

Daniel A. Stolper

Personal Data

Date of birth: May 16, 1986

Marital status: Married with one child

Department of Earth and Planetary Science

University of California, Berkeley

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Professional History

2017-present Assistant Professor, Department of Earth and Planetary Science
University of California, Berkeley

2017-present Faculty Scientist, Earth & Environmental Sciences Area
Lawrence Berkeley National Laboratory

2015-2016 Postdoctoral Scholar, Department of Geosciences
Princeton University

2015 Petroleum Geochemistry Intern
ExxonMobil Upstream Research Company

2014 Postdoctoral Scholar, Division of Geological Sciences
California Institute of Technology

Education

2014 Ph.D. Geobiology
California Institute of Technology
Advisors: John Eiler and John Grotzinger

2011 M.S. Geobiology
California Institute of Technology

2008 A.B. Earth and Planetary Sciences *Magna Cum Laude*
Harvard College

Fellowships and Awards

2020 Sloan Research Fellow
Ocean Sciences

2020 F.W. Clarke Medal
The Geochemical Society

2019 Hisashi Kuno Award
Volcanology, Geochemistry, & Petrology Section
American Geophysical Union

2019	Hellman Fellow University of California, Berkeley
2017	Rose Hills Innovator University of California, Berkeley
2015-2016	NOAA Climate & Global Change Postdoctoral Fellowship
2013	Richard H. Jahns Teaching Prize Division of Geological and Planetary Sciences California Institute of Technology
2010-2013	NSF Graduate Research Fellowship
2009-2010	Eaton Fellowship Division of Geological and Planetary Sciences California Institute of Technology
2008-2009	Fulbright Scholar University of Southern Denmark
2008	Thomas Temple Hoopes Prize Harvard College
2004	National Merit Scholar

Publications

- [30] Eldridge DL, R Korol, MK Lloyd, AC Turner, MA Webb, TF Miller, **DA Stolper** (2019). Comparison of experimental vs. theoretical abundances of $^{13}\text{CH}_3\text{D}$ and $^{12}\text{CH}_2\text{D}_2$ for isotopically equilibrated systems from 1 to 500°C. *ACS Earth and Space Chemistry*, 3, p. 2747-2764 (Chosen as ACS Editor's Choice).
- [29] Kast ER, **DA Stolper**, A Auderset, JA Higgins, H Ren, XT Wang, A Martínez-García, GH Haug, DM Sigman (2019). Nitrogen isotope evidence for expanded ocean suboxia in the early Cenozoic. *Science*, 364, p. 386-389.
- [28] **Stolper DA**, CE Bucholz. Neoproterozoic to early Phanerozoic rise in island arc redox state due to deep ocean oxygenation and increased marine sulfate levels (2019). *Proceedings of the National Academy of Sciences*. 116.18, p. 8746-8755.
- [27] **Stolper DA**, WW Fischer, ML Bender (2018). Effects of temperature and carbon source on the isotopic fractionations associated with O_2 respiration for $^{17}\text{O}/^{16}\text{O}$ and $^{18}\text{O}/^{16}\text{O}$ ratios in *E. coli*. *Geochimica et Cosmochimica Acta*, 240, p. 152-172.
- [26] YL Yung, P Chen, K Nealson, S Atreya, P Beckett, JG Blank, B Ehlmann, J Eiler, G Etiope, JG Ferry, F Forget, P Gao, R Hu, A Kleinböhl, R Klusman, F Lefèvre, C Miller, M Mischna, M Mumma, S Newman, D Oehler, M Okumura, R Oremland, V Orphan, R Popa, M Russell, L Shen, BS Lollar, R Staehle, V Stamenković, **D Stolper**, A Templeton, AC Vandaele, S Viscardy, CR Webster, PO Wennberg, ML Wong, J Worden (2018). Methane on Mars and habitability: challenges and responses. *Astrobiology*, 18, p. 1221-1242.
- [25] **Stolper DA**, JM Eiler, JA Higgins (2018). Modeling the effects of diagenesis on carbonate clumped-isotope values in deep- and shallow-water settings. *Geochimica et Cosmochimica Acta*, 227, p. 264-291.

- [24] Lawson M, BJ Shenton, **D Stolper**, JM Eiler, T Rasbury, TP Becker, C Lander, AS Buono, SP Becker, R Pottorf, GG Gray, D Yurewicz, J Gournay (2018). Deciphering the diagenetic history of the El Abra Formation of eastern Mexico using reordered clumped isotope temperatures and U-Pb dating. *Geological Society of American Bulletin*, 130, p. 617-629.
- [23] Brenner D, BH Passey, **DA Stolper** (2018). Influence of water on clumped-isotope bond reordering kinetics in calcite. *Geochimica et Cosmochimica Acta*, 224, p. 42-63.
- [22] Shuai Y, P Douglas; S Zhang; **D Stolper**; M Lewan; M Lawson; G Ellis; M Formolo; J Mi; K He; G Hu; JM Eiler (2018). Equilibrium and non-equilibrium controls on the abundances of clumped isotopologues of methane during thermogenic formation in laboratory experiments: Implications for the chemistry of pyrolysis and the origins of natural gases. *Geochimica et Cosmochimica Acta*, 223, p. 159-174.
- [21] **Stolper DA** and CB Keller (2018). A record of deep-ocean dissolved O₂ from the oxidation state of iron in submarine basalts. *Nature*, 553, p. 323-327.
- [20] **Stolper DA**, M Lawson, MJ Formolo, CL Davis, PMJ Douglas, JM Eiler (2017). The utility of methane clumped isotopes to constrain the origins of methane in natural-gas accumulations. *Geological Society of London, Special Publications*, 468, p. 23-52.
- [19] Douglas PMJ, **DA Stolper**, JM Eiler, AL Sessions, M Lawson, Y Shuai, A Bishop, OG Podlaha, AA Ferreira, EV Santos Neto, M Niemann, AS. Steen, L Huang, E Chimiak, DL Valentine, J Fiebig, AJ Luhmann, WE Seyfried Jr., G Etiope, M Schoell, WP Inskeep, JJ Moran, N Kitchen (2017). Methane clumped isotopes: progress and potential for a new isotopic tracer. *Organic Geochemistry*, 113, p. 262-282.
- [18] Ryb U, MK Lloyd, **DA Stolper**, JM Eiler (2017) The clumped-isotope geochemistry of exhumed marbles from Naxos, Greece. *Earth and Planetary Science Letters*, 470, p. 1-12.
- [17] **Stolper DA**, GD Love, S Bates, TW Lyons, E Young, AL Sessions, JP Grotzinger (2017). Paleoecology and paleoceanography of the Athel Silicilyte, Ediacaran-Cambrian boundary. *Geobiology*, 15, p. 401-426.
- [16] **Stolper DA**, ML Bender, GB Dreyfus, Y Yan, JA Higgins (2016). A Pleistocene ice core record of atmospheric O₂ concentrations. *Science*, 363, p. 1427-1430.
- [15] Douglas PMJ, **DA Stolper**, DA Smith, KM Walter Anthony, CK Paull, S Dallimore, M Wik, PM Crill, M Winterdahl, JM Eiler, AL Sessions (2016). Diverse origins of Arctic and Subarctic methane seeps identified with multiply-substituted isotopologues. *Geochimica et Cosmochimica Acta*, 188, p. 163-188.
- [14] **Stolper DA** and JM Eiler (2016). Diagenesis of phosphorites through time as recorded by carbonate clumped isotopes. *Geochimica et Cosmochimica Acta*, 181, p. 238-259.
- [13] **Stolper DA**, AM Martini, M Clog, PM Douglas, SS Shusta, DL Valentine, AL Sessions, JM Eiler (2015). Distinguishing and understanding thermogenic and biogenic sources of methane using multiply substituted isotopologues. *Geochimica et Cosmochimica Acta*, 161, p. 219-247.
- [12] **Stolper DA** and JM Eiler (2015). The kinetics of solid-state isotope-exchange reactions for clumped isotopes: A study of inorganic calcites and apatites from natural and experimental samples. *American Journal of Science*, 315, p. 363-411.
- [11] Clog M, **DA Stolper**, JM Eiler (2015). Kinetics of CO_{2,g}-H₂O_l isotopic exchange, including mass 47 isotopologues. *Chemical Geology*, 395, p. 1-10.
- [10] **Stolper DA**, M Lawson, CL Davis, A Ferreira, EV Santos Neto, GS Ellis, MD Lewan, AM Martini, Y Tang, M Schoell, AL Sessions, JM Eiler (2014). Formation temperatures of thermogenic and biogenic methane. *Science*, 344, p. 1500-1503.

- [9] **Stolper, DA** (2014). New insights into the formation and modification of carbonate-bearing minerals and methane gas in geological systems using multiply substituted isotopologues. PhD thesis. California Institute of Technology.
- [8] Eiler JM, B Bergquist, I Bourg, P Cartigny, J Farquhar, A Gagnon, W Guo, I Halevy, A Hofmann, TE Larson, N Levin, EA Schauble, **D Stolper** (2014). Frontiers of stable isotope geoscience. *Chemical Geology*, 372, p. 119-143.
- [7] **Stolper DA**, AL Sessions, AA Ferreira, EV Santos Neto, A Schimmelmann, SS Shusta, DL Valentine, JM Eiler (2014). Combined ¹³C-D and D-D clumping in methane: methods and preliminary results. *Geochimica et Cosmochimica Acta*, 126, p. 169-191.
- [6] Eiler JM, M Clog, P Magyar, A Piasecki, A Sessions, **D Stolper**, M Deerberg, H-J Schlueter, J Schwieters (2013). A high-resolution gas-source isotope ratio mass spectrometer. *International Journal of Mass Spectrometry*, 335, p. 45-56.
- [5] Frei R, C Gaucher, **D Stolper**, DE Canfield (2013). Fluctuations in Late Neoproterozoic atmospheric oxidation — Cr isotope chemostratigraphy and iron speciation of the late Ediacaran lower Arroyo del Soldado Group (Uruguay). *Gondwana Research*, 23.2, p. 797-811.
- [4] Zhang Y, G Sicot, X Cui, M Vogel, CA Wuertzert, K Lezon-Geyda, J Wheeler, DA Harki, K Muzikar, **DA Stolper**, PB Dervan, AS Perkins (2011). Targeting a DNA binding motif of the EVI1 protein by a pyrrole-imidazole polyamide. *Biochemistry*, 50, p. 10431-10441.
- [3] **Stolper DA**, NP Revsbech, DE Canfield (2010). Aerobic growth at nanomolar oxygen concentrations. *Proceedings of the National Academy of Sciences*, 107, p. 18755-18760.
- [2] **Stolper DA** (2008). Constraining the physiological activity of deep-sea sedimentary microbial communities: the development and application of methods to characterize proteins in deep-sea sedimentary sites. Undergraduate Senior Thesis. Harvard College.
- [1] Herkenhoff KE, J Grotzinger, AH Knoll, SM McLennan, C Weitz, A Yingst, R Anderson, BA Archinal, RE Arvidson, JM Barrett, KJ Becker, JF Bell III, C Budney, MG Chapman, D Cook, B Ehlmann, B Franklin, LR Gaddis, DM Galuszka, PA Garcia, P Geissler, TM Hare, E Howington-Kraus, JR Johnson, L Keszthelyi, RL Kirk, P Lanagan, EM Lee, C Leff, JN Maki, KF Mullins, TJ Parker, BL Redding, MR Rosiek, MH Sims, LA Soderblom, N Spanovich, R Springer, SW Squyres, **D Stolper**, RM Sucharski, T Sucharski, R Sullivan, JM Torson (2008). Surface processes recorded by rocks and soils on Meridiani Planum, Mars: Microscopic Imager observations during Opportunity's first three extended missions. *Journal of Geophysical Research-Planets*, 113, p. 1-39.

Invited Seminars

- 2020 University of Nevada, Reno, Dept. of Geological Sciences and Engineering
 2020 Syracuse University, Dept. of Earth Science
 2019 University of New Mexico, Dept. of Earth and Planetary Sciences
 2018 University of California, Santa Cruz, Dept. of Earth and Planetary Sciences
 2018 University of California, San Diego, Scripps Institution of Oceanography
 2018 Harvard University, Dept. of Earth and Planetary Sciences
 2017 University of California, Berkeley, Dept. of Integrative Biology
 2017 University of California, Berkeley, Center for Integrative Planetary Science
 2016 Princeton University, Dept. of Geosciences
 2016 University of Chicago, Dept. of the Geophysical Sciences
 2016 Yale University, Dept. of Geology and Geophysics
 2016 Rutgers University, Dept. of Earth and Planetary Sciences

2016 Carnegie Institute of Washington, Geophysical Lab
2015 Yale University, Dept. of Geology and Geophysics
2014 Lawrence Berkeley National Laboratory, Earth and Environmental Sciences Area
2014 University of Southern California, Dept. of Geological Sciences
2014 Harvard University, Dept. of Earth and Planetary Sciences
2014 Columbia University, Lamont-Doherty Earth Observatory
2014 Brown University, Dept. of Earth, Environmental, and Planetary Sciences
2014 University of California, Berkeley, Dept. of Earth and Planetary Science
2014 Stanford University, School of Earth, Energy, and Environmental Sciences
2013 California Institute of Technology, Div. of Geological and Planetary Sciences
2013 University of California, Berkeley, Dept. of Earth and Planetary Science
2012 Hebrew University of Jerusalem, Institute of Earth Sciences
2012 Weizmann Institute of Science, Dept. of Earth and Planetary Sciences

Conference Talks

Talks

- Eldridge D, M Lloyd, **D Stolper** (2019). Methane clumped isotope compositions from ethane pyrolysis experiments. *Goldschmidt Conference*, Barcelona, Spain.
- Turner A, D Eldridge, M Bill, M Conrad, **D Stolper** (2019). Experimental calibration of methane-H₂-H₂O hydrogen isotope fractionation factor from 4-160°C. *Goldschmidt Conference*, Barcelona, Spain.
- Stolper DA**, CE Bucholz (2018). A Phanerozoic increase in arc rock oxidation state. *Goldschmidt Conference*, Boston, MA.
- Stolper DA**, CB Keller (2017). Off-axis oxidation of oceanic crust as a record of marine O₂ concentrations. *Goldschmidt Conference*, Paris, France.
- Stolper DA**, MA Antonelli, DS Ramos, ML Bender, DP Schrag, DJ DePaolo, JA Higgins (2016). Isotopic constraints on the formation of carbonates during low-temperature hydrothermal oceanic crust alteration. *American Geophysical Union, Fall Meeting*, San Francisco, CA.
- Stolper DA**, BB Ward, WW Fischer, ML Bender (2015). An experimental study on what controls the ratio of ¹⁸O/¹⁶O and ¹⁷O/¹⁶O of O₂ during microbial respiration. *American Geophysical Union, Fall Meeting*, San Francisco, CA.
- Stolper, D**, J Eiler, A Sessions, D Valentine, A Martini, C Davis, M Formolo, M Lawson, A Ferreira, E Santos Neto (2015). The potential of methane clumped isotopes to constrain the formational environments of natural gas deposits. *Goldschmidt Conference*, Prague, Czech Republic (invited keynote).
- Stolper, DA** (2014). The isotopic anatomies of natural gas components. Gordon Research Conference on organic geochemistry (invited).
- Stolper DA**, CL Davis, JM Eiler, GS Ellis, AA Ferreira, M Lawson, AM Martini, EV Santos Neto, M Schoell, AL Sessions, SS Shusta, Y Tang, DL Valentine (2014). Clumped isotopes of methane: applications to both low and high temperature natural systems. *Goldschmidt Conference*, Sacramento, CA (invited).

Stolper D, S Shusta, D Valentine, A Sessions, A Ferreira, E Santos Neto, J Eiler (2013). Combined ^{13}C -D and D-D clumping in CH_4 : preliminary results. *Goldschmidt Conference*, Florence, Italy.

Stolper DA, AL Sessions, JM Eiler (2012). Measurement of intact methane isotopologues, including $^{13}\text{CH}_3\text{D}$. *Goldschmidt Conference*, Montreal, Canada.

Stolper DA, I Halevy, JM Eiler (2011). The kinetics of the ordering ^{13}C - ^{18}O bonds in calcite and apatite. *American Geophysical Union, Fall Meeting*, San Francisco, CA.

Stolper DA, N Revsbech N, DE Canfield (2009). Growth of *E. coli* at nanomolar concentrations of oxygen. *American Geophysical Union, Fall Meeting*, San Francisco, CA.

Stolper D, M. Kennedy, and J Grotzinger (2007). Scale of lamination in sedimentary rocks as a guide to depositional processes on Mars. *Geological Society of America Annual Meeting*, Denver, CO.

Posters

Lloyd MK, D Ibarra, T Kukla, P Chamberlain, N Pester, W Seyfried, **D Stolper** (2019). Triple oxygen isotopes of fluids and solids from hydrothermal systems. *Goldschmidt Conference*, Barcelona, Spain.

Stolper DA, JM Eiler (2014). The kinetics of clumped-isotope reactions in calcite and apatite from natural and experimental samples. *American Geophysical Union, Fall Meeting*, San Francisco, CA (invited).

Stolper DA, AL Sessions, JM Eiler (2012). Measurement of intact methane isotopologues, including $^{13}\text{CH}_3\text{D}$. *Gordon Conference on Organic Chemistry*, Holderness, NH.

Classes Taught

Spring 2020	EPS 125: Stable Isotope Geochemistry
Fall 2019	EPS 102: History and Evolution of Planet Earth
Spring 2019	EPS 50: The Planet Earth
Spring 2018	EPS 125: Stable Isotope Geochemistry
Fall 2017	EPS 24: Freshman Seminar

Service

Committee work

2019	Interviewer for UC Berkeley undergraduate scholarships
2017-2018	Fulbright interviewing and selection committee
2017-present	Dept. of Earth and Planetary Science curriculum committee

Seminar organization:

2017-2020	Organize the main departmental and isotope geochemistry seminar series
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Reviews:

Reviewer for geochemical and earth and planetary science journals (e.g., *Geochimica et Cosmochimica Acta*, *Chemical Geology*, *Earth and Planetary Science Letters*, *Nature Geoscience*) as well as multi-discipline journals (e.g., *Proceedings of the National Academy of Sciences*, *Science*, *Nature Communications*, and *Science Advances*). Reviewer for DOE, NSF, and ACS grants.

Public Presentations:

2018 and 2019: Cal Day speaker

Mentoring**Graduate students mentored**

Naomi Intrator (Spring 2016): mentor on secondary research project

Andrew Turner (Fall 2017-present): thesis advisor

Postdocs mentored

Daniel Ibarra (7/2019-present)

Daniel Eldridge (7/2018-present)

Max Lloyd (3/2018-present)