for a Dichotomy in the Interior Structures of Jupiter and Saturn from Helium Phase Separation. [ApJ 889, 1](#)

Mankovich, C., Marley, M. S., Fortney, J. J., & Movshovitz, N. 2019. Cassini Ring Seismology as a Probe of Saturn's Interior I: Rigid Rotation. [ApJ 879, 1](#)

Moll, R., Garaud, P., **Mankovich, C.**, & Fortney, J. J. 2017. Double-diffusive Erosion of the Core of Jupiter. [ApJ 849, 24](#)

Mankovich, C., Fortney, J. J., & Moore, K. L. 2016. Bayesian Evolution Models for Jupiter with Helium Rain and Double-diffusive Convection. [ApJ 832, 113](#)

Garaud, P., Medrano, M., Brown, J. M., **Mankovich, C.**, & Moore, K. 2015. Excitation of Gravity Waves by Fingering Convection, and the Formation of Compositional Staircases in Stellar Interiors. [ApJ, 808, 89](#)

Nettelmann, N., Fortney, J. J., Moore, K., and **Mankovich, C.** 2015. An exploration of double diffusive convection in Jupiter as a result of hydrogen-helium phase separation. [MNRAS, 447, 3422](#)

Cantiello, M., **Mankovich, C.**, Bildsten, L., Christensen-Dalsgaard, J., & Paxton, B. 2014. Angular Momentum Transport within Evolved Low-mass Stars. [ApJ, 788, 93](#)

Paxton, B., Cantiello, M., Arras, P., et al. 2013. Modules for Experiments in Stellar Astrophysics (MESA): Planets, Oscillations, Rotation, and Massive Stars. [ApJS, 208, 4](#)

Teaching

Teaching Assistant & Lab Design, MESA Summer School (with J. Fortney)	2017
Teaching Assistant, UCSC Astronomy 112: Physics of Stars (with J. Fortney)	2016
Teaching Assistant, UCSC Astronomy 2: Overview of the Universe (with C. Rockosi)	2014
Teaching Assistant & Lab Design, MESA Summer School (with P. Garaud)	2014
Teaching Assistant, UCSC Astronomy 3: Planetary Systems (with J. Fortney)	2013
Teaching Assistant & Lab Design, MESA Summer School (with S. Kawaler)	2013
Teaching Assistant & Lab Design, MESA Summer School (with M. Cantiello)	2012