

Marissa M. Tremblay

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<https://www.purdue.edu/science/geochronology/thermochron/>

EDUCATION

University of California, Berkeley (UC Berkeley) Ph.D., Earth and Planetary Science (EPS) <i>Dissertation:</i> Reconstructing past Earth and planetary surface temperatures with cosmogenic noble gases Advisor: David L. Shuster	2012–2017
Barnard College of Columbia University B.A. Environmental Science, <i>summa cum laude</i> <i>Thesis:</i> Late Miocene tilting of the Resting Spring Range, California, with implications for models of crustal extension Advisors: Nicholas Christie-Blick and Sidney R. Hemming	2008–2012

PROFESSIONAL APPOINTMENTS

Assistant Professor, Purdue University Department of Earth, Atmospheric, and Planetary Sciences (EAPS)	2019–present
Newton International Fellow of the Royal Society Scottish Universities Environmental Research Centre (SUERC) Mentor: Darren Mark	2018–2019
University of California President’s Postdoctoral Fellow University of California, Davis Mentor: Sujoy Mukhopadhyay	2017
Research & Teaching Assistant, UC Berkeley	2012–2017

HONORS AND AWARDS

Citation for Excellence in Refereeing, American Geophysical Union	2018
Charles & Nancy Naeser Prize, Intl. Standing Committee on Thermochronology	2018
Marie Skłodowska-Curie Individual Fellowship (<i>declined</i>)	2018
The Royal Society Newton International Fellowship	2017
University of California President’s Postdoctoral Fellowship	2017
Lamont-Doherty Earth Observatory Postdoctoral Fellowship (<i>declined</i>)	2017
Louderback Award, UC Berkeley EPS	2015
National Science Foundation Graduate Research Fellowship	2014
Outstanding Graduate Student Mentor, NERDS program, UC Berkeley	2013
Richards Family Graduate Fellowship, UC Berkeley	2012
Departmental Honors, Barnard College Environmental Science	2012
Distinction, Senior Thesis, Barnard College Environmental Science	2012
Phi Beta Kappa	2011
Barry M. Goldwater Scholarship	2011
National Oceanic and Atmospheric Administration Ernest F. Hollings Scholar	2010

PUBLICATIONS (G = Graduate student advised; U = Undergraduate student advised)

18. Carter, J.N.^G, Ickert, R.B., Mark, D.F., **Tremblay, M.M.**, Cresswell, A.J., and Sanderson, D.C.W., Percent-level production of ⁴⁰Ar by an overlooked mode of ⁴⁰K decay. *submitted*
17. **Tremblay, M.M.**, and Cassata, W.S., Noble gas thermochronology of extraterrestrial materials. *in revision*
16. Zeitler, P.K., and **Tremblay, M.M.**, Measuring noble gases for thermochronology. *in revision*
15. Carter, J.N.^G, **Tremblay, M.M.**, and Mark, D.N., A Bayesian approach to the deconvolution of ⁴⁰Ar/³⁹Ar data from mixtures. *in revision*
14. Mark, D.M., **Tremblay, M.M.**, Barfod, D.N., Cohen, B.E., Ickert, R.B., Lee, M.R., Tomkinson, T., and Smith, C., Dating of recent aqueous activity on Mars. *in revision*
13. Park, Y., Swanson-Hysell, N.L., MacLennan, S.A., Maloof, A.C., Gebreslassie, M., **Tremblay, M.M.**, Schoene, B., Alene, M., Antilla, E.S.C., Tesema, T., and Haileab, B., 2019, The lead-up to the Sturtian Snowball Earth: Neoproterozoic chemostratigraphy time-calibrated by the Tambien Group of Ethiopia. *Geological Society of America Bulletin*. doi: doi:10.1130/B35178.1
12. **Tremblay, M.M.**, Shuster, D.L., Spagnolo, M., Renssen, H., and Ribolini, A., 2019, Temperatures recorded by cosmogenic noble gases since the last glacial maximum in the Maritime Alps: *Quaternary Research*, v. 91(2), p. 829-847. doi:10.1017/qua.2018.109
11. Dygert, N., Jackson, C.R.M., Hesse, M.A., **Tremblay, M.M.**, Shuster, D.L., and Gu, J.T., 2018 Plate tectonic cycling modulates Earth's ³He/²²Ne ratio. *Earth and Planetary Science Letters*, v. 498, p. 309-321. doi:10.1016/j.epsl.2018.06.044
10. Ingalls, M., Rowley, D., Olack, G., Currie, B., Li, S., Schmidt, J., **Tremblay, M.**, Shuster, D.L., Lin, D., and Colman, A., 2017, Paleocene to Pliocene low-latitude high elevation of southern Tibet: Implications for tectonic models of India-Asia collision, Cenozoic climate, and geochemical weathering. *Geological Society of America Bulletin*, v. 130(1-2), p. 307-330. doi:10.1130/B31723.1
9. **Tremblay, M.M.**, Shuster, D.L., Balco, G., and Cassata, W.S., 2017, Neon diffusion kinetics and implications for cosmogenic neon paleothermometry in feldspars. *Geochimica et Cosmochimica Acta*, v. 205, p. 14-30. doi:10.1016/j.gca.2017.02.013
8. Garrick-Bethell, I., Weiss, B.P., Shuster, D.L., Tikoo, S.M., and **Tremblay, M.M.**, 2017, Further evidence for early lunar magnetism from troctolite 76535. *Journal of Geophysical Research: Planets*, v. 122(1), p. 76-93. doi:10.1002/2016JE005154
7. Schmidt, J.L., Zeitler, P.K., Pazzaglia, F.J., **Tremblay, M.M.**, Shuster, D.L., and Fox, M., 2015, Knickpoint evolution on the Yarlung Tsangpo, southern Tibet: Evidence for a regional late Cenozoic base level adjustment. *Earth and Planetary Science Letters*, v. 430, p. 448-457. doi:10.1016/j.epsl.2015.08.041
6. **Tremblay, M.M.**, Fox, M., Schmidt, J.L., Tripathy-Lang, A., Wielicki, M.M., Harrison, T.M., Zeitler, P.K., and Shuster, D.L., 2015, Erosion in southern Tibet shut down at 10 Ma due to enhanced rock uplift within the Himalaya. *Proceedings of the National Academy of Sciences*, v. 112(39), p. 12030-12035. doi:10.1073/pnas.1515652112
5. Swanson-Hysell, N.L., Maloof, A.C., Condon, D.J., Jenkin, G.R.T., Alene, M., **Tremblay, M.M.**, Tesema, T., Rooney, A.D., and Haileab, B., 2015, Stratigraphy and

- geochronology of the Tambien Group, Ethiopia: Evidence for globally synchronous carbon isotope change in the Neoproterozoic. *Geology*, v. 43(4), p. 323-326. doi:10.1130/G36347.1
4. Breecker, D.O., Bergel, S., Nadel, M., **Tremblay, M.M.**, Osuna-Orozco, R., Larson, T.E., and Sharp, Z.D., 2015, Minor stable carbon isotope fractionation between respired carbon dioxide and bulk soil organic matter during laboratory incubation of topsoil. *Biogeochemistry*, v. 123, p. 83-98. doi:10.1007/s10533-014-0054-3
 3. **Tremblay, M.M.**, Shuster, D.L., and Balco, G., 2014, Diffusion kinetics of ^3He and ^{21}Ne in quartz and implications for cosmogenic noble gas paleothermometry. *Geochimica et Cosmochimica Acta*, v. 142, p. 186-204. doi:10.1016/j.gca.2014.08.010
 2. **Tremblay, M.M.**, Shuster, D.L., and Balco, G., 2014, Cosmogenic noble gas paleothermometry. *Earth and Planetary Science Letters*, v. 400, p. 195-205. doi:10.1016/j.epsl.2014.05.040
 1. Straub, M., **Tremblay, M.M.**, Sigman, D.M., Studer, A.S., Ren, H., Toggweiler, J.R., and Haug, G.H., 2013, Nutrient conditions in the subpolar North Atlantic during the last glacial period reconstructed from foraminifera-bound nitrogen isotopes. *Paleoceanography*, v. 28, p. 79-90. doi:10.1002/palo.20013

CONFERENCE PROCEEDINGS, LAST 3 YEARS (* = cancelled due to covid-19)

17. ***Tremblay, M.M.**, 2020, Using noble gas diffusion kinetics to inform geochronology. 30th Annual V.M. Goldschmidt Conference, Honolulu, USA.
16. *Brown, N.D., **Tremblay, M.M.**, Uebner, M., Stock, G.M., Balco, G., and Shuster, D.L., 2020, Constraining post-glacial temperatures of rock avalanche deposits in the Yosemite Valley with cosmogenic noble gas and luminescence paleothermometry. European Geophysical Union General Assembly 2020, Vienna, Austria.
15. **Tremblay, M.M.**, Rugenstien, M.A.A., and Caves Rugenstein, J.K., 2020, A Warm, Productive Environment at the India-Asia Suture Zone During a Warm, Productive Oligocene-Miocene World? American Geophysical Union Chapman Conference on the Evolution of the Monsoon, Biosphere and Mountain Building in Cenozoic Asia, Washington, D.C., USA.
14. **Tremblay, M.M.**, Guralnik, B., Phillips, M., Gribenski, N., Haberkorn, A., Hippe, K., Valla, P.G., and Shuster, D.L., 2019, Cosmogenic ^{10}Be - ^{14}C - ^3He observations in Gotthard Pass, Switzerland, document snow-related rock temperature increases during the industrial period. American Geophysical Union Fall Meeting, San Francisco, USA.
13. Carter, J.N., Mark, D.F., and **Tremblay, M.M.**, 2019, A Bayesian approach to deconvolving $^{40}\text{Ar}/^{39}\text{Ar}$ data from multi-component mixtures. American Geophysical Union Fall Meeting, San Francisco, USA.
12. Ickert, R.B., Carter, J.N., Mark, D.F., **Tremblay, M.M.**, Cresswell, A., and Sanderson, D.C.W., 2019, Percent-level production of ^{40}Ar by an overlooked mode of ^{40}K decay. American Geophysical Union Fall Meeting, San Francisco, USA.
11. Pickersgill, A.E., Christou, E., Mark, D.F., Lee, M.R., **Tremblay, M.M.**, Rasmussen, C., Morgan, J.V., Gulick, S.P.S., Schmieder, M., Osinski, G.R., Simpson, S., Kring, D.A., Cockell, C., Collins, G.S., Christeson, G., and Tikoo, S., 2019, 6 million years of hydrothermal activity at Chicxulub? Large Meteorite Impact and Planetary Evolution VI, Brasília, Brazil.

10. **Tremblay, M.M.**, Sprain, C.J., Mark, D.F., and Sanderson, D., 2019, A multi-system approach to determining the ages of vitrified hill forts in Scotland. Geological Society of America Annual Meeting, Phoenix, USA.
9. Schmidt, J.L., Zeitler, P.K., **Tremblay, M.M.**, and Shuster, D.L., 2019, Differential Unroofing Across the Southeastern Lhasa Block and Namche Barwa Antiform. Geological Society of America Annual Meeting, Phoenix, USA.
8. Gribenski, N., Valla, P.G., **Tremblay, M.M.**, Guralnik, B., Phillips, M., Hippe, K., and Shuster, D.L., 2019, Using cosmogenic ^3He for paleotemperature reconstruction in formerly glaciated areas of the central European Alps. International Union for Quaternary Research, Dublin, Ireland.
7. **Tremblay, M.M.**, Mark, D.F., Carter, J.N., Cohen, B.E., Robinson, A., and Chung, P., 2019, Thermal evolution of lunar feldspathic breccias constrained by $^{40}\text{Ar}/^{39}\text{Ar}$ thermochronology. 50th Lunar and Planetary Science Conference, Houston, USA.
6. **Tremblay, M.M.**, Domingos, R., Militzer, B., and Shuster, D.L., 2018, Experimental and theoretical constraints on helium diffusion in quartz. 16th International Conference on Thermochronology, Quedlinburg, Germany.
5. Carter, J.N.*, Mark, D.F., and **Tremblay, M.M.**, 2018, Multiphase $^{40}\text{Ar}/^{39}\text{Ar}$ dating. 16th International Conference on Thermochronology, Quedlinburg, Germany.
4. **Tremblay, M.M.**, Uebner, M., Shuster, D.L., Stock, G.M., and Balco, G., 2018, Late Quaternary temperatures recorded by cosmogenic ^3He in Yosemite Valley rock avalanche deposits. 28th Annual V.M. Goldschmidt Conference, Boston, USA. (*invited*)
3. Guralnik, B., **Tremblay, M.M.**, Phillips, M., Gribenski, N., Valla, P.G., and Hippe, K., 2018, Cosmogenic ^3He – ^{10}Be – ^{14}C dating quantifies Alpine climate response to global warming. 28th Annual V.M. Goldschmidt Conference, Boston, USA.
2. **Tremblay, M.M.**, Cohen, B.E., Mark, D.F., Ickert, R.B., and Smith, C.L., 2018, Revisiting the $^{40}\text{Ar}/^{39}\text{Ar}$ chronology of lunar meteorite NWA 773 provides new constraints on its diachronous geologic history. 6th European Lunar Symposium, Toulouse, France.
1. **Tremblay, M.M.**, Willett, S.D., Shuster, D.L., Fox, M., Zeitler, P.K., Schmidt, J.L., Winn, C., and Karlstrom, K.E., 2018, The Neogene evolution of topography and rivers along the Indus-Yarlung Suture Zone, southern Tibet. European Geophysical Union General Assembly, Vienna, Austria. (*invited*)

INVITED LECTURES (* = cancelled due to covid-19)

*Department of Geophysical Sciences, University of Chicago	April 2020
Department of Earth and Environmental Sciences, Vanderbilt University	Feb. 2020
Department of Geosciences, Princeton University	Nov. 2019
Department of Geology, University of Illinois Urbana-Champaign	Oct. 2019
The Hutton Club, University of Edinburgh	Nov. 2018
School of Geographical & Earth Sciences, University of Glasgow	March 2018
School of Earth and Environmental Sciences, University of Manchester	Feb. 2018
Department of Geoscience, University of Wisconsin–Madison	Feb. 2018
Department of Earth, Atmospheric, and Planetary Sciences, Purdue University	Feb. 2018
Department of Geology and Geophysics, Yale University	Feb. 2018
School of School of Earth and Ocean Sciences, University of Victoria	Jan. 2018
Department of Earth, Ocean and Ecological Sciences, University of Liverpool	Nov. 2017
School of Earth and Environmental Sciences, University of St Andrews	Nov. 2017

Department of Earth and Planetary Science, UC Berkeley	May 2017
Department of Earth and Planetary Sciences, UC Davis	March 2017
Department of Geological Sciences, Stanford University	Feb. 2017
Department of Earth Science, University of California, Santa Barbara	Jan. 2017
Department of Geography and Environment, University of Aberdeen	Oct. 2015
Scottish Universities Environmental Research Centre	Oct. 2015

STUDENTS SUPERVISED

PhD students, primary advisor

John Fink, Purdue University, EAPS	starting fall 2020
Moshammam Mijjum, Purdue University, EAPS	starting fall 2020
John Carter, SUERC (co-advised with Darren Mark)	2018–present

PhD students, committee member

Angus Moore, Purdue University, EAPS	2020–present
Laura Chaves, Purdue University, EAPS	2019–present
Alexandria Koester, Purdue University, EAPS	2019–present

Undergraduate students

Samantha Golding, Purdue EAPS	2019–2020
John Herring, Purdue EAPS (URSA Scholar)	2020
Simon Mason, Purdue Computer Science (Summer Stay Scholar)	2020
Juliana Peckenpaugh, Purdue EAPS	2020
Isabella Zuffoletti, Purdue EAPS (URSA Scholar)	2020
Abigail Robinson, SUERC (Paneth Meteorite Trust Intern)	Summer 2018
Matthew Kirk, UC Berkeley EPS	2017–2018
Tristan Bench, UC Berkeley EPS	2016–2017
Maura Uebner, UC Berkeley EPS (Honors thesis)	2015–2017
Sylvia Woodmansee, UC Berkeley EPS	Summer 2015
Sarah Beroff, UC Berkeley EPS (NERDS program)	Summer 2013

DEPARTMENT & UNIVERSITY SERVICE

Graduate Committee, Purdue EAPS	2019–present
Outreach Committee, Purdue EAPS	2019–present
Judge, Purdue Undergraduate Research Conference	2020
Coordinator, SUERC seminar series	2018–2019
Member, SUERC self-assessment team, Athena-SWAN Charter application	2018
Co-coordinator, Center for Isotope Geochemistry seminar series, UC Berkeley	2017
Graduate Student Representative, Earth and Planetary Science, UC Berkeley	2015
Co-coordinator, EPS graduate student brown bag seminar, UC Berkeley	2013–2014

PROFESSIONAL SERVICE

Journal Referee

Boreas; Chemical Physics; Earth and Planetary Science Letters; Earth Surface Dynamics; Geochemistry, Geophysics, Geosystems; Geochimica et Cosmochimica Acta;

The Journal of Geology; Journal of Geophysical Research: Earth Surface; Meteoritics & Planetary Science; Palaeogeography, Palaeoclimatology, Palaeoecology; Quaternary Geochronology; Science Advances; Tectonics

Proposal Referee

AAAS Research Competitiveness Program; US National Science Foundation; UK Science and Technology Facilities Council

Discussion Leader, <i>Evolution of the Lithosphere</i> , Gordon Research Conference on Geochronology	2020–2021
Associate Editor, <i>Geochronology (GChron)</i>	2019–present
Organizing Committee, Thermo2020 Conference	2019–present
Guest Editor, <i>Elements</i> magazine thematic issue on noble gas thermochronology	2019–2020
Session Convener, “ <i>Advances and applications in Quaternary geochronology</i> ” 100 th Annual American Geophysical Union Fall Meeting	2019
Outstanding Student Paper Award Coordinator & Student Travel Grant	2017–2018
Reviewer, VGP Section, American Geophysical Union	
Session Convener, “ <i>Innovations and Advances and in Thermochronology</i> ” 27 th Annual V.M. Goldschmidt Conference	2017
Session Convener, “ <i>Novel Geochemical Approaches for Quantifying Rates of Surface Processes</i> ” 26 th Annual V.M. Goldschmidt Conference	2016

TEACHING

Purdue University (as Instructor)

EAPS 591 Geologic Dating Methods Fall 2019

UC Berkeley (as Graduate Student Reader or Graduate Student Instructor)

EPS 124/224 Isotope Geochemistry Spring 2017

EPS 116 Structural Geology and Tectonics Spring 2016

EPS 124/224 Isotope Geochemistry Spring 2015

EPS 117 Geomorphology Fall 2014

EPS 131 General Geochemistry Spring 2013

OUTREACH AND VOLUNTEERING

Volunteer, Skype a Scientist 2019–present

Pen pal, Letters to a Pre-Scientist 2018–present

Mentor, Society of Women in the Physical Sciences, UC Berkeley 2013–2015

EPS graduate student outreach, Bay Area Scientists in Schools 2013–2016

Research Mentor, UC Berkeley NERDS program 2013

Alumni Admissions Representative, Barnard College 2014–present

PROFESSIONAL MEMBERSHIPS

American Geophysical Union (2009–present); European Association of Geochemistry (2018–present); European Geosciences Union (2016–present); Geochemical Society (2012–present); Geological Society of America (2009–present); Meteoritical Society (2017–present).