

Dr. Aleisha C. Johnson

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RESEARCH INTERESTS

Isotope Geochemistry and Metal Cycling; Paleoredox Proxies; Co-Evolution of Life and the Environment; Magmatic Differentiation; the Composition of Earth's Continental Crust

PROFESSIONAL PREPARATION

- Ph.D. Geological Sciences, Arizona State University, 2020. **Advisor:** Ariel D. Anbar
“*Investigations into crustal composition and oxidative weathering in the Archean*”
- B.S. Geology, University of Wisconsin – Eau Claire, 2014. **Advisor:** Phillip D. Ihinger

PROFESSIONAL APPOINTMENTS

<i>NSF EAR Postdoctoral Fellow</i> , University of Chicago	2020-Present
<i>NASA Earth and Space Science Fellow</i> , Arizona State University	2017-2020
<i>Research Assistant</i> , Arizona State University	2014-2017
<i>Teaching Assistant</i> , Arizona State University	2015
<i>Research Assistant</i> , University of Wisconsin – Eau Claire	2012-2014

PEER-REVIEWED PUBLICATIONS

8. Aarons S.M., **Johnson A.C.**, and Rader S.T. (*upcoming 2021*) Forming Earth's continental crust: A non-traditional stable isotope perspective. *Elements*.
7. **Johnson A.C.**, Ostrander C.M., Romaniello S.J., Reinhard C.T., Greaney A.T., Lyons T.W., Anbar A.D. (*in press*) Reconciling evidence of oxidative weathering and atmospheric anoxia on Archean Earth. *Science Advances*.
6. Aarons S.M., Dauphas N., Blanchard M., Zeng H., Nie N.X., **Johnson A.C.**, Greber N.D., Hopp T. (2021) Clues from *ab initio* calculations on titanium isotopic fractionation in tholeiitic and calc-alkaline magma series. *ACS Earth and Space Chemistry*.
5. Ostrander C.M., **Johnson A.C.**, Anbar A.D. (2021) Earth's first redox revolution. *Annual Review of Earth and Planetary Sciences*, 49, 337-366.
4. Greaney A.T., Rudnick R.L., Romaniello S.J., **Johnson A.C.**, Anbar A.D., Cummings M.L. (2021) Assessing molybdenum isotope fractionation during continental weathering as recorded by weathering profiles in saprolites and bauxites. *Chemical Geology*, 120103.
3. Greaney A.T., Rudnick R.L., Romaniello S.J., **Johnson A.C.**, Gaschnig R.M., Anbar A.D. (2020) Molybdenum isotope fractionation in glacial diamictites tracks the onset of oxidative weathering of the continental crust. *Earth and Planetary Science Letters*, 534, 1-9.
2. **Johnson A.C.**, Aarons S.M., Dauphas N., Nie N.X., Zeng H., Helz R.T., Romaniello S.J., Anbar A.D. (2019) Titanium isotopic fractionation in Kilauea Iki lava lake driven by oxide crystallization. *Geochimica et Cosmochimica Acta*, 264, 180-190.
1. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D., Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2019) Experimental determination of pyrite and molybdenite oxidation kinetics at nanomolar oxygen concentrations. *Geochimica et Cosmochimica Acta*, 249, 160-172.

GRANTS AND FUNDING

Current Support

3. PI: NSF EAR Postdoctoral Fellowship (\$174,000, 2020-2022)
“Application of Paired Ti and Fe Isotopes to Understand the Evolution of Earth's Upper Continental Crust”
2. Collaborator: NASA Interdisciplinary Consortia for Astrobiology Research (2021-2026)
“What Life Wants: Exploring the Natural Selection of Elements” (PI: Kaçar)

Past Support

1. NASA Earth and Space Science Fellowship, Arizona State University (\$216,000, 2017-2020)
“How low can we go: Measuring Archean weathering rates in ultra low-O₂ experiments”

TEACHING EXPERIENCE

- 2019 **Geochemistry** (GLG 481/598) ASU. Guest lectures, grading, exam proctoring.
2015 **Habitable Worlds** (SES 106, online) ASU. Online discussion boards, grading.
2013 **Mineralogy and Petrology II** (GEOL 313) UW – Eau Claire. Lab teaching assistant.
2012 **Rocky Mountain Field Studies** (GEOL 303) UW – Eau Claire. Field teaching assistant.

INVITED TALKS

- 2021 Purdue University Geology and Geophysics Seminar Series (West Lafayette, Indiana)
“Reconciling evidence of oxidative weathering and atmospheric anoxia on Archean Earth”
- 2020 University of California – Davis Department Colloquium (Davis, California)
“Reconciling O₂ whiffs and sulfur MIF: Constraints on Archean atmospheric redox from oxidative weathering signatures”

PRESENTATIONS AND CONTRIBUTED ABSTRACTS

19. Anbar A.D., Ostrander C.M., **Johnson A.C.**, Catling D.C. (2020) Redox Revolutions on Earth and Beyond: Implications for Life Detection on Extrasolar Worlds. *AGU* (poster).
18. **Johnson A.C.**, Romaniello S.J., Ostrander C.M., Reinhard C.T., Lyons T.W., Anbar A.D. (2020) Assessing the Availability of Mo in Archean Oceans: Implications for N fixation. *Geobiology Gordon Research Conference* (poster).
17. **Johnson A.C.**, Greaney A.T., Toc M., Rudnick R.L., Foden J., Anbar A.D. (2019) Molybdenum isotope fractionation in arc settings: Implications for the distribution of Mo in the continental crust. *AGU* (oral presentation).
16. **Johnson A.C.**, Romaniello S.J., Ostrander C.M., Reinhard C.T., Lyons T.W., Anbar A.D. (2019) Assessing the bioavailability of Mo in Archean oceans. *GSA* (oral presentation).
15. **Johnson A.C.**, Aarons S.M., Dauphas N., Nie N.X., Zeng H., Helz R.T., Romaniello S.J., Anbar A.D. (2019) Titanium isotopic fractionation in Kilauea Iki lava lake is driven by oxide crystallization. *Goldschmidt* (oral presentation).
14. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2018) Constraints on Earth's Stepwise

- Oxygenation from Sulfide Oxidation Experiments at Low pO₂. *Goldschmidt* (oral presentation).
13. Greaney A.T., Rudnick R.L., Romaniello S.J., **Johnson A.C.**, Gaschnig R.M., Anbar A.D. (2017) Molybdenum isotopes reveal oxidation of Earth's continental crust during the 2.4 Ga Great Oxidation Event. *AGU* (poster).
 12. Gregory D.D., Lyons T., Cliff J.B., Perea D.E., **Johnson A.C.**, Romaniello S.J., Large R.R. (2017) The effects of trace element content on pyrite oxidation rates. *AGU* (poster).
 11. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2017) Quantifying Archean oxygenation – Insights from sulfide oxidation experiments at low pO₂. *GSA* (oral presentation).
 10. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2017) Archean oxidative weathering: Insights from sulfide oxidation experiments at ultra-low pO₂. *Goldschmidt* (oral presentation).
 9. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2017) Reconciling O₂ whiffs and sulfur MIF. *Southern California Geobiology Symposium* (oral presentation).
 8. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2016) Reconciling “whiffs” of O₂ with the Archean MIF S record: Insights from sulfide oxidation experiments.
 - *Astrobiology Science Conference 2017* (oral presentation)
 - *AGU 2016* (poster)
 7. Romaniello S.J., Ostrander C.M., **Johnson A.C.**, Planavsky N., Anbar A.D. (2016) What the flux? Deriving empirical estimates of riverine Mo fluxes over Earth history. *AGU* (poster).
 6. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2016) Mobilizing molybdenum: Interpreting Archean oxidative weathering signatures. *Goldschmidt* (oral presentation).
 5. **Johnson A.C.**, Romaniello S.J., Reinhard C.T., Gregory D.D. Garcia-Robledo E., Revsbech N.P., Canfield D.E., Lyons T.W., Anbar A.D. (2015) Oxidative weathering of Archean sulfides: Implications for the Great Oxidation Event. *AGU* (poster).
 4. **Johnson A.C.**, Wipperfurth S.A., Ihinger P.D. (2014) High-Resolution Infrared Characterization of Hydrothermal Quartz: Toward Identifying the Chemical Signature of Varying Fluid Regimes Within the Swiss Alps. *UWEC CERCA* (poster).
 3. **Johnson A.C.**, Wipperfurth S.A., Lindblad T.A., Ihinger P.D. (2013) Chemical Fingerprint of Hydrothermal Quartz Crystals Sampled Along a Traverse Across the Swiss Alps (poster).
 - *GSA National Conference 2013*
 - *UWEC McNair Seniors Colloquia 2013*
 - *National McNair Research Conference 2013*
 2. Wipperfurth S.A., **Johnson A.C.**, Lindblad T.A., Ihinger P.D. (2013) Tracking Growth Evolution in Contemporaneous Hydrothermal Quartz: High Resolution FTIR Characterization of Crystals Sampled at Windgällenhütte, Switzerland. *GSA* (poster).
 1. **Johnson A.C.**, Wipperfurth S.A., Lindblad T.A., Ihinger P.D. (2013) Chemical Fingerprint of Quartz Crystals Sampled Along a Metamorphic Gradient Across the Swiss Alps. *UWEC CERCA* (Provost Honor Symposium oral presentation).

PROFESSIONAL SERVICE

Leadership Alliance Program Mentor	2021
NSF Proposal Reviewer	2020-2021
Reviewed for journal Science (IF=41.1)	2020
AZ Astrobiology Organizing Committee Member	2019-2020
NASA FINESST19 Planetary Program Reviewer	2019
Goldschmidt Conference Session Chair	2019
Reviewed for journal Geology (IF=4.6)	2019
AGU Conference Session Chair	2016

Departmental Service and Outreach

Volunteer for Letters to a Pre-Scientist	2019
ASU Sundial Freshman Mentor	2019
Guest Scientist for Brains On! Podcast	2019
Volunteer for ASU Ask an Earth and Space Scientist Webpage	2019
Volunteer for “Life as an Earth and Planetary Scientist” online video series	2018
ASU GPSA Research Grant Reviewer	2018-2019
ASU GPSA Travel Grant Reviewer	2017-2019
Grand Canyon Prep Science Fair Judge	2015

HONORS

Featured Article in ASU Now	2020
Graduate Student Excellence Award	2019
Graduate College Travel Award	2018
GPSA Travel Award	2018
University Graduate Fellowship	2014
TriO Day Achiever Award	2014
Outstanding Senior Award	2013
Myers/Willis Field Camp Scholarship	2013
Field Camp I Excellence Award	2013
Ronald E. McNair Post Baccalaureate Achievement Program	2012-2014
Golder Associates Geology Major Scholarship	2012
Leoba Hogan Scientific Research Scholarship	2012

PROFESSIONAL AFFILIATIONS

Geological Society of America || American Geophysical Union || Geochemical Society ||
National Association of Geoscience Teachers

WORKSHOPS ATTENDED

- “Preparing for an Academic Career” (2019) National Association of Geoscience Teachers (NAGT) – Earth Educators Rendezvous, Vanderbilt and UT – Nashville, TN.
- “Succeeding in Academia/Finding and Succeeding Outside of Academia” (2018) Goldschmidt Conference, Boston MA.
- “Solid Earth Dynamics and Climate – Mantle Interactions with the Hydrosphere & Carbonsphere” (2015) Cooperative Institute for Dynamic Earth Research (CIDER), University of California – Berkeley.