WILLIAM DAVIE LEAVITT, PHD.

Assistant Professor of Earth Sciences
Department of Earth Sciences, Dartmouth College
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Education

2009-2014 Harvard University (Cambridge, MA, USA)
Ph.D., Dept. Earth & Planetary Science, Advisor: David T. Johnston.

2007-2009 Harvard University (Cambridge, MA, USA)
M.A., Dept. Organismic & Evolutionary Biology, Advisor: Peter R. Girguis

2002-2006 Hampshire College (Amherst, MA, USA)
B.A. Microbial Ecology & Molecular Biology, Advisor: Jason M. Tor

Professional Experience

2024-present Associate Professor, Dept. Earth Sciences, Dartmouth College
2024-present Adjunct Associate Professor, Chemistry, Dartmouth College
2016-2024 Assistant Professor, Earth Sciences, Dartmouth College
2018-2024 Adjunct Assistant Professor, Chemistry, Dartmouth College
2014-2016 Steven Fossett Postdoctoral Fellow, Washington University in St. Louis
2011-2015 Visiting Scientist, Bacterial Energy Metabolism Group,
Instituto de Tecnologia Química e Biológica, Lisbon, Portugal
2014 Postdoctoral Researcher, Earth & Planetary Sciences, Harvard University
2006-2007 Research Assistant, Earth & Planetary Sciences, Harvard University
2006 Research Assistant, Dept. Microbiology, Montana State University,

Awards

2019-2022 Simons Early Career Investigator in Marine Microbial Ecology and Evolution
2017-2019 American Chemical Society Petroleum Research Fund New Investigator
2014-2016 Steven Fossett Postdoctoral Fellowship, Washington University in St. Louis
2008-2011 NSF-BIO & EAR Graduate Research Fellowship

Grants Awarded

Lead/Sole PI on >$1.996M of >2.59M to Dartmouth, out of >$4.408M total.

-National Aeronautics and Space Administration Exobiology (**W.D. Leavitt, Co.I.;** P.I. E. Trembath-Reichert, Arizona State U.; Co.I. J. Saunders U. Georgia.). *Drivers and predictors of cryptic inorganic carbon assimilation and constraints on habitability*. $279,583 (Dartmouth) of $903,790 (total). July 2024 to June 2027.

-National Aeronautics and Space Administration Exobiology (**Leavitt, Co.I.;** P.I. M. Palucis). $675,191. *Toward predictive mapping of biosignatures across extreme aridity and salinity gradients in the Atacama Desert: A modern-day Mars analog*. October 2023 to Sept 2026.

-National Aeronautics and Space Administration Exobiology (**Leavitt, Co-P.I.;** Co-P.I. E. Young UCLA; CoI T. McCollom, CU Boulder). *Developing methane isotopologues as interplanetary biosignatures.* Leavitt: $282,990 (Dartmouth) of $927,880 (total). Start: January 2021 – 2024.

-Simons Foundation (**Leavitt, sole PI**). *Molecular fingerprinting of microbial surface ocean methane*. $644,000. Start: April 2019, NCE thru April 2025.
-National Science Foundation EAR Low Temperature Geochemistry and Geobiology (**Leavitt lead PI**; Co-PI Kopf, CU Boulder). *Collaborative Proposal: Establishing the hydrogen isotopic window into Archaeal lipid biomarkers;* Leavitt: $274,935 (+$9,691 supplement) of $564,806. September 2019 to Nov 2023. Grant#1928309.
-National Science Foundation Major Research Initiation Grant (**Leavitt Co-I;** PI C. Hicks-Pries, Co.I J. Strauss, Dartmouth). *Acquisition of an Isotope Ratio Mass Spectrometer (IRMS) to enable interdisciplinary research at Dartmouth and beyon*d. $483,126. June 2018 - May 2021.
-American Chemical Society Petroleum Research Fund Doctoral New Investigator. (**Leavitt, sole P.I.**). *The inner lives of Archaea: the hydrogen isotopic composition of Archaeal lipids may represent a proxy of past metabolic state.* $110,000. July 2017 - June 2019, (no cost extension thru August 2021).
-Department of Energy Joint Genome Institute Community Sequencing Project (**Leavitt P.I**). *Identification of genes involved in Archaeal lipid cyclization.* RNAseq award. January 2019 – December 2020.
-Sloan Foundation, Deep Carbon Observatory. *The Deep Carbon Cycle through geological time: An interdisciplinary synthesis of the carbon cycle in the Earth's lithosphere-biosphere system.* (Lead: S. Zahirovic & D. Muller; **Co.I Leavitt** & 22-others), $100,000. January 2018 to September 2019.
-Dartmouth College Office of Provost RPF SEED funding. (**Leavitt, Sole P.I**). *From microbial enzymes to global climate: toward isotopically fingerprinting methane produced in Earths' surface waters.* ($49,000). Active period: June 2017 to May 2018 (no cost extension from thru May 2019).

Grants *under review*

-Irving Institute SEED Proposal (**W.D. Leavitt, W. & E. Pletneva Co-P.I's**). *Decarbonization via Microbial Methane Sequestration.* Requested $100,000 for 2yrs, *final review* in May 2024.

Grants pre-2016

2014 to 2017: NASA-Exobiology (**Leavitt, Science I.;** P.I.: A. Bradley, Washington Univ. St. Louis). *Coevolution of sulfate reducer biosignatures and the redox state of the early Earth*. $388,253.
2008 to 2011 NSF Graduate Research Fellowship
2005 NSF-REU Yellowstone Microbial Observatory, Montana State University.
2004 NSF-REU Dept. of Biology, University of South Carolina.

Manuscripts in preparation, draft available upon request (est. submission)

i. Li[#], J., J. Ash, A. Cobban[★], S. Berger, K. Morra, Y. Lin, M. Fogel, M. Torres, X. Feng, A. Masterson, D. Stolper, C. Welte, M. Jetten, E. Young, **WD Leavitt[§]**. Clumped isotopes differentiate microbialgenic methanogenesis pathways. *Est.* Summer 2024.

ii. Harris[#], C., S. Kopf, A. Zhou[#], B. Chiu, A. Cobban[★], J. McFarlin, Y. Weber[‡], A. Pearson and W.D. Leavitt. Hydrogen isotope systematics in GDGTs from the model thermoacidophile *Sulfolobus acidocaldarius*. *Est.* Summer 2024.

Legend for manuscript contributions

Leavitt lab #graduate student, ★undergrad author, ‡postdoc; *Equal contribution. §**Leavitt** senior/communicating; @**Leavitt** first/communicating. Other &student, %postdoc.

Manuscripts in revision, review, or submitted (with latest status)

[i] Rhim‡, J., S.Kopf, J. McFarlin%, H. Batther&, C.M. Harris#, A. Zhou#, X. Feng, Y. Weber‡, S. Hoeft-McCann, A. Pearson, and **WD Leavitt§**. The hydrogen isotope signatures of autotrophy versus heterotrophy recorded in archaeal tetraether lipids. *In revision* May 2024 at *Geochimica et Cosmochimica*.
Preprint: www.biorxiv.org/content/10.1101/2023.11.29.569324v1.

[ii] Tsang, M.-Y., A. Ijiri, **W.D. Leavitt,** Y. Yamamoto, J.-I. Ishibashi, R.M. Coggon, J.B. Sylvan, J.S. Reece, D.A.H. Teagle, G.L. Christeson, E.R. Estes, T.J. Williams, and the South Atlantic Transect IODP Expedition 390/393 Scientists. Stable carbon isotope ratios of dissolved inorganic carbon in sediment porewater of the Southern Mid-Atlantic Ridge (IODP Exp. 390/393). Submitted, May 2024, *Geochemical Journal.*

[vi]. Calhoun, ★ A.N., J. Blewett, D.R. Colman, M.J. Amenabar, C.M. Harris, E.S. Boyd, A. Pearson, and **W.D Leavitt^**. Environmental controls on crenarchaeol distributions in hydrothermal springs. July 2024 *Submitted to Applied & Env. Micro.*

[iv] Liu, J., E.D. Young, A. Pellerin, J.L. Ash, G.T. Barrett, X. Feng, P.R. Girguis, S.J.E. Krause, **W.D. Leavitt**, K. Murphy, Q. Qin, O. Sivan, A. Teske, D.L. Valentine, K.W. Anthony, T. Treude**.** Clumped isotopes of methane trace bioenergetics in the environment. Submitted, July 2024.

Peer Reviewed Publications (includes *accepted*, *in press*, and *in print*)

[37] Labidi, J., McCollom, T.M., Giunta, T., Sherwood Lollar, B., **Leavitt, W.D**., Young E.D. accepted, July 2024. Clumped isotope signatures of abiotic methane: the role of combinatorial isotope effect. *Journal of Geophysical Research - Solid Earth*. *Preprint:* essopenarchive.org/doi/full/10.22541/essoar.169947270.05360251/v1.

[36] Li#, J., B.K. Chiu, A.M. Piasecki‡, X. Feng, J.D. Landis&, S. Marcum&, E.D. Young, **W.D. Leavitt§**. *accepted* June 2024.The evolution of multiply substituted isotopologues of methane during microbial aerobic oxidation. *Geochimica et Cosmochimica Acta.* *Preprint*: www.biorxiv.org/content/10.1101/2023.11.02.565373v1.

[35] Lyons*, T., C. Tino*&, G. Fournier, R. Anderson, **WD Leavitt**, K. Konhauser, and E. Stüeken. *In press,* April 2024. Co-evolution of early environments and microbial life. *Nature Reviews in Microbiology.*

[34] **Leavitt@, WD**, J Waldbauer, MS Sim, S Venceslau, F Boidi, I.A.C Pereira, and AS Bradley. 2024. Energy availability drives net sulfur isotope fractionation and protein abundance in dissimilatory sulfate reducing bacteria. *Geobiology*. doi.org/10.1111/gbi.12600.

[33] Rhim‡, J.R., Zhou#, Y. Zhang, M Amenabar, FJ Elling, A Pearson, E.S. Boyd, **WD Leavitt§**. 2024. Mode of carbon and energy metabolism shifts lipid composition in the thermoacidophile *Acidianus*. *Applied & Environmental Microbiology*. *doi.org/10.1128/aem.01369-23*.
see Appl. Env. Microbio cover, February 2024 https://journals.asm.org/toc/aem/90/2

[32] Liu[&], J., Treude, T., Abbasov, O.R., Baloglanov, E.E., Aliyev, A.A., Harris[#], C.M., **Leavitt, W.D.** and Young, E.D. 2024. Clumped isotope evidence for microbial alteration of thermogenic methane in terrestrial mud volcanoes. *Geology*.
see Geology cover, January 2024 http://pubs.geoscienceworld.org/geology/issue/52/1

[31] Chiu, B., J. Waldbauer, O. [★]Mete, F. Elling, A. Zhang, L., A. Pearson, E. Eggleston, **WD [§]Leavitt**. 2023. Membrane lipid and expression responses of *Saccharolobus islandicus* REY15A to acid and cold stress. *Frontiers in Microbiology,* 2023.07.24. DOI: 10.3389/fmicb.2023.1219779.

[30] Mete[★], Ö., Subhas, A., Kim, H., Dunlea, A., Whitmore, L., Shiller, A., Gilbert, M., **Leavitt, W.D.,** Horner, T. 2023. Barium in seawater: Dissolved distribution, relationship to silicon, and barite saturation state determined using machine learning, *Earth Syst. Sci. Data Discuss.* doi.org/10.5194/essd-2023-67.

[29] [@]**Leavitt, WD***, S. Kopf*, Weber[‡], Y., B. Chiu, McFarlin[%], J., Zhou[#], FJ Elling, A Pearson*. 2023. Controls on the hydrogen isotope composition of tetraether lipids in an autotrophic ammonia-oxidizing marine archaeon. *Geochimica et Cosmochimica Acta*. doi.org/10.1016/j.gca.2023.04.033.

[28] [#]Blum, L.; D. Coleman, E. Boyd, E. Eloe-Fadrosh, M. Kellom, O. Zhaxybayeva, **W.D. [§]Leavitt**. 2023. Distribution and abundance of tetraether lipid cyclization genes in terrestrial hot springs reflect pH. *Environmental Microbiology*, 1– 15. doi.org/10.1111/1462-2920.16375.

[27] Ferreira, D., Venceslau, S.S., Bernardino, R., Preto, A., Zhang, L., Waldbauer, J.R., **Leavitt, W.D**. and Pereira, I.A., 2023. DsrC is involved in fermentative growth and interacts directly with the FlxABCD-HdrABC complex in Desulfovibrio vulgaris Hildenborough. *Environmental Microbiology*. doi.org/10.1111/1462.

[26] Harris[#*], C.M, MT Maclay[&*], KA Lutz[&], V Nathan[&], NA Ortega Dominguez[&], **WD [§]Leavitt**, and MC [§]Palucis. 2022. Remote and in-Situ Characterization of Mars Analogs: Coupling Scales to Improve the Search for Microbial Signatures on Mars. *Frontiers in Astronomy and Space Sciences*, 9, p.849078. doi.org/10.3389/fspas.2022.849078

[25] Lengger, S.K., Weber, Y., Taylor, K.W., Kopf, S.H., Berstan, R., Bull, I.D., Mayser, J.P., **Leavitt, W.D**., Blewett, J., Pearson, A. and Pancost, R.D., 2021. Determination of the δ^2H values of high molecular weight lipids by high temperature GC coupled to isotope ratio mass spectrometry. *Rapid Communications in Mass Spectrometry*. doi.org/10.1002/rcm.8983.

[24] Cobban[★], A., Zhou[#], Y [‡]Weber, FJ [%]Elling, A Pearson, **WD [§]Leavitt**. 2020. Cyclization of *Sulfolobus acidocaldarius* GDGTs changes in response to temperature and pH. *Environmental Microbiology*. doi.org/10.1111/1462-2920.15194.

[23] Luxem[&], K., **WD Leavitt**, X Zhang. 2020. Large hydrogen isotope fractionation distinguish nitrgenase-derived methane from other sources. *Applied & Environmental Microbiology.* doi.org/10.1128/AEM.00849-20.

[22] Taenzer[#], L, J Labidi, A Masterson, X Feng, Rumble III, E Young, **WD Leavitt[§]**. 2020. *Low apparent*. $\Delta^{12}CH_2D_2$ in microbialgenic methane result from combinatorial isotope effects. *Geochimica et Cosmochimica Acta.* doi.org/10.1016/j.gca.2020.06.026.

[21] Bertran[&], E, A Waldeck[&], BA Wing, I Halevy, **WD Leavitt**, AS Bradley, DT Johnston. 2020. Oxygen isotope effects during microbial sulfate reduction: Applications to sediment cell abundances. *Nature ISME.* doi.org/10.1038/s41396-020-0618-2.

[20] Taenzer[#], L, P Carini, J Gaube[★], B Bourque[%], A Masterson, **WD Leavitt[§]**. 2020. Microbial Methane from Methylphosphonate Isotopically Records Source. *Geophysical Research Letters.* doi.org/10.1029/2019GL085872.

[19] Zhou[#], A, Y Weber, B. Chiu, FJ Elling, A. Cobban[★], A Pearson, **WD Leavitt[§]**. 2020. Energy flux controls tetraether lipid cyclization in *Sulfolobus acidocaldarius*. *Environmental Microbiology*. doi.org/10.1111/1462-2920.14851.

[18] Gomes, M., **Leavitt, W.D.,** Smith, D. (2019). Sulfate Reduction. In: Gargaud, M., et al. Encyclopedia of Astrobiology. Springer, Berlin, Heidelberg. doi.org/10.1007/978-3-642-27833-4_5420-1.

[17] **Leavitt[@], WD**, S Venceslau, J Waldbauer, D Smith, IAC Pereira, and AS Bradley. 2019. Proteomic and isotopic response of *Desulfovibrio vulgaris* to DsrC perturbation. *Frontiers in Microbiology.* doi: 10.3389/fmicb.2019.00658.

[16] Bertran[&], E, **W.D. Leavitt**, A.Pellerin, GM Zane, JD Wall, I Halevy, B. Wing, D.T. Johnston. 2018. Deconstructing the dissimilatory sulfate reduction pathway: Isotope fractionation of a mutant unable of growth on sulfate. *Frontiers in Microbiology.* doi.org/10.3389/fmicb.2018.03110.

[15] **Leavitt[@], W.D.,** S. Jean-Loup Murphy, L. R. Lynd, A.S. Bradley. 2017. Hydrogen isotope composition of *Thermoanaerobacterium saccharolyticum* lipids: comparing wild type to a nfn- transhydrogenase mutant. *Organic Geochemistry*. doi.org/10.1016/j.orggeochem.2017.06.020.

[14] **Leavitt[@], WD**, S Venceslau, DT Johnston, IAC Pereira and AS Bradley. 2016. Fractionation of sulfur and hydrogen isotopes in *Desulfovibrio vulgaris* with perturbed DsrC expression. *FEMS Microbiology Letters*. 363:20. doi.org/10.1093/femsle/fnw226

[13] **Leavitt[@], WD**, Flynn, TM, Suess, MK and Bradley, AS. 2016. Transhydrogenase and Growth Substrate Influence Lipid Hydrogen Isotope Ratios in *Desulfovibrio alaskensis* G20*. Frontiers in Microbiology. 7:918.* doi: 10.3389/fmicb.2016.00918

[12] Fike, DA, AS Bradley and **WD Leavitt**. Ch. 20: Geomicrobiology of Sulfur. Ed: H.L. Erlich, D.K. Newman and A. Kappler. 2016. Geomicrobiology, 6th edition. CRC Press.

[11] Bradley, AS*, **W.D. Leavitt***, M.L. Schmidt, A.H. Knoll, P.R. Girguis and D.T. Johnston. 2016. Patterns of sulfur isotope fractionation during Microbial Sulfate Reduction. *Geobiology* 10.1111/gbi.12149.

[10] **Leavitt, WD[@]***, AS Bradley*, AA Santos, IAC Pereira and DT Johnston. 2015. Sulfur isotope fractionation by dissimilatory sulfite reductase. *Frontiers in Microbiology.* doi: 10.3389/fmicb.2015.01392

[9] Santos*, A.A., S. Venceslau* F. Grein, **WD Leavitt**, C. Dahl, D.T. Johnston and I.A.C Pereira. 2015. A protein trisulfide couples dissimilatory sulfate reduction to energy conservation. *Science.* 350: 1541-45.

[8] **Leavitt[@], WD**, R.C. Cummins, M.L. Schmidt, M.S. Sim, S. Ono, A.S. Bradley and D.T. Johnston. 2014. Multiple sulfur isotope signatures of sulfite and thiosulfate reduction by the model dissimilatory sulfate-reducer*, Desulfovibrio alaskensis* str. G20. *Frontiers in Microbiology* 5: 1- 16.

[7] Reardon, C.L., T.S. Magnuson, E.S. Boyd, **W.D. Leavitt**, D.W. Reed and G.G. Geesey. 2014. Hydrogenase Activity of Mineral-Associated and Suspended Populations of *Desulfovibrio desulfuricans* Essex 6. *Microbial Ecology*. 67: 318-326.

[6] **Leavitt@, W.D.,** I. Halevy, A.S. Bradley and D.T. Johnston. 2013.The influence of sulfate reduction rates on the Phanerozoic sulfur isotope record. *Proceedings of the National Academy of Science, USA.* 110: 11244-11249.

[5] Bradley, A.B., **W.D. Leavitt** and D.T. Johnston. 2011. Revisiting the dissimilatory sulfate reduction pathway. *Geobiology*. 9: 446–457.

[4] Pearson, A., **W.D. Leavitt**, J.P. Saenz, R.E. Summons, M.C.-M. Tam and H. Close. 2009. Diversity of hopanoids and squalene-hopene cyclases across a tropical land-sea gradient. *Environmental Microbiology*. 11: 1208-1223*.*

[3] Boyd, E.S., **W.D. Leavitt** and G.G. Geesey. 2009. CO_2 Uptake by a Thermoacidophilic Microbial Community Attached to Precipitated Sulfur in a Geothermal Spring. *Applied and Environmental Microbiology*. 75: 4289-4296.

[2] Pearson, A., K.S. Kraunz, A.L. Sessions, A.E. Dekas, **W.D. Leavitt** and K.J. Edwards. 2008. Quantifying Microbial Utilization of Petroleum Hydrocarbons in Salt Marsh Sediments by using the ^{13}C Content of Bacterial rRNA. *Applied and Environmental Microbiology*. 74: 1157-1166.

[1] Boyd, E.S., R.A. Jackson, G. Encarnacion, J.A. Zahn, T. Beard, **W.D. Leavitt**, Yundan Pi, C.L. Zhang, A. Pearson and G.G. Geesey. 2007. Isolation, Characterization, and Ecology of Sulfur-Respiring Crenarchaea Inhabiting Acid-Sulfate-Chloride-Containing Geothermal Springs in Yellowstone National Park. *Applied & Environmental Microbiology*. 73: 6669-6677.

Active On-going Projects

Projects where experiments & data collection are underway, conference abstracts available.

i. Guibourdenche, L.L. A.Teske, J.L. Ash, Marcum&, S., W.D. Leavitt, and E.D. Young. Differentiating thermogenic from microbial methanogenesis: insights from multiply substituted isotopologues of methane from Guaymas Basi and a Bayesian Approach to Developing Methane as a Biosignature.

ii. Harris, Rhim et al. Substrate controls on archaeal GDGT hydrogen isotopes.

iii. Harris, et al. The hydrogen isotope compositions of archaea iGDGTs from hot springs.

iv. Li#, J, D. Levy, L. Labidi, WD Leavitt. Hydrogen isotope clumping during microbial oxidation.

v. Thompson, M., Li#, E. Young, WD Leavitt. The clumped isotope effect of microbial methane from acetate.

vi. Benson#, J., WD Leavitt, S. Slotznick. Magnetic mineral formation and preservation in New Hampshire lakes.

vi. Chan, Palucis, Leavitt, & Nichols. Detecting microbial biosignatures in the Atacama with remote sensing and ML.

Other Publications

i. Meadows, V., Graham, H., Abrahamsson, V., Adam, Z., Amador-French, E., Arney, G., Barge, L., Barlow, E., Berea, A., Bose, M., Bower, D., **Leavitt, WD**, et al. (76 authors). 2022. Community Report from the Biosignatures Standards of Evidence Workshop. *arXiv preprint arXiv:2210.14293*.

ii. Young, E., **W.D. Leavitt**. 2021. Developing Methane Isotopologues as Interplanetary Biosignatures. *Bulletin of the American Astronomical Society*. 53: 4. (White Paper).

Teaching

Dartmouth *course I both developed & taught; ^upcoming.

*EARS_7.06: FYS Life on Mars? W17, W18, W19, W20, W21, W23, W24^.
*EARS_34: Global Biogeochemical Cycles. S18, F18, X20, S23.
*EARS_72/172 (undergrad/grad): Geobiology. S17, S20, F21.
*EARS_272: Historical Geobiology (grad seminar, co-taught), S18, S19, S20, F21.
EARS_88: The Earth System (co-taught). F18.
EARS_202: Critical Analysis, graduate (co-taught, solo#). W18, W20, W23#, W24^
EARS_203: Writing in Earth Sciences, graduate (co-taught). S21, S23, S24^.
EARS/ASTRO_19: Habitable Planets (co-taught). S'24.

Prior to 2016:

Life as a Planetary Phenomenon, *TA* Harvard University, 2012.
Biogeochemical cycles, *TA* Harvard University, 2010.
Aqueous and Environmental Chemistry, *TA* Harvard University, 2009.
Geomicrobiology Field Course, *TA* Hampshire College, 2008, 2009.
Gene Cloning, *TA* Hampshire College, 2004, 2006.
Introduction to Microbial Ecology, *TA* Hampshire College, 2004.
Natural History of Infectious Disease, *TA* Hampshire College, 2003.

Mentoring

Postdoctoral Scholars & Research Scientists

-Dr. Laetitia Guibourdenche at UCLA/Dartmouth (co-supervised, 2024-ongoing)
-Dr. Jeemin Rhim, Society of Fellows at Dartmouth, 2020-2023.
-Dr. Alison Piasecki, at Dartmouth, 2020-2021.
-Dr. Yuki Weber, at Harvard/Dartmouth (co-supervised w/ A. Pearson), 2017-2020.

Graduate Students, Primary Advisor

-Andrea Chen, MSc student, Earth Science, Dartmouth, 2024 to present (co-advised)
-Carolynn Harris, PhD student, Earth Science, Dartmouth, 2020 to present
-Jiawen Li, PhD student, Earth Science, Dartmouth, 2021 to present
-Mia Thompson, MSc student, Earth Science, Dartmouth, 2023 to present
-Josephine Benson, MSc student, Earth Science, Dartmouth, 2021- 2023 (co-advised)
-Laura Blum, MS Student, Earth Science, Dartmouth, 2020 to 2022
-Yujiao Zhang, visiting PhD student, Guangzhou Institute of Geochemistry, China, 2019
-Alice Zhou, MS, Earth Science, Dartmouth, 2017 to 2019
-Lina Taenzer, MS, Earth Science, Dartmouth, 2017 to 2019.

Graduate Student Committee Member

-Kinga Santha, PhD, University of Lausanne, 2024 to present
-Luke Rein, MSc, Dartmouth Earth Science, 2023 to present
-Reina Harding, PhD, Dartmouth Earth Science, 2023-2024

-Vignesh G. Menon, MSc, Dartmouth Earth Science, 2022-2024
-Genevieve Goeble, PhD, Dartmouth EEES, 2020-2024
-Anne Farrell, PhD, Dartmouth EEES, 2017-2023
-James Busch, PhD, Dartmouth Earth Science, 2018-2022
-Virginia Wala, MS, Dartmouth Earth Science, 2017-2019.

Undergraduate Students

Dartmouth Senior Honors Theses: Amanda Calhoun, Earth Science, 2023*;* Öykü Mete, Earth Science, 2022; Lucy Langenberg, Biology, 2022; Carter Boyd, Earth Science, 2021*;* Alec Cobban, Biology, 2019*;* Janel Gaube, Chemistry, 2018*;* Emma Rieb, Earth Science, 2018.

Lab trainees at Dartmouth (UGAR or project-funded): Dankweli Mwaka (’27); Olivia Pendas (’25); Abigail Shepherd (’23); Whitney Thomas (’25); Rowan Gregoire (’24); Öykü Mete (‘22); Theo Green (’21); Rachel Rubin (‘20); Cameron Buxton (’19); Alec Cobban (’19).

Women in Science Project (WISP) at Dartmouth: Melanie Prakash (’21); Maria Trevino (’23); Soyeon Cho (’24), Madison Spivak (’24), Crystal Igwe (’24), Emily Masuda (’24); Katherine Takoudes (’24).

Other trainees: Beverly Chiu (2017-2022), research associate; Vinitra Nathan, MSc candidate (2021-2022); Alec Cobban, BA (2019-2020), lab technician; Alan Hicking (2018-2020), River Valley Community College & Dartmouth College.

Pre-2016: Flavia Boidi (2015-2016) PhD Fulbright Fellow, Washington University in St. Louis; Claire Wallace (2014-2015) undergraduate research, WashU. in St. Louis; Marian Schmidt (2011-2012) post-baccalaureate scholar, Harvard University; Renata Cummins (2009-2011) undergraduate thesis, Harvard University.

Professional Development:

2016 to present: numerous workshops through DCAL (at Dartmouth).
2022 NCFDD Faculty Success Program.
2021 URGE: Dartmouth Pod https://urgeoscience.org/pods/dartmouth-earth-science/
2020 The Center for the Improvement of Mentored Experiences in Research (CIMER) Dartmouth “Entering Mentoring” and “Training the Trainor” series.
2017 Sloan Foundation Deep Carbon Observatory Workshop, Catania, Italy.
2016 NSF-SERC-NAGT Early Career Geoscience Faculty workshop.
2008 Microbial Diversity, Marine Biological Laboratory (Woods Hole, MA, USA)

Synergistic Activities (Service)

Conference Session Chair, Co-Chair, Organizer:

2024: American Chemical Society, San Diego, CA
Microbially-Driven Geochemical Reactions: Kinetics and Communities.
2024: Geobiology Gordon Research Conference, Galveston, TX.
Session Chair: Early Branches on the Tree of Life.
2023: Goldschmidt Conference, Lyon, France.
Rare isotopes of common gases: Tools and applications for multiply substituted isotopologues in global (bio)geochemistry
2022: American Chemical Society, San Diego, CA
Microbially-Driven Geochemical Reactions: Kinetics and Communities.
2018: Goldschmidt Conference, Boston, MA.
Traditional and Non-Traditional Stable Isotopes in Geobiology & Biogeochemistry

2017: American Geophysical Union, New Orleans.
3rd annual (Bio-isotopic) message in a (rock record) bottle.
2017: Goldschmidt Conference, Paris, France.
Microbial metabolic and isotopic processes.
2016: American Geophysical Union, San Francisco, CA
2nd annual (Bio-isotopic) message in a (rock record) bottle.
2015: American Geophysical Union, San Francisco, CA
1st annual (Bio-isotopic) message in a (rock record) bottle.

Grant review (since 2016):
NASA-Exobiology (panels & ad-hoc); French National Research Agency (ad-hoc); Austrian Science Foundation (ad-hoc); NSF-EAR Low Temperature Geochemistry and Geobiology (panels & ad-hoc); NSF-EAR Postdoc Fellowship (panels & ad-hoc); INACH (Chile, ad-hoc); NSERC (Canada, ad-hoc); NSF-OCE Biological Oceanography (ad-hoc); NSF-OCE Chemical Oceanography (ad-hoc); NSF-OCE Marine Geology & Geophysics (ad-hoc); NASA Planetary Sciences Graduate student fellowship (panel).

Journal editor or *reviewer* (since 2016): *Guest Editor:* PNAS (2023); *Manuscript Reviewer:* Science Advances (AAAS); Nature ISME; Nature Microbiology; Nature Communications; Geology; Geochimica et Cosmochimica Acta; Astrobiology; Geomicrobiology; Limnology & Oceanography Methods; Applied & Environmental Microbiology; Environmental Microbiology; Earth & Planetary Science Letters; Geobiology; Geomicrobiology Journal; Chemical Geology; Frontiers in Microbiology.

Outreach
2017 to 2021: Faculty Advisor, Dartmouth *ManyMentors*
2019 Pathways to STEM, Hanover High School
2023 visiting scientist project week, Hanover High School.

Field Work
2023 El Tatio and Atacama Desert, Chile
2005, 2006, 2016, 2018, 2019, 2022 Yellowstone National Park, WY, USA
2021, 2022 New Hampshire Meromictic lakes, USA.
2017 Mt. Etna, Sicily, Italy.
2014 Little Sippewisset Marsh, Cape Cod, MA, USA.
2009 Long Island Sound, CT, USA
2008 Deep Springs Lake, Death Valley National Park, CA, USA
2007 Panamait Valley, Deep Springs Lake and Hot Creek, CA, USA

Professional Societies:
Geochemical Society, American Chemical Society,
American Geophysical Union, SigmaXi

Invited Talks (Universities, Conferences, Workshops)
2024 *upcoming,* Dept. Microbiology, University of Radboud (June 2024)
2024 *upcoming*, Dept. Marine Microbiology & Biogeochemistry, NIOZ (June 2024)
2024 *upcoming*, Dept. Earth Professes, University of Lausanne (May 2024)
2024 Dept. Geology & Geophysics, University of Utah, March 2024
2024 Dept. Earth & Planetary Sciences, Northwestern University,

2023 UMass Boston, School for the Environment
2023 Penn State Geosciences, State College, PA.
2022 American Chemical Society Spring Meeting, San Diego, CA.
2022 Simons Foundation, Marine Microbial Ecol. Evol, NY, NY.
2021 University of Oklahoma Department of Microbiology, Norman, OK.
2021 Simons Foundation, Marine Microbial Ecol. Evol., remote.
2021 ASLO Aquatic Sciences, virtual global conference, remote.
2019 Carnegie Science Laboratory for Earth & Planets, Washington D.C.
2019 Woods Hole Oceanographic Institution, Falmouth, MA
2019 University of Arizona, Tucson, AZ
2019 2nd International Geobiology Conference, Banff, Canada
2019 McGill University, Dept. Earth & Planetary Sciences, Montreal, Canada
2019 Sloan Fdn., Deep Carbon Observatory, Deep Energy Meeting, La Clusaz, France
2018 Montana State University, Bozeman, MT
2018 American Chemical Society Spring Meeting, San Francisco, CA
2017 Northeast Geobiology Conference, Storrs, CT
2017 COGC3, Massachusetts Institute of Technology, Cambridge, MA
2017 University of Connecticut, Storrs, CT
2017 American Chemical Society Spring Meeting, San Francisco, CA
2016 Williams College, Geology Department, Williams, MA
2016 Dartmouth College, Biology Department, Hanover, MA
2016 Woods Hole Oceanographic Institution, Falmouth, MA
2016 Bigelow Marine Science Labs, Boothbay, ME
2016 Princeton University, Dept. of Geosciences, Princeton, NJ
2015 Goldschmidt Conference, Prague, Czech Republic
2015 Cambridge University, Isotope Coffee, Cambridge, UK
2015 Dartmouth College, Earth Science Dept., Hanover, NH
2014 American Geophysical Union Annual Meeting, San Francisco, CA
2014 Southern Illinois U., Geology Dept., Carbondale, IL
2014 Agouron Institute, Sulfur Cycle Symposium, Rancho Palos Verdes, CA
2014 Cornell University, Microbiology Dept. Seminar, Ithaca, NY
2014 Woods Hole Oceanographic Institution, Marine Chem. & Geochem., Falmouth, MA
2014 Hampshire College, School of Natural Sciences, Amherst, MA
2013 Instituto de Tecnologia Química e Biológica, Oeiras, Portugal
2013 Origins of Life Initiative Chalk Talk series, Harvard University, Cambridge, MA
2013 Microbial Sciences Initiative Chalk Talk series, Harvard University, Cambridge, MA
2012 Washington University in St. Louis, Dept. Earth & Planetary Sciences, MO
2012 Max Planck Institute for Marine Microbiol., Biogeochem. Dept., Bremen, Germany

Conference Proceedings, 2016 to present *§undergraduate, #graduate, *postdoc*

2024 Geobiology Gordon Research Conference. A.N. Calhoun§, J. Blewett, D.R. Colman, C.M. Harris#, E.S. Boyd, A. Pearson, **W.D. Leavitt**. Environmental controls on crenarchaeol distributions in hot springs.

2023 AGU Annual Meeting. Marcum#, S., J. Liu#, J. Li#, **W.D. Leavitt**, E.D. Young. A Bayesian Approach to Developing Methane as a Biosignature.

2023 Goldschmidt Annual Conference. Calhoun§, A.N., *Blewett, J., Colman, DR, #Harris, CM Boyd, ES, Pearson, A., **WD Leavitt**. On the origins of crenarchaeol: Environmental factors controlling distribution in hot springs.

2023 Goldschmidt Conference. Ash JL, #Li J, #Nathan V, Torres M, Welte C, Morra K, Frisch S, Jetten M, Feng X, Young ED, **WD Leavitt*** (*presenting). The multiply substituted isotopologue 12CH2D in methane differentiates biological production mechanisms.

2023 Goldschmidt Conference. Labidi J, McCollom T, **Leavitt WD**, Young ED. Experimental determination of the clumped isotope signatures of abiotic methane.

2022 AGU Annual Meeting. Pearson, A., Phelps, S.R., Weber, Y., §Calhoun, A.N., #Nathan, V., McCann, S.E.H., Elling, F.J., Hurley, S. and **Leavitt, WD**. Carbon Isotope Fractionation in the 3HP/4HB Pathway and Prospects for an Archaeal Lipid pCO_2 Paleobarometer.

2022 Organic Geochemistry Gordon Research Conference. **WD Leavitt**. A new perspective on archaeal lipid hydrogen isotopes as recorders of environmental and metabolic state

2022 Goldschmidt Conference. *Rhim, J.H., #Harris, C.M., Batther, H., McFarlin, J., Kopf, S. and **Leavitt, W.D.** Archaeal Lipid Hydrogen Isotope Signatures of the Metabolically Flexible Archaeoglobus fulgidus During Autotrophy and Heterotrophy.

2022 Goldschmidt Conference. #Li, J., Chiu, B., Cobban, A., *Piasecki, A., #Nathan, V., *Rhim, J.H., Young, E.D. and **Leavitt, WD**. Combinatorial and rate effects on the multiply substituted isotope signatures in methane during biological production and consumption.

2022 AGU Astrobiology Conference. #Blum L, Colman DR, Eloe-Fadrosh E, Kellom M, Boyd ES, Zhaxybayeva O, **Leavitt WD**. Distribution of GDGT membrane lipid cyclization genes in terrestrial thermal springs linked to pH.

2021 AGU Annual Meeting. Rhim, J., Harris, C., Batther, H., McFarlin, J., Kopf, S. and **Leavitt, W**. Factors Controlling the Hydrogen Isotope Composition of Lipids from Thermophilic Archaea.

2021 International Meeting of Organic Geochemists. S Lengger, S Kelly, KWR Taylor, Y Weber, S Kopf, R Berstan, M Seed, I Bull, J Meyser, **WD Leavitt**, J Blewett, A Abrahim, A Cannavan, A Pearson, R Pancost. New Frontiers in Compound-Specific δ^2H Analysis.

2019 Goldschmidt Conference. #Taenzer, L, **WD Leavitt**, J Labidi, E Young. The origin of $^{12}CH_2D_2$ depletions in microbialgenic methane gases.

2019 Gordon Research Conference Appl. and Environ. Microbio. Luxem#, K, L Taenzer#, **WD Leavitt**, X Zhang. Large hydrogen isotope fractionation distinguishes nitrogenase-derived methane from other sources.

2018 Goldschmidt Conference. Taenzer#, L, J §Gaube, D Rumble III, ED Young, **WD Leavitt**. Clumped and bulk isotopic fingerprints of methane produced by C~P lyase.

2018 Goldschmidt Conference. Bertran#, E, **WD Leavitt**, A Pellerin#, GM Zane, JD Wall, I Halevy, B Wing, DT Johnston. Deconstructing the dissimilatory sulfate reduction pathway: Isotope fractionation of a mutant unable of growth on sulfate.

2018 Goldschmidt Conference. Zhou#, A, M Amenabar, Y Weber, FJ Elling, A Pearson, **WD Leavitt**. Archaeal GDGT profiles as recorders of free energy availability.

2018 Geobiology Gordon Research Conference. Bertran#, E, A Waldeck#, BA Wing, I Halevy, **WD Leavitt**, AS Bradley, DT Johnston. 2017. Oxygen isotope trends during microbial sulfate reduction.

2017 Archaea Gordon Research Conference **Leavitt, WD**. The NAD(P)(H) transhydrogenase and growth rate influence H-isotopic fractionation in the lipids of obligate anaerobes.

2017 Goldschmidt Conference. Venceslau, SS, Santos, AA, **Leavitt, WD**, Johnston, D, Bradley, AS & Pereira, IAC. Dissimilatory Sulfate Reduction is a Four-Step Pathway.

2017 Goldschmidt Conference. The Role of Reversibility and S Intermediates in the S Metabolism. Farquhar J, **Leavitt WD**, Guo W, D Eldridge, & D Bojanova.

2017 AGU Annual Meeting. **Leavitt, W.D.,** Zhou, A., Cobban, A., Suess, M. and Bradley, A.S. Hydrogen isotopic messages in sulfate reducer lipids: a recorder of metabolic state?

2016 AGU Annual Meeting. Leavitt, W.D., Venceslau, S., Waldbauer, J., Smith, D.A., Boidi, F.J. and Bradley, A.S. Sulfur isotopic and proteomic profiles of sulfate reducers grown under differential steady-states.

2016 Goldschmidt Conference. Relating Geochemical Signatures to the Metabolic State of Cells. Bradley, A, **Leavitt, WD** & Waldbauer, J.

2016 Molecular Basis of Microbial One-Carbon Metabolism Gordon Research Conference. **Leavitt, WD**. Electron bifurcating transhydrogenase and growth rate influence H-isotopic fractionation in the lipids of obligate anaerobes.

Contributed Conference Talks and Posters (prior to July 2016*,* Leavitt first author-only)
2016 Geobiology Gordon Research Conference, Galveston, TX, poster.
2015 American Geophysical Union Annual Meeting, poster.
2015 Midwest Geobiology Conference, Bloomington, IN, talk.
2015 EMBO Workshop on Microbial Sulfur Metabolism, talk.
2014 Goldschmidt Conference, talk.
2014 Midwest Geobiology Conference, Chicago, IL, poster.
2014 Northeast Geobiology Conference, Yale University, New Haven, CT, poster.
2013 Goldschmidt Conference, Florence, Italy, talk.
2013 Midwest Geobiology Conference, IUPUI in Indianapolis, IN, poster.
2012 Goldschmidt Conference, Montreal, Canada, talk.
2012 EMBO Workshop on Microbial Sulfur Metabolism, talk.
2012 Northeast Geobiology Conference, McGill University, Montreal, Canada, talk.
2012 Midwest Geobiology Conference, Washington University, St. Louis, MO, poster.
2008 International Conference on Gas Hydrates, Bremen, Germany, poster.
2008 American Society for Microbiology General Meeting, Boston, MA, poster.
2007 American Geophysical Union General Meeting, San Francisco, CA, poster.
2006 American Society for Microbiology General Meeting, Orlando, FL, poster.
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