

## Rebecca A. Fischer

- CONTACT INFORMATION** Harvard University  
Department of Earth and Planetary Sciences  
20 Oxford St  
Cambridge, MA 02138  
*Email:* rebeccafischer@g.harvard.edu  
*Webpage:* <https://scholar.harvard.edu/raf>
- EDUCATION** **University of Chicago** Ph.D. in Geophysical Sciences, August 2015  
**Northwestern University** B.A. in Integrated Science and Earth and Planetary Sciences, June 2009
- POSITIONS HELD** **2024–present** Associate Professor of Earth and Planetary Sciences, Harvard University  
**2017–2024** Clare Boothe Luce Assistant Professor of Earth and Planetary Sciences, Harvard University  
**2015–2017** NSF Postdoctoral Fellow, Smithsonian National Museum of Natural History and the University of California Santa Cruz  
**2015–2017** Visiting Assistant Professor of Earth and Planetary Sciences, Harvard University  
**2010–2015** Graduate research assistant, University of Chicago, Laboratory for Mineral Physics  
**2009–2010** Graduate research assistant, University of Maryland, Laboratory for Mineral Physics
- SELECT HONORS AND AWARDS** **2017–2024** Clare Boothe Luce professorship, Henry Luce Foundation  
**2022** Doornbos Memorial Prize, Study of the Earth’s Deep Interior  
**2019–2021** Consortium for Materials Properties Research in Earth Sciences (COMPRES) Distinguished Lecturer  
**2015–2017** Postdoctoral Fellowship, National Science Foundation  
**2014** Graduate Research Award, Mineral and Rock Physics, American Geophysical Union  
**2014–2015** American Dissertation Fellowship, American Association of University Women  
**2014** Takken Award, Association of Women Geoscientists  
**2013–2014** Plotnick Fellowship, University of Chicago  
**2013–2014** Ludo Frevel Crystallography Scholarship, International Centre for Diffraction Data  
**2013** Career Development Award, Lunar and Planetary Institute  
**2012–2013** Graduate Research Fellowship, Illinois Space Grant Consortium  
**2009–2012** Graduate Research Fellowship, National Science Foundation

**2009–2010** Flagship Fellowship, University of Maryland

- BOOKS EDITED Terasaki H., Fischer R.A., editors (2016) *Deep Earth: Physics and Chemistry of the Lower Mantle and Core*. AGU Geophysical Monograph Series, American Geophysical Union/John Wiley & Sons.
- PUBLICATIONS \*Asterisk indicates my students and postdocs
- \*Dong J., Fischer R.A., Stixrude L., \*Brennan M.C., \*Daviau K., \*Suer T.-A., \*Turner K.M., Meng Y., Prakapenka V.B. (submitted) Nonlinearity of the post-spinel transition and its expression in slabs and plumes worldwide.
- Fischer R.A., McDonough W.F. (in press) Earth's core composition and core formation. In: *Treatise on Geochemistry*, 3<sup>rd</sup> edition.
- \*Gu J.T., Peng B., Ji X., Zhang J., Yang H., Hoyos S., Hirschmann M.M., Kite E.S., Fischer R.A. (2024) Composition of Earth's initial atmosphere and fate of accreted volatiles set by core formation and magma ocean redox evolution. *Earth and Planetary Science Letters* (629), 118618.
- Lichtenberg T., Schaefer L.K., Nakajima M., Fischer R.A. (2023) Geophysical evolution during rocky planet formation. In: *Protostars and Planets VII*, edited by S.-i. Inutsuka, Y. Aikawa, T. Muto, K. Tomida, and M. Tamura, Astronomy Society of the Pacific, pp. 907–946.
- \*Gu J.T., Fischer R.A., \*Brennan M.C., Clement M.S., Jacobson S.A., Kaib N.A., O'Brien D.P., Raymond S.N. (2023) Comparisons of the core and mantle compositions of Earth analogs from different terrestrial planet formation scenarios. *Icarus* (394), 115425.
- \*Dong J., Fischer R.A., Stixrude L.P., Lithgow-Bertelloni C.R., Eriksen Z.T., \*Brennan M.C. (2022) Water storage capacity of the Martian mantle through time. *Icarus* (385), 115113.
- \*Brennan M.C., Fischer R.A., Nimmo F., O'Brien D.P. (2022) Timing of Martian core formation from models of Hf–W evolution coupled with  $N$ -body simulations. *Geochimica et Cosmochimica Acta* (316), 295–308.
- Chidester B.A., Thompson E.C., Fischer R.A., Heinz D.L., Prakapenka V.B., Meng Y., Campbell A.J. (2021) An experimental thermal equation of state of B2-KCl. *Physical Review B* (104), 094107.
- \*Brennan M.C., Fischer R.A., Couper S., Miyagi L., Antonangeli D., Morard G. (2021) High-pressure deformation of iron–nickel–silicon alloys and implications for Earth's inner core. *Journal of Geophysical Research: Solid Earth* (126), e2020JB021077.
- \*Daviau K., Fischer R.A., \*Brennan M.C., \*Dong J., \*Suer T.-A., Couper S., Meng Y., Prakapenka V.B. (2021) Equation of state of TiN at high pressures and temperatures: A possible host for nitrogen in planetary mantles. *Journal of Geophysical Research: Solid Earth* (126), e2020JB020074.

- \*Dong J., Fischer R.A., Stixrude L.P., Lithgow-Bertelloni C.R. (2021) Constraining the volume of Earth's early oceans with a temperature-dependent mantle water storage capacity model. *AGU Advances* (2), e2020AV000323.
- Fischer R.A., Zube N.G., Nimmo F. (2021) The origin of the Moon's Earth-like tungsten isotopic composition from dynamical and geochemical modeling. *Nature Communications* (12), 35.
- Jackson M.G., Blichert-Toft J., Halldórsson S.A., Mundl-Petermeier A., Bizimis M., Kurz M.D., Price A.A., Harðardóttir S., Willhite L.N., Breddam K., Becker T.W., Fischer R.A. (2020) Ancient helium and tungsten isotopic signatures preserved in mantle domains least modified by crustal recycling. *Proceedings of the National Academy of Sciences of the U.S.A.* (117), 30,993–31,001.
- Fischer R.A., Cottrell E., Hauri E., Lee K.K.M., Le Voyer M. (2020) The carbon content of Earth and its core. *Proceedings of the National Academy of Sciences of the U.S.A.* (117), 8743–8749.
- Mundl-Petermeier A., Walker R.J., Fischer R.A., Lekic V., Jackson M.G., Kurz M.D. (2020) Anomalous  $^{182}\text{W}$  in high  $^3\text{He}/^4\text{He}$  ocean island basalts: Fingerprints of Earth's core? *Geochimica et Cosmochimica Acta* (271), 194–211.
- \*Brennan M.C., Fischer R.A., Irving J.C.E. (2020) Core formation and geophysical properties of Mars. *Earth and Planetary Science Letters* (530), 115923.
- Zube N., Nimmo F., Fischer R.A., Jacobson S.A. (2019) Constraints on terrestrial planet formation timescales and equilibration processes in the Grand Tack scenario from Hf–W isotopic evolution. *Earth and Planetary Science Letters* (522), 210–218.
- Fischer R.A., Nimmo F. (2018) Effects of core formation on the Hf–W isotopic composition of the Earth and dating of the Moon-forming impact. *Earth and Planetary Science Letters* (499), 257–265.
- Wordsworth R.D., Schaefer L., Fischer R.A. (2018) Redox evolution via gravitational differentiation on low mass planets: Implications for biosignatures, water loss, and habitability. *The Astronomical Journal* (155), 195.
- Fischer R.A., Campbell A.J., Chidester B.A., Reaman D.M., Thompson E.C., Pigott J.S., Prakapenka V.B., Smith J.S. (2018) Equations of state and phase boundary for stishovite and  $\text{CaCl}_2$ -type  $\text{SiO}_2$ . *American Mineralogist* (103), 792–802.
- Chidester B.A., Pardo O.S., Fischer R.A., Thompson E.C., Heinz D.L., Prescher C., Prakapenka V.B., Campbell A.J. (2018) High-pressure phase behavior and equations of state of  $\text{ThO}_2$  polymorphs. *American Mineralogist* (103), 749–756.
- Fischer R.A., Nimmo F., O'Brien D.P. (2018) Radial mixing and Ru–Mo isotope systematics under different accretion scenarios. *Earth and Planetary Science Letters* (482), 105–114.

- Fischer R.A., Campbell A.J., Ciesla F.J. (2017) Sensitivities of Earth's core and mantle compositions to accretion and differentiation processes. *Earth and Planetary Science Letters* (458), 252–262.
- Thompson E.C., Chidester B.A., Fischer R.A., Myers G.I., Heinz D.L., Prakapenka V.B., Campbell A.J. (2016) Equation of state of pyrite to 85 GPa and 2400 K. *American Mineralogist* (101), 1046–1051.
- Fischer R.A. (2016) Melting of Fe-alloys and the thermal structure of the core. In: *Deep Earth: Physics and Chemistry of the Lower Mantle and Core*, edited by H. Terasaki and R.A. Fischer, AGU Geophysical Monograph Series, AGU/Wiley, pp. 3–12.
- Shofner G.A., Campbell A.J., Danielson L.R., Richter K., Fischer R.A., Wang Y., Prakapenka V.B. (2016) The W–WO<sub>2</sub> oxygen fugacity buffer (WWO) at high pressure and temperature: Implications for fO<sub>2</sub> buffering and metal–silicate partitioning. *American Mineralogist* (101), 211–221.
- Pigott J.S., Ditmer D.A., Fischer R.A., Reaman D.M., Hrubiak R., Meng Y., Davis R.J., Panero W.R. (2015) High-pressure, high-temperature equations of state using nanofabricated controlled-geometry Ni/SiO<sub>2</sub>/Ni double hot-plate samples. *Geophysical Research Letters* (42), 10239–10247.
- Fischer R.A., Campbell A.J. (2015) The axial ratio of hcp Fe and Fe–Ni–Si alloys to the conditions of Earth's inner core. *American Mineralogist* (100), 2718–2724.
- Fischer R.A., Nakajima Y., Campbell A.J., Frost D.J., Harries D., Langenhorst F., Miyajima N., Pollok K., Rubie D.C. (2015) High pressure metal–silicate partitioning of Ni, Co, V, Cr, Si, and O. *Geochimica et Cosmochimica Acta* (167), 177–194.
- Salamat A., Fischer R.A., Briggs R., McMahon M., Petitgirard S. (2014) *In situ* synchrotron X-ray diffraction in the laser-heated diamond anvil cell: melting phenomena and synthesis of new materials. *Coordination Chemistry Reviews* (277–278), 15–30.
- Fischer R.A., Campbell A.J., Caracas R., Reaman D.M., Heinz D.L., Dera P., Prakapenka V.B. (2014) Equations of state in the Fe–FeSi system at high pressures and temperatures. *Journal of Geophysical Research: Solid Earth* (119), 2810–2827.
- Fischer R.A., Ciesla F.J. (2014) Dynamics of the terrestrial planets from a large number of N-body simulations. *Earth and Planetary Science Letters* (392), 28–38.
- Fischer R.A., Campbell A.J., Reaman D.M., Miller N.A., Heinz D.L., Dera P., Prakapenka V.B. (2013) Phase relations in the Fe–FeSi system at high pressures and temperatures. *Earth and Planetary Science Letters* (373), 54–64.
- Fischer R.A., Campbell A.J., Caracas R., Reaman D.M., Dera P., Prakapenka V.B. (2012) Equation of state and phase diagram of Fe–16Si alloy as a candidate component of Earth's core. *Earth and Planetary Science Letters* (357–358), 268–276.

- Fischer R.A., Campbell A.J., Lord O.T., Shofner G.A., Dera P., Prakapenka V.B. (2011) Phase transition and metallization of FeO at high pressures and temperatures. *Geophysical Research Letters* (38), L24301.
- Fischer R.A., Campbell A.J., Shofner G.A., Lord O.T., Dera P., Prakapenka V.B. (2011) Equation of state and phase diagram of FeO. *Earth and Planetary Science Letters* (304), 496–502.
- Fischer R.A., Campbell A.J. (2010) High pressure melting of wüstite. *American Mineralogist* (95), 1473–1477.
- Cottrell E., Kelley K.A., Lanzirotti A.T., Fischer R.A. (2009) High-precision determination of iron oxidation state in silicate glasses using XANES. *Chemical Geology* (268), 167–179.
- Lin J.F., Scott H.P., Fischer R.A., Chang Y.Y., Kantor I., Prakapenka V.B. (2009) Phase relations of Fe–Si alloy in Earth’s core. *Geophysical Research Letters* (36), L06306.
- Jacobsen S.D., Holl C.M., Adams K.A., Fischer R.A., Martin E.S., Bina C.R., Lin J.F., Prakapenka V.B., Kubo A., Dera P. (2008) Compression of single-crystal magnesium oxide to 118 GPa and a ruby pressure gauge for helium pressure media. *American Mineralogist* (93), 1823–1828.

INVITED  
DEPARTMENTAL  
COLLOQUIA

- Brown University, Department of Earth, Environmental and Planetary Science, 2021.
- University of Cambridge, Bullard Laboratories, 2021.
- Carnegie Institution of Washington, Earth & Planets Laboratory, 2021.
- Arizona State University, School of Earth and Space Exploration, 2021.
- University of California San Diego, Scripps Institution of Oceanography, 2020.
- University of New Mexico, Department of Earth and Planetary Sciences, 2020.
- University of Hawaii at Manoa, Hawaii Institute of Geophysics and Planetology, 2020.
- Westfälische Wilhelms-Universität Münster, 2019.
- Freie Universität Berlin, 2019.
- Columbia University, Lamont-Doherty Earth Observatory, Geodynamics Seminar, 2019.
- Stanford University, Department of Geological Sciences, 2019.
- Princeton University, Department of Geosciences, Solid Earth Seminar, 2018.
- Massachusetts Institute of Technology, Chemical Oceanography, Geology, Geochemistry, and Geobiology group, 2018.
- Yale University, Department of Geology and Geophysics, 2016.
- Geological Society of Washington, 2016.
- University of Maryland, Department of Geology, 2016.

Smithsonian National Museum of Natural History, Department of Mineral Sciences, 2016.

Columbia University, Lamont-Doherty Earth Observatory, Geodynamics Seminar, 2016.

Argonne National Laboratory, Advanced Photon Source, High Pressure Interest Group, 2015.

Eidgenössische Technische Hochschule (ETH) Zürich, Department of Earth Sciences, 2015.

Northwestern University, Department of Earth and Planetary Sciences, 2015.

University of California Santa Cruz, Department of Earth & Planetary Sciences, 2015.

California Institute of Technology, Seismological Laboratory, 2015.

Massachusetts Institute of Technology, Department of Earth, Atmospheric and Planetary Sciences, 2015.

Harvard University, Department of Earth and Planetary Sciences, 2015.

University of Southern California, Department of Earth Sciences, 2015.

University of Chicago, Department of the Geophysical Sciences, 2015.

Washington University in St. Louis, Department of Earth and Planetary Sciences, 2014.

University of California Berkeley, Department of Earth and Planetary Science, 2014.

Harvard University, Department of Earth and Planetary Sciences, 2014.

Carnegie Institution of Washington, Geophysical Laboratory, 2014.

INVITED  
CONFERENCE  
PRESENTATIONS

*Study of the Earth's Deep Interior Meeting*, 2024. Boundary layers and their implications for the deep Earth's thermal structure, dynamics, and composition.

*Earth and Planets Origin and Evolution Workshop*, 2024. Modeling Earth's core-mantle differentiation: Core formation conditions and core composition.

*Gordon Research Conference: Interior of the Earth*, 2023. How and when did Earth's core form?

*Study of the Earth's Deep Interior Meeting*, 2022. The origins of Si, O, and C in planetary cores.

*Rocky Worlds II Conference*, 2022. The solid mantle water storage capacities and divergent fates of water on Earth and Mars.

*Advances in Synchrotron-Based Research Towards Understanding the Structure, Evolution, and Dynamics of Earth and Planetary Interiors Workshop*, 2021. Axial and radial diffraction studies of  $\text{Mg}_2\text{SiO}_4$  and Fe-Si(-Ni) alloys.

*Goldschmidt Conference*, 2021. The origins of the mantle's carbon and the bulk carbon content of the Earth.

*NASA Prebiotic Chemistry and Early Earth Environments Workshop*, 2020. Accretion history & planetary dynamics: The influence of accretion, core formation, and magma oceans on habitability.

*Goldschmidt Conference*, 2020, Keynote talk. Influence of accretion and core formation on the light element compositions of planetary cores.

*Deep Carbon Observatory Meeting*, 2019. The carbon content of Earth's core from metal-silicate partitioning experiments.

*AGU Fall Meeting*, 2018. Metal-silicate partitioning of carbon to 59 GPa and >5000 K with implications for Earth's core formation.

*NASA Differentiation: Building the Internal Architecture of Planets Meeting*, 2018. What can the Hf-W system tell us about the mechanism and timing of Earth's core formation?

*AGU Fall Meeting*, 2017. Radial mixing and Ru-Mo isotope systematics under different accretion scenarios.

*Magma Oceanology Workshop*, 2016. Effects of core formation on the Hf-W system on Earth.

*Goldschmidt Conference*, 2016, Keynote talk. Sensitivities of Earth's core and mantle compositions to accretion and differentiation processes.

*European Geophysical Union General Assembly*, 2016. The composition of Earth's core from equations of state, metal-silicate partitioning, and core formation modeling.

*Carbon at Extreme Conditions Workshop, Centre Européen de Calcul Atomique et Moléculaire (CECAM)*, 2015. Metal-silicate partitioning of Ni, Co, V, Cr, Si, and O in the presence of carbon to 100 GPa and 5700 K with application to Earth's core formation.

*Goldschmidt Conference*, 2014, Keynote talk. Experimental constraints on the core's Si and O contents from equations of state and metal-silicate partitioning.

*Geological Society of America Annual Meeting*, 2013. Phase diagrams of FeO and Fe-Si alloys.

*Goldschmidt Conference*, 2013. Phase diagrams of FeO and Fe-Si alloys.

CONTRIBUTED  
CONFERENCE  
PRESENTATIONS

*AGU Fall Meeting*, 2023. Metal-silicate partitioning of Pd at Earth's core formation conditions and implications for late accretion.

*AGU Fall Meeting*, 2019. Using  $\Delta^{95}\text{Mo}$  to trace late carbonaceous and non-carbonaceous contributions to the Earth and Mars.

*Goldschmidt Conference*, 2019. The carbon content of Earth's core from metal-silicate partitioning experiments.

*Lunar and Planetary Science Conference*, 2019. Quantifying the probability of the Earth and Moon having the same tungsten isotopic composition.

*AGU Fall Meeting*, 2018. Equations of state of stishovite and CaCl<sub>2</sub>-type SiO<sub>2</sub> to lower mantle conditions.

- Goldschmidt Conference*, 2018. Equations of state and phase diagram of SiO<sub>2</sub> to lower mantle conditions.
- Lunar and Planetary Science Conference*, 2018. The origin of the Moon's Earth-like <sup>182</sup>W isotopic composition.
- Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2017. Sensitivities of Earth's core and mantle compositions to accretion and differentiation processes.
- Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2017. Effects of core formation on the Hf–W system.
- AGU Fall Meeting*, 2016. Effects of core formation on the Hf–W system.
- Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2016. Radial mixing and Ru–Mo isotope systematics under different accretion scenarios.
- Lunar and Planetary Science Conference*, 2016. Radial mixing under different accretion scenarios: Observational constraints.
- AGU Fall Meeting*, 2015. The axial ratio of hcp Fe and Fe–Ni–Si alloys to the conditions of Earth's inner core.
- Deep Carbon Observatory Early Career Scientist Workshop*, 2015. Metal–silicate reactions in the presence of carbon with application to Earth's core formation.
- Deep Carbon Observatory Early Career Scientist Workshop*, 2015. Metal–silicate partitioning of Ni, Co, V, Cr, Si, and O in the presence of carbon to 100 GPa and 5500 K.
- COMPRES Annual Meeting*, 2015. The axial ratio of hcp Fe and Fe–Ni–Si alloys to the conditions of Earth's inner core.
- AGU Fall Meeting*, 2014. Combining N-body accretion simulations with partitioning experiments in a statistical model of terrestrial planet accretion and core formation.
- HPCAT Workshop*, 2014. High pressure phase transition in (Mg,Mn)O.
- COMPRES Annual Meeting*, 2014. High pressure phase transition in (Mg,Mn)O.
- Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2014. Metal–silicate partitioning of Co, Ni, V, Cr, Si, and O up to 100 GPa and 5500 K.
- Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2014. Quantitative chemical analysis of carbon and oxygen in molten Fe-rich alloy by analytical transmission electron microscopy.
- AGU Fall Meeting*, 2013. Metal–silicate partitioning of Co, Ni, V, Cr, Si, and O up to 100 GPa and 5500 K: Implications for core formation.
- Gordon Research Conference: Origins of Solar Systems*, 2013. Dynamics and chemical evolution of the terrestrial planets from a large number of N-body simulations.
- COMPRES Annual Meeting*, 2013. High pressure metal–silicate partitioning of Co, Ni, Si, V, Cr, and O.

*Lunar and Planetary Science Conference*, 2013. Dynamics and chemical evolution of the terrestrial planets from a large number of N-body simulations.

*Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting*, 2013. Metal–silicate experiments in the laser-heated diamond anvil cell.

*AGU Fall Meeting*, 2012. High pressure melting, phase diagrams, and equations of state in the Fe–FeSi system with applications to Earth’s core.

*COMPRES Annual Meeting*, 2012. Equations of state and phase diagrams of iron–silicon alloys.

*AGU Fall Meeting*, 2011. Phase diagram and equation of state of Fe–Si alloy.

*COMPRES Annual Meeting*, 2011. The phase diagram of FeO.

*COMPRES Annual Meeting*, 2011. The phase diagram of FeO.

*AGU Fall Meeting*, 2010. Equation of state of FeO.

*HPCAT/CDAC Short Course*, 2010. Equation of state and B1/B8 phase transition in FeO.

*International Mineralogical Association Meeting*, 2010. Equation of state and B1/B8 phase transition in FeO.

*COMPRES Annual Meeting*, 2010. Equation of state and B1/B8 phase transition in FeO.

*AGU Fall Meeting*, 2008. Phase diagram of wüstite at high pressures and temperatures.

*AGU Fall Meeting*, 2007. Micro-XANES determination of Fe speciation in natural basalts at mantle-relevant  $fO_2$ .

TEACHING  
EXPERIENCE

**Harvard University**, professor

EPS 10: A Brief History of the Earth

EPS 54: Minerals and Rocks of the Earth and Planets

EPS 142: Mineralogy

EPS 248: Topics in Mineral Physics and Chemistry (rotating topics: Mineralogy of Planetary Interiors, Magma Oceanology, Volatiles in the Deep Earth, Foundations of Mineral Physics)

MENTORING

**As Ph.D. supervisor:**

Chiara Chung-Halpern, 2022–present

John “Jack” Sheehan, 2022–present

Jesse Gu, 2020–present

Junjie “JJ” Dong, 2017–2023

Matthew Brennan, 2017–2022

**As undergraduate research supervisor:**

Lucy Jacobsen, 2023–2024 (senior thesis)

Darius Mardaru, 2021–2023

**As postdoctoral supervisor:**

Kierstin Daviau, 2019–2020

Terry-Ann Suer, 2018–2021

Katlyn Turner, summer 2018

**As visiting scientist mentor:**

Riko Iizuka-Oku, 2021–2023

*And numerous other short-term high school and undergraduate interns*

SELECT PRESS  
COVERAGE

“Earth may have been a water world 3 billion years ago.” *The Harvard Gazette*, 30 April 2021. By J. Siliezar.

“Ancient Earth was a water world.” *Science*, 9 March 2021. By P. Voosen.

“Watering down the mantle.” *Eos*, Editor’s Highlights, 9 March 2021. By V. Salters.

“Most of Earth’s carbon was hidden in the core during its formative years.” *ScienceDaily, Phys.org*, 1 April 2020.

“Solar System Simulation Reveals Planetary Mystery.” *NASA Astrobiology Magazine, Phys.org*, 8 September 2014. By E. Howell.

“In a Squeeze.” *Science News*, 14 January 2012, Vol. 181 (1), p. 2. By A. Witze.

SCIENTIFIC AND  
UNIVERSITY  
SERVICE

**Journal reviewer:** American Mineralogist; Astronomy & Astrophysics; Astrophysical Journal; Calphad; Chemical Geology; Communications: Physics; Comptes Rendus Geoscience; Earth and Planetary Science Letters; Elements; Geochemical Perspectives Letters; Geochemistry, Geophysics, Geosystems; Geochimica et Cosmochimica Acta; Geophysical Research Letters; High Temperatures-High Pressures; Icarus; Journal of Alloys and Compounds; Journal of Applied Physics; Journal of Geophysical Research: Planets; Journal of Geophysical Research: Solid Earth; Nature; Nature Astronomy; Nature Communications; Nature Reviews: Earth & Environment; Physics and Chemistry of Minerals; Physics of the Earth and Planetary Interiors; Powder Metallurgy; Proceedings of the National Academy of Sciences of the United States of America; Progress in Earth and Planetary Science; Review of Scientific Instruments; Science; Science Advances

**2022–present** Co-organizer/host of Rocky Worlds Discussions

Board member, 2024–present

**2018–present** Museum Committee member, Department of Earth and Planetary Sciences, Harvard University

**2017–present** Graduate Studies Committee member, Department of Earth and Planetary Sciences, Harvard University

**2024** Study of Earth’s Deep Interior 2024 Doornbos Award committee member

- 2023–2024** Study of Earth’s Deep Interior 2024 scientific steering committee member
- 2023** Session organizer and chair, American Geophysical Union Fall Meeting: *Of cores we can: Interdisciplinary studies of Earth and planetary cores*; and *Planetary formation and differentiation in the inner Solar System: From molecular cloud to rocky planets*
- 2023** Panelist for Academic Job Market Summer Camp, University of Chicago
- 2021–2022** COMPRES Annual Meeting Committee member  
Chair, 2021
- 2021–2022** COMPRES Facilities Committee member
- 2021** Session chair, COMPRES Annual Meeting
- 2021** Session organizer, Goldschmidt Conference: *An interdisciplinary view of core–mantle interactions and processes*
- 2020** Session organizer and chair, American Geophysical Union Fall Meeting: *Accretion and differentiation of rocky planets: Perspectives from geophysics, geochemistry, & astronomy*
- 2019–2020** Daly Postdoctoral Fellowship Committee member, Department of Earth and Planetary Sciences, Harvard University
- 2019** Session organizer and chair, Goldschmidt Conference: *The Earth’s Core and Lower Mantle: Composition, Structure, and Dynamics*
- 2018–2019** Search Committee member, Department of Earth and Planetary Sciences, Harvard University
- 2018** Session organizer and chair, American Geophysics Union Fall Meeting: *Composition and Material Properties of the Core*
- 2017–2018** Department colloquium organizer, Department of Earth and Planetary Sciences, Harvard University
- 2013–2018** Executive Committee member, Mineral and Rock Physics, American Geophysical Union  
Program Committee member, 2015–2017  
Student representative, 2013–2015
- 2017** Session organizer and chair, American Geophysical Union Fall Meeting: *Liquids and Melting in Earth and Planetary Interiors; Petrology, Partitioning, and Phase Diagrams at Extreme Conditions*; and *Rock-Fluid Interactions and Their Influence on Multiphase Flow in Petroleum Reservoirs*
- 2017** Nominations Committee member, COMPRES
- 2016–2017** Theme chair, Earth’s Mantle and Core, 2017 Goldschmidt Conference
- 2016** Session organizer and chair, American Geophysical Union Fall Meeting: *Elasticity, Plasticity, and Microstructures in Planetary Interiors*

- 2015** Session organizer and chair, American Geophysical Union Fall Meeting: *Elasticity of Earth Materials: From Mantle to Core, and General Contributions to Mineral and Rock Physics*
- 2015** Panelist, COMPRES Annual Meeting, student and postdoc panel discussion: *Interviewing for a job*
- 2014** Session chair, Goldschmidt Conference: *Collisional evolution of terrestrial planets: Accretion and post-accretion bombardment*
- 2014** Session chair, Accretion and Early Differentiation of the Earth and Terrestrial Planets Meeting: *Earth composition*
- 2013** Session organizer and chair, American Geophysical Union Fall Meeting: *Chemistry and physics of Earth's lower mantle and core*
- 2013** COMPRES Annual Meeting Committee member and session chair
- 2012** Disciplinary Review Committee member, University of Chicago
- 2012–2013** Representative to the Dean's Student Advisory Board, University of Chicago
- 2011–2013** Student and Postdoc Committee member, COMPRES Chair, 2012–2013

OUTREACH

- 2017–present** Mentor, Harvard Graduate Women in Science and Engineering, Harvard University
- 2024** Interviewed for SEISMA magazine (<https://seismamag.com/visual-fine-art/sarah-derat>)
- 2023** Interviewed for:
  - LiveScience (<https://www.livescience.com/planet-earth/how-do-we-know-how-old-earth-is>)
  - Space.com (<https://www.space.com/17777-what-is-earth-made-of.html>)
- 2021** Mentor, Goldschmidt Mentor Program
- 2021** Science fair judge, Regeneron International Science and Engineer Fair (ISEF)
- 2021** Interviewed for:
  - HMSC Connects! Podcast, Harvard Museums of Science & Culture (<https://hmsc.harvard.edu/podcast>)
  - Eos (<https://eos.org/articles/superlasers-shed-light-on-super-earth-mantles>)
- 2019–2021** Advisor, WGBH Education
- 2020** Interviewed for:
  - The Harvard Crimson
  - Science Magazine (<https://www.sciencemag.org/news/2020/12/mars-lander-spots-deep-layers-beneath-surface-offering-clues-planet-s-formation>)

- 2019** Advisor, *Cosmic Origins* exhibit, Harvard Museum of Natural History  
(<https://hmnh.harvard.edu/cosmic-origins>)
- 2019** Interviewed for:
- The Harvard Crimson
  - Harvard Museum of Natural History  
(<https://hmnh.harvard.edu/news/lunar-sample-nasa-cosmic-origins-exhibition>)
  - The Harvard Gazette  
(<https://news.harvard.edu/gazette/story/2019/07/mini-exhibits-at-the-museum-of-natural-history-feature-lunar-rock-from-apollo-12-mission/>)
  - Harvard Magazine  
(<https://www.harvardmagazine.com/2019/07/moon-landing-50th-anniversary-at-the-harvard-museum-of-natural-history#>)
- 2019** Public lecturer, Harvard Museum of Natural History  
(<https://www.youtube.com/watch?v=NT9pNZRe7s0>)
- 2018–2019** Consultant for children’s book *Your Place in the Universe* (2020)  
by Jason Chin
- 2017–2019** Student presentation judge, COMPRES Meeting
- 2018** Panelist, Harvard Origins of Life Initiative symposium
- 2018** Student presentation judge, Dwornik Award, Lunar and Planetary Science Conference
- 2018** Interviewed for:
- The Harvard Crimson  
(<http://www.thecrimson.com/article/2018/3/8/eps-new-junior-faculty/>)
  - Popular Science (<https://www.popsci.com/diamonds-meteorites-long-lost-planet>)
- 2016–2018** Student presentation judge, Outstanding Student Paper Award, Mineral and Rock Physics, AGU Fall Meeting
- 2017** Speaker, Lightning Talks, Smithsonian National Museum of Natural History (<https://www.youtube.com/watch?v=3IWGsUhmmd4>)
- 2017** Interviewed for:
- The Harvard Crimson
  - Popular Science (<https://www.popsci.com/neutron-star-gold>)
- 2016** CRAM career mentor, AGU Fall Meeting
- 2016** Halloween “Air and Scare” Event, Smithsonian National Air and Space Museum
- 2016** Panelist, “Science Speed Dating” program for high school interns, Smithsonian National Museum of Natural History

- 2016** Science fair judge:  
 DC elementary school STEM fair  
 DC middle and high school STEM fair
- 2016** Interviewed for:  
 Live Science (<http://www.livescience.com/53431-magnesium-powers-earth-magnetic-field.html>)  
 GeoSpace, American Geophysical Union Blogosphere  
 (<http://blogs.agu.org/geospace/2016/06/15/new-study-questions-source-rare-earth-metals-provide-clues-lifes-origins>)  
 EARTH Magazine
- 2015** “Scientist is In” program, Smithsonian National Museum of Natural History
- 2015** Speaker, volunteer education event, Smithsonian National Museum of Natural History
- 2015** Interviewed for Smithsonian Magazine  
 (<http://www.smithsonianmag.com/science-nature/weird-new-type-carbon-harder-brighter-than-diamond-180957433>)
- 2014** Science fair judge, St. Thomas Elementary School, Chicago, IL
- 2014** Speaker, American Association of University Women, Chicago branch
- 2012, 2013** Speaker, undergraduate geology club, University of Chicago
- 2012** Essay judge, New Frontiers in Astronomy and Cosmology
- 2012** Science mentor, St. Thomas Elementary School, Chicago, IL
- 2010–2011** Math club leader, William H. Ray Elementary School, Chicago, IL
- 2010** Maryland Day volunteer, University of Maryland
- 2009** Science club leader, Dr. Bessie Rhodes Magnet School, Skokie, IL