

## Danielle P. Santiago Ramos, Ph.D.

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Postdoctoral Scholar | Departments of Geology & Geophysics and Marine Chemistry & Geochemistry  
Woods Hole Oceanographic Institution  
Woods Hole, MA 02543  
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### EDUCATION

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**Ph.D.**, Geosciences | *Princeton University, Princeton, NJ* 11/2019

Dissertation title: "Potassium cycling in seawater and aquatic organisms: Insights from high-precision stable potassium isotopes ( $^{41}\text{K}/^{39}\text{K}$ )."

Advisor: Dr. John A. Higgins

**Master of Arts**, Geosciences | *Princeton University, Princeton, NJ* 06/2015

Thesis title: "Understanding potassium isotope fractionation during authigenic clay formation in pore-fluid systems: Implications for the  $\delta^{41}\text{K}$  of seawater."

Advisor: Dr. John A. Higgins

**Bachelor of Arts**, Geology | *Amherst College, Amherst, MA* 05/2013

Thesis title: "Assessing the potential effects of dolomitization on the sulfur isotopic composition of late Ordovician-early Silurian dolomites from the Basin and Range province, Nevada."

Advisor: Dr. David S. Jones

### RESEARCH EXPERIENCE

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**Postdoctoral Scholar** 11/2019 – present

*Woods Hole Oceanographic Institution, Woods Hole, MA*

I collaborate with Dr. Sune Nielsen and Dr. Frieder Klein on the use of K isotopes to track subduction recycling of incompatible elements/volatiles, and on the applicability of altered oceanic crust as an archive of seawater chemistry.

**Graduate Research Assistant** 08/2013 – 11/2019

*Higgins Lab, Princeton University, Princeton, NJ*

I contributed to the development of a high-precision method for measurements of stable potassium isotopes by multicollector inductively coupled plasma mass spectrometer (MC-ICP-MS), and applied this and other non-traditional isotope systems (Li, Mg) to investigate links between the global potassium cycle, ocean chemistry and Earth's climate stability.

**Undergraduate Research Assistant** 01/2011 – 05/2013

*Geology Department, Amherst College, Amherst, MA*

I used major/minor element and stable isotopic compositions of Ordovician/Silurian carbonates to assess the role of dolomitization on the sulfur isotopic composition of carbonate-associated sulfate (CAS).

Woods Hole Oceanographic Institution, Woods Hole, MA

Under the mentorship of Dr. Nobu Shimizu, I used *in situ* (SIMS) sulfur isotopic measurements of sulfides in serpentinized peridotites in order to test the hypothesis that the subduction of serpentinites might introduce sulfur isotopic heterogeneities into the mantle.

## RESEARCH INTERESTS

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Assessing links between ocean chemistry, carbon cycle and Earth's climate stability by using measurements of the isotopic composition of sedimentary and igneous archives.

Using stable isotopes (e.g.  $^{41}\text{K}/^{39}\text{K}$ ) to investigate mechanisms of osmotic regulation in animals and plants.

## PUBLICATIONS

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### Peer-reviewed articles:

1. Sial, A.N., Chen, J., Lacerda, L.D., Frei, R., Higgins, J.A., Tewari, V.C., ... & **Santiago Ramos, D.** (2018). Chemostratigraphy across the Cretaceous-Paleogene (K-Pg) boundary: Testing the impact and volcanism hypotheses. *Chemostratigraphy Across Major Chronological Boundaries*, 240, 223.
2. **Santiago Ramos, D.P.**, Morgan, L.E., Lloyd, N.S., and Higgins, J.A. (2018) Reverse weathering in marine sediments and the geochemical cycle of potassium in seawater: Insights from the K isotopic composition ( $^{41}\text{K}/^{39}\text{K}$ ) of deep-sea pore-fluids. *Geochimica et Cosmochimica Acta*, 236:99-120.
3. Morgan, L.E., **Santiago Ramos, D.P.**, Davidheiser-Kroll, B., Faithfull, J., Lloyd, N., Ellam, E., and Higgins, J.A. (2018) High-precision  $^{41}\text{K}/^{39}\text{K}$  measurements by MC-ICP-MS indicate terrestrial variability of  $\delta^{41}\text{K}$ . *Journal of Analytical Atomic Spectrometry*, 33:175-186.
4. Higgins, J.A., Blättler, C.L., Lundstrom, E.A., **Santiago Ramos, D.P.**, Akhtar, A.A., Crüger Ahm, A-S., Bialik, O., Holmden, C., Bradbury, H., Murray, S.T., and Swart, P.K. (2018) Mineralogy, early marine diagenesis, and the chemistry of shallow-water carbonate sediments. *Geochimica et Cosmochimica Acta*, 220:512-534.
5. Dunlea, A. G., Murray, R. W., **Santiago Ramos, D. P.**, and Higgins, J. A. (2017) Cenozoic global cooling and increased seawater Mg/Ca via reduced reverse weathering. *Nature Communications*, 8:844.
6. Jones, D. S., Creel, R. C., Rios, B. A., and **Santiago Ramos, D. P.** (2015) Chemostratigraphy of an Ordovician-Silurian carbonate platform:  $\delta^{13}\text{C}$  records below glacioeustatic exposure surfaces. *Geology*, 43:59-62.

### Manuscript in review:

7. **Santiago Ramos, D.P.**, Coogan, L.A., Murphy, J.G., and Higgins, J.A. (EPSL) Low-temperature oceanic crust alteration and the isotopic budgets of potassium and magnesium in seawater.

Conference abstracts:

8. de Obeso, J.C., **Santiago Ramos, D.P.**, Higgins, J.A., and Kelemen, P.B. (2019) Carbon mineralization accompanying serpentinization in the Oman ophiolite: A magnesium isotope perspective. *American Geophysical Union Fall Meeting, San Francisco, CA (oral presentation)*.
9. Mayfield, K.K., Eisenhauer, A., **Santiago Ramos, D.P.**, Higgins, J.A., Horner, T.J., Auro, M.E.E., Magna, T., Moosdorf, N., Charette, M.A., Gonnee, M.E., Komar, N., Peucker-Ehrenbrink, B., Paytan, A., and Brady, C. (2019) The role of submarine groundwater discharge in marine isotope budgets. *American Geophysical Union Fall Meeting, San Francisco, CA (poster)*.
10. **Santiago Ramos, D.P.**, Coogan, L.A., and Higgins, J.A. (2018) Low-temperature oceanic crust alteration and the isotopic budgets of K and Mg in seawater. *Goldschmidt Geochemistry Conference, Boston, MA (oral presentation)*.
11. Bitterwolf, K., Peucker-Ehrenbrink, B., Eisenhauer, A., **Santiago Ramos, D.P.**, Higgins, J.A., and Paytan, A. (2018) Silicate vs. carbonate weathering: Isotopic co-variability in the Fraser River, Canada. *Goldschmidt Geochemistry Conference, Boston, MA (oral presentation)*.
12. **Santiago Ramos, D.P.**, Coogan, L.A., and Higgins, J.A. (2018) Low-temperature oceanic crust alteration and the isotopic budgets of K and Mg in seawater. *Northeastern Geobiology Symposium, WHOI, Woods Hole, MA (poster)*.
13. **Santiago Ramos, D.P.**, Coogan, L.A., and Higgins, J.A. (2017) A multi-proxy isotope study ( $\delta^{41}\text{K}$ ,  $\delta^{26}\text{Mg}$ ,  $^{87}\text{Sr}/^{86}\text{Sr}$ ) of low-temperature oceanic crust alteration: the Troodos Ophiolite and Ocean Drilling Program Hole 801C. *American Geophysical Union Fall Meeting, New Orleans, LA (oral presentation)*.
14. **Santiago Ramos, D.P.** and Higgins, J.A. (2017) Potassium cycling in seawater and aquatic organisms: Insights from stable potassium isotopes ( $^{41}\text{K}/^{39}\text{K}$ ). *Goldschmidt Geochemistry Conference, Paris, France (poster)*.
15. Morgan, L., **Santiago Ramos, D.P.**, Lloyd, N., and Higgins, J.A. (2017) High precision  $^{41}\text{K}/^{39}\text{K}$  measurements by MC-ICP-MS indicate terrestrial variability of  $\delta^{41}\text{K}$ . *Goldschmidt Geochemistry Conference, Paris, France (invited talk)*
16. Lloyd, N., Fields, P., Morgan, L., **Santiago Ramos, D.P.**, and Higgins, J.A. (2017) Measurements of stable isotope  $^{41}\text{K}/^{39}\text{K}$  by MC-ICP-MS. *Goldschmidt Geochemistry Conference, Paris, France (poster)*.
17. **Santiago Ramos, D.P.** and Higgins, J.A. (2017) Potassium isotopic composition of marine and freshwater fish: An example of diffusive K fractionation in biological systems. *Northeastern Geobiology Symposium, University of Connecticut, Storrs, CT (oral presentation)*.
18. **Santiago Ramos, D.P.** and Higgins, J.A. (2016) Assessing the role of clay authigenesis in the seawater potassium cycle: A paired K and Mg isotope study of deep-sea pore-fluids. *American Geophysical Union Fall Meeting, San Francisco, CA (oral presentation)*.
19. Higgins, J.A., Blättler, C.L., Swart, P.K., **Santiago Ramos, D.P.**, and Akhtar, A.A. (2016) How I learned to stop worrying and embrace diagenesis. *American Geophysical Union Fall Meeting, San Francisco, CA (oral presentation)*.

20. Dunlea, A.G., Murray, R.W., **Santiago Ramos, D.P.**, and Higgins, J.A. (2016) Deep-sea authigenic clays as a sink for seawater Mg through the Cenozoic. *American Geophysical Union Fall Meeting, San Francisco, CA (poster)*.
21. Stolper, D.A., Antonelli, M.A., **Santiago Ramos, D.P.**, Bender, M.L., Schrag, D.P., DePaolo, D.J., and Higgins, J.A. (2016) Isotopic constraints on the formation of carbonates during low-temperature hydrothermal oceanic crust alteration. *American Geophysical Union Fall Meeting, San Francisco, CA (oral presentation)*.
22. **Santiago Ramos, D.P.** and Higgins, J.A. (2016) Understanding potassium isotope fractionation during authigenic clay formation in pore-fluid systems: Implications for the  $\delta^{41}\text{K}$  of seawater. *Biogeochemistry Gordon Conference, Galveston, TX (poster)*.
23. **Santiago Ramos, D.P.** and Higgins, J.A. (2015) Understanding potassium isotope fractionation during authigenic clay formation in pore-fluid systems: Implications for the  $\delta^{41}\text{K}$  of seawater. *American Geophysical Union Fall Meeting, San Francisco, CA (poster)*.
24. **Santiago Ramos, D.P.** and Jones, D.S. (2013) Assessing the potential effects of dolomitization on the sulfur isotopic composition of late Ordovician-early Silurian dolomites from the Basin and Range province, Nevada. *Northeastern Geological Society of America Annual Meeting, Bretton Woods, NH (poster)*.
25. **Santiago Ramos, D.P.**, Shimizu, N., and Scambelluri, M. (2012) Sulfur isotopic variations during subduction of hydrated lithosphere: the Erro Tobbio case. *American Geophysical Union Fall Meeting, San Francisco, CA (oral presentation)*.

## HONORS, AWARDS AND FELLOWSHIPS

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Postdoctoral Scholar, Woods Hole Oceanographic Institution (WHOI)	2019-2021
Walbridge Fund Graduate Award, Princeton Environmental Institute (\$5,000)	2018
The Forris Jewett Moore Graduate Fellowship, Amherst College (\$9,000)	2016-2017
Outstanding Student Presentation Award, AGU Fall Meeting, San Francisco, CA	2016
The Graduate School Teaching Award, Princeton University	2015
The John Mason Clarke 1877 Graduate Fellowship, Amherst College (\$10,400)	2014-2015
Arnold Guyot Teaching Award, Princeton University	2014
Graduate Engineering Council Teaching Award, Princeton University	2014
Canadian Geology Fund, Princeton University (Graduate Fellowship)	2014
Phi Beta Kappa, Amherst College	2013
Sigma Xi, Amherst College	2013
The Belt-Brophy Prize, Amherst College	2012
The Richard M. Foose Scholarship, Amherst College	2011-2012
The Harvey Blodgett & Phi Delta Theta Scholarships, Amherst College	2011
The Koenig Scholarship, Amherst College (Undergraduate Fellowship)	2009-2013

## INVITED TALKS AND LECTURES

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<i>Lamont-Doherty Earth Observatory, Geochemistry Seminar, Palisades, NY</i>	05/2018
Title: New insights on the global potassium cycle from stable K ( $^{41}\text{K}/^{39}\text{K}$ ) isotopes	

AGU Fall Meeting, Session V14A, San Francisco, CA 12/2017  
Title: A multi-proxy isotope study ( $\delta^{41}\text{K}$ ,  $\delta^{26}\text{Mg}$ ,  $^{87}\text{Sr}/^{86}\text{Sr}$ ) of low-temperature oceanic crust alteration: the Troodos Ophiolite and Ocean Drilling Program Hole 801C

Guest lecturer for Surface Earth Dynamics, Amherst College, Amherst, MA 04/2017  
Title: Silicate weathering and the chemistry of the oceans

## TEACHING EXPERIENCE

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Assistant-in-Instruction for the following Princeton University Undergraduate and Graduate Classes:

Geochemistry of the Human Environment (GEO 360) Spring/2017  
Fundamentals of Solid Earth Science (GEO 203) Fall/2015, Fall/2014

## PROFESSIONAL AFFILIATIONS

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Geological Society of America (GSA)  
American Geophysical Union (AGU)  
Mineralogical Society of America (MSA)  
Sigma Xi: The Scientific Research Society  
The Phi Beta Kappa Society

## SERVICE AND OUTREACH

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*Undergraduate student mentorship:*

Vinicius Amaral, Princeton University Senior Thesis (now graduate student at UC Santa Cruz) 2017  
Joan Cannon, Princeton University Junior Research Project 2013

*Volunteer work:*

Latinas in Earth and Planetary Science (Member volunteer) 2019-present  
Princeton Women in Geosciences (PWIGS; Board member and Mentor) 2014-2019  
Princeton Latino Graduate Students Association (Professional Development Chair) 2017  
Trenton Area Soup Kitchen, Trenton, NJ (Adult Learning Center; Tutor) 2015