
Michael A. Antonelli, Ph.D.

Born: Edmonton, Canada

Nationality: Canadian citizen, French citizen

Languages: English (fluent), French (fluent)

*Asst. Professor and TIMS lab director
Dept. of Earth and Atmospheric Sciences
University of Houston, Houston, TX*

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EDUCATION

Ph.D., Earth & Planetary Science, University of California – Berkeley (Dec. 14)	2018
M.S., Geology, University of Maryland – College Park	2013
B.Sc. with First-Class Honors, Honors Geology, University of Alberta	2011

PROFESSIONAL APPOINTMENTS

Assistant Professor, University of Houston	2023 –
BNF Postdoctoral Researcher, ETH Zürich	2023 – 2023
Postdoctoral Research Fellow, ETH Zürich	2020 – 2022
Postdoctoral Researcher, Institut de Physique du Globe de Paris	2019 – 2020

HONORS AND AWARDS

ETH Zürich Postdoctoral Fellowship	2020
Marie Skłodowska-Curie Individual Fellowship, European Commission	2020
Post-Graduate Scholarship – Doctoral (PGS-D3), Natural Sciences and Engineering Research Council of Canada (NSERC)	2013
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 (USRA)	2009, 2010
P.S. Warren Memorial Prize in Earth History, University of Alberta	2009
SHELL Canada Scholarship in Geology	2009

FUNDING

Proposals funded

NSF Petrology and Geochemistry grant (PI); *Distinguishing mantle source heterogeneity from process-based Ca isotope signatures in ocean island basalts* (2437738); **\$463,475 USD** (2025-2028)

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

Submitted

17. Li, Z.-X., **Antonelli, M.A.**, Zhou, K., Zhang, S.-B., Zheng, Y.-F. The behavior of O–Si–Zr–Hf isotopes during the dissolution and growth of zircons in crustal melting. *Geochimica et Cosmochimica Acta* (resubmitted with minor revisions, Sept. 17, 2025).

Published (Google Scholar – Citations: 798, i10-index: 14, h-index: 13)

16. Li, Z.-X., Zhang, S.-B., Zheng, Y.-F., **Antonelli, M.A.**, Zhang, W., Zhang, L., Sun, F.-Y., Liang, T. (2025) Transition from kinetic to equilibrium Zr isotope fractionations during magma crystallization. *Geochimica et Cosmochimica Acta* 400, 1-17.

<https://doi.org/10.1016/j.gca.2025.05.017>

15. **Antonelli, M.A.**, Sartori, G., Giuliani, A., Schauble, E.A., Hoffman, J., Schmidt, M. (2023) Calcium isotope fractionation during melt immiscibility and carbonatite petrogenesis. *Geochemical Perspectives Letters* 28, 13-19.

<https://doi.org/10.7185/geochemlet.2338>

14. **Antonelli, M.A.**, Giuliani, A., Wang, Z., Wang, M., Zhou, L., Feng, L., Li, M., Zhang, Z., Liu, F., Drysdale, R.N. (2023) Subducted carbonates not required: deep mantle melting explains stable Ca isotopes in kimberlite magmas. *Geochimica et Cosmochimica Acta* 348, 410-427.

<https://doi.org/10.1016/j.gca.2023.03.025>

13. **Antonelli, M.A.**, Yakymchuk, C., Schauble, E.A., Foden, J., Janoušek, V., Moyen, J.-F., Hoffmann, J., Moynier, F., Bachmann, O. (2023) Granite Petrogenesis and the $\delta^{44}\text{Ca}$ of Continental Crust. *Earth and Planetary Science Letters* 608, 118080.

<https://doi.org/10.1016/j.epsl.2023.118080>

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* 595, 117706.
<https://doi.org/10.1016/j.epsl.2022.117706>
11. Watkins, J.M. & **Antonelli, M.A.** (2021) Beyond equilibrium: Kinetic isotope fractionation in high-T environments. *Elements* 17, 6, 383-388.
<https://doi.org/10.2138/gselements.17.6.383>
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.
<https://doi.org/10.1021/acsearthspacechem.1c00179>
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.
<https://doi.org/10.1038/s41467-021-22748-2>
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.
<https://doi.org/10.1039/d0mt00134a>
7. **Antonelli, M.A.** & Simon, J.T. (2020) Calcium isotopes in high temperature terrestrial processes. *Chemical Geology* 548, 119651.
<https://doi.org/10.1016/j.chemgeo.2020.119651>
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.
<https://doi.org/10.1073/pnas.1908921116>
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.
<https://doi.org/10.1016/j.epsl.2019.04.013>
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.
<https://doi.org/10.7185/geochemlet.1904>
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).
<https://doi.org/10.1073/pnas.1709145114>

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). <https://doi.org/10.1073/pnas.1418907111>
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. <https://doi.org/10.1038/nature12020>

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)

23. **Antonelli, M.A.***, Syverson, D.D., Schauble, E.A., Awolayo, A.N., Evans, G.N., Chelle-Michou, C., Seyfried Jr., W.E. Stable Calcium Isotopes in Scheelite and Skarn Systems: Advances, Complexities, and Future Directions. Goldschmidt Conference, Prague, July 2025.
22. **Antonelli, M.A.***, Sartori, G., Giuliani, A., Schauble, E.A., Hoffman, J., Schmidt, M.W. Ca isotope fractionation during carbonatite petrogenesis and melt-immiscibility. AGU Annual Meeting, San Francisco, December 2023.
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 ^{40}Ca 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 ^{40}Ca 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/SO_4 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)

- 2025 Texas A&M University (*Upcoming*, Oct. 3)
Carnegie Institution for Science, Washington D.C. (May 29)
- 2024 University of Texas – Austin (Sept. 13)
University of Texas – Austin (Sept. 12)
Rice University (Aug. 29)
University of Houston – Faculty Lightning Talks (Aug. 23)
- 2023 University of Toronto (Apr. 20)
University of Florida (Feb. 23)
University of Houston (Feb. 20)
Florida Atlantic University (Feb. 3)
- 2022 University of Tokyo (Nov. 21)
Swedish Museum of Natural History (Nov. 18)
Australian National University (June 17)
Woods Hole Oceanographic Institution (May 23)

Zhejiang University (May 18)
2021 University of Geneva (Nov. 30)
University of Bern (Nov. 26)
SwissSIMS Ion probe national facility (Aug. 26)
2020 ETH Zürich (June 10)
2019 ETH Zürich (May 9)
Institut de Physique du Globe de Paris (March 11)

TEACHING EXPERIENCE

Course Instructor

University of Houston, Dept. of Earth and Atmospheric Sciences
Geol 6397 – Non-traditional stable isotope geochemistry (Spring 2025)
Geol 3370 – Mineralogy (Fall 2024)
Geol 1303 – Physical geology (Spring 2024)

Guest Lecturer

University of Bern, Institute of Geology
Isotopic fractionation in geological processes, Nov. 25, 2021
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

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

STUDENTS MENTORED

Primary Advisor

Grant DeKoekKoek, UH EAS – Ph.D. Student 2025 –

Melania D. Maqway, UH EAS – Ph.D. student	2025 –
Amberlee J. Enger, UH EAS – M.S. student	2024 –
Zachary Guess, UH EAS – M.S. student	2024 –

Thesis/Dissertation Committee Member

Sanjay Sharma Poudel, UH Physics Dept. – Ph.D. student (A. Renshaw)	2025 –
Abigail M. Cantoni, UH EAS – M.S. student (T. Lapen)	2024 –
Debra L. Bailey, UH EAS – Ph.D. student (N. Voarintsoa)	2024 –

Undergraduate Students

Daniel A. Duran (B.S. Geology), Undergraduate Researcher	2025 –
Melissa Unlu (B.S. Computer Science), Undergraduate Researcher	2024 – 2024

PROFESSIONAL SERVICE AND OUTREACH

Journal Reviewer (>80 articles in 20 different journals)

Proceedings of the National Academy of Sciences | Science Advances | Nature Geoscience | Geology | Geochemical Perspectives Letters | PNAS Nexus | Communications Earth & Environment | Earth and Planetary Science Letters | Geochimica et Cosmochimica Acta | Chemical Geology | Lithos | Geophysical Research Letters | Precambrian Research | Journal of Geophysical Research: Planets | Journal of Geophysical Research: Solid Earth | Geochemistry, Geophysics, Geosystems | Journal of the Geological Society | Marine Geology | Physics and Chemistry of Minerals | Minerals | AGU Books

Proposal Reviewer

3 National Science Foundation proposals (NSF, 2023, 2024, 2025)

1 French National Centre for Scientific Research proposal (CNRS, 2021)

Session Convener

Beyond equilibrium: Kinetic isotope fractionation in high-T environments, AGU Fall Meeting, New Orleans, USA, December 2021 (primary convenor and chair)

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

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

Departmental and University Service (University of Houston)

Co-chair and organizer (w/ J. Radovic), EAS Geochemistry Seminar (Spring 2025 – Present)

Faculty Annual Performance Review (APR) Committee, Dept. of Earth and Atmospheric Sciences (Spring 2025)

UH Carbon Capture and Utilization Strategies (CCUS) Graduate Certificate Program Development Committee (Fall 2024)

UH EAS Faculty & Student Bowling initiative, organizer and chair (Fall 2023 – Present)
<https://newsletter.eas.uh.edu/issues/spring-2025/articles/eas-bowling>

Outreach

Producer/director/editor, publicly-available NSF-funded (Grant 2437738) educational lectures and training videos for the “Antonelli Geochemistry” Youtube channel (2025 – present)
<https://www.youtube.com/@AntonelliGeochemistry>

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

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

Member: We/Men, Switzerland (July 2021 – present), <https://we-men.net/support>

Science Fair Project Mentor (7th grade students): Community Resources for Science - *Be a Scientist* program, Willard Middle School, Berkeley, California, USA (March 11 – April 29, 2017)
<https://crscience.org/outreach/beascientist/>

Guest Judge (w/ James Farquhar): Earth-Sciences Category, Prince George’s Area Science Fair, Maryland, USA (March 9, 2013)

Society Memberships

Geochemical Society, American Geophysical Union