

Bethany A. Chidester

Earth and Planetary Sciences
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- Education** **University of Chicago** Ph.D. Geophysical Sciences 2017
University of Toledo B.S. Chemistry, December 2011 (magna cum laude)
- Research Experience**
- 2018-** Postdoctoral Researcher, UC Davis, Earth and Planetary Sciences
Primary Advisor: Dr. Sarah Stewart
 - 2017** Postdoctoral Appointee, Sandia National Laboratories, Dynamic Materials Properties
Advisor: Dr. Christopher Seagle
 - 2012-2017** Graduate Research, University of Chicago, Lab. for Mineral Physics
Advisors: Dr. Andrew Campbell, Dr. Dion Heinz
Dissertation: The distribution of heat-producing radioactive elements in the deep Earth
 - 2011-2012** Undergraduate Research, University of Toledo, Department of Chemistry
Advisor: Dr. Terry Bigioni
Research project: Silver nanoparticle synthesis: Controlling the chemistry to eliminate competing products
 - 2010** Summer scholar (Research Experiences for Undergraduates), Carnegie Institution of Washington, Geophysical Laboratory
Advisor: Dr. Timothy Strobel
Research project: The ammonia-hydrogen system under pressure
- Grants, Honors and Awards** **Proposals awarded time at user facilities:**
- 4.** Investigating giant impacts between rocky planets with high pressure melting and shock equations of state measurements on complex silicates (Steady and decaying shock experiments at Omega EP) (2 days, ~28 shots) 2019, 2020
 - 3.** Actinide partitioning in metal-silicate systems at high pressures and temperatures (XANES measurements at APS 13-ID-E) (54 shifts) 2015-2016
 - 2.** Equation of state and phase studies of uranium- and thorium-bearing minerals (APS 13-ID-D) (18 shifts) 2013-2015
 - 1.** Spectroscopic properties of pyrite (FeS₂) at high pressure (NSLS I U2A) (5 days) 2013
- Awards**
- 2013-2016** National Science Foundation Graduate Research Fellowship
 - 2015** Outstanding Student Paper Award, Mineral and Rock Physics, American Geophysical Union Fall Meeting
 - 2011** Magna cum laude, University of Toledo

2011 Departmental Physical Chemistry Award, Department of Chemistry,
University of Toledo

Publications

†Undergrads mentored by BAC

7. **Chidester B.A.**, Lock, S.J., Rahman Z., Righter K., and Campbell A.J. (In Revision) The lithophile element budget of Earth's core. *Geochimica et Cosmochimica Acta*.
6. Boujibar A., Habermann M., Righter K., Ross D.K., Pando K., Righter M., **Chidester B.A.**, and Danielson L.R. (2019) U, Th, and K partitioning between metal, silicate, and sulfide and implications for Mercury's structure, volatile content, and radioactive heat production. *American Mineralogist*, **104**, 1221-1237.
5. Fischer R.A., Campbell A.J., **Chidester B.A.**, Reaman, D.M., Thompson E.C., Pigott J.S., Prakapenka V.B., and Smith J.S. (2018) Equations of state and phase boundary for stishovite and CaCl₂-type SiO₂. *American Mineralogist*, **103**, 792-802.
4. **Chidester B.A.**, †Pardo O.S., Fischer R.A., Thompson E.C., Heinz D.L., Campbell A.J., Prescher C., and Prakapenka V.B. (2018) High pressure phase behavior and equations of state of ThO₂ polymorphs. *American Mineralogist*, **103**, 749-756.
3. **Chidester B.A.**, Rahman Z., Righter K., and Campbell A.J. (2017) Metal–silicate partitioning of U: Implications for the heat budget of the core and evidence for reduced U in the mantle. *Geochim. Cosmochim. Acta*, **199**, 1-12.
2. Thompson E.C., **Chidester B.A.**, Fischer R.A., Myers G.I., Heinz D.L., Prakapenka V.B., and Campbell A.J. (2016) Equation of state of pyrite to 85 GPa and 2400 K. *Am. Mineral.*, **101**, 1046-1051.
1. **Chidester B.A.** and Strobel T.A. (2011) The ammonia-hydrogen system under pressure. *J. Phys. Chem. A*, **115**, 10433-10437.

Papers in prep

- Chidester B.A.** and Lock S.J. (In prep for EPSL) Exploring the conditions of metal–silicate equilibration during and after giant impacts.
- Frost D.A., Avery M.S., **Chidester B.A.**, Deng J., Li Z., Lv M., Martin J.F., and Buffett B.A. (In prep for G3) Multidisciplinary constraints on the thermal-chemical boundary between Earth's core and mantle.
- Chidester B.A.**, Panero W., Fischer R.A., Thompson E.C., Heinz D.L., Prescher C., Prakapenka V.B., and Campbell A.J. (In prep for Phys. Rev. B) High-pressure phase behavior and equations of state of UO₂ polymorphs.
- Shofner G.A., Campbell A.J., **Chidester B.A.**, Danielson L.R., Lanzirrotti A., Rahman Z., and Righter K. (In prep) Metal–silicate partitioning of tungsten from 10 to 50 GPa: Implications for core formation.

Invited talks

November 2019 University of North Carolina, Chapel Hill Geology Colloquium.
“Exploring the conditions of terrestrial planet formation using high-pressure, high-temperature experiments”.

May 2019 Caltech, Division of Geological and Planetary Sciences Geology Club Seminar. “Exploring the systematics of Earth’s core formation using lithophile elements.”

February 2017 Harvard University, Department of Earth and Planetary Sciences BiSEPPS Seminar. “The lithophile element budget of Earth’s core.”

November 2017 Penn State University, Department of Geosciences. “The distribution of heat producing radioactive elements in the deep Earth.”

October 2017 University of Rochester, Laboratory for Laser Energetics. “The distribution of heat producing radioactive elements in the deep Earth.”

March 2017 University of Rochester, Department of Earth and Environmental Sciences. “Radioactive heat-producing elements in the deep Earth”; and, “Actinide mineralogy under extreme conditions.”

March 2017 Sandia National Labs, High Energy Density Materials Physics. “Radioactive heat-producing elements in the deep Earth.”

November 2014 NASA Johnson Space Center, Astro Research and Exploration Science, Experimental Petrology. “Metal–silicate partitioning of uranium: Implications for the heat budget of the core.”

Teaching Experience

Spring 2017 Guest lecture for Physics of the Earth “Earth’s Global Heat Budget”

Winter 2017 Teaching assistant for “Mineralogy” GEOS 21000

Winter 2016 Teaching assistant for “Evolution of the Solar System and the Earth” PHSC 10100

Spring 2015 Teaching assistant for “Physics of the Earth” GEOS 21200/31200

Spring 2014 Teaching assistant for “Global Warming” PHSC 13400

Winter 2013 Teaching assistant for “Evolution of the Solar System and the Earth” PHSC 10100

Autumn 2012 Teaching assistant for “Ice Age Earth” PHSC 10900

Service

Journal reviewer: Science Advances, Geochimica et Cosmochimica Acta, American Mineralogist, Earth and Planetary Science Letters, Geophysical Research Letters, Journal of Nuclear Materials, Physics and Chemistry of Minerals

2018-present: Meeting organizer for the UC Center for Frontiers in High-Energy-Density Sciences

2017 Session organizer, chair and OSPA liaison, American Geophysical Union Fall Meeting: MR21C and MR31B – *Liquids and melting in Earth and planetary interiors*

2016 Session organizer, chair and OSPA liaison, American Geophysical Union Fall Meeting: DI014 - *Structure, dynamics and evolution of Earth’s deep mantle*

Mentor for undergrad honors theses (Jacob Britz (2015), Olivia Pardo (2017))

Professional Development

Cooperative Institute for Dynamic Earth Research (CIDER), July 2018

The 7 Secrets of Mentoring Highly Successful Graduate Students, UC Davis, 2018

Strengths Based Leadership Training, UC Davis, 2018

AGU, Studies on Earth’s Deep Interior Convener Mentorship Program, 2016

Seminar on Teaching Portfolios, Chicago Center for Teaching Excell., 2016

Seminar on Course Design and College Teaching, CCTE, Spring 2016
Teaching@Chicago: Course Assistants workshop, 2015
Uranium - Cradle to Grave, GAC-MAC short course, 2013

**Activities and
Outreach**

UC Davis Picnic Day – Team Impact Factors, April 2018, 2019
Telescope facilitator volunteer, Adler Planetarium, 2015-2017
Speaker at GeoUnion (undergrad geology club), 2015, 2016
Featured Speaker at UChicagoGRAD Lab Crawl, October 2016
Phys. Sci. Div. NSF-GRFP prior winners panel, Univ. of Chicago, August 2015
Teen Science Career Panel, Lincoln Park Zoo, July 2014
American Geophysical Union member 2010-2011, 2013-present
American Chemical Society member 2010-2012
Volunteer at the UT Outdoor Classroom Garden 2010-2011
USAC Study Abroad, San Sebastian, Basque Country, Spain, Summer 2009

**Select
Conference
Presentations**

†Students mentored by BAC
***Chidester B.A.**, Lock S.J., Stewart S.J. Exploring the conditions of metal–silicate equilibration during and after giant impacts. *Goldschmidt 2019* (oral)
***Chidester B.A.**, Davies E.J., Spaulding D.K., Millot M.A., Stewart S.T. Shock equations of state and melting temperatures of Fe-bearing silicates to 1 TPa. *COMPRES 2019 Meeting* (poster)
***Chidester B.A.**, †Pardo O.S., Panero W.R., Fischer R.A., Thompson E.C., Heinz D.L., Prescher C., Prakapenka V.B., and Campbell A.J. Phase behavior and equations of state of the actinide oxides. *2017 AGU Fall Meeting* (oral)
***Chidester B.A.**, Rahman Z., Righter K., and Campbell A.J. Heat producing elements and the energy budget of Earth’s core. *2016 AGU Fall Meeting* (oral)
***Chidester B.A.**, Shofner, G.A., Rahman, Z., Righter, K., Lanzirotti, A. and Campbell A.J. Synchrotron XANES measurement of cation oxidation state in high pressure metal–silicate partitioning samples. *2016 COMPRES Annual Meeting* (oral and poster)
***Chidester B.A.**, Rahman Z., Righter K. and Campbell A.J. Metal–silicate partitioning of lithophile elements at high pressures and temperatures. *2015 AGU Fall Meeting* (poster, OSPA winner)
***Chidester B.A.**, Rahman Z., Righter K. and Campbell A.J. Metal-silicate partitioning of uranium at high pressures and temperatures. *2015 COMPRES Annual Meeting* (oral and poster)