Curriculum Vitae

Christopher R. Mankovich

California Institute of Technology
Mailcode 150-21
Pasadena, CA 91125

chkvch.github.io
chkvch@caltech.edu
626 395 6367

Research Positions

Calfornia Institute of Technology

Postdoctoral Scholar Research Associate in Planetary Science 2019 – 2022

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
Thesis: "Interior Structure of the Gas Giants: Thermal evolution and normal mode seismology"

MSc, Astronomy and Astrophysics 2015

University of California, Santa Barbara

BS, Physics (minor Mathematics) 2012

Research Interests

Planetary and stellar physics, pulsations and rotation, giant planet seismology, planet formation and evolution, asteroseismology, advanced stages of stellar evolution.

Honors and Awards

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 Service

PSJ, ApJ, AJ, JGR, AGU

External Reviewer, Swiss National Science Foundation

External Reviewer, NASA

Outreach

Physics Tutor, Natural Sciences STEM Learning Center, Pasadena City College 2020-present

Student Mentorship Program, Pasadena City College 2020-present

Astronomy on Tap, Santa Cruz, California 2018
"Making waves: Cassini, Saturn's rings, and sounding the depths of a giant planet"'

Advising

Joseph A'Hearn, University of Idaho 2020-2022
Ring seismology of Uranus and Neptune

Hima Aramona, Reed College 2021
Markov Chain Monte Carlo models for Uranus and Neptune's gravity fields and the role of stable stratification

Robert Schroder, University of California Santa Cruz 2017-2021
Inhibition of convection by water condensation in the atmospheres of Uranus and Neptune

Zafar Rustamkulov, University of California Santa Cruz 2017-2018
Seismology of Jupiter and Saturn from Doppler imaging in reflected light

Presentations

Symposia and Seminars

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

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