

Kimberly M. Moore

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EDUCATION

Harvard University, Cambridge, MA

PhD in Earth & Planetary Science, expected May 2020

Committee: Jeremy Bloxham, Jerry Mitrovica, Robin Wordsworth, & Roger Fu

Teaching Certificate, 2019

Yale University, New Haven, CT

B.S. in Applied Physics, 2014

Magna cum laude & departmental distinction

FELLOWSHIPS

2020-present Heising-Simons Foundation, 51 Pegasi b Fellowship in Planetary Astronomy

2019 Harvard Graduate School of Arts & Sciences Merit Fellowship

2015-2018 National Defense Science & Engineering Graduate Fellowship (NDSEG)

2014-2015 Harvard Smith Family Graduate Fellowship for Science & Engineering

2012 Yale Alan S. Tetelman 1958 Fellowship for International Research in the Sciences

2012 Yale Spanish and Latin American Studies Fellowship

AWARDS

2018, 2017 American Geophysical Union Outstanding Student Presentation Award

2017 Harvard Earth & Planetary Sciences Shaler Teaching Award

2016, 2017 Harvard Certificate of Distinction in Teaching Award

2014 Yale Applied Physics Award

2013 American Geophysical Union Student Travel Grant

2010 Intel Science Talent Search Semifinalist

2010 National Merit Finalist

PROFESSIONAL EXPERIENCE

2014-present PhD Research, Harvard University, Dept. of Earth & Planetary Sciences

2019-present Science Education Partner (Outreach), Harvard Museums of Science & Culture

2019 Principal Investigator, NASA JPL Planetary Science Summer Seminar

Bridge to the Stars: Mission to an Interstellar Object

2013-2014 Research Assistant, Yale University, Dept. of Mechanical Engineering

2013 Research Assistant, NASA Student Airborne Research Program

2012 Research Assistant, Polytech. U. of Valencia, Spain, Dept. of E. Engineering

2011-2012 Research Assistant, Yale University, Dept. of Applied Physics

2009-2011 Research Assistant, U.S. Naval Research Laboratory, D.C., Acoustics Division

PUBLICATIONS

9. **Moore, K.M.**, Cao, H., Bloxham, J., Stevenson, D. J., Connerney, J. E. P., and Bolton, S. J. (2019). Time variation of Jupiter's magnetic field consistent with zonal wind advection. *Nature Astronomy* **3**, 730-735.
 8. **Moore, K. M.**, Yadav, R., Cao, H., Kulowski, L., Bloxham, J., Connerney, J. E. P., Kotsiaros, S., Jørgensen, J. L., Merayo, J. M. G., Stevenson, D. J., Bolton, S. J., & Levin, S. M. (2018). Hemispheric dichotomy of Jupiter's magnetic field indicative of a complex Jovian dynamo. *Nature*, **561**, 76-78.
 7. Connerney, J. E. P., Kotsiaros, S., Oliverson, R. J., Espley, J. R., Joergensen, J. L., Joergensen, P. A., Merayo, J. M. G., Herceg, M., Bloxham, J., **Moore, K.**, Bolton, S. J., & Levin, S. M. (2018). A New Model of Jupiter's Magnetic Field from Juno's First Nine Orbits. *Geophysical Research Letters*, **45**, 2590-2596.
 6. **Moore, K. M.**, & Bloxham, J. (2017). The construction of sparse models of Mars' crustal magnetic field. *Journal of Geophysical Research*. DOI: 10.1002/2016JE005238
 5. **Moore, K. M.**, Bloxham, J., Connerney, J. E. P., Jorgensen, J. L., & Merayo, J. M. G. (2017). The analysis of initial Juno magnetometer data using a sparse magnetic field representation. *Geophysical Research Letters*, **44**, DOI: 10.1002/2017GL073133
 4. **Moore, K. M.**, Chan, N. H., Daradich, A., & Mitrovica, J. X. (2017). Time-dependent rotational stability of dynamic planets with viscoelastic lithospheres. *Icarus*, **289**, 34-41. DOI: 10.1016/j.icarus.2017.01.036
 3. Liu, J., Liu, Y., Gong, P., Li, Y., **Moore, K. M.**, Scanley, E., Walker, F., Broadbridge, C. C., & Schroers, J. (2015). Combinatorial exploration of color in gold-based alloys. *Gold Bulletin*, doi: DOI 10.1007/s13404-015-0167-z
 2. Martin, T. P., Layman, C. N., **Moore, K. M.**, & Orris, G. J. (2012). Elastic shells with high-contrast material properties as acoustic metamaterial components. *Phys. Rev. B* **85**, 161103.
 1. Layman, C. N., Martin, T. P., **Moore, K. M.**, Calvo, D. C., & Orris, G. J. (2011). Designing acoustic transformation devices using fluid homogenization of an elastic substructure. *Appl. Phys. Lett.*, **99**, 163503.
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SCIENTIFIC PRESENTATIONS

INVITED TALKS

- 2020 **UCLA**, Dept. of Earth, Planetary, and Space Sciences, Planetary Seminar, May 5
- 2019 **American Geophysical Union Fall Meeting**, SF, USA, Dec 9-13
Harvard University, Center of Mathematical Sciences & Applications,
Fluid Dynamics Seminar, Cambridge, USA, Oct 16
Lockheed Martin, Denver, USA, Sept 26
Johns Hopkins University, Baltimore, USA, Aug 2
Applied Physics Laboratory (JHU-APL), Baltimore, USA, Aug 1
IUGG General Assembly (IUGG Centennial), Montreal, Canada, July 8-18
Caltech, Div. of Geological & Planetary Sciences, Planetary Science Seminar, May 21
Yale, Dept. of Geology & Geophysics, AOCD Seminar, April 18
MIT, Dept. of Earth, Atmospheric, & Planetary Sciences, Colloquium, March 20
European Geophysical Union General Assembly, Vienna, Austria, April 7-12
- 2018 **Study of the Earth's Deep Interior (SEDI)**, Edmonton, Canada, July 8-13
Asia Oceania Geosciences Society, Honolulu, USA, June 3-8
- 2017 **American Geophysical Union Fall Meeting**, New Orleans, USA, Dec 11-15
MIT, Dept. of Earth, Atmospheric, & Planetary Sciences: Planetary Colloquium, Oct 24

ADDITIONAL CONFERENCE PRESENTATIONS (FIRST AUTHOR OR PRESENTING AUTHOR)

** indicates the presenting author*

- 2019 **Moore, K.M.***, Cao, H., Bloxham, J., Stevenson, D. J., Connerney, J. E. P., & Bolton, S. J. (2019). Connecting Jupiter's atmosphere and magnetic field. American Geophysical Union Fall Meeting, Washington, D. C., Dec 9-13.
Moore, K.M.*, Cao, H., Bloxham, J., Stevenson, D. J., Connerney, J. E. P., & Bolton, S. J. (2019). Connecting Jupiter's atmosphere and magnetic field: Wind-driven advection of the Great Blue Spot. EPSC-DPS Joint Meeting, Geneva, Sept 15-20. Oral presentation.
- 2018 Bloxham, J., **Moore, K.M.***, Yadav, R. K., Kulowski, L., Cao, H., Connerney, J. E. P., Kotsiaros, S., Jorgensen, J. L., Merayo, J. M. G., Stevenson, D. J., Bolton, S. J., & Levin, S. M. (2018). Secular variation of Jupiter's magnetic field. American Geophysical Union Fall Meeting, Washington, D. C., Dec 11-15. Poster presentation. PS43D-3804.
Moore, K.M.*, Cao, H., Bloxham, J., Stevenson, D. J., & Connerney, J. E. P. (2018). Secular variation of Jupiter's magnetic field. American Geophysical Union Fall Meeting, Washington, D. C., Dec 11-15. Oral presentation.
Moore, K.*, Yadav, R., Kulowski, L., Cao, H., Bloxham*, J., Connerney, J. E. P., Kotsiaros, S., Jorgensen, J. L., Merayo, J. M. G., Stevenson, D. J., Bolton, S. J., & Levin, S. M. (2018). Jupiter's magnetic field morphology and implications for its dynamo. European Planetary Science Congress, Berlin, Germany, Sept 16-21, 2018. Oral presentation.

- Moore, K.***, Bloxham, J., Connerney, J., Jørgensen, J., Merayo, J., Levin, S., & Bolton, S. (2018). Implications of Initial Juno Magnetic Field Models for the Jovian Dynamo. European Geophysical Union General Assembly, Vienna, April 8-13, 2018. Oral presentation: PS3.2.
- Moore, K.***, Bloxham, J., Connerney, J. E. P., Jørgensen, J. L., & Merayo, J. M. G. (2018). Analysis of Juno magnetometer data: Use of an elastic net to probe small-scale dynamo structure. Jupiter Day, Boston University, Jan 10, 2018. Oral presentation.
- 2017 **Moore, K.**, Bloxham, J.*, Connerney, J. E. P., Jørgensen, J. L., & Merayo, J. M. G. (2017). Juno at Jupiter: Initial Magnetic Field Results. Fifty years after Roberts' MHD: Dynamos and planetary flows today, Royal Astronomical Society, Piccadilly, London, Nov 16-17, 2017. Oral presentation.
- Moore, K.**, Bloxham, J.*, Connerney, J. E. P., Jørgensen, J. L., & Merayo, J. M. G. (2017). Analysis of initial Juno magnetometer data: Use of an elastic net to probe small-scale structure. IAGA, Cape Town, South Africa, Aug 27-Sept 1, 2017. Oral presentation.
- Moore, K.**, Bloxham, J.*, Connerney, J. E. P., Jørgensen, J. L., & Merayo, J. M. G. (2017). Analysis of initial Juno magnetometer data: Use of an elastic net to probe small-scale structure. Asia Oceania Geosciences Society, Singapore, Aug 6-11, 2017. Poster: PS08-A001.
- Moore, K.**, Bloxham, J.*, Connerney, J. E. P., Jørgensen, J. L., & Merayo, J. M. G. (2017). Analysis of initial Juno magnetometer data using a new method of magnetic field analysis. European Geophysical Union General Assembly, Vienna, April 23-28, 2017. Invited Poster: EGU2017-3783.
- Moore, K.***, & Bloxham, J. (2017). The construction of sparse models of Mars' crustal magnetic field. European Geophysical Union General Assembly, Vienna, April 23-28, 2017. Poster: EGU2017-3787
- Moore, K.***, & Bloxham, J. (2017). The construction of sparse models of Mars' crustal magnetic field. European Geophysical Union General Assembly, Vienna, April 23-28, 2017. Poster: EGU2017-11349
- Moore, K.***, Chan, N.-H., Daradich, A., & Mitrovica, J. (2017). Long-term rotational stability of terrestrial planets with viscoelastic lithospheres: Theory and application to Martian True Polar Wander (TPW). European Geophysical Union General Assembly, Vienna, April 23-28, 2017. Poster: EGU2017-11349
- 2016 Chan, N.-H., **Moore, K.***, Daradich, A., & Mitrovica, J. (2016). The long-term rotational stability of terrestrial planets with viscoelastic lithospheres: A new theory with application to Mars. American Geophysical Union Fall Meeting, San Francisco, Dec 12-16, 2016. Oral presentation: Abstract #167669.
- Moore, K.***, & Bloxham, J. (2016). The construction of sparse models of Mars' crustal magnetic field. American Geophysical Union Fall Meeting, San Francisco, Dec 12-16, 2016. Poster: #149373.
- 2013 **Moore, K*.**, Broughton, J., & Kudela, R.M. (2013). *Remote sensing of Akashiwo sanguinea in the vertical column*. American Geophysical Union Fall Meeting, San Francisco, Dec 9-13, 2013. Poster: #OS33A-1742

TEACHING & MENTORING

TEACHING AWARDS

- 2017 Harvard Earth & Planetary Sciences Shaler Teaching Award
Highest departmental award for teaching by a graduate student
- 2016, 2017 Harvard Certificate of Distinction in Teaching Award

TEACHING EXPERIENCE

Bok Pedagogy Fellow (Derek Bok Center for Education and Learning, Harvard University):

Pedagogy Fellows are teaching consultants for the university. They lead seminars on teaching strategies, and collaborate with faculty and staff on Harvard-wide initiatives.

Co-Instructor & Course Head, Bok Center Teaching Seminar

Communicating Science (6 weeks)

Spring 2020

Teaching Fellow (TF):

- EPS 10 A Brief History of the Earth (Prof. Jerry Mitrovica) Fall 2018, Fall 2017
An undergraduate survey class of Earth history
- EPS 52 Global Geophysics: A Primer (Prof. Jerry Mitrovica) Fall 2016
An undergraduate introduction to geophysics

MENTORSHIP EXPERIENCE

Student Researchers Mentored:

- 2019 A. Sheat (Undergraduate, Cambridge University)
B. Bolton (High School Student, Texas)

TRAINING

- 2019-present Harvard Museums of Science & Culture: Science Education Partner
Multi-day science communication training workshop, with ongoing museum outreach role
- 2020 Teaching with Objects and Images Workshop
- 2019 Harvard Teaching Certificate Program
- 2019 Foundations of Teaching in STEM (6 week seminar)
Let's Play! What games can teach us about motivation & engagement (6 weeks)
Mentoring Undergraduates Workshop
Developing research projects, writing recommendation letters, fellowships, diversity & inclusion
- 2016-2019 Title IX Training for Graduate Students (Annual)
- 2017 Harvard EPS Teaching Fellow Training Lunch
- 2017 "Tricky Situations" Workshop by Prof. John Shaw
- 2016 Harvard EPS First-time Teaching Fellow Workshop
- 2015 Harvard EPS First-Year Teaching Seminar Series
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PROFESSIONAL SERVICE

Reviewer: *Earth, Planets, Space*
Geophysical Research Letters
Journal of Geophysical Research: Planets
Journal of Geophysical Research: Space Physics

Member: American Geophysical Union
European Geophysical Union
Outer Planets Assessment Group

Convener: IAGA-IASPEI Joint Scientific Assembly (2021, Hyderabad, India)
EGU General Assembly (2020, Vienna, Austria)
AGU Fall Meeting (2019, San Francisco, USA; Primary Convener)

WORKSHOPS

2019 NASA Planetary Science Summer Seminar (Role: Principal Investigator)
2018 Rayleigh tutorial (magnetohydrodynamics/dynamo code), Boulder, CO, Sept. 15.
2018 Outer Planets Assessment Group Meeting, Pasadena, CA, Sep 11-12
2015 ASPECT Hackathon (mantle convection code), Bodega Bay, CA, May 19-30

OUTREACH

2020 **Guest Speaker**, “How the Universe Works”, Season 8, Discovery Channel (mult. episodes)

2019—present **Harvard Museums of Science & Culture—Science Education Partner**
***Gallery Guide**, Ongoing volunteer role with the mineral gallery*
***Co-Planner & Volunteer**, Space Week (K-2nd grade) (Summer 2019)*
***Volunteer**, A Lunar Soirée (50-year anniversary of Apollo 11) (2019)*
***Volunteer**, I Heart Science Festival (2019)*
***Volunteer**, Tabletop science demo—Exploring magnetic fields (2019)*

2018 **Organizer**, panel for undergraduates: “How to get a summer research internship”
2017 **Organizer**, panel for undergraduates: “How to get a summer research internship”
2017 **Volunteer**, Cambridge Public Schools 8th Grade Science & Engineering Showcase
2017 **Physical Sciences Panelist**, E3 (mentorship program for high school girls)
2017 **Lab Tour**, 2017 APS Conference for Undergraduate Women in Physics

SELECTED PRESS

FILM/TELEVISION

2020 How the Universe Works, Season 8, Discovery Channel

ARTICLES

- 2019 Feedback between Jupiter's atmosphere and magnetic environment
(*Nature Reviews Physics News & Views*)
NASA's Juno finds changes in Jupiter's magnetic field (*NASA Press Release*)
- 2018 Jupiter's bizarre magnetic field is unlike anything scientists have ever seen (*NBC News*)
Jupiter's dynamo is unlike any other (*Physics Today*)
Jupiter's magnetic field revealed by the Juno spacecraft (*Nature News & Views*)
Jupiter's magnetic field has weird structure (*Sky & Telescope*)
Jupiter's magnetic field is surprisingly weird (*Science News*)
- 2017 Jupiter's secrets revealed by NASA probe (*Nature*)
Juno Reveals Jupiter's Deep Secrets (*Scientific American*)

PRESS CONFERENCES

Panelist, "The New Jupiter: A Mid-Mission Report on the Discoveries of NASA's Juno". American Geophysical Union Fall Meeting, December 2018.
