Matthew C. Brennan

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Education

2017 – **Harvard University**
Ph.D. candidate in Earth & Planetary Sciences

2013 – 2017 **University of Chicago**
B.S. with Honors in Geophysical Sciences.
B.S. in Environmental Sciences

Research Positions

2017 – **Graduate student**
Laboratory for Mineral Physics, Harvard University
Advisor: Dr. Rebecca A. Fischer

2016 – **Synchrotron user**
GSECARS, Advanced Photon Source, Argonne National Laboratory
Beamline 12.2.2, Advanced Light Source, Berkley National Laboratory

2015 – 2017 **Undergraduate lab technician**
Laboratory for Mineral Physics, University of Chicago
Advisor: Dr. Andrew J. Campbell
Thesis: "Molten Iron – Solid Silicate Interactions in Earth's Deep Interior"

2016 **Summer Undergraduate Laboratory Internships (SULI) researcher**
Energy Systems Division, Argonne National Laboratory
Advisor: Dr. May Wu
Project: "Water Use for Power Generation in the United States"

Publications

In revision Brennan, M. C., Fischer, R. A., Couper, S., Miyagi, L., Antonangeli, D., & Morard, G. **"High-Pressure Deformation of Iron–Nickel–Silicon Alloys and Implications for Earth's Inner Core."**

In press Daviau, K., Fischer, R.A., Brennan, M. C., Dong, J., Suer, T.-A., Couper, S., Meng, Y., & Prakapenka, V.B. "**Equation of state of TiN at high pressures and temperatures: A possible host for nitrogen in planetary mantles."**

2020 Brennan, M. C., Fischer, R. A., & Irving, J. C. (2020). "**Core formation and geophysical properties of Mars."** *Earth and Planetary Science Letters*, *530*, 115923.

Presentations and Proposals

2020	**"High pressure deformation and texturing of Fe–Ni–Si alloys"** Oral Presentation (COMPRES Annual Meeting)
2019	**"Martian Core Formation: Implications from the Hf–W System."** Poster Presentation (Goldschmidt Conference)
2019	**"Physical properties of iron alloys with implications for inner core anisotropy"** Fellowship Proposal (NSF Graduate Research Fellowship)
2019	**"Using Core Formation and Geophysical Modelling to Predict the Core Radius and Seismic Properties of Mars."** Oral Presentation (Lunar and Planetary Science Conference)
2018	**"A Core Formation Model with Implications for the Properties of the Martian Interior."** Oral Presentation (AGU Fall Meeting)
2018	**"The Composition and Seismic Properties of the Martian Interior."** Oral Presentation (Goldschmidt Conference)
2018	**"Mantle Melting Temperatures of the Earth and Mars"** Synchrotron Proposal (GSECARS, Advanced Photon Source)
2017	**"Deep-Earth Partitioning between Molten Iron Alloys and Solid Silicates."** Poster Presentation (AGU Fall Meeting)

Teaching

Fall 2020	**Teaching Fellow for EPS 10 (A Brief History of the Earth)**
Fall 2019	**Teaching Fellow for EPS 142 (Mineralogy)**

Honors and Awards

2019 –	**National Science Foundation Graduate Research Fellow**
2019 – 2020	**Associate Member of Sigma Xi**
2017	**Departmental Honors in Geophysical Sciences** University of Chicago
2014 – 2017	**Dean's List** University of Chicago

Service and Outreach

2020	**Student panelist** COMPRES Annual Meeting
2020	**Peer reviewer** Physics and Chemistry of Minerals
2020	**Science Education Partner** Harvard Museum of Natural History

2018 – 2020	**Museum volunteer trainer** Harvard Museum of Natural History
2018 – 2019	**Graduate Outreach Chair** Department of Earth & Planetary Sciences, Harvard University
2018	**Volunteer tutor** Cambridge School Volunteers, Cambridge Public Schools
2017 –	**Laboratory Safety Officer** Department of Environmental Health & Safety, Harvard University
2017 – 2018	**Gallery guide** Harvard Museum of Natural History

Skills

Experiment	**Diamond Anvil Cell** (assembly, sample loading, ruby fluorescence, laser heating, Raman spectroscopy) **Synchrotron X–ray Diffraction** (axial and radial geometries, beamline operation, diffraction analysis) **Scanning Electron Microscope** (focused ion beam, backscattered electron detector, EDS analysis) **Piston-cylinder Press** (stack assembly, hydraulic operation, thermocouple operation, sample recovery)
Computation	**Programming** **(**MATLAB, Python, Mathematica, R, LaTeX, HTML) **X-Ray Diffraction** (DIOPTAS, MAUD, BEARTEX, FIT2D, APEX3, Olex^2)

Professional Societies

2018 –	**Geological Society of America**
2017 –	**American Geophysical Union**
2017 –	**Geochemical Society**