

CHRISTINE Y. CHEN

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- RESEARCH BIO** I am a geologist broadly interested in the history of interactions between Earth's changing climate and land surface processes. Currently, I focus on reconstructing past changes in the hydrological cycle from ancient lakes: through field mapping and characterization of paleoshorelines and fossilized microbial lake carbonates called 'tufas,' combined with precise uranium-thorium dating of such deposits, I aim to produce quantitative and precisely-dated records of past lake levels changes. Thus far, I am investigating sites in the high-altitude central Andes (northern Chile) and western United States (Searles Lake, CA), two presently water-limited areas where my work will inform our understanding of past climate change impacts on water availability and surface hydrology.
- POSITIONS**
- 2021– Postdoctoral Researcher. Chemical and Isotopic Signatures Group, Nuclear and Chemical Sciences Division, Lawrence Livermore National Laboratory.
 - 2020–2021 O.K. Earl Postdoctoral Scholar Research Associate. Geological & Planetary Sciences, California Institute of Technology (Caltech).
 - 2013–2019 Research and Teaching Assistant/Fellow. Earth, Atmospheric & Planetary Sciences, Massachusetts Institute of Technology (MIT).
- EDUCATION**
- 2019 Ph.D. in Geology, MIT/WHOI Joint Program.
Thesis: *U-Th Dating of Lacustrine Carbonates*
Committee: David McGee (MIT; advisor), Kristin Bergmann (MIT), Andrew Ashton (WHOI), Jay Quade (U. of Arizona), Tim Lowenstein (SUNY Binghamton)
 - 2013 A.B. in Geosciences, *summa cum laude*, Princeton University.
Thesis: *Revisiting the deformed high shoreline of Lake Bonneville*
Advisors: Adam Maloof and Jeroen Tromp
 - 2009 Union Endicott High School. Endicott, NY, USA. Salutatorian.
- AWARDS AND FELLOWSHIPS**
- 2019 Caltech O.K. Earl Postdoctoral Fellowship.
 - 2019 [MIT Larry G. Benedict Leadership Institute Award](#).
For dedication to empowering fellow students to develop as leaders and being an active mentor to peers within the MIT community.
 - 2018 Best Student Oral Presentation Award (1 of 2 awarded total), [IPA-IAL Meeting](#).
 - 2017 [MIT Martin Family Society of Fellows for Sustainability](#).
 - 2017 [MIT Office of Graduate Education Wellington and Irene Loh Fund Fellowship](#).
 - 2016 MIT Dept. of Earth, Atmospheric, and Planetary Sciences Award for Excellence in Teaching.
 - 2013 [MIT Office of Graduate Education Ida M. Green Fellowship](#).
 - 2013 NSF Graduate Research Fellowship.
 - 2013 Princeton Arthur F. Buddington Award.
 - 2012 Princeton Benjamin F. Howell Junior Independent Work Prize.
- RESEARCH GRANTS**
- 2016 Geological Society of America (GSA) Charles A. & June R. P. Ross Research Award.
 - 2016 GSA Farouk El-Baz Student Research Grant for Desert Research.
 - 2016 The Explorers Club Exploration Fund, Mamont Scholars Program.
 - 2016 [American Philosophical Society, Lewis and Clark Field Research Fund](#).
 - 2015 [National Geographic Society Young Explorers Grant](#).
 - 2015 Woods Hole Oceanographic Institution Ocean Ventures Fund.
 - 2012 Princeton Stanley J. Seeger Research Fellowship for Hellenic Studies.

PUBLICATIONS

PUBLISHED/ACCEPTED [PEER REVIEWED]

- [9] De Cort, G., Chevalier, M., Burrough, S., **Chen, C.Y.**, Harrison, S.P. (2021) An uncertainty-focused database approach to extract spatiotemporal trends from qualitative and discontinuous lake-status histories. *Quaternary Science Reviews*. In press. [[EarthArXiv](#)]
- [8] Cooperdock, E.H.C., **Chen, C.Y.**, Guevara, V.E., Metcalf, J.R. (2021) Addressing Systemic Bias In the Lab, Field, and Classroom. *AGU Advances*. In press. [[ESSOAr](#)]
- [7] Woods, A., Rodbell, D.T., Abbott, M.B., Hatfield, R.G., **Chen, C.Y.**, Lehmann, S.B., McGee, D., Weidhaas, N.C., Tapia, P.M., Valero-Garcés, B.L., Bush, M.B., Stoner, J.S. (2020) Abrupt Arctic Warming Repeatedly Led to Glacial Retreat and Drought in the Eastern Tropical Andes During the Last Glacial Cycle. *Nature Communications*, 11, 5135. doi: [10.1038/s41467-020-19000-8](https://doi.org/10.1038/s41467-020-19000-8)
- [6] **Chen, C.Y.**, McGee, D., et al. (2020) U-Th dating of lake sediments: Lessons from the 700 ka sediment record of Lake Junín, Peru. *Quaternary Science Reviews*. 244:106422. doi: [10.1016/j.quascirev.2020.106422](https://doi.org/10.1016/j.quascirev.2020.106422)
Invited research article. [[EarthArXiv](#)]
- [5] Hatfield, R.G., Stoner, J.S., Solada, K., Morey, A.E., Woods, A., **Chen, C.Y.**, McGee, D., Abbott, M.B., Rodbell, D.T. (2020) Paleomagnetic constraint of the Brunhes age sedimentary record from Lake Junín, Peru. *Front. Earth Sci.* 8:147. doi: [10.3389/feart.2020.00147](https://doi.org/10.3389/feart.2020.00147)
- [4] Austermann, J., **Chen, C.Y.**, Lau, H.C.P., Maloof, A.C., Latychev, K. (2020) Constraints on mantle viscosity and Laurentide ice sheet evolution from pluvial paleolake shorelines in the western United States. *Earth and Planetary Science Letters*. 532:116006. doi: [10.1016/j.epsl.2019.116006](https://doi.org/10.1016/j.epsl.2019.116006)
- [3] Hatfield, R.G., Woods, A., Lehmann, S.B., Weidhaas IV, N., **Chen, C.Y.**, Kück, J., Pierdominici, S., Stoner, J.S., Abbott, M.B., Rodbell, D.T. (2019) Stratigraphic correlation and splice generation for sediments recovered from a large-lake drilling project: an example from Lake Junín, Peru. *Journal of Paleolimnology*, 1–18. doi: [10.1007/s10933-019-00098-w](https://doi.org/10.1007/s10933-019-00098-w)
- [2] **Chen, C.Y.** and Maloof, A.C. (2017) Revisiting the deformed high shoreline of Lake Bonneville, *Quaternary Science Reviews*, 159, 169–189. doi: [10.1016/j.quascirev.2016.12.019](https://doi.org/10.1016/j.quascirev.2016.12.019)
- [1] Husson, J.M., Maloof, A.C., Schoene, B., **Chen, C.Y.**, Higgins, J.A. (2015) Stratigraphic expression of Earth's deepest $\delta^{13}\text{C}$ excursion in the Wonoka Formation of South Australia, *American Journal of Science*, 315, 1–45. doi: [10.2475/01.2015.01](https://doi.org/10.2475/01.2015.01)

OTHER PUBLICATIONS (NON-PEER REVIEWED)

- (2) **Chen, C.Y.** (2020) Diversity and Inclusion in Quaternary Sciences. *Quaternary Times*, 42(2). November.
- (1) **Chen, C.Y.** (2020) Growing Healthy Labs. *figshare*. doi: [10.6084/m9.figshare.12660077.v2](https://doi.org/10.6084/m9.figshare.12660077.v2)

OTHER RECENT PRESENTATIONS

- T. Pico, H.C.P. Lau, **C.Y. Chen**, and 5 others, AGU Fall Meeting. Higher education teaching resources on imperialism and scientific racism in the geosciences, from past to present. December 2020.
- C.Y. Chen**, R. Shivamoggi, AGU Fall Meeting, Growing Healthy Labs: A Student-Run Workshop for Future Faculty on Creating Effective Research Environments. December 2019.

INVITED SEMINARS

- 2021 **Universität Bern**, Institute of Geological Science. May (anticipated).
2021 **University of Nevada Las Vegas**, Department of Geoscience. March.
2021 **Univ. of Wash.**, Earth & Space Sciences, *Distinguished Lecture Series*. February.
2021 **Univ. of Victoria**, *School of Earth & Ocean Sciences Seminar*. February.
2020 **Vanderbilt Univ.**, Earth & Environmental Science, *EES Seminar Series*. November.
2020 **Lawrence Livermore National Lab**, Nuclear & Chemical Sciences Division. October.
2020 **WHOI**, Dept. of Marine Geology & Geophysics, *Paleoclimate Seminar*. May.
2020 **Caltech**, Division of Geological and Planetary Sciences, *Geology Club Seminar*. February.
2019 **Brown Univ.**, Earth, Environ. & Planetary Sciences, *Climate & Environment Lunch Bunch Series*.
2019 **MIT**, EAPS, *Chemical Oceanography, Geology, Geochemistry, and Geobiology Seminar*.
2019 **USGS, Menlo Park**. *Informal Brown Bag Seminar*.
2018 **SUNY Binghamton**, Dept. of Geological Sciences, *Invited Speaker Seminar*.
2018 **Lamont-Doherty Earth Observatory**, Columbia Univ., *Biology & Paleo-Environment Seminar*.
2018 **Harvard University**, Earth & Planetary Sciences, *Solid Earth & Planetary Science Seminar*.

CONFERENCE TALKS *Denotes invited.

- 2019 *AGU Fall Meeting, invited speaker for *Carbonate Sediments Through Time* session.
 “A Tufa Nut to Crack: The Timing and Duration of Lacustrine Tufa Formation in the Late Pleistocene.”
2019 AGU Fall Meeting, speaker for *Advances and Applications in Quaternary Geochronology* session.
 “The 700-kyr Sediment Record of Lake Junín, Peru: Lessons for U-Th Dating Lake Sediments.”
2019 *EGU General Assembly, invited speaker for *Limnogeology: Reading the Geological Record of Lakes* session.
 “Lessons from U/Th dating the sediment record from Lake Junín, Peru.”
2019 Northeast Section Geological Society of America Meeting.
2019 Pacific Climate Workshop (PACLIM). Pacific Grove, CA, USA.
2018 *Utah Geological Survey, Utah Dept. of Natural Resources, *Lake Bonneville Geological Conference*.
2018 Goldschmidt. Boston, MA.
2018 IPA-IAL Joint Meeting (×2). Stockholm, Sweden.
2015 AGU Fall Meeting. San Francisco, CA, USA.
2015 Graduate Climate Conference. Woods Hole, MA, USA.

IN THE MEDIA

- Seven Ways PIs Can Counteract Systematic Bias Now. *Eos*. March 2021. <http://bit.ly/2OFT1jm>
- Teaching Geoscience History in Context. *Eos*. March 2021. <http://bit.ly/3c2NKey>
- Geoscientists Explore Scientific Racism in the Teachings of a Princeton Pioneer. *Princeton Alumni Weekly*. January 2021. <http://bit.ly/3sAHeBX>
- An Ice Sheet’s Footprint on Ancient Shorelines. *Eos*. February 2020. <https://bit.ly/3iKhzAm>
- Featured scientist in *National Geographic Kids Almanac 2020*. May 2019. <https://bit.ly/3nuT127>
- James Hansen’s legacy: Scientists reflect on climate change in 1988, 2018, and 2048. *Salon, Grist*. June 2018. <https://goo.gl/3ttnK6>
- What Natural ‘Bathtub Rings’ Teach Us About Climate Change. *National Geographic*, Facebook video. March 2017. Cumulative 1.8 million views. <https://goo.gl/cvRDTH>
- Women’s March Protest Signs And Placards Make For Inspiring Reading, *The Huffington Post UK*, January 2017. <https://goo.gl/sNhbZy>
- Scientists Politely Troll Bill Nye The Science Guy, Bill Responds Brilliantly. *IFLScience*. May 2017. <https://goo.gl/PyUAGj>
- Telltale ‘Bathtub Rings’ Reveal Ancient Rainfall, *Oceanus Magazine*, Vol. 52, No. 1, Summer 2016.
- Answers in the Andes: Scientists look to ancient lakes to predict where climate change is heading, by Neil Murthy. *Medill Climate Change News*, November 2015. <https://goo.gl/oH3fkM>

UNDERGRADUATE
ADVISING AND
MENTORSHIP

- Valeria Torres-Olivares '22 (Princeton), Pace Center for Civic Engagement RISE ([Recognizing Inequities and Standing for Equality](#)) Initiative, Summer 2020.
- Ruth Tweedy '20 (MIT), 2019–2020 Senior Thesis. *Tufas from Salar del Huasco, northern Chile*.
- Zixuan “Crystal” Rao '18 (USTC, China), Summer 2017, Spring 2018 Senior Thesis. *Tufas from Lagunas Miscanti, Miñiques, and Pampa Varela*. (Now at Princeton for Ph.D.)
- A.J. Iversen '20 (MIT), Spring 2018–2019 and 2020 Senior Thesis. *GIS-based reconstructions of paleolake area and volumes in the western United States and central Andes*. Poster presentation at Northeastern Section GSA Meeting, March 2019.
- Jade Fischer '21 (MIT) and A.J. Iversen '20 (MIT), Winter 2018 (participation in fieldwork). Project: *Testing heliotropism of columnar tufas in Searles Lake basin, California*.
- Jasmine Jin '19 (MIT), Summer 2017.
- Ashling Neary '16 (MIT), Fall 2014, now at Brown University for Ph.D. program.
- Kaylee Brent '17 (MIT), 2015 Grad-Undergrad Mentorship Program.

TEACHING
EXPERIENCE

- Contributor and co-organizer of GeoContext, a project dedicated to creating educational materials that provide social and political context for the geosciences. <https://geo-context.github.io/>
- Teaching Assistant for [International Geobiology Course](#), 3-day petrography unit, 2018 & 2019. Lead instructor: Kristin Bergmann.
- [MIT Kaufman Teaching Certificate Program](#), Summer 2017.
- Guest lecturer for Massachusetts Maritime Academy *Oceanography* course, Spring 2017.
- Teaching Assistant for MIT *The History of Earth's Climate*, Spring 2017. Overall TA Rating: 7.0/7.0 [[Evaluations](#)]. Lead instructor: David McGee.
- Teaching Assistant for MIT *Climate Science*, Fall 2016. Overall TA Rating: 6.9/7.0 [[Evaluations](#)]. Lead instructors: Kerry Emanuel & Edward Boyle.
- Teaching Assistant for MIT *Sedimentology in the Field: Precambrian Environments*, Spring 2016. Overall TA Rating: 6.7/7.0 [[Evaluations](#)]. Lead instructor: Kristin Bergmann.
- Teaching Assistant for University of Arizona *Summer Field Geology Camp*, Summer 2015, half term (2.5 weeks). Lead instructor: Jay Quade.
- Teaching Assistant for Princeton *Earth's Environments and Ancient Civilizations*, Fall 2012. Lead instructors: Adam Maloof & Frederik Simons.

LEADERSHIP

- Co-founder of [Asian Americans and Pacific Islanders in Geosciences](#). 2020–present.
- Panelist for “[Sitting Down with Uncomfortable Things in the Caltech Archives](#),” part of the institute-wide *Critical Intersections: Conversations on History, Race, and Science* seminar series organized by the Division of Humanities and Social Sciences. October 2020. [[LA Times](#)]
- Panelist for session on *Diversity and Inclusion in the Quaternary Sciences*, American Quaternary Association (AmQua) 50th anniversary meeting, June 2020.
- AmQua Diversity Committee, member. 2020–present.
- Invited facilitator for workshop on remote mentoring of summer undergraduate researchers, hosted by Society for Women in Marine Science, June 2020.
- MIT EAPS Resource for Easing Friction and Stress ([EAPS REFS](#)), 2017–2019. Serving as a trained graduate student mediator to provide low barrier, confidential peer-to-peer coaching, listening, de-escalation, informal mentoring and mediation for the department.
- Creator and facilitator of a 1.5-hour interactive workshop on [Growing Healthy Labs: Effective Leadership of Research Groups](#).
- [MIT Women in Course 12](#) (WiXII), Vice President (Fall 2016) & Board Member (2016–2017).
- Princeton Undergraduate Geosciences Society, Co-founder and President, 2011–2013.

- SERVICE
- Community Partner for [Princeton Pace Center for Civic Engagement's RISE](#) (Recognizing Inequalities and Standing for Equality) Initiative. 2020–present.
 - [Legal Observer](#), National Lawyers Guild, Los Angeles chapter. 2020–present.
 - Panelist for *Professional and Graduate School Panel Discussion*, hosted by MIT Office of Undergraduate Advising and Academic Programming and Office of Graduate Education. April 2018.
 - Reviewer for National Geographic Society, American Chemical Society, *Geobiology*. 2017–present.
 - Science Planning Meeting, NSF Continental Scientific Drilling Coordination Office. Nov 2016.
- PUBLIC ENGAGEMENT
- Active Twitter for science communication ([@earth2christine](#)), 2,300+ followers. 2012–present.
 - Speaker for [Exploring By The Seat of Your Pants](#), video broadcast into classrooms. April 2019.
 - Speaker for CafeSci Boston at the Boston Public Library, “[Decoding the Climate from Ancient Lakes and Caves](#),” hosted by NOVA and WGBH Educational Foundation. March 2019.
 - “Resident Geologist” of HBO’s *Westworld* (TV series) on Reddit, author of a [post](#) explaining the tufa towers of the Trona Pinnacles in Searles Valley, a major filming site for the series. 13k views. Picked up by *Harper’s Bazaar* and YouTube channel *Alt Shift X*.
 - [Letters to a Pre-Scientist](#), Pen Pal. 2016–2018.
 - Created a science booth on how geologists reconstruct past rainfall patterns, presenting at MIT Museum Girls Day (March 2018), MIT Environmental Solutions Initiative Earth Day Celebration (April 2018), [Cambridge Science Festival](#) (2016, 2017, 2018), [MIT Open House](#) (2017), and the annual John H. Carlson Lecture at the New England Aquarium (2015, 2016).
 - 8th grade Earth science class from Dana Hall School, final field trip assistant. May 2017.
 - Northeast Regional Middle School Science Bowl Competition, Moderator. February 2017.
 - [Science Club for Girls](#), K–1st After School Program, Mentor Scientist (5 hrs/wk). Fall 2016.
 - National Geographic Young Explorers Workshop, Washington D.C., USA. June 2016.
 - [Project Scientist](#), [STEM Superstar](#) for Charlotte, North Carolina. June 2016.
 - Princeton [Community House After School Academy](#), tutor and mentor, 2009–2011.
 - [Science blog](#) about experience as a geologic field assistant in South Australia. Summer 2010.
- FIELD WORK & OTHER FIELD EXPERIENCE
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| 2020 | Death Valley & Searles Lake, CA (PI for 2 weeks): Tufas and paleoshorelines |
| 2018 | Searles Lake, CA (PI for 4.5 weeks): Tufas and paleoshorelines of Searles Valley |
| 2017 | Searles Lake, CA (10 days): Continental drilling of lake sediments from Searles Lake bed |
| 2016 | Altiplano and Atacama, Chile (PI for 4 weeks): Central Andes paleolake levels |
| 2016 | Van Horn, Texas (9 days, teaching assistant): Precambrian sedimentology |
| 2015 | Lake Junín (Chinchaycocha), Peru (one month): ICDP drilling of lake sediments |
| 2015 | Western U.S., University of Arizona Summer Field School (2.5 weeks, student TA) |
| 2015 | Altiplano and Atacama, Chile (PI for 5 weeks): Central Andes paleolake levels |
| 2014 | Utah, Nevada (2 weeks, field assistant): Lake Bonneville lake and cave carbonates |
| 2014 | Utah, New Mexico (9 days, class assistant): 3D drone mapping of ancient landscapes |
| 2012 | Utah, Idaho, and Nevada (PI for 9 weeks): Lake Bonneville shoreline features |
| 2012 | Cyprus (10 days, class TA): Geophysical survey of Polis Chrysochous archeology site |
| 2011 | South Australia (8 weeks, field assistant): Ediacaran carbonates, Shuram anomaly |
- OTHER GRANTS
- MIT School of Science Quality of Life Grant, 2018. For [Growing Healthy Labs](#) workshop.
 - European Geosciences Union, Roland Schlich Travel Support for Early Career Scientists, 2018.
- PROFESSIONAL AFFILIATIONS
- American Geophysical Union (AGU), Geological Society of America (GSA), European Geosciences Union (EGU), National Association of Geoscience Teachers (NAGT), American Quaternary Association (AMQUA), Earth Science Women’s Network (ESWN)
- OTHER SKILLS
- Proficient: MATLAB, LaTeX, ArcGIS, Adobe Illustrator and Photoshop
 Intermediate: Git, Python, C++, C, Java, HTML
 Tier 3 Conflict Management Training (40 hours), Conflict Management@MIT, Spring 2017.