

Marjorie D. Cantine

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EDUCATION

- 2015-2021 **Massachusetts Institute of Technology**; Cambridge, Massachusetts, USA.
PhD, Department of Earth, Atmospheric and Planetary Science.
- 2009-2013 **Wellesley College**; Wellesley, Massachusetts, USA.
BA, Geosciences; *Phi Beta Kappa*; *magna cum laude*.

APPOINTMENTS

- University of Washington**; Seattle, WA, USA.
- 2023-now Assistant Professor, Department of Earth and Space Sciences. *start date 1 Nov.*
Goethe-Universität Frankfurt; Frankfurt am Main, Germany.
- 2021-2023 Marie Skłodowska-Curie postdoctoral fellowship.
Massachusetts Institute of Technology; Cambridge, MA, USA.
- 2015-2021 Teaching and research assistant, PhD student.
- 2021 Research specialist.
Bank of America Merrill Lynch; New York, NY, USA.
- 2013-2014 Analyst, Investment Banking Power and Energy Group.

FELLOWSHIPS and AWARDS

- 2020 **Marie Skłodowska-Curie Actions Individual Fellowship.**
€162,806 awarded to Project CARBCHRON—Award Number 892258.
- 2017-2021 **National Defense Science and Engineering Graduate Fellowship.**
US\$153,600 + four years' tuition.
- 2017-2018 **Hugh Hampton Young Fellowship**, MIT. US\$29,790.
- 2018 **Excellence in Teaching**, MIT EAPS.
- 2017 **Graduate Woman of Excellence**, MIT.
- 2015-2016 **Presidential Fellowship**, MIT.
- 2013 **Margaret D. Thompson Award for Scholarship in the Geosciences**,
Wellesley College.
- 2012 **Sara F. Langer Award**, Wellesley College.

PUBLICATIONS

★ equal authorship; ‡ student mentee

- 2023 **Cantine, M.D.**, Orzechowski, E., Stein, N., Lincoln, T., Hibner, B., Present, T.,
Thorpe, M., Strauss, J., Bahniuk Rumbelsperger A.M., Knoll, A.H.,
Grotzinger, J., Gomes, M., Trower, E. “Rapid growth of a carbonate island
over the last millennium.” in revision.

PUBLICATIONS continued

★ equal authorship; ‡ student mentee

- 2023 Stein, N.T., Grotzinger, J.P., Quinn, D.P., Lingappa, U.F., Present, T.M., Trower, E.J., Gomes, M.L., Orzechowski, E., **Cantine, M.D.**, Metcalfe, K.S., Fischer, W.W., Ehlmann, B.L., Strauss, J.V., Knoll, A.H., “Geomorphic and environmental controls on microbial mat fabrics on Little Ambergris Cay, Turks and Caicos.” *Sedimentology*.
- 2022 Gilbert, P.U.P.A., Bergmann, K.D., Boekelheide, N., Tambutté, S., Mass, T., Marin, F., Adkins, J., Erez, J., Gilbert, B., Knutson, V., **Cantine, M.D.**, Ortega-Hernandez, J., Knoll, A.H. “Biom mineralization: integrating mechanism and evolutionary history.” *Science Advances*.
- 2021 **Cantine, M.D.**, Setera, J.B., VanTongeren, J. A., Mwinde, C.‡, Bergmann, K.D. “Grain size and transport biases in an Ediacaran detrital zircon record.” *Journal of Sedimentary Research*.
- Cantine, M.D.**, “Dying to know: Death during geological fieldwork.” *The Sedimentary Record*.
- Reahl, J.N.‡, **Cantine, M.D.**, Wilcots, J., Mackey, T.J., Bergmann, K.D. “Meta-analysis of Cryogenian through modern quartz microtextures reveals sediment transport histories.” *Journal of Sedimentary Research*.
- Smith, B.P., **Cantine, M.D.**, Bergmann, K.D., Ramos, E.J., Martindale, R.C., Kerans, C., “Arid coastal carbonates and the Phanerozoic record of carbonate chemistry.” *AGU Advances*.
- Present, T.M., Gomes, M.L., Trower, E.J., Stein, N.T., Lingappa, U.F., Naviaux, J., Thorpe, M.T., **Cantine, M.D.**, Fischer, W.W., Knoll, A.H., Grotzinger, J.P., “Non-lithifying microbial ecosystem dissolves peritidal lime sand.” *Nat. Comm.*
- 2020 Rooney, A.D.★, **Cantine, M.D.**★, Bergmann, K.D., Baloushi, B., Gomez Perez, I., Boag, T., Busch, J., Sperling, E. Strauss J.V., 2020, “Calibrating the co-evolution of Ediacaran life and environment.” *PNAS*.
- Cantine, M.D.**, Knoll, A.H., and Bergmann, K.D. 2020, “Carbonate rocks before skeletons: a database approach.” *Earth-Science Reviews*.
- 2018 Trower, E.J., **Cantine, M.D.**, Gomes, M.L., Grotzinger, J.P., Knoll, A.H., Lamb, M.P., Lingappa, U., O’Reilly, S.S., Present, T.M., Stein, N. and Strauss, J.V., 2018, “Active Ooid Growth Driven By Sediment Transport in a High-Energy Shoal, Little Ambergris Cay, Turks and Caicos Islands.” *Journal of Sedimentary Research*.
- Cantine, M.D.** and Fournier, G. P., 2018, “Environmental adaptation from the origin of life to the Last Universal Common Ancestor.” *Origins of Life and Evolution of Biospheres*.

FUNDING

- 2023 **NSF OCE. RAPID: Assessing the role of hurricanes and microbes in enhancing coastal sediment accumulation.** Co-I, UW. *US\$44,246.*
NSF ER2. Project SAFER. Co-I, UW. *US\$387,995.*
Goethe-Universität Frankfurt. GRADE Sustain travel grant. *€1,000.*

INVITED TALKS and SEMINARS

- 2023 **University of Washington**, PaleoLunch, UW Biology/Burke Museum.
upcoming
University of Wisconsin, Weeks Lecture, Department of Geoscience, *upcoming*
Max-Planck-Institut für Chemie, Climate Geochemistry Group
City College of New York, Earth and Environmental Science Seminar Series.
University of Cambridge, Department of Earth Sciences.
Advances in the Understanding and Interpretation of Carbonates, invited speaker on Precambrian carbonates. *August 2023.*
- 2022 **Geological Society of America Annual Meeting**, Pardee Symposium
 Keynote Speaker, session on *The Proterozoic-Phanerozoic Transition: Laying the Foundation for the Modern Earth System*
University of Washington, Department of Earth and Space Sciences
University of Minnesota, Department of Earth and Environmental Sciences
Colorado State University, Department of Geosciences
Carleton University, Department of Earth Sciences
- 2021 **Purdue University**, Geology and Geophysics Group Seminar (December)
Université de Genève, Department of Earth Sciences (December)
SUNY Stony Brook, Department of Geosciences
Wellesley College, Science Center Summer Research Program
Carleton University, Department of Earth Sciences
Université de Genève, DESTE Seminar, Department of Earth Sciences (February)
Goethe-Universität Frankfurt, Department of Geosciences
Purdue University, Geology and Geophysics Group Seminar (January)
- 2020 **University of St. Andrews**, School of Earth and Environmental Sciences
MIT, Chemical Oceanography, Geology, Geochemistry, and Geobiology Seminar
University of California Santa Barbara, Department of Earth Sciences
- 2019 **University of Kansas**, Department of Geology
- 2018 **Yale University**, Department of Geology and Geophysics, LSP-Geochemistry Lunch Seminar
- 2017 **Wellesley College**, Department of Geosciences

SELECTED CONFERENCE ABSTRACTS (past 5 years)

‡ student mentee

- 2022 **Cantine, M.D.**, Gerdes, A., “U-Pb and B isotope measurements using in situ LA-ICP-MS in carbonate sediments across the Proterozoic-Phanerozoic transition.” *GSA Pardee Keynote Symposium*.
- Cantine, M.D.**, Gerdes, A., “Facies and environmental controls on dating carbonates using LA-ICP-MS.” *EGU 2022*.
- 2021 **Cantine, M.D.**, Walds, C., “What happens when we braid science and poetry? An experiment in place-based education from the Mississippi Delta.” *AGU 2021*.
- Cantine, M.D.**, Rooney, A.D., Knoll, A.H., Bergmann, K.D., Gomez Perez, I., Baloushi, B., Gerdes, A. “Telling time three ways in Ediacaran Oman.” *AGU 2021*.
- Cantine, M.D.**, Rooney, A.D., Knoll, A.H., and Bergmann, K.D., “Depositional rates in the Ediacaran Nafun Group, Oman, and the wider late Proterozoic world.” *NE Geobiology 2021, Goldschmidt 2021*.
- 2020 **Cantine, M.D.**, Rooney, A.D., Knoll, A.H., and Bergmann, K.D., “Depositional rates in the Ediacaran Nafun Group, Oman, and the wider late Proterozoic world.” *GSA 2020, AGU 2020*.
- Reahl, J.N.‡, **Cantine, M.D.**, Wilcots, J.K., Mackey, T.J., and Bergmann, K.D., “Revealing sediment transport histories with quartz microtextural analysis and principal component analysis (PCA).” *GSA 2020, AGU 2020*.
- 2019 **Cantine, M.D.**, Rooney, A.D., Linnemann U., Hofmann, M., Albert, R., Gomez Perez, I., Baloushi, B., Gerdes, A., and Bergmann, K.D. “Geochronologic constraints on the Shuram excursion in Oman.” *AGU 2019*.
- Reahl, J.N.‡, Bergmann, K.D., **Cantine, M.D.** “Linking sedimentary textures to Neoproterozoic climate dynamics.” *AGU 2019*.
- Cantine, M. D.**, Cummings, A.‡, Bergmann, K.D. “Fitting the facies mosaic together: Controls on lateral heterogeneity of microbial reefs.” *AAPG ACE, 2019*.
- 2018 **Cantine, M.D.** and Bergmann, K.D. “Insights into the rise of thrombolites from database and field.” *AGU 2018*.

TEACHING EXPERIENCE

- 2023 **Geobiology**, co-taught with Drew Gorman-Lewis, fall 2023. *University of Washington*.
- 2022 **Instructor of record**, Gravity, Freedom Summer Collegiate. *Meridian Freedom Project, Meridian, Mississippi*.
- 2021 **Instructor of record**, Ways To See, Freedom Summer Collegiate. Co-taught with Calvin Walds, writer. *Online due to coronavirus pandemic*.

TEACHING EXPERIENCE continued

- 2020 **Instructor of record**, Advanced Math and Science, Freedom Summer Collegiate. Co-taught with Professor Stephanie Dick (UPenn), historian of science. *Online due to coronavirus pandemic.*
- 2019 **Instructor of record**, Searching for Extraterrestrial Life, Freedom Summer Collegiate. *Eudora, Arkansas.*
- 2019 **Teaching assistant**, Great Papers in the Earth, Atmospheric and Planetary Sciences. *MIT EAPS.*
- 2018 **Teaching assistant**, Sedimentology and Modern Carbonate Field Sedimentology *MIT EAPS; field trip to Bermuda.*
- 2017 **Teaching assistant**, Sedimentology and Phanerozoic Field Sedimentology *MIT EAPS; field trip to Death Valley.*
- 2016, 2017 **Teaching assistant**, Freshman Pre-Orientation Program *MIT EAPS; field trip to Yellowstone National Park.*

ADVISING

- 2023-now Hannah R. Cothren (UW); *PhD advisor*
- 2023-now Sabrina J. H. Kainz (UW; 2023 NSF GRF recipient); *PhD advisor*
- 2023-now Tyler A. Lincoln (University of Colorado at Boulder); *PhD committee member*
- 2018-2020 Jocelyn Reahl (Wellesley College); *co-advisor and undergraduate thesis committee member*; currently at Caltech for PhD
- 2016 Andrew Cummings (MIT); *undergraduate researcher*; currently postdoc at Princeton

PROFESSIONAL SERVICE

- 2021-now **Reviewer.** *Geology (2); Geochronology; Geological Magazine; GSA Bulletin; Journal of Sedimentary Research; Nature Communications Earth and Environment; Geochemistry, Geophysics, Geosystems; Histories; Paleoceanography and Paleoclimatology; Palaeogeography, Palaeoclimatology, Palaeoecology; Earth and Planetary Science Letters (2); Geochemistry; Journal of the Geological Society*
- 2023 **Review panelist.** Advancing Geochronology Science, Spaces, and Systems (AGeS3). NASA Exobiology Large Scale Environmental Change and Macro-evolution.
- 2021 **Session co-convener.** *Co-evolution of Earth's surface environment and biotic innovation from the Neoproterozoic through the Pre-Cambrian.* Goldschmidt.
- 2020 **Session co-chair.** *Interactions between Life, Tectonics, Climate, and Sedimentary Systems at the Neoproterozoic-Early Cambrian transition.* GSA.
- 2017-2020 **Carbonate Research Group Committee.** *SEPM.*

PROFESSIONAL DEVELOPMENT

- 2023 **Workshop.** Teaching Quantitative Reasoning Using Data: Project EDDIE Workshop at AGU 2022.
- Workshop.** Building Better Broader Impacts Workshop at AGU 2022.

INSTITUTIONAL SERVICE

- 2019 **Chair of Student Advisory Group on Faculty Search.** *MIT EAPS.*
2012-2013 **Student body president.** *Wellesley College.*
2011-2013 **Budgetary Advisory Committee.** *Wellesley College.*

PUBLIC SERVICE

- 2019-now **Teaching Advisory Board.** *Freedom Summer Collegiate.*
2019-2022 **Teacher.** 4 university-level month-long summer seminars for talented, first-gen-aspiring high school youth in Mississippi. *Freedom Summer Collegiate.*
2017-2019 **Opportunity Day.** Coordinated an annual “Career Day” visit for 20+ middle schoolers from Prospect Hill Academy to MIT EAPS.
2020 **MIT Cascade.** Co-instructor for 5-week Saturday enrichment class for Boston-area high schoolers.
2017 **STEAM Saturday.** Instructor for 4-week Saturday enrichment class for Cambridge middle schoolers at Prospect Hill Academy.

OTHER WRITING and CONTRIBUTIONS

- 2022 “Playing it safe in field science.” EOS. Print (July 2022) and online (17 May 2022). <https://eos.org/opinions/playing-it-safe-in-field-science>
2021 One of my drone photos was used on the September 2021 cover of the *Journal of Sedimentary Research*. It shows the Bråvika Member in Svalbard (and me!): <https://pubs.geoscienceworld.org/jsedres/issue/91/9>