

John A. Krantz

Curriculum Vitae

Marine Chemistry & Geochemistry
Woods Hole Oceanographic Institution
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OVERVIEW

I am a geochemist studying the physical and chemical behavior of volatiles, including noble gases, on scales ranging from individual grains to entire planets. I have a background in engineering and the geosciences and draw on my interdisciplinary training to perform high quality experimental, analytical, and numerical work. My research includes:

- Developing new experimental methods for determining solubility and diffusivity of noble gases and nitrogen
- High spatial-resolution measurement of noble gases in mineral phases
- High precision measurement of nitrogen isotopes in natural samples
- Modelling the volatile contents of planetary bodies, including mantle and atmospheric reservoirs
- Modeling the onset of mantle regassing via volatile recycling in subducting slabs

EMPLOYMENT

- 2020 Postdoctoral Investigator, Woods Hole Oceanographic Institution
Dichotomy of Nitrogen Isotopes in Mantle Materials
- 2020 Visiting Assistant Professor, Brown University
Sustainability of Earth Resources
- 2014 Adjunct Professor, Colorado School of Mines
Field Geology

EDUCATION

- 2019 Ph.D. Earth, Environmental, and Planetary Sciences, Brown University
Dissertation: *Tracing Planetary Scale Volatile Cycling with Inert Gases: A Combined Experimental and Numerical Approach*
Advised by Stephen W. Parman
- 2018 M.Sc. Earth, Environmental, and Planetary Sciences, Brown University
- 2014 B.S. Geological Engineering (Exploration Track), Colorado School of Mines

PUBLICATIONS

- Krantz, J.A.**, Parman, S.W., Kelley, S.P. (2019) Recycling of heavy noble gases by subduction of serpentinite. *Earth and Planetary Science Letters*. Elsevier B.V. 521, 120–127.
- Krantz, J.A.**, Cannon, K.M. Parman, S.W. Sequestration of Xe in an early, hydrous Martian crust. *Submitted to Geochemical Perspectives Letters 16 Oct. 2019, in revision.*
- Krantz, J.A.**, Barry, P.H., Parman, S.W. Tracing Water in the Mantle: Results from a Coupled Nitrogen and Xenon System. *Submitted to EPSL 22 June 2020, in revision.*
- Krantz, J.A.**, Parman, S.W. Komatiitic Origin of Archean Anorthosites. *In preparation for submission to GCA.*

AWARDS AND HONORS

- 2019 Brown University Deans' Faculty Fellow

- 2018 Goldschmidt Student Travel Grant, sponsored by NASA
2016 AGU Outstanding Student Presentation Award

PRESENTATIONS

Invited Presentations

- 2019 Geochemistry Seminar, WHOI, MA, USA
2017 AGU Fall Meeting, New Orleans, LA, USA

Conference Presentations

- 2019 Goldschmidt, Barcelona, Spain
2019 Developments In Noble Gas Understanding and Expertise VI, Zurich, Switzerland
2018 AGU Fall Meeting, Washington, D.C., USA
2018 Goldschmidt, Boston, MA, USA
2018 Lunar and Planetary Science Conference, Houston, TX, USA
2017 AGU Fall Meeting, New Orleans, LA, USA
2017 Goldschmidt, Paris, France
2017 Developments In Noble Gas Understanding and Expertise V, Paris, France

ONGOING WORK

- Towards Characterizing the Nitrogen Isotope Systematics of the Oceanic Mantle
In collaboration with: P. Barry
Origin of High-An Archean Anorthosites: Fractional Crystallization of Komatiites
In collaboration with: S. Parman, G. Bybee, L. Ashwal
Onset of Mantle Regassing Controlled by Stability of Serpentinite in Subducting Slabs
In collaboration with: A. Smye, C. Jackson

TEACHING EXPERIENCE

- Instructor – Sustainability of Earth’s Resources (2020)
Teaching Assistant – Earth Materials (2016, 2018, 2019)
Teaching Assistant – Physical Processes in Geology (2017)
Adjunct Professor – Field Geology, Colorado School of Mines (2014)
Sheridan Center for Teaching and Learning at Brown University
2018 Course Design Seminar (Certificate II)
2014 Teaching Seminar – Reflective Teaching (Certificate I)

MENTORING

- C.M. Hill, M.S., University of the Witwatersrand, 2017
- *Experimental constraints on crustal contamination in Proterozoic anorthosite*
A.T. Akinosho, B.S., College of the Holy Cross, anticipated 2020
- *Calibration of piston-cylinder P and T conditions by solid-solid reaction rate*
G. Usabal, B.S., Brown University, 2019
- *Crystallization of Proterozoic anorthosite*
J. Ruiz Gonzalez, B.S., Sonoma State University, anticipated 2020
- *Electrostatic potential of silicate ring sites*, Leadership Alliance SR-EIP

DEPARTMENTAL AND UNIVERSITY SERVICE

Graduate Council, 2016-2019
Graduate Student Council, Chair of Student Life, 2019
Graduate Student Council, Nominations Committee, 2016-2019
Graduate Student Council, Departmental Representative, 2016-2019
Student Conduct Board, 2017-2019
Departmental Faculty Representative, 2017-2019
GeoGrad Student Organization, President, 2015-2016

COURSES PREPARED

Principles and Processes of Geology
Fundamentals of Mineralogy
Mineral Resources and Sustainability

PROFESSIONAL ACTIVITIES

American Geophysical Union (Joined 2014)
Geochemical Society (Joined 2016)

COMMUNITY INVOLVEMENT AND OUTREACH

Science Teaching and Outreach Program (2017-2018)
North Scituate Volunteer Fire Department, RI (2016-2020)

REFERENCES

Stephen Parman, Associate Professor
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Simon Kelley, Head of School of GeoSciences, Chair in Isotope Geochemistry
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