
Michael A. Antonelli, Ph.D.

Languages: English (fluent), French (fluent)

Institute of Geochemistry and Petrology (IGP)

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EDUCATION

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| Ph.D., Earth & Planetary Science, University of California – Berkeley | 2018 |
| M.S., Geology, University of Maryland – College Park | 2013 |
| B.Sc. with First-Class Honors, Honors Geology, University of Alberta | 2011 |

PROFESSIONAL APPOINTMENTS

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| Postdoctoral Research Fellow, ETH Zürich | 2020 – 2022 |
| Postdoctoral Researcher, Institut de Physiques du Globe de Paris | 2019 – 2020 |

HONORS AND AWARDS

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| ETH Zürich Postdoctoral Fellowship | 2020 – 2022 |
| Marie Skłodowska-Curie Individual Fellowship, European Commission | 2020 |
| Post-Graduate Scholarship – Doctoral (PGS-D3), Natural Sciences and Engineering Research Council of Canada (NSERC) | 2013 – 2016 |
| Student Travel Grant, Mineralogical Association of Canada (MAC) | 2013 |
| Post-Graduate Scholarship – Masters (PGS-M), NSERC | 2012 |
| Past Presidents Medal in Geology, Association of Professional Engineers and Geoscientists of Alberta | 2011 |
| Dean’s Silver Medal in Science, University of Alberta | 2011 |
| MAC Undergraduate Award | 2010 |
| Michael Woollett Memorial Scholarship, University of Alberta | 2010 |
| 2x ENCANA Geology and Geophysics Scholarship | 2009, 2010 |
| 2x NSERC Undergraduate Student Research Award | 2009, 2010 |
| P.S. Warren Memorial Prize in Earth History, University of Alberta | 2009 |
| SHELL Canada Scholarship in Geology | 2009 |

FUNDING

Proposals under review

Ambizione Grant, Swiss National Science Foundation: “Experimental calibration and application of Ca and Mg isotopes to carbonate recycling through geologic time” **949,469 CHF** (*equivalent to 968 k USD, 2022-2026*)

Proposals funded (total equivalent to 515 k USD)

AO INSU TelluS-SYSTER: “Quantifying the contribution of hybrid magmatism to crustal growth in collisional orogens (QuantHyCCO)” **11,000 €** (2021, Co-I, PI: *Oscar Laurent*)

European Commission, Marie Skłodowska-Curie Action, Individual Fellowship (MSCA IF 895850 – CASIMS; Total Score: 95.6%); **191,149 €** (2020-2022), *declined for ETH fellowship*

ETH Zürich Postdoctoral Fellowship (19-2 FEL-33); **231,800 CHF** (2020-2022)

NSERC PGS-D3 (438843-2013); **63,000 CAD** (2013-2016)

NSERC PGS-M (420592-2012); **17,300 CAD** (2012-2013)

NSERC USRA; **4,500 CAD** (2010-2011)

NSERC USRA; **4,500 CAD** (2009-2010)

PUBLICATIONS

Published (Google Scholar – Citations: 379, i10-index: 7, h-index: 8)

12. Cornet, J., Wotzlaw, J.-F., Laurent, O., **Antonelli, M.A.**, Otamendi, J., Bergantz, G., Bachmann, O. (2022) “The role of reworking subducted sediments in arc magmas for the isotopic diversity of the continental crust” *Earth and Planetary Science Letters* (minor revisions).
11. Watkins, J.M. & **Antonelli, M.A.** (2021) “Beyond equilibrium: Kinetic isotope fractionation in high-T environments” *Elements* 17, 6, 383-388.
10. **Antonelli, M.A.**, DePaolo, D.J., Christensen, J.N., Wotzlaw, J.-F., Pester, N.J., Bachmann, O. (2021) “Radiogenic ⁴⁰Ca in seawater: implications for modern and ancient Ca cycles” *ACS Earth Space Chem.* 5, 9, 2481–2492.
9. **Antonelli, M.A.**, Kendrick, J., Yakymchuk, C., Guitreau, M., Mittal, T., Moynier, F. (2021) “Calcium isotope evidence for early Archaean carbonates and subduction of oceanic crust” *Nature Communications* 12, 2534.
8. Mahan, B., **Antonelli, M.A.**, Burckel, P., Turner, S., Chung, R., Habekost, M., Jørgensen, A.L., Moynier, F. (2020) “Longitudinal biometal accumulation and Ca isotope composition of the Göttingen minipig brain” *Metallomics* 12, 1585-159.
7. **Antonelli, M.A.** & Simon, J.T. (2020) “Calcium isotopes in high temperature terrestrial processes” *Chemical Geology* 548, 119651.
6. **Antonelli, M.A.**, Mittal, T., McCarthy, A., Tripoli, B., Watkins, J.M., DePaolo, D.J. (2019) “Ca isotopes record rapid crystal growth in volcanic and sub-volcanic systems” *Proceedings of the National Academy of Sciences, USA*, 116(41) 20315-20321.
5. **Antonelli, M.A.**, Schiller, M., Schauble, E.A., Mittal, T., DePaolo, D.J., Chacko, T., Grew, E.S., Tripoli, B. (2019) “Kinetic and equilibrium Ca isotope effects in high-T rocks and minerals” *Earth and Planetary Science Letters* 517, 71-82.

4. **Antonelli, M.A.**, DePaolo, D.J., Chacko, T., Grew, E.S., Rubatto, D. (2019) “Radiogenic Ca isotopes confirm post-formation K depletion of lower crust” *Geochemical Perspectives Letters* 9, 43–48.
3. **Antonelli, M.A.**, Pester, N.J., Brown, S.T., DePaolo, D.J. (2017) “Effect of Paleo-Seawater Composition on Hydrothermal Reactions in Mid-Ocean Ridges” *Proceedings of the National Academy of Sciences, USA* 114(47).
2. **Antonelli, M.A.**, Kim, S.-T., Peters, M., Labidi, J., Cartigny, P., Walker, R.J., Lyons, J.R., Hoek, J., Farquhar, J. (2014) “Early Inner Solar System Origin for Anomalous Sulfur Isotopes in Differentiated Protoplanets” *Proceedings of the National Academy of Sciences, USA* 111(50).
1. Cabral, R.A., Jackson, M.G., Rosa-Koga, E.F., Koga, K.T., Whitehouse, M.J., **Antonelli, M.A.**, Farquhar, J., Day, J.M.D., Hauri, E.H. (2013) “Anomalous Sulfur Isotopes in Plume Lavas Reveal Deep Mantle Storage of Archaean Crust” *Nature* 496, no. 7446, 490-493.

DISSERTATION AND THESES

Antonelli, M.A. (Advisor: DePaolo, D.J.) Ca Isotopes in Igneous and High-Temperature Metamorphic Systems and the Hydrothermal Chemistry of Paleoseawater (2018). PhD Dissertation, University of California – Berkeley, 170pp.

Antonelli, M.A. (Advisor: Farquhar, J.) The Multiple Sulfur Isotopic Composition of Iron Meteorites: Implications for Nebular Evolution (2013). MS Thesis, University of Maryland – College Park, 105pp.

Antonelli, M.A. (Advisors: Chacko, T., Muehlenbachs, K.) Petrologic and Oxygen Isotopic Characteristics of Lower Crustal Granulite Xenoliths from the A154N Kimberlite, Diavik Diamond Mine, Canada (2011). BSc Thesis, University of Alberta, 133pp.

SELECTED CONFERENCE ABSTRACTS (*Oral/†Poster Presentation)

21. **Antonelli, M.A.***, Hantsche, A.L., Schauble, E.A., Hoffman, J., Kouzmanov, K., Dini, A., Chelle-Michou, C. “Disequilibrium $\delta^{44}\text{Ca}$ in calc-silicate minerals and kinetic isotope effects during skarn formation” AGU Annual Meeting, New Orleans, December 2021.
20. **Antonelli, M.A.***, Kendrick, J., Yakymchuk, C., Guitreau, M., Mittal, T., Moynier, F. “Ca isotopes as tracers of geothermal gradients in TTG magmas: evidence for hot subduction throughout the Archean” V.M. Goldschmidt Conference, virtual, July 2021.
19. Mahan, B.[†], **Antonelli, M.A.**, Burckel, P., Turner, S., Chung, R., Moynier, F. “A longitudinal investigation of metal accumulation in brain regions of Göttingen minipigs, and a first glimpse of Ca isotopes in the mammalian brain” V.M. Goldschmidt Conference, virtual, June 2020.

18. **Antonelli, M.A.***, Moynier, F., Yakymchuk, C., Guitreau, M., Foden, J.D., Amsellem, E. "Ca Isotope Composition of the Continental Crust Through Time: Insights from TTGs, Granites, and Adakites" AGU Annual Meeting, San Francisco, December 2019.
17. Pester, N.J.* , Brown, S.T., **Antonelli, M.A.**, DePaolo, D.J. "Relationships between Na-Ca exchange, reaction temperature, and Sr isotopes in deep-sea hydrothermal fluids" AGU Annual Meeting, Washington D.C, December 2018.
16. **Antonelli, M.A.*** , DePaolo, D.J., Chacko, T., Grew, E.S., Rubatto, D. "Radiogenic ⁴⁰Ca in Garnet: A New Proxy for K Loss during Granulite Metamorphism" V.M. Goldschmidt Conference, Boston, August 2018.
15. **Antonelli, M.A.**, DePaolo, D.J.* , Brown, S.T., Pester, N.J. "Radiogenic ⁴⁰Ca in Seawater" V.M. Goldschmidt Conference, Boston, August 2018.
14. **Antonelli, M.A.†** , Watkins, J., DePaolo, D.J. "Growth Rates and Mechanisms of Magmatic Orbicule Formation: Insights from Calcium Isotopes" AGU Fall Meeting, New Orleans, December 2017.
13. **Antonelli, M.A.*** , DePaolo, D.J., Schauble, E.A., Grew, E.S., Chacko, T., Rubatto, D. "High-Temperature Calcium Isotope Fractionation: Theory vs. Nature" V.M. Goldschmidt Conference, Paris, August 2017.
12. **Antonelli, M.A.**, DePaolo, D.J.* , Pester, N.J., Brown, S.T. "Effects of seawater Ca/SO₄ and Mg on Sr isotope exchange in MOR hydrothermal systems" Goldschmidt Conference, Paris, August 2017.
11. Stolper, D.A.* , **Antonelli, M.A.**, Ramos, D.S., Bender, M.L., Schrag, D.P., DePaolo, D.J., Higgins, J.A. "Isotopic Constraints on the Formation of Carbonates During Low-Temperature Hydrothermal Oceanic Crust Alteration" AGU Fall meeting, San Francisco, December 2016.
10. **Antonelli, M.A.*** , DePaolo, D.J., Grew, E.S. "Large Ca Isotope Fractionation in Granulite Facies Minerals" V.M. Goldschmidt Conference, Yokohama, June 2016.
9. **Antonelli, M.A.**, DePaolo, D.J.* , Brown, S.T., Pester, N.J., Sonnenthal, E.L. "Effect of Paleoseawater Composition on Hydrothermal Exchange at Mid-Ocean Ridges" V.M. Goldschmidt Conference, Yokohama, June 2016.
8. **Antonelli, M.A.*** , DePaolo, D.J. "Ca Isotope Fractionation and Crystal Growth Rates of Volcanic Phenocrysts" V.M. Goldschmidt Conference, Prague, August 2015.
7. Arias-Del Razo, I.* , **Antonelli, M.A.**, Dawson, T.E., Dirzo, R., Owlett, T., Young, H., Woodroffe, R. "Tracking the Isotopic Changes of $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$, and $\delta^2\text{H}$ of African Wild Dogs (*Lycaon Pictus*) Over a 12 Year Period in Laikipia, Kenya" Ecological Society of America Meeting, Baltimore, 2015.
6. Brown, S.T.* , **Antonelli, M.A.**, Staudigel, H. Owens, T.L., DePaolo, D.J. "The Ca Isotope Composition of Altered MORB" V.M. Goldschmidt Conference, Sacramento, June 2014.

5. Jackson, M.G.* , Cabral, R.A., Rose-Koga, E.F., Koga, K.T., Whitehouse, M.J., **Antonelli, M.A.**, Farquhar, J., Day, J.M.D., Hauri, E.H. “Returning from the deep: atmospheric fingerprints in modern hotspot lavas” AGU Fall meeting, San Francisco, December 2013.
4. **Antonelli, M.A.**[†], Peters, M., Farquhar, J. “Multiple Sulfur Isotope Analyses of Iron Meteorites: Implications for Nebular Evolution” 44th Lunar and Planetary Science Conference, #1279, March 2013.
3. Cabral, R.A., Jackson, M.G.* , Rosa-Koga, E.F., Koga, K.T., Whitehouse, M.J., **Antonelli, M.A.**, Farquhar, J., Day, J.M.D., Hauri, E.H. “Mass independently fractionated sulfur isotopes in HIMU lavas reveal Archean crust in their mantle source” V.M. Goldschmidt Conference, Florence, 2013.
2. Jackson, M.G.* , Cabral, R.A., Rose-Koga, E.F., Koga, K.T. Whitehouse, M.J., **Antonelli, M.A.**, Farquhar, J., Day, J.M.D., Hauri, E.H. “Mass Independently Fractionated Sulfur Isotopes Reveal Recycling of Archean Lithosphere in Oceanic Hotspots” European Geosciences Union General Assembly, Vienna, 2013.
1. **Antonelli, M.A.*** , Peters, M., Farquhar, J. “The Sulfur Isotopic Compositions of Magmatic and Non-Magmatic Iron Meteorites” 43rd Lunar and Planetary Science Conference, #2081, March 2012.

INVITED LECTURES (ACADEMIA, NON-CONFERENCE)

Woods Hole Oceanographic Institution (May 23, 2022)

School of Earth Sciences, Zhejiang University (May 18, 2022)

Department of Earth Sciences, University of Geneva (November 30, 2021)

Institute of Geology, University of Bern (November 26, 2021)

SwissSIMS Meeting, Ion probe national facility (August 26, 2021)

Institute of Geochemistry and Petrology, ETH Zürich (June 10, 2020)

Department of Earth Sciences, ETH Zürich (May 9, 2019)

Geochemistry Seminar, Institut de Physique du Globe de Paris (IPGP, March 11, 2019)

TEACHING EXPERIENCE

Teaching Assistant

University of California – Berkeley, Dept. of Earth and Planetary Science

EPS 102. History and Evolution of Planet Earth. Course Leader: M.A. Richards (2017)

Guest Lecturer

Eidgenössische Technische Hochschule (ETH) Zürich

“Stable & radiogenic Ca isotopes (and stable isotopes in general)”, Oct. 9, 2020

University of California – Berkeley, Dept. of Earth and Planetary Science

“Stable Isotopes and Ice Ages”, April 11, 2017

“Geologic History of the Atmosphere and Oceans”, April 18, 2017

Field Trip Assistant

University of California – Berkeley, Dept. of Earth and Planetary Science

EPS 119. Geologic Field Studies. Course Leader: D.J. DePaolo, 4 days (2018)

EPS 50. The Planet Earth. Course Leader: C.Y. Wang, 1 day (2016)

PROFESSIONAL SERVICE AND OUTREACH

Reviewer

Proceedings of the National Academy of Sciences; Geochemical Perspectives Letters; Communications Earth & Environment; Earth and Planetary Science Letters; Geochimica et Cosmochimica Acta; Geophysical Research Letters; Precambrian Research; Chemical Geology; Journal of Geophysical Research: Solid Earth; Geochemistry, Geophysics, Geosystems (G-Cubed); AGU Books; CNRS AO INSU TelluS-SYSTER 2021 (*proposal reviewer*).

Session Convener

“Beyond equilibrium: Kinetic isotope fractionation in high-T environments”, AGU Fall Meeting, New Orleans, USA, December 2021 (primary convener)

“Calcium isotope geochemistry: from carbonates to comets”, V.M. Goldschmidt Conference, Lyon, France, July 2021 (co-convener)

“Crust-Mantle Processes: A Stable Isotope Perspective”, V.M. Goldschmidt Conference, Yokohama, Japan, June 2016 (co-convener)

Volunteer

Judge: BSc Poster Fair, Dept. of Earth Sciences, ETH-Zurich (May 30, 2022)

Judge: Outstanding Student Presentation Award (OSPA), AGU Conference (Dec. 2021)

Science Fair Project Mentor: Community Resources for Science “Be a Scientist” program, Willard Middle School, Berkeley, CA, USA (March 11 – April 29, 2017)

Judge: *Earth-Sciences Category*, Prince George’s County Science Fair, MD, USA (March 9, 2013)

REFERENCES

Donald J. DePaolo (depaolo@berkeley.edu) | David L. Shuster (dshuster@berkeley.edu) | James Farquhar (jfarquha@umd.edu) | Olivier Bachmann (olivier.bachmann@erdw.ethz.ch) | Todd E. Dawson (tdawson@berkeley.edu) | Frederic Moynier (moynier@ipgp.fr) | Cyril Chelle-Michou (cyril.chelle-michou@erdw.ethz.ch) | Karlis Muehlenbachs (karlis.muehlenbachs@ualberta.ca) | Thomas Chacko (tom.chacko@ualberta.ca)