

Bradley R. Markle

Curriculum Vitae

Institute of Arctic and Alpine Research
Department of Geological Sciences
University of Colorado, Boulder
Boulder, CO 80309 USA
✉ bradley.markle@colorado.edu
🌐 bradleymarkle.com

Education

- 2017 **Ph.D.**, *The University of Washington*, WA, USA, Department of Earth and Space Sciences
- 2013 **M.Sc.**, *Victoria University of Wellington*, New Zealand, Geology with Distinction
- 2008 **B.A.**, *Pomona College*, CA, USA, Geology (major), Physics (minor)

Professional Appointments

- 2020 - present **Assistant Professor**, *University of Colorado Boulder*, CO, USA, Institute of Arctic and Alpine Research; Department of Geological Sciences; Stable Isotope Laboratory
- 2023 - present **Director of Academics**, *Juneau Icefield Research Program*
- 2019 - 2022 **Associate Director of Academics and Research**, *Juneau Icefield Research Program*
- 2018 - 2020 **Stanback Postdoctoral Fellow**, *California Institute of Technology*, CA, USA, Division of Geologic and Planetary Science
- 2018 **Postdoctoral Scholar**, *The University of California Santa Barbara*, CA, USA, Earth Research Institute
Feb - Nov
- 2017 **Postdoctoral Researcher**, *The University of Washington*, WA, USA, Department of Earth and Space Sciences
Oct - Dec

Awards

Fellowships, Scholarships

- 2018-2020 **Stanback Postdoctoral Fellowship**, *California Institute of Technology*
- 2019 **Bjerknes Visiting Fellow**, *Bjerknes Centre for Climate Research, University of Bergen*
- 2017 *(Alternate)* **Climate and Global Change Fellowship**, *NOAA*.
- 2016 **David A. Johnston Award for Research Excellence**, *University of Washington*
- 2016 **Dean's Medal, College of the Environment**, *University of Washington*
- 2011-2014 **ARCS Foundation Fellowship**
- 2010-2011 **Fulbright Fellow**, *U.S. Department of State*
- 2008 **Mason Hill Award for Geology**, *Pomona College*
- 2004-2008 **Susan Walker Burke Memorial Endowment Scholarship**, *Pomona College*
(Numerous travel scholarships not listed.)

Grants

Current:

- 2021 **Supporting and Empowering the Association of Polar Early Career Scientists**, *NSF, CO-I*, awarded, \$847,237
This award enabled the creation of PSECCO; the title no longer reflects the impact.
- 2022 **Beyond Mean Climate: Quantifying climate variability and extremes under varying boundary conditions**, *NSF, CO-I*, awarded, \$1,237,840

- 2023 **OPP-PRF: Spatiotemporal evolution of firn hydrology on the Juneau Icefield, Alaska**, *NSF Postdoc Fellowship*, w/ *Dr. Annika Horlings*, awarded, \$348,823
- 2023 **Impacts of spatial-temporal precipitation, snowpack properties, and snowmelt variability on alpine landscapes and runoff**, *DOD*, PI for CUB, pending, \$9,000,021 (\$796,545 to CUB)
- 2023 **Collaborative Research: Sea to Summit Station (S2SS): Water-isotope observation stations to inform the next generation of Arctic hydrologic modeling**, *NSF*, CO-I, pending, \$5,051,277
- 2024 **Collaborative Research: Beyond temperature - Recasting climate to water-isotope relationships in polar snow and ice cores**, *NSF*, CO-I, pending, \$767,745
- Past:**
- 2022 **Consequences of Warming for Coupled Biogeochemical Cycles Across Terrestrial and Aquatic Environments in the Alpine Critical Zone**, *DOE*, CO-I, declined, \$990,000
- 2022 **Arctic Observing Network: Collaborative Research: Monitoring the Amplified Arctic Water Cycle with the Arctic Water Isotope Network (AWIN)**, *NSF*, PI for CUB, declined, \$736,129
- 2021 **Beyond Mean Climate: Quantifying climate variability and extremes under varying boundary conditions**, *NSF*, CO-I, declined, \$1,464,190
- 2021 **Arctic Observing Network: Collaborative Research: Monitoring the New Arctic Water Cycle with a Pan Arctic isotope forensics network: Present, Past and Future**, *NSF*, PI for CUB, declined, \$999,998
- 2018 **Greenland Ice Core Expedition –Climate and sea Ice Past and Present, Greenland Circumnavigation Expedition**, *Swiss Polar Institute*, CO-I, *Awarded but on indefinite hold.*
- 2016 **Subantarctic Ice Coring Project, Antarctic Circumnavigation Expedition**, *Swiss Polar Institute*, Contributor
- 2008 **Geologic Society of America GeoCorps**, *Internship.*
- 2007-2008 **Sigma Xi Research Grant**, *To support undergraduate research thesis*
- 2007 **Research Scholarship**, *NASA/Foundation for Glacier and Environmental Research*

Teaching

Courses

- 2024 **GEOL 5700, Polar Amplification (co-taught with Dr. Katie Snell)**, *University of Colorado, Boulder, CO, USA*
- 2024 **ATOC 5900, Independent Study**, *University of Colorado, Boulder, CO, USA*
- 2023 **GEOL 3400, Global Change: The Recent Geologic Record**, *University of Colorado, Boulder, CO, USA*
- 2022-present **GEOL 1060, Global Change, the Earth Science Perspective**, *University of Colorado, Boulder, CO, USA*
- 2021-present **GEOL 5700, Abrupt Climate Change**, *University of Colorado, Boulder, CO, USA*
- 2020 **GEOL 1170, Deadly Planet**, *University of Colorado, Boulder, CO, USA*
- 2017-present **Academic Lead**, *Juneau Icefield Research Program, AK, USA*
- 2015-present, 2012 **Faculty**, *Juneau Icefield Research Program, AK, USA*

- 2014 **Teaching Assistant**, *The University of Washington*, The Earth System and Climate (ESS 201)
- 2007, 2008 **Teaching Assistant**, *Pomona College*, Earth History
- 2006 **Teaching Assistant**, *Pomona College*, Introductory Physics
- Mentoring**
- 2023-present **PostDoc Advisor**, *A. Horlings*, INSTAAR, University of Colorado, Boulder
- 2022-present **PhD Co-Advisor**, *M. Thompson-Munson*, ATOC, University of Colorado, Boulder
- 2023-present **Phd Advisor**, *R. J. Leon*, GEOL, University of Colorado, Boulder
- 2023-present **Msc Co-Advisor**, *J. Reuf*, GEOL, University of Colorado, Boulder
- 2023-present **Phd Co-Advisor**, *L. Bayless*, GEOL, University of Colorado, Boulder
- 2022-present **PhD Committee Chair**, *N. Ochwat*, GEOL, University of Colorado, Boulder
- present **PhD Committee member**, *E. Pierce, J. Herbert, T. Tellez, L. Nyblade*, GEOL, University of Colorado, Boulder
- present **PhD Committee member**, *B. Chase*, ENVS, University of Colorado, Boulder
- present **PhD Committee member**, *J. Shaw, C. Persch, A. Gilbert*, ATOC, University of Colorado, Boulder
- 2021-2023 **MSc Advisor**, *H. Bennett*, GEOL, University of Colorado, Boulder, Graduated!
- past **PhD Committee member**, *T. Halamka*, GEOL, University of Colorado, Boulder
- past **MsC Committee member**, *S. Clemons*, GEOG, University of Colorado, Boulder
- 2021-present **Other research mentoring**, *M. Maceleennan, K. Rozmiarek*, University of Colorado, Boulder
- 2021 **External Committee Member and Reviewer**, *Masters thesis and exam*, R. Harris, University of Bergen, Norway
- 2020-2023 **Undergraduate research mentoring**, *P. Siegel*, University of Colorado, Boulder
- 2022-present **Undergraduate research mentoring**, *L. Zook*, University of Colorado, Boulder
- 2012-present **Undergraduate research field research project mentor**, *≈60 students*, Juneau Icefield Research Program

Research

Positions

- 2020-present **Institute of Arctic and Alpine Research, Boulder, CA USA**, *Stable Isotope Laboratory- Principle Investigator*
- 2018-2020 **Caltech, Pasadena, CA USA**, *Postdoctoral Research*, Ice, atmosphere, ocean interactions
- 2018 **University of California, Santa Barbara, CA USA**, *Postdoctoral Research*, Climate modeling
- 2017 **University of Washington, Seattle, USA**, *Postdoctoral Research*, Water isotope field measurements and modeling
- 2011-2017 **University of Washington, Seattle, USA**, *West Antarctic Ice Sheet Divide Ice Core Project*, Research Assistant
- 2012 **Institute of Arctic and Alpine Research, University of Colorado, Boulder**, *Visiting Scholar*
- 2010-2011 **Victoria University of Wellington, Wellington, NZ**, *Joint Antarctic Research Institute, GNS Science*, Research Assistant
- 2009 **Oregon State University, OR, USA**, *Ice Core Gas Laboratory*, Lab Technician

- 2008 **Zion National Park, UT, USA**, *United States Park Service*, Intern Paleontologist
- 2007-2008 **Pomona College, CA, USA**, *Undergraduate Research Thesis*, Paleolimnology
- 2006-2008 **Pomona College, CA, USA**, *Paleontology and Paleoecology Laboratory*, Research Assistant
- Fieldwork**
- 2022 **Expedition Member and Driller**, *Mt. Logan Ice Core Expedition*, Yukon, Canada
- 2015-present, **Project Lead**, *Climate and water Isotope geochemistry, Juneau Icefield Research Program*, AK, USA
- 2012
- 2017-2018 **Guest Scientist**, *Quixote Expeditions*, Antarctica
- 2017 **Antarctic Circumpolar Expedition, SubIce Project**, *Swiss Polar Institute*
- 2015 **Geochronology Field Assistant**, *University of Washington*, WA, USA
- 2012-2013 **West Antarctic Ice Sheet Divide Ice Core Project**, *NSF*, Antarctica, Ice core handler, shallow ice core project lead
- 2012, 2013 **Denali Ice Core Project**, *Dartmouth College, University of Maine*, Alaska Range, AK, USA, Ice core driller, field science technician
- 2011, 2012 **Field Staff**, *Juneau Icefield Research Program*, AK, USA
- 2010-2011 **Roosevelt Island Climate Evolution Project**, *Antarctica New Zealand*
- 2008 **North Cascades Glacier Climate Project**, WA, USA, field science technician
- 2008 **Intern Paleontologist**, *Zion National Park, National Park Service*, UT, USA
- 2007 **Paleontology Field Assistant**, *Pomona College*, UT, USA
- 2006 **Desert Spring and Ecology Surveyor**, *Great Basin Institute*, UT, USA
- 2005 **Stream Surveyor**, *Oregon Fish and Wildlife*, OR, USA

Publications

Refereed Journal Articles

Citations: 2419; H-index: 21; *last updated February 2, 2024*

Full list and metrics available at [Google Scholar](#).

- 2024 Segato D, Thomas ER, Tetzner D, Jackson S, Moser DE, Turetta C, Fernandez RP, Saiz-Lopez A, Pedro J, **Markle BR**, Spolaor A. Investigating halogens and MSA in the Southern Hemisphere: A spatial analysis. *Atmospheric Environment*. 2024 Feb 15;319:120279.
- 2023 Thompson-Munson, M., Kay, J. E., and **Markle, B. R.**: Greenland's firn responds more to warming than to cooling, *EGUsphere preprint*, <https://doi.org/10.5194/egusphere-2023-2629>, 2023.
- (in review) **Markle BR**. Water Isotopes and the hydrological cycle. *Treatise on Geochemistry*
- Jones T, Cuffey K, Roberts W, **Markle BR**, Steig E, Stevens C, Valdes P, Fudge TJ, Sigl M, Hughes A, Garland J, Vinther B, Rozmiarek K, Brashear C, White J. Seasonal temperatures in West Antarctica during the Holocene. *Nature* 613 (7943), 292-297
 - Thomas ER, Tetzner D, **Markle B**, Pedro J, Gacitúa G, Moser DE, Jackson S. The first firn core from Peter 1 st Island—capturing climate variability across the Bellingshausen Sea. *EGUsphere*. 2023 Jun 8;2023:1-7.
- 2022 **Markle BR**, Steig EJ. Improving temperature reconstructions from ice-core water-isotope records. *Climate of the Past*

- Davies B, Bendle J, Carrivick J, McNabb R, McNeil C, Pelto M, Campbell S, Holt T, Ely J, **Markle BR**. Topographic controls on ice flow and recession for Juneau Icefield (Alaska/British Columbia). *Earth Surface Processes and Landforms* 47(9), pp.2357-2390.
- 2021 **Markle BR**, Steig EJ. Improving temperature reconstructions from ice-core water-isotope records. *Climate of the Past Discussions (review version)*
- Li et al. Antarctic Climate Changes Attributable to Teleconnections from the Tropics. *Nature Reviews Earth and Environment*
- Siler N, Bailey A, Roe GH, Buizert C, **Markle BR**, Noone D. The coupling of temperature, hydrology, and water isotopes in the large-scale, longterm climate. *Journal of Climate*
- Moser DE, Jackson S, Kjær HE, **Markle BR**, Ngoumtsa E, Pedro JB, Segato D, Spolaor A, Tetzner D, Vallelonga P, Thomas ER. An age scale for the first shallow (sub-) Antarctic ice core from Young Island, Northwest Ross Sea. *Geosciences*
- Thomas ER, Gacitúa G, Pedro JB, King ACF, **Markle BR**, Potocki M, Moser DE. Physical properties of shallow ice cores from Antarctic and sub-Antarctic islands. *The Cryosphere* .
- 2020 Hughes AG, Jones TR, Vinther BM, Gkinis V, Stevens CM, Morris V, Vaughn BH, Holme C, **Markle BR**, White JWC. High-frequency climate variability in the Holocene from a coastal-dome ice core in east-central Greenland (2020). *Climate of the Past*.
- 2019 Baxter I, Ding Q, Schweiger A, L'Heureux M, Baxter S, Wang T, Zhang Q, Harnos K, **Markle BR**, Topal D, Lu J. How tropical Pacific surface cooling contributed to accelerated sea ice melt from 2007 to 2012 as ice is thinned by anthropogenic forcing (2019). *Journal of Climate*.
- King A, Thomas ER, Pedro JB, **Markle BR**, Potocki M, Jackson SL, Wolff E, Kalberer M. (2019). Organic compounds in a sub-Antarctic ice core: A potential suite of sea ice markers. *Geophysical Research Letters*.
- 2018 **Markle BR**, Steig EJ, Roe GH, Winkler G, McConnell JR (2018). Concomitant variability in high-latitude aerosols, water-isotopes, and the hydrologic cycle. *Nature Geoscience*.
- Ding Q, Schweiger A, L'Heureux M, Steig EJ, Battisti DS, Johnson NC, Blanchard-Wrigglesworth E, Po-Chedley S, Zhang Q, Harnos K, Bushuk M, **Markle BR**, Baxter I (2018). Fingerprints of internal drivers of Arctic sea ice loss in observations and model simulations *Nature Geoscience*.
- Buizert C, Sigl M, Severi M, **Markle BR**, McConnell JR, Pedro JB, Wettstein JJ, Sodemann H, Goto-Azuma K, Kawamura K, Fujita S, Motoyama H, Hirabayashi M, Uemura R, Stenni B, Parrenin F, He F, Fudge TJ, and Steig EJ (2018). The Southern Westerlies and Antarctic Climate during the Last Ice Age. *Nature*.
- Jones TR, Roberts W, Steig EJ, Cuffey KM, **Markle BR**, White JWC (2018). Southern Hemisphere climate variability forced by Northern Hemisphere ice-sheet topography. *Nature*.
- Kirby ME, Heusser L, Scholz C, Ramezan R, Anderson MA, **Markle BR**, Rhodes E, Glover KC, Fantozzi J, Hiner C, and Price B, (2018). A late Wisconsin (32-10k cal a BP) history of pluvials, droughts and vegetation in the Pacific south-west United States (Lake Elsinore, CA). *Journal of Quaternary Science*.
- Emanuelsson BD, Bertler NAN, Neff PD, Renwick JA, **Markle BR**, Baisden WT, Keller ED (2018). The role of Amundsen-Bellinghshausen Sea anticyclonic circulation in forcing marine air intrusions into West Antarctica. *Climate Dynamics*: 1-8.

- 2017 **Markle, BR**, Steig, EJ, Buizert, C, Schoenemann, SW, Bitz, CM, Fudge, TJ, Pedro, JB, Ding, Q, Jones, TR, White, JW and Sowers, T, (2017). Global atmospheric teleconnections during Dansgaard-Oeschger events. *Nature Geoscience*, 10(1), pp.36-40.
- Jones, TR, White, JW, Steig, EJ, Vaughn, BH, Morris, V, Gkinis, V, **Markle, BR** and Schoenemann, SW, (2017). Improved methodologies for continuous-flow analysis of stable water isotopes in ice cores. *Atmospheric Measurement Techniques*, 10(2), p.617.
 - Koffman, BG, Dowd, EG, Osterberg, EC, Ferris, DG, Hartman, LH, Wheatley, SD, Kurbatov, AV, Wong, GJ, **Markle, BR**, Dunbar, NW and Kreutz, KJ, (2017). Rapid transport of ash and sulfate from the 2011 Puyehue-Cordón Caulle (Chile) eruption to West Antarctica. *Journal of Geophysical Research: Atmospheres*.
 - Jones, TR, Cuffey, KM, White, JWC, Steig, EJ, Buizert, C, **Markle, BR**, McConnell, JR and Sigl, M, (2017). Water isotope diffusion in the WAIS Divide ice core during the Holocene and last glacial. *Journal of Geophysical Research: Earth Surface*, 122(1), pp.290-309.
- 2016 Fudge, TJ, **Markle, BR**, Cuffey, KM, Buizert, C, Taylor, KC, Steig, EJ, Waddington, ED, Conway, H and Koutnik, M, (2016). Variable relationship between accumulation and temperature in West Antarctica for the past 31,000 years. *Geophysical Research Letters*, 43(8), pp.3795-3803.
- Pedro JB, Bostock HC, Bitz CM, He F, Vandergoes MJ, Steig EJ, Chase BM, Krause CE, Rasmussen SO, **Markle BR**, Cortese G, (2016). The spatial extent and dynamics of the Antarctic Cold Reversal. *Nature Geoscience*, 9(1), p.51.
- 2015 WAIS Divide Project Members, (2015). Precise inter-polar phasing of abrupt climate change during the last ice age. *Nature*, 520(7549), 661-665.
- Buizert, C, Cuffey, KM, Severinghaus, JP, Baggenstos, D, Fudge, TJ, Steig, EJ, **Markle, BR**, Winstrup, M, Rhodes, RH, Brook, EJ and Sowers, TA, (2015). The WAIS Divide deep ice core WD2014 chronology-Part 1: Methane synchronization (68-31 ka BP) and the gas age-ice age difference. *Climate of the Past*, 11(2), pp.153-173.
- 2014 Schoenemann SW, Steig EJ, Ding Q, **Markle BR**, Schauer AJ (2014). Triple water-isotope record from WAIS Divide, Antarctica: Controls on glacial-interglacial changes in $\delta^{18}O$ excess of precipitation. *Journal of Geophysical Research: Atmospheres*, 119(14), pp.8741-8763.
- 2013 WAIS Divide Project Members (Fudge TJ, Steig EJ, **Markle BR**, Schoenemann SW, Ding Q, Taylor KC, McConnell JR, Brook EJ, Sowers T, White JW, Alley RB, *et al.*), (2013). Onset of deglacial warming in West Antarctica driven by local orbital forcing. *Nature*, 500(7463).
- Steig EJ, *et al.* (2013). Recent climate and ice-sheet changes in West Antarctica compared with the past 2,000 years. *Nature Geoscience*, 6(5), p.372.
- 2012 **Markle BR**, Bertler NAN, Sinclair KE, Sneed SB, (2012). Synoptic variability in the Ross Sea region, Antarctica, as seen from back-trajectory modeling and ice core analysis. *Journal of Geophysical Research: Atmospheres*, 117(D2).
- [Encyclopedias, Textbooks, and other refereed material](#)
- 2019 Rahmstorf, S and **Markle, BR** (2019), Abrupt Climate Change, *Encyclopedia of Ocean Sciences*, 3rd Edition.
- [Other Publications](#)
- 2020 Campbell, S, **Markle, BR**, *et al.* (2020), Developing polar-extreme environment collaborations to support NASA earth and space science missions, *Juneau Icefield Research Program, White Paper*.

- 2017 **Markle, BR**. Climate dynamics revealed in ice cores: advances in techniques, theory, and interpretation. *Ph.D. Thesis*
- 2016 Bertler NAN, Brook E, Landais A, **Markle BR**, Masson-Delmotte V, Wolff E. Terminations and seesaws: an ice core contribution to understanding orbital and millennial scale climate change. *International Partnerships in Ice Coring Science, White Paper*.
- Lecavalier BS, and **Markle BR** (2016), Developments in ice core research on past climate change, *Eos*, 97, doi:10.1029/2016EO060145. Published on 04 October 2016.
- 2012 **Markle, BR**. Decadal Climate Oscillations, Synoptic Variability, and Ice Core Climate Proxy Records in the Ross Sea Region, Antarctica. *M.Sc. Thesis*
- 2008 **Markle, BR** (2008). Development of Paleontological Resource Monitoring Program, Zion National Park. National Park Service, Fort Collins, Colorado.

Manuscripts Submitted and in Preparation

- nearly submitted **Markle BR**. Water Isotopes and ice core. Encyclopedia of Quaternary Research
- nearly submitted Hubertus Fischer, Andrea Burke, James Rae, Tobias Erhardt, Birthe Twarloh, Maria Hörhold, Johannes Freitag, **Bradley Markle**, Mirko Severi, Helena Pryer, Emily Doyle, Eric Wolff. Little net change in Southern Ocean biogenic sulfur production before and after the penultimate glacial termination.
- in prep. Pengfei Liu, Loretta J. Mickley, Nathan Chellman, **Bradley R. Markle**, Monica M. Arienzo, and Joseph R. McConnell. Rapid Responses of Aerosol Emissions and Transport to Abrupt Climate Transitions during the Last Glacial Period.
- in prep. Kevin Rozmiarek, Laura J. Dietrich, Bruce Vaughn, Michael S. Town, **Bradley Markle**, Valerie Morris, Hans Christian Steen-Larsen, Xavier Fettweis, Chloe Brashear, Hayley Bennett, Tyler Jones. Atmosphere to surface profiles of water vapor isotopes and meteorological conditions over the northeast Greenland ice sheet.
- in prep. **Markle BR**, et al. The pattern of Antarctic temperature change across timescales.
- in prep. **Markle BR**. An energy balance perspective of past abrupt climate change and the role of CO₂.
- in prep. **Markle BR**, et al. A spatial and temporal survey of stable water isotope variability on the Juneau Icefield, Alaska.
- in prep. **Markle BR**, et al. The pattern of recent temperature variability on the Juneau Icefield, Alaska.

Presentations

Invited and Keynote Talks

- 2023 Ice Cores, Climate, and Antarctic temperature. *Woodford Ekis Centennial, Pomona College, 2023*.
- Frontiers in Polar Science, Panel Discussion. *Polar Postdoc Leadership Workshop, PSECCO, 2023*.
 - Water isotopes and ice cores. *National Ice Core Facility, 2023*.
- 2022 Understanding the Fundamental Pattern of Antarctic Temperature Change. *American Geophysical Union Fall Meeting, 2022*.
- Invited Panelist at Ice Core Young Scientist Conference. *International Partnerships in Ice Core Science, 2022*.
- 2021 Combing proxies, a proxy model, and a simple climate model to probe the mechanisms of abrupt climate change in the past. *American Geophysical Union Fall Meeting, 2021*.

- Ice cores and climate variability. *University of Maine.*
- Water Isotopes and Climate. *Rice University.*
- Improving temperature reconstructions from ice core water isotope records. *Ice Core Young Scientists Virtual Symposium.*
- 2020 Improving temperature reconstructions from ice cores and a timeless pattern of Antarctic temperature change. *University of Colorado, Boulder.*
- A timeless pattern of Antarctic temperature change. *University of Southern California.*
- 2019 An energetic perspective on Dansgaard-Oeschger events. *European Geophysical Meeting, 2019*
- A timeless pattern of Antarctic temperature change. *Bjerknes Center for Climate Research, Bergen, Norway.*
- Reconciling climate, water isotopes, and aerosols in the high latitudes. *University of British Columbia, Canada*
- 2018 The dust mystery and the Great Atmospheric Washing Machine. *Pomona College, 2018*
- 2017 The Big Rinse: Reconciling climate, water isotopes, and aerosols in the high latitudes. *University of California Santa Barbara, 2017*
- 2016 Moisture Transport to West Antarctica constrained by shared water isotopes and impurity variability at millennial and orbital time scales. *Keynote Talk at International Partnerships in Ice Core Science Open Science Conference 2016, Australia*
- 2015 Moisture Transport to West Antarctica constrained by shared water isotopes and impurity variability at millennial and orbital time scales. *Lamont Earth Institute, Columbia University, 2015*
- Precise inter-polar phasing of abrupt climate change during the last ice age. (*On behalf of C. Buizert*) *International Union of Geology and Geophysics, 2015.*
- 2014 Millennial climate Change, the ITCZ, and Antarctic Circulation, or Redefining Deuterium Excess in Ice Cores. *Center for Ice and Climate, Neils Bohr Institute, University of Copenhagen, 2014.*

Submitted Presentations

(Presentations at smaller science conferences and coauthored presentations not listed.)

- 2023 Patterns of Polar Amplification. *Colorado Glaciology Workshop.*
- Forcing, fluxes, feedbacks: fast and slow. *US Open Ice core science meeting, 2023.*
- 2022 Understanding the Fundamental Pattern of Antarctic Temperature Change. *Colorado Glaciology Workshop.*
- Dansgaard–Oeschger events as coupled climate-carbon cycle oscillations. *International Partnerships in Ice Coring Science, Open Science Meeting 2022.*
- 2020 The pattern of recent temperature variability on the Juneau Icefield, Alaska. *American Geophysical Meeting, 2020*
- 2019 An energetic perspective on Dansgaard-Oeschger events and the role of CO₂. *American Geophysical Meeting, 2019*
- An energy balance perspective of past abrupt climate change and the role of CO₂. *South Pole Ice Core Project meeting, 2019*
- Improving ice-core temperature reconstructions with a simple distillation model. *US CLIVAR: water isotopes and climate workshop, 2019*
- A recurrent pattern of Antarctic temperature change. *European Geophysical Union Meeting, 2019.*

- A timescale-independent pattern of Antarctic temperature change. *Perspective talk at Advanced Climate Dynamics Course Anniversary Conference, 2019.*
- The Big Rinse: Reconciling climate, water isotopes, and aerosols in the high latitudes. *Environmental Science and Engineering Seminar, Caltech, 2019*
- 2018 A recurrent pattern of Antarctic temperature change. *American Geophysical Union Meeting, 2018.*
- The pattern of Antarctic temperature change across timescales. *South Pole Ice Core Meeting, 2018.*
- A recurrent pattern of Antarctic temperature change. *Earth Research Institute Seminar, University of California Santa Barbara, 2018.*
- 2017 Improving ice-core temperature reconstructions with a simple distillation model. *American Geophysical Union, 2017.*
- Improving ice-core temperature reconstructions with a simple distillation model. *South Pole Ice Core Meeting, 2017.*
- Non linear water isotope inversion. *University of Washington, Earth and Space Sciences Research Gala, 2017, won Best Glaciology Presentation*
- 2016 Moisture Transport to West Antarctica constrained by shared water isotopes and impurity variability at millennial and orbital time scales. *American Geophysical Union, 2016.*
- Atmospheric teleconnections between the tropics and high southern latitudes during millennial climate change. *International Partnerships in Ice Core Science Open Science Conference, 2016.*
- Moisture Transport to West Antarctica constrained by shared water isotopes and impurity variability at millennial and orbital time scales. *University of Washington, Earth and Space Sciences Research Gala, 2016, won Best Overall Presentation*
- 2015 Atmospheric teleconnections between the tropics and high southern latitudes during millennial climate change. *American Geophysical Union, 2015.*
- Atmospheric teleconnections between the tropics and high southern latitudes during millennial climate change. *European Geophysical Union, 2015.*
- Atmospheric teleconnections between the tropics and high southern latitudes during millennial climate change. *International Union of Geology and Geophysics, 2015.*
- Moisture Transport to West Antarctica constrained by shared water isotopes and impurity variability at millennial and orbital time scales. *West Antarctic Ice Sheet Divide Project Meeting, 2015.*
- Atmospheric teleconnections between the tropics and high southern latitudes during millennial climate change. *University of Washington, Department of Oceanography Seminar, 2015.*
- 2014 Evidence for changes in atmospheric circulation at high Southern Latitudes, in phase with Dansgaard-Oeschger events. *American Geophysical Union, 2014.*
- Millennial Climate Change, the ITCZ, and Antarctic Circulation. *Graduate Climate Conference, 2014.*
- Millennial Climate Change, the ITCZ, and Antarctic Deuterium Excess. *West Antarctic Ice Sheet Divide Project Meeting, 2014.*
- 2013 Redefining deuterium excess in Antarctic ice cores. *American Geophysical Union, 2013.*
- Deuterium excess, Millennial Climate Variability, and an atmospheric teleconnection. *West Antarctic Ice Sheet Divide Project Meeting, 2013.*
- 2012 Orbital and Millennial Climate Variability recorded in Stable Isotopes from West Antarctica. *International Partnerships in Ice Core Science Open Science Conference, 2012.*

- Orbital and Millennial Climate Variability recorded in Stable Isotopes from West Antarctica. *West Antarctic Ice Sheet Divide Project Meeting, 2012.*
 - 2011 Synoptic drivers in the Ross Sea region, Antarctica, back-trajectory modeling and ice core analysis. *American Geophysical Union, 2011.*
 - Synoptic drivers in the Ross Sea region, Antarctica, back-trajectory modeling and ice core analysis. *West Antarctic Ice Sheet Divide Project Meeting, 2011.*
 - 2008 The Occurrence and Climatic Implications of a Rapid Regression of Lake Elsinore, CA, During the Last Glacial Maximum. *American Geophysical Union, 2008.*
- Presentations lead by students or supervisees (2021 and later)
- 2023 The Nonlinear Effect of Temperature Governs the Asymmetric Response of Greenland Firn to Idealized Atmospheric Warming and Cooling. M Thompson-Munson, JE Kay, B Markle *AGU Fall Meeting 2023.*
 - Evolution of firn hydrology on the Juneau Icefield, Alaska. A Horlings, B Markle, SW Campbell *AGU Fall Meeting 2023.*
 - Characterizing the influence of idealized atmospheric forcings on firn using the SNOWPACK firn mode. M Thompson-Munson, J Kay, B Markle *EGU 2023.*
 - Community-Building As a Mechanism for Inclusion and Belonging: First Thoughts from New Polar Science Early Career Community Office RL Batchelor, M Dryak, A Gold, B Markle *103rd AMS Annual Meeting 2023.*
 - Reconstructing Abrupt Wind Shifts During the Last Glacial Period. H Bennett, B Markle *IPICS 2023. Won Best Student Poster in section*
 - Post depositional changes in water isotopes, Juneau Icefield Alaska. P Seigel, B Markle *IPICS 2023*
 - 2022 Reconstructing Abrupt Climatic Shifts During the Last Glacial Period Using Modeled Absolute Temperature. H Bennett, B Markle *AGU Fall Meeting 2022.*
 - Community-Building As a Mechanism for Inclusion and Belonging: First Thoughts from New Polar Science Early Career Community Office. MC Dryak, AU Gold, RL Batchelor, B Markle *AGU Fall Meeting 2022.*
 - Reconstructing Interannual Variability in Regional Climate from Water Isotope Sampling of the Juneau Icefield, Alaska. C Wexler, A Fatta, J Drebber, F Meier, S Guest, S Ornes, A Goldstein, BR Markle. *AGU Fall Meeting 2022.*
 - PSECCO: A New Community Office for Supporting Early Career Scientists and Advancing Equity and Inclusion in the Polar Sciences MC Dryak, RL Batchelor, AU Gold, B Markle *AGU Fall Meeting 2022.*
 - 2021 Understanding spatial and temporal water isotope variability across the Juneau Icefield, Alaska. L Kirkpatrick, P Siegel, M Savignano, A Holt, N Bakken-French, E Klein, BR Markle. *AGU Fall Meeting 2021.*

Additional Education and Training

Additional Education

- 2021 Learning by Design: Active Learning Pedagogy Course, CU Boulder.
- 2016 The Swiss Climate Summer School, ETH Zurich.
- 2014 The Advanced Climate Dynamics Course, Disko Island, Greenland.
- 2011, 2012, 2014, 2016 Program on Climate Change Summer Institute, University of Washington.
- 2007 Juneau Icefield Research Program, AK, USA

Certification

2019 Helicopter Underwater Escape Training

Service to Science Community

Justice, Equity, Diversity, and Inclusion

- 2021-present Polar Science Early Career Community Office, CU Boulder; co-Founder, Leadership Team
- 2021-present DEI Committee member, Geological Sciences Department, CU Boulder
- 2022-2023 JEDI Task Force Lead, INSTAAR, CU Boulder
- 2020-present JEDI Task Force contributor, INSTAAR, CU Boulder
- 2020-2021 JEDI Committee for Juneau Icefield Research Program; Founding Member

Department, Institute, and Campus Service

- 2021-2022 INSTAAR Awards and Recognition Committee, CU Boulder
- 2022 Search Committee Member, INSTAAR, CU Boulder
- 2021 Search Committee (nominal) Member, INSTAAR, CU Boulder
- 2020-2021 INSTAAR Seminar Committee, CU Boulder
- 2020-2021 Joint Earth Science Seminar Series, INSTAAR representative, CU Boulder

Peer review and Editing

- 2011-present Reviewer for Nature, Nature Geoscience, Proceedings of the National Academy of Science, Earth and Planetary Science Letters, Journal of Geophysical Research-Atmospheres, Geophysical Research Letters, The Cryosphere, Climate Dynamics, Environmental Research Letters, Journal of Applied Meteorology and Climate, Climate of the Past.
- 2021 Grant review for French Antarctic Program
- 2020 Editor for Proceedings of the National Academy of Sciences Journal
- 2020 Grant review National Science Foundation

Organizations and Leadership

- 2022-2023 Climate Democracy Initiative.
- 2021 Session Convener, AGU 2021. *Water Isotope Systematics*
- 2020 Session Co-Convener, AGU 2020. *Spatial and temporal variability of dust emissions and transport: importance of high latitude sources and insights from paleodust archives.*
- 2019 Session Co-Convener Advanced Climate Dynamics Course Anniversary Conference, 2019. *Centennial and Millennial Climate Variability.*
- 2012-2019 Ice Core Young Scientists (ICYS), Founding and Executive Committee Member
- 2015-2018 International Partnerships in Ice Core Science (IPICS) Steering Committee, ICYS Representative
- 2017 Session Co-Convener, AGU 2017. *Spatial and temporal variability of dust emissions and transport: importance of high latitude sources and insights from paleodust archives.*
- 2016 Organizer, Early Career Researcher Workshop, IPICS Open Science Conference 2016
- 2016 Panel discussion Co-Convener, Future of ice coring science, ICYS workshop, IPICS 2016
- 2016 Poster Sessions Finalist Judge, IPICS 2016
- 2015 Session Co-Convener, EGU 2015. *Greenland ice loss and response to climate forcings: past, present, and future.*
- 2014-2016 Organizer of Graduate Student Seminar Series for the UW Program on Climate Change

- 2014-2016 Representative of the Earth and Space Science Department to the UW Program on Climate Change
Member of AGU, IPICS, EGU

Community Outreach

- 2023 Ice core science presentation for grade school students, STEAM day at SEEC.
2020 - present Periodic lab tour and paleoclimate presentation for school students, Stable Isotope Lab.
2020 - present Annual Climate science presentation to Denver-area elementary school.
2020 Skype a Scientist- climate science outreach.
2018 Careers in Science outreach with Actively Learn.
2017 Earth Day Climate Science Booth, Santa Barbara, CA
2015 Climate science talk at the Seattle Art Institute, Seattle WA
2011-2017 Climate science outreach with local elementary, middle, and high schools, Seattle WA.
2011, 2014, 2015 Polar Science Weekend, Pacific Science Center, Seattle WA
2014 Art and Science in Antarctica, public lecture, Olympia, WA
2014 Featured Speaker, ARCS Foundation Annual Banquet
2013 Blogging from the field, Polartrec, Denali Ice Core Project

Media

(The following contain hyperlinks.)

Research

- [Ancient ice samples from highest mountain in Canada](#), CBC.
[Mountain Logan Ice Core](#), State of the Mountains.
[Faces of the Front Range: Scientists Bruce Vaughn and Bradley Markle look to save the world by understanding it](#), The Denver Post.
[I Traveled the World to Witness the End of Winter](#), Time Magazine.
[The Last Winter](#), Little, Brown, and Company.
[Earth's polar regions communicate via oceanic "postcards", atmospheric "text messages"](#)
[Simulation Versus Observation](#)
[Dust, Rain and the Poles](#)
[Ice core shows North American ice sheet's retreat affected Antarctic weather](#)
[Coverage of the SubIce Project, Antarctic Circumpolar Expedition](#)
[Quixote Expeditions Guest Scientist Program](#)
[Snopes.com: Did 58 Scientific Papers Published in 2017 Say Global Warming is a Myth?](#)
[Climatefeedback.org: Breitbart misrepresents research from 58 scientific papers to falsely claim that they disprove human-caused global warming](#)
[Rapid Arctic warming has in the past shifted Southern Ocean winds](#)
[The Bipolar See-Saw: Dansgaard-Oeschger Events and the Antarctic Climate](#)
[Will More snow over Antarctica offset rising seas?](#)
[How long does it take Antarctica to notice the Northern Hemisphere is warming?](#)
[University of Washington, Be Boundless Profile](#)
[University of Washington, College of the Environment Spotlight](#)
[Juneau Icefield Research Program](#)

[On the Juneau Icefield, Women Reimagine Who Does Science](#), Sierra Magazine.
[The Adventure Activist Podcast](#)

[Expedition Photography](#)

My [photography](#) has appeared on the cover of [Nature](#), in [EOS](#), [Powder Magazine](#), the University of Washington's [Program on Climate Change](#) page, featured in [AGU informational videos](#) and [promotion](#) of the Juneau Icefield Research Program, promotional material for the Swiss Polar Institute, and numerous press releases.