

Sebastian Kopf

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1. Research Interests

Geomicrobiology, stable isotope geochemistry, microbial physiology, mass spectrometry

2. Education

2008 BS in Geosciences & Astrophysics, Jacobs University, Bremen, Germany

2010 MS in Geochemistry, MIT, Cambridge, MA

2014 PhD in Geobiology, California Institute of Technology, Pasadena, CA

3. Employment

2024-present Associate Professor, Department of Geological Sciences, CU Boulder

2016-present Assistant Professor, Department of Geological Sciences, CU Boulder

Parental leave semesters: Spring 2019, Spring 2021

2015-2016 Postdoctoral Research Fellow, Princeton University

Summer 2015 Teaching Assistant, Microbial Diversity Course, Marine Biological Laboratory, Woods Hole, MA

2010-2014 Graduate Research and Teaching Assistant, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA

2008-2010 Graduate Research Assistant, Department of Earth Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA

2003-2008 Lead Software Engineer and Co-Founder, CleverSoft GmbH, Freiburg, Germany

4. Awards, and Honors

2020 National Science Foundation Early Career Research Award

2015 Postdoctoral Fellowship Award, Agouron Institute

2014 Lawrence L. and Audrey W. Ferguson Prize for the outstanding doctoral thesis of the year, Division of Biology, California Institute of Technology

2011 International Student Predoctoral Fellowship Award, Howard Hughes Medical Institute

2008 Charles Vest Presidential Fellowship Award, Massachusetts Institute of Technology

5. Research and Creative Works

Key: members of the Kopf lab are highlighted in **bold**: **graduate student***, **undergraduate student****, **postdoc[#]**, **research staff[†]**. Informally advised students (e.g. as member of their thesis committee) are highlighted in *italic*: *student[§]*.

Peer-Reviewed Publications

Rhim[#] J., Kopf S., McFarlin[#] J., Maloney[†] A. E., Bather^{*} H., Harris C. M., Zhou A., Feng X., Weber Y., Hoeft-McCann S., Pearson A., Leavitt W. D. Metabolic imprints in the hydrogen isotopes of *Archaeoglobus fulgidus* tetraether lipids. *Geochimica et Cosmochimica Acta*, 2024, 0016-7037. doi: 10.1016/j.gca.2024.09.032

Harning D., Raberg J., **McFarlin[#] J.**, Axford Y., Florian C., Ólafsdóttir K., **Kopf S.**, Sepúlveda J., Miller G., and Geirsdóttir Á. Spatiotemporal variation of modern lake, stream, and soil water isotopes in Iceland. *Hydrology and Earth System Sciences*, 2024; 28(18), 4275-4293. doi: 10.5194/hess-28-4275-2024

Tristan^{*} C., Srishti K., Claudia C., George B., **Kopf S.**, Templeton A. Single-cell measurement of microbial growth rate with Raman microspectroscopy. *FEMS Microbiology Ecology*, 2024; fiae110, doi: 10.1093/femsec/fiae110

FEMS Microbiology Editor's Choice' article of the month.

- Halamka* T.**, Garcia A., Evans T., **Schubert** S.**, **Younkin[†], A. D.**, Hinrichs K-U., **Kopf S.** Occurrence of Ceramides in the Acidobacterium *Solibacter usitatus*: Implications for Bacterial Physiology and Sphingolipids in Soils. *Frontiers in Geochemistry*, Vol 2, 2024. doi: 10.3389/fgeoc.2024.1400278
- Shipley O., Anna J., Gabriel J., Hayden B., Pauli J., Jordan C., Anderson L., Bailey A., Bataille C., Cicero C., Close H., Cook C., Cook J., Desai A., Evaristo J., Filley T., France C., Kim S., **Kopf S.**, Loisel J., Manlick P., **McFarlin[#] J.**, McMeans B., O'Connel T., Semmens B., Stantis C., Szejner P., Pilaar Birch S. Putman A., Stricker C., Trammell, T., Uhen M., Weintraub-Leff S., Wooler M., Willimas J., Yarnes C., Vander Zanden H., Newsome S.: Design, development, and implementation of IsoBank: a centralized repository for isotopic data. *PLoS One*. 2024 Sep 6;19(9):e0295662. doi: 10.1371/journal.pone.0295662.
- Maloney[†] A. E.**, **Kopf S.**, Zhang Z., **McFarlin[#] J.**, Nelson D. B., Masterson A. L., Zhang X. Large enrichments in fatty acid $^2\text{H}/^1\text{H}$ ratios distinguish respiration from aerobic fermentation in yeast *Saccharomyces cerevisiae*. *PNAS*, 121 (20) e2310771121, 2024. doi: 10.1073/pnas.2310771121
- Kantnerová[#] K.**, Kuhlbusch N., Juchelka D., Hilker A., **Kopf S.**, **Neubauer[†] C.**: ESI-Orbitrap IRMS: A Guide to Precision Isotopocule Analysis for Life and Environmental Scientists. In press at *Nature Protocols*.
- Havranek[§], R.*; Snell, K.; **Kopf, S.**; Davidheiser-Kroll, B.; Claymore, V.; Vaugh, B. Technical note: Lessons from and best practices for the deployment of the Soil Water Isotope Storage System. *Hydrology and Earth System Sciences*, 27: 2951-2971, 2023. doi: 10.5194/hess-27-2951-2023
- Leavitt, W.; **Kopf S.**; Weber, Y.; Chiu, B.; **McFarlin[#], J. M.**; Zhou, A.; Zhang, Y.; Elling, F.; Hoeft-McCann, S.; Pearson, A. Controls on the hydrogen isotope composition of tetraether lipids in an autotrophic ammonia-oxidizing marine archaeon. *Geochimica et Cosmochimica Acta*, 352: 194-210, 2023. doi: 10.1016/j.gca.2023.04.033
- Caro*, T. A.**; **McFarlin[#], J. M.**; *Jech[§], S.*; Fierer, N; **Kopf, S.** Hydrogen stable isotope probing of lipids demonstrates slow rates of microbial growth in soil. *Proceedings of the National Academy of Sciences*, 120:16, 2023. doi: 10.1073/pnas.2211625120
- Rempfert[§], K. R.*; *Nothhaft[§], D. B.*; Kraus, E. A.; **Asamoto*, C. K.**; Evans, R. D.; Spear, J. R.; Matter, J. M.; **Kopf, S. H.**; Templeton, A. S. Subsurface biogeochemical cycling of nitrogen in the actively serpentinizing Samail Ophiolite, Oman. *Frontiers in Microbiology*, 2023. doi: 10.3389/fmicb.2023.1139633
- Boettger, J, **Neubauer[†], C.**, **Kopf, S.**, and Kubicki, J. Microbial Denitrification: Active Site and Reaction Path Models Predict New Isotopic Fingerprints. *ACS Earth and Space Chemistry*, 6(11): 2582-2594, 2022, doi: 10.1021/acsearthspacechem.2c00102
- Halamka*, T. A.**; *Raberg[§], J. H.*; **McFarlin[#], J. M.**; **Younkin[†], A. D.**; **Mulligan**, C.**; Liu, X.; and **Kopf, S. H.** Production of diverse brGDGTs by Acidobacterium *Solibacter usitatus* in response to temperature, pH, and O₂ provides a culturing perspective on brGDGT proxies and biosynthesis. *Geobiology*, 2022, doi: 10.1111/gbi.12525
- Halamka*, T A.**; **McFarlin[#], J M.**; **Younkin[†], A D.**; **Depoy**, J.**; Dildar, N; and **Kopf, S H.** Oxygen limitation can trigger the production of branched GDGTs in culture. *Geochemical Perspectives Letters*, 19: 36–39, 2021, doi: 10.7185/geochemlet.2132
- Fripiat F, Martínez-García A, Marconi D, Fawcett S, **Kopf S**, Luu V, Rafter P, Zhang R, Sigman D, Haug G. Nitrogen isotopic constraints on nutrient transport to the upper ocean. *Nature Geoscience*, 2021, doi: 10.1038/s41561-021-00836-8
- Nothhaft[§], D.*, Templeton, A, Rhim, J, Wang, D, Labidi, J, Miller, H, Boyd, E, Matter, J, Ono, S, Young, E, **Kopf, S**, Kelemen, P, Conrad, M, and Team T. O. D. P. S. Geochemical, Biological, and Clumped Isotopologue Evidence for Substantial Microbial Methane Production Under Carbon Limitation in Serpentinites of the Samail Ophiolite, Oman. *Journal of Geophysical Research: Biogeosciences*, 126(10), 2021, doi: 10.1029/2020JG006025
- Boudinot[§] G.*, **Kopf S**, Dildar N, Sepulveda J. Carbon Cycling During Oceanic Anoxic Event 2: Compound-Specific Carbon Isotope Evidence From the Western Interior Seaway. *Paleoceanography and Paleoclimatology*, 36(9): e2021PA004287, 2021, doi: 10.1029/2021PA004287

- Hilkert, A.; Böhlke, J. K.; Mroczkowski, S. J.; Fort, K. L.; Aizikov, K.; Wang, X. T.; **Kopf, S. H.**; and **Neubauer, C.** Exploring the Potential of Electrospray-Orbitrap for Stable Isotope Analysis Using Nitrate as a Model. *Analytical Chemistry*, 93(26): 9139-9148, 2021, doi: 10.1021/acs.analchem.1c00944
- Kopf, S.**; Davidheiser-Kroll, B.; and Kocken, I. Isoreader: An R package to read stable isotope data files for reproducible research. *Journal of Open Source Software*, 6(61): 2878. 2021, doi: 10.5194/bg-18-3579-2021
- Asamoto C**, *Rempfert*[§] K, Luu V, **Younkin**[†] A, Sigman D, **Kopf S**. Enzyme-Specific Coupling of Oxygen and Nitrogen Isotope Fractionation of the Nap and Nar Nitrate Reductases. *Environmental Science & Technology*, 2021, 55(8): 5537-5546, doi: 10.1021/acs.est.0c07816
- Lengger S, Weber Y, Tayler K, **Kopf S**, Berstan R, Bull I, Mayser J-P, Leavitt W, Blewett J, Pearson A, Pancost R. Determination of the $\delta^2\text{H}$ values of high molecular weight lipids by high temperature GC coupled to isotope ratio mass spectrometry. *Lengger et al. Rapid Communications in Mass Spectrometry* (2021), doi: 10.1002/rcm.8983
- Bhatnagar S, **Cowley**^{**} E, **Kopf S**, Pérez Castro S, Kearney S, Dawson S, Hanselmann K, Ruff SE. Microbial community dynamics and coexistence in a sulfide-driven phototrophic bloom. *Environmental Microbiome* 15, 3 (2020) doi:10.1186/s40793-019-0348-0
- Silverman**^{**} S, **Kopf S**, Gordon R, Bebout B, Som S. Morphological and isotopic changes of heterocystous cyanobacteria in response to N_2 partial pressure. *Geobiology*. 2019, 17(1), 60-75, doi: 10.1111/gbi.12312
- McRose D, Lee A, **Kopf S**, Baars O, Kraepiel A, Sigman D, Morel F, Zhang X. Effect of Iron Limitation on the Isotopic Composition of Cellular and Released Fixed Nitrogen in *Azotobacter vinelandii*. *Geochimica Et Cosmochimica Acta*, 2019, 244, doi: 10.1016/j.gca.2018.09.023
- Neubauer C, Sessions A, Booth I, Bowen B, **Kopf S**, Newman D, Dalleska N. Towards measuring growth rates of pathogens during infections by D_2O -labeling lipidomics. *Rapid Communications in Mass Spectrometry*, 2018, 32, 2129-2140, doi: 10.1002/rcm.8288
- Neubauer C, Kasi A, Grahl N, Sessions A, **Kopf S**, Kato R, Hogan D, Newman D. Refining the application of microbial lipids as tracers of *Staphylococcus aureus* growth rates in cystic fibrosis sputum. *Journal of Bacteriology*, 2018, 200 (24), doi: 10.1128/JB.00365-18
- Miller*[§] H, Chaudhry N, Conrad M, Bill M, **Kopf S**, Templeton A. Large carbon isotope variability during alkaline methanogenesis. *Geochimica Et Cosmochimica Acta*, 2018, 237, 18-31, doi: 10.1016/j.gca.2018.06.007
- Marconi*[§] D, **Kopf S**, Rafter P, Sigman D. Aerobic respiration along isopycnals leads to overestimation of the isotope effect of denitrification in the ocean water column. *Geochimica et Cosmochimica Acta*, 2017, 197, 417-432, doi: 10.1016/j.gca.2016.10.012
- Pasulka A, Thamatrakoln K, **Kopf S**, Guan Y, Poulos B, Moradian A, Sweredoski M, Hess S, Sullivan M, Bidle K, Orphan V. BONCAT and nanoSIMS-based methods for the direct measurement of newly synthesized viral particles and the flow of carbon and nitrogen after host lysis. *Environmental Microbiology*, 2017, 20(2), 671-692, doi: 10.1111/1462-2920.13996
- Kopf S**, Sessions AL, Cowley ES, Reyes C, Van Sambeek L, Hu Y, Orphan VJ, Kato R, Newman DK. Trace incorporation of heavy water reveals slow and heterogeneous pathogen growth rates in cystic fibrosis sputum. *PNAS*, 2016, 113 (2), doi: 10.1073/pnas.1512057112
- Kopf S**, McGlynn S, Green-Saxena A, Guan Y, Newman DK, Orphan VJ. Heavy water and ^{15}N labelling with NanoSIMS analysis reveals growth rate dependent metabolic heterogeneity in chemostats. *Environmental Microbiology*, 2015, 17 (7), doi: 10.1111/1462-2920.12752
- Kramer D, **Kopf S**, Bau M. Oxidative mobilization of cerium and uranium and enhanced release of “immobile” high field strength elements from igneous rocks in the presence of the biogenic siderophore desferrioxamine B. *Geochimica Cosmochimica Acta*, 2015, 165, 263-279, doi: 10.1016/j.gca.2015.05.046
- Cowley ES, **Kopf S**, LaRiviere A, Ziebis W, Newman DK. Pediatric cystic fibrosis sputum can be chemically dynamic, anoxic and extremely reduced due to hydrogen sulfide formation. *mBio*, 2015, 6 (4), e00767-15, doi: 10.1128/mBio.00767-15

- Kopf S**, Henny C and Newman DK. Ligand-enhanced abiotic iron oxidation and the effects of chemical versus biological iron cycling in anoxic environments. *Environmental Science & Technology*, 2013, 47(6), 2602-2611, doi: 10.1021/es3049459
- Kopf S** and Ono S. Sulfur mass-independent fractionation in liquid phase chemistry: UV photolysis of phenacylphenylsulfone as a case study. *Geochimica Et Cosmochimica Acta*, 2012, 85, 160-169, doi: 10.1016/j.gca.2012.02.008
- Kopf S** and Newman DK. Photomixotrophic growth of *Rhodobacter capsulatus* SB1003 on ferrous iron. *Geobiology*, 2011, 10(3), 216-222, doi: 10.1111/j.1472-4669.2011.00313.x
- Kopf S**, Hallegatte S, Ha-Duong M. Using maps of city analogues to display and interpret climate change scenarios and their uncertainty. *Natural Hazards and Earth System Sciences*, 2008, 8 (4), 905-918, www.nat-hazards-earth-syst-sci.net/8/905/2008

Non-Peer-Reviewed Publications

- Bose A, **Kopf S**, Newman DK. From geocycles to genomes and back. In: *Microbial metal and metalloid metabolism: advances and applications* (Stolz JF & Oremland RS, Eds). ASM Press, 2010.

Manuscripts in review

6. Grants (at CU Boulder)

- 2024-2027 NSF Geoinformatics (2411458). Kopf (PI), Neubauer (Co-I, INSTAAR), Newsome (Co-PI, University of New Mexico), Yarnes (Co-PI, University of California Davis). *Collaborative Research: Innovative Resources: Into the ISOVERSE - open-source data tools for efficient, transparent, and reproducible processing of stable isotope data*. \$425,030 to CU Boulder.
- 2022-2025 NASA Exobiology (20NSSC22K1895). Templeton, Kopf (Co-Is at CU Boulder), Hoehler (PI at NASA Ames / lead institution). *Methanogenic Activity and Isotopic Biosignatures Under Carbon Limitation*. \$498,279 to CU Boulder.
- 2021-2024 Army Research Office Life Sciences Branch (W911NF2120119). Kopf (PI). *Microbial activity in a changing Arctic*. \$357,002 to CU Boulder / total.
- 2020-2025 NSF EAR Geobiology & Low Temperature Geochemistry (1945484). Kopf (PI). *CAREER: Uncovering the origins and biological purpose of the orphaned branched GDGT temperature biomarker*. \$537,699 to CU Boulder / total.
- 2020-2021 NSF OCE Chemical Oceanography (2041539). Kopf (PI), Neubauer (Co-I, INSTAAR). *EAGER: Unlocking the clumped isotope signatures of marine nitrate*. \$185,920 to CU Boulder / total.
- 2019-2022 NSF EAR Geobiology and Low Temperature Geochemistry (1928303). Kopf (PI at CU Boulder), Leavitt (PI at Dartmouth). *Collaborative Research: Establishing the hydrogen isotopic window into Archaeal lipid biomarkers*. \$280,180 to CU Boulder, \$555,115 total.
- 2019-2020 CU Boulder RIO SEED Grant. Kopf (PI), Fierer (Co-I, EBio), Wieder (Co-I, NCAR). *Measuring the pulse of global change at the interface of Earth & Life*. \$49,990 total (CU internal).
- 2017-2020 NASA Exobiology (80NSSC17K0667). Kopf (PI at CU Boulder), Zhang (PI at Princeton / lead institution), Kraepiel (CoI, Princeton). *What Controls the Nitrogen Isotope Fractionation of N₂ Fixation?* \$119,613 to CU Boulder, \$569,419 total.

7. Invited Presentations (since at CU Boulder)

Conferences

- 2024 Geobiology Gordon Research Conference. *Insane in the membrane: bacterial tetraether (brGDGT) production in laboratory culture*
- 2023 2nd International GDGT Workshop. *Controls on the hydrogen isotope composition of tetraether lipids in laboratory cultures*

- 2022 Organic Geochemistry Gordon Research Conference. *Paleoclimatological insights, applications, and limitations of brGDGT production in culture*
- 2022 American Chemical Society Spring Meeting. *A closer look at the isotopic levers of the nitrogen cycle: isotope effects in denitrification and nitrogen fixation*
- 2020 GSA Annual Meeting. *Into the isoverse: open-source data tools for stable isotope ratio mass spectrometry.*
- 2019 Geobiology Society Meeting. *Geobiological approaches to studying the environmental chemistry and microbial ecology of chronic infections.*
- 2016 Telluride Science Research Conference on Iron Biogeochemistry. *The role of iron in anoxic nitrogen transformations.*

Seminars

- 2023 Geological Sciences Colloquium, University of Colorado, Boulder, CO.
- 2022 Virtual Biological and Biotechnological Sciences Seminar, Army Research Laboratories
- 2021 Earth Science Department Seminar, Dartmouth College, Hanover, NH.
- 2021 Society of Fellows, Dartmouth College, Hanover, NH.
- 2019 INSTAAR Seminar, University of Colorado Boulder, Boulder, CO.
- 2017 Lamont Doherty Earth Observatory Colloquium, Columbia University, NY.
- 2017 USGS Colloquium, Federal Center, Denver, CO.
- 2017 Civil & Environmental Engineering Seminar, Colorado School of Mines, Golden, CO.
- 2016 Geography and Environmental Engineering Colloquium, John's Hopkins University, Baltimore, MD.

Workshops and Summer Courses

- 21-24 Isocamp Summer Course on Stable Isotope Biogeochemistry & Ecology, University of New Mexico.
- 2019 IsoBank workshop at the University of New Mexico.
- 2019 Isocamp Summer Course on Stable Isotope Biogeochemistry & Ecology, University of Utah.
- 2016 International Geobiology Summer Course at the Wrigley Institute/University of Southern California/Colorado School of Mines.

8. Teaching (at CU Boulder)

- GEOL 1180: Our Microbial Planet (Fall 2018, Spring 2020, Spring 2023, Spring 24)
New general interest science class on the crucial role microbes play on Earth - class open to all majors.
- GEOL/MCDB 3181: Microbial Planet Lab (Fall 2022, Fall 2023)
New upper division hands-on research class isolating and characterizing soil microorganism – first course based undergraduate research experience (CURE) class in the department.
- GEOL/MCDB/ENVS 4185 / GEOL 5185: Geomicrobiology (Fall 2017, Fall 2019, Spring 2022)
New upper division flipped classroom using team-based learning to gain a quantitative understanding of microbial energetics and earth-life interactions.
- GEOL/EBIO 4444 / 5444: Data Visualization (Fall 2021, Spring 2023)
New graduate/undergraduate hands-on data analysis and visualization using tidyverse R.
- GEOL 5042: Computational Tools (Fall 2018, Fall 2020)
New graduate course on advanced computational tools in R, python and microcontroller programming.
- GEOL 5253: Stable Isotope Fractionation (Fall 2016, Spring 2018, Fall 2020)
New graduate class on stable isotope fractionation including modelling advanced isotope systematics.

9. Mentoring (since at CU Boulder)

Postdoctoral Researchers

- 2022-present Dr. Kristýna Kantnerová (co-advised with C. Neubauer)
- 2020-2023 Dr. Jeemin Rhim (co-advised with W. Leavitt at Dartmouth College)
- 2019-2022 Dr. Jamie McFarlin

Research Staff

2023-present Dr. Ashley Maloney
 2020-present Dr. Cajetan Neubauer
 2018-present Adam Younkin
 2016-2021 Dr. Nadia Dildar

Graduate Students

2023-present GEOL PhD student Catherine Fontana (co-advised with B. Wing)
 2020-present GEOL PhD student Harp Batther (co-advised with A. Templeton)
 2020-present GEOL PhD student Tristan Caro (co-advised with A. Templeton)
 2019-2023 GEOL PhD student Toby Halamka
 2017-2023 GEOL PhD student Ciara Asamoto
 2019/2020 IQ Biology rotation student Tristan Caro
 2018/2019 IQ Biology rotation student Corinne Walsh
 2016/2017 IQ Biology rotation student Kelsey Dahlgren
 2016/2017 IQ Biology rotation student Elise Cowley

Undergraduate Students

Fall 2023 UROP student Carolyn Bivins
 Summer 2022 RECCS summer student Madison Scarlotti
 2022-2023 UROP student Madigan Rumley
 Summer 2022 RECCS summer student Adeena Chughtai
 Summer 2022 RECCS summer student Sal Greenberger
 2022-2023 UROP student Julia Kelley-Kern
 2021-2022 UROP student Stephanie Schubert
 Summer 2021 Summer research assistant Josie Mottram
 Summer 2021 Summer research assistant Christopher Mulligan
 2019-2020 UROP student Joely Depoy
 Summer 2019 RECCS summer student Alec Elder
 2016-2017 MCDB Honors thesis student Shaelyn Silverman

Training Visitors

Summer 2024 Amanda Calhoun, PhD student, Havard University
 Summer 2024 Vivien Schneider, PhD student, University of Bristol
 Summer 2024 Chris Rosendahl, PhD student, University of Kiel
 Spring 2023 Olivia Pendas, undergraduate student, Dartmouth College
 Summer 2022 Alta Howells, Postdoc, NASA Ames
 Fall 2021&23 Carolyn Harris, PhD student, Dartmouth College
 Spring 2019 Yuki Weber, Postdoc, Harvard University
 Summer 2018 Ashley Maloney, Postdoc, Princeton University
 Summer 2018 Eunah Han, PhD student, Princeton University
 Summer 2017 Matthew Salie, Postdoc, Scripps Research Institute

Graduate Student Committees

2023-present EBIO PhD student Laura Rea
 2023-present GEOL PhD student Harry Allbrook
 2022-present Dartmouth College PhD student Carolyn Harris
 2022-present EBIO PhD student Jessica Rush
 2022-present GEOL PhD student Kevin Rozmiarek
 2021-2024 EBIO PhD student Sierra Jech
 2018-2024 Princeton PhD student Eunah Han
 2017-2024 GEOL PhD student Ellie Hara
 2017-2023 GEOL PhD student Jennifer Reeve

2019-2023	Colorado School of Mines PhD student Patrick Thieringer
2018-2023	EBIO PhD student Corinne Walsh
2021-2022	GEOL PhD student Rachel Havranek
2021-2022	Biochemistry PhD student Kelsey Dahlgreen
2017-2022	GEOL PhD student Sebastian Cantarero
2020-2021	EBIO MSc student Molly Huber
2019-2021	GEOL PhD student Katie Rempfert
2018-2021	EBIO MSc student Amy Barfield
2017-2021	GEOL PhD student Jonathan Raberg
2016-2021	GEOL PhD student Mike Zawaski
2017-2020	INSTAAR/CEAE PhD student Anna Bergstrom
2017-2020	GEOL PhD student Daniel Nothaft
2017-2020	GEOL PhD student Garrett Boudinot
2017-2019	GEOL PhD student Lina Perez Angel
2016-2018	GEOL/USGS MSc student Tyler Kane

10. Professional Development (since at CU Boulder)

2021	CU Boulder Supporting Student Resiliency Series
2020	Small World Initiative Workshop: Designing and implementing Course-based Undergraduate Research Experience (CURE) lab classes.
2018	CU Boulder PI Academy Workshop: Navigating Resources for Research, Scholarship and Creative Work
2018	CU Boulder PI Academy Workshop: Research and Seed Grant Mixer
2018	CU Boulder PI Academy Workshop: Packard & Keck Fellowships Workshop
2018	CU Boulder FTEP Workshop: Flipping the classroom
2017	CU Boulder FTEP Workshop: Student pushback in active classrooms
2017	Goldschmidt Workshop: Team-based-learning (TBL) for flipping Earth Sciences classrooms
2017	CU Boulder LEAP Workshop: Introductory Leadership
2016	NAGT/SERC Early Career Geoscience Workshop for Teaching, Research and Career Management

11. Service & Outreach (since at CU Boulder)

Department

2022-present	Undergraduate Curriculum Committees
Fall 2022	Department Chair Search Committee
2021/2022	Graduate Curriculum Committees
2020/2021	Diversity, Equity & Inclusivity Committee
2019/2020	Executive Committee
Fall 2018	Graduate Curriculum Committee
Fall 2017	Committee of the Future
2017-2018	Web Committee (Chair)
2016/17	Space Committee

University

2019-2021	ASSETT Inclusive Data Science Innovation Incubator
2017-2018	RIO Campus Computing Resources Workgroup
2017	IQBiology Admissions Committee
2016	RIO Advisory Board Subcommittee on Engaging Faculty in Innovation

Community

2016-present	Developer of open-source software and hardware for the geochemistry and geomicrobiology research communities including www.isoverse.org
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- 2016-present* Manuscript Reviewer for: Geobiology, Environmental Microbiology, Geochimica et Cosmochimica Acta, Nature Communications, Microbial Ecology, mBio, PLOS One, Environmental Microbiology, Chemical Geology, PNAS, Environmental Science & Technology
- 2016-present* Proposal Reviewer for: NASA Astrobiology, NSF Geobiology and Low Temperature Geochemistry, NSF Chemical Oceanography, Department of Energy Office of Science, American Chemical Society Petroleum Research Fund, Novo Nordisk Foundation
- 2022* Proposal review panelist for NSF EAR Geobiology & Low Temperature Geochemistry program
- 2020-2021* Lead organizer of the CU Boulder visit days for community college students from the Denver Metro STEM Alliance for Minority Participation (comprising Community College of Aurora, Arapahoe Community College and Front Range Community College).
- 2020* Lead organizer for the first Isoverse Workshop on reproducible stable isotope data processing, University of Colorado Boulder, CO.
- 2019* Lead faculty organizer for the 3rd Rocky Mountain Geobiology Symposium, University of Colorado Boulder, CO.
- 2018* Co-Chair for AGU Conference Session: “Understanding the Biogeochemistry of Nitrogen Inputs and Outputs from Molecular to Global Scales”
- 2018* Co-Chair for Goldschmidt Conference Session: “Traditional and Non-Traditional Stable Isotopes in Geobiology and Biogeochemistry”
- 2017* Co-Chair for Goldschmidt Conference Session: “Novel tools and approaches for investigating biogeochemical cycling and organic signatures of microbial activity”
- 2016* Co-Instructor for GSA Short course: “Organic, Light and Clumped Stable Isotope Geochemistry in the 21st Century: Principles, Practices and Novel Applications” with K. Snell, J. Sepulveda, and B. Davidheiser-Kroll

12. Other Conference Presentations (since at CU Boulder)

- 2024* Geobiology Gordon Research Conference, American Chemical Society Spring Meeting, Rocky Mountain Geobiology Symposium, International Conference on Permafrost, Ecological Society of America Annual Meeting, Organic Geochemistry Gordon Research Conference, Goldschmidt Conference
- 2023* American Chemical Society Spring Meeting, Rocky Mountain Geobiology Symposium, Front Range Microbiome Symposium, American Society for Mass Spectrometry Annual Conference, Goldschmidt Conference, Advances in Stable Isotope Techniques & Applications (ASITA) Conference, Archaea Gordon Research Conference, 2nd International GDGT workshop, International Meeting on Organic Geochemistry
- 2022* Northeast Geobiology Symposium, Astrobiology Science Conference (AbSciCon), Goldschmidt Conference, International Symposium on Microbial Ecology (ISME), International Workshop on Microbial Life (Microenergy), International Clumped Isotope Workshop, Geobiology Gordon Research Conference, American Geophysical Union (AGU) Fall Meeting, Czech Society for Stable Isotopes Meeting
- 2021* International Arctic Workshop, European Geosciences Union (EGU) General Assembly, Rocky Mountain Geobiology Symposium, American Geophysical Union (AGU) Fall Meeting
- 2019* International Clumped Isotope Workshop, Rocky Mountain Geobiology Symposium, Front Range Microbiome Symposium, Astrobiology Science Conference (AbSciCon), Gordon Research Conference on Applied & Environmental Microbiology, Water Isotopes and Climate Workshop, American Geophysical Union (AGU) Fall Meeting
- 2018* Rocky Mountain Geobiology Symposium, Northeast Geobiology Symposium, Goldschmidt Conference, Front Range Isotope Day, Geological Society of America (GSA) Annual Meeting, American Geophysical Union (AGU) Fall Meeting

- 2017* Astrobiology Science Conference (AbSciCon), Geobiology Society Conference, Goldschmidt Conference, Geological Society of America (GSA) Annual Meeting
- 2016* American Society for Microbiology (ASM) Microbe Meeting, American Geophysical Union (AGU)