

Matthew R. Siegfried [he/him]

CONTACT	Department of Geophysics	<i>Tel:</i> 303.384.2004
INFORMATION	Colorado School of Mines	<i>Mobile:</i> 847.525.8487
	1500 Illinois St	siegfried@mines.edu
	Golden, CO 80401 USA	https://glaciology.mines.edu/
ACADEMIC	Associate Professor	April 2024 to present
APPOINTMENTS	Assistant Professor	January 2019 to April 2024
	Department of Geophysics	
	Hydrologic Science and Engineering, Affiliated Faculty	
	Space Resources Program, Affiliated Faculty	
	Payne Institute for Public Policy, Faculty Fellow	
	Colorado School of Mines	
	Thompson Postdoctoral Fellow	May 2017 to December 2018
	Department of Geophysics	
	School of Earth, Energy, and Environmental Sciences	
	Stanford University	
	Mentor: Dr. Dustin M. Schroeder	
	Postdoctoral Scholar	October 2015 to April 2017
	Institute of Geophysics and Planetary Physics	
	Scripps Institution of Oceanography	
	University of California, San Diego	
	Supervisor: Dr. Helen A. Fricker	
EDUCATION	PhD in Earth Sciences	October 2015
	Institute of Geophysics and Planetary Physics	
	Scripps Institution of Oceanography, La Jolla, CA	
	Dissertation: <i>Investigating Antarctic ice sheet subglacial processes beneath the Whillans Ice Plain, West Antarctica, using satellite altimetry and GPS</i>	
	Adviser: Dr. Helen A. Fricker	
	Master of Science in Earth Sciences	July 2010
	Dartmouth College, Hanover, NH	
	Thesis: <i>On the use of high-precision GPS surveys for validation of ICESat altimetry measurements and investigation of seasonal ice-surface fluctuations</i>	
	Adviser: Dr. Robert L. Hawley	
	Bachelor of Arts in Earth Sciences	June 2008
	Dartmouth College, Hanover, NH	
	<i>Magna cum Laude, Phi Beta Kappa</i>	
	Senior Thesis for High Honors: <i>Hydrothermal Waters of Ischia, Italy: A revisitation of groundwater mixing and the ramifications for environmental arsenic contamination</i>	
	Adviser: Dr. Benjamin Bostick	
MANUSCRIPTS		* indicates student or postdoctoral advisee
IN REVIEW		^ indicates student on whose dissertation committee I served
		† indicates co-first authors

- [94] *Follingstad, V. M., R. J. Michaelides*, **M. R. Siegfried**, T. M. Meng, J. Bradford, K. H. Hughson, A. R. Kubas, A. Mullen, E. Quartini, A. Routt, H. G. Sizemore, A. Swidinsky and B. E. Schmidt, in review. Quantifying the Surface Deformation of Pingos on the Alaskan North Slope using Interferometric Synthetic Aperture Radar (InSAR), *Permafrost and Periglacial Processes*.

- [93] *Garvey, S., **M. R. Siegfried**, J. Shragge, L. Zoet, D. Hansen and N. Stevens, in review. Multi-component Rayleigh wave dispersion analysis, *Journal of Glaciology*.
- [92] ^Peter, I. C., E. J. Anderson, **M. R. Siegfried**, A. B. Villas Bôas and N. T. Kurtz, in review. Advancing Large Lake Ice Observations: Water Surface Representation from ICESat-2 Altimetry, Operational Hydrodynamic Models, and Shoreline Gauges, *Water Resources Research*.
- [91] *Snow, T., A. Harris, S. Grigsby, E. Abrahams, E. Savidge*, T. Scambos, F. Pérez, C. Shuman, W. Abdalati and **M. R. Siegfried**, in review. Application of a new Landsat sea surface temperature algorithm to the Amundsen Sea, West Antarctica, *IEEE Transactions on Geoscience and Remote Sensing*.
- [90] *Verboncoeur, H., B. H. Hills*, **M. R. Siegfried**, E. Abrahams* and N. Holschuh, in review. Subglacial conditions estimated from unsupervised clustering analysis of radar bed-echo shape, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.
- [89] Matsuoka, K., G. Moholdt, J. F. Arthur, J. A. Bodart, X. Cui, F. Ferraccioli, R. Forsberg, V. Goel, T. A. Jordan, F. S. McCormack, R. Mottram, H. D. Pritchard, C. Shackleton, K. Tinto, F. Boberg, M. G. P. Cavitte, R. Drews, P. Dutrieux, J. Ebbing, O. Eisen, H. Eisermann, A. S. Gardner, C. A. Greene, N. Holschuh, S. S. R. Jamieson, B.-H. Kim, N. Krauzig, B. Kulesa, C. Leuschen, J. Li, L. Li, J. Liebsch, J. A. MacGregor, E. MacKie, A. Mahagaonkar, J. Maton, M. Morlighem, F. Navarro, P. Neff, I. N. Otsuka, F. Pattyn, A. Ruppel, R. J. Sanderson, H. Seroussi, A. Shepherd, **M. R. Siegfried**, T. Slater, A. P. Stroeven, M. Studinger, T. Teisberg, R. A. Venturelli, P. J. Winberry, C. Zhao, L. An, J. L. Bamber, R. E. Bell, R. G. Bingham, J. Brehmer-Moltmann, G. Eagles, J. Greenbaum, J. Gronset, W. S. Lee, E. L. Meur, L. M. Jon, K. Lindbäck, S. Lidström, M. Lösing, M. Minowa, M. Pandey, Y. Ray, M. Scheinert, D. M. Schroeder, T. Seehaus, K. Shahateet, D. Steinhage, X. Tang, D. Taylor, H. Verboncoeur*, J. Yang and D. A. Young, in review. Towards an improved understanding of the Antarctic coastal zone and its contribution to future global sea level, *Reviews of Geophysics*.
- [88] Meng, T. M., R. J. Michaelides, S. Vivero, A. Nguyen and **M. R. Siegfried**, in review. Fusion of InSAR and stereophotogrammetry improves 3D alpine permafrost surface displacement measurements, *Earth and Space Science*.
- [87] Ross, N., R. J. Sanderson, B. Kulesa, M. Siegert, G. J. G. Paxman, K. A. Nichols, **M. R. Siegfried**, S. S. R. Jamieson, M. J. Bentley, T. A. Jordan, C. L. Batchelor, D. Small, O. Eisen, K. Winter, R. G. Bingham, S. L. Callard, R. Carr, C. F. Dow, H. A. Fricker, E. Hill, B. H. Hills*, C. Hofstede, H. Jeofry, F. Napoleoni and W. Sauthoff*, in review. Review Article: The Foundation-Patuxent-Academy ice stream system, Antarctica, *The Cryosphere*, doi:10.5194/egusphere-2025-3625.
- [86] Smith, B., T. C. Sutterley, H. A. Fricker, L. Padman, **M. R. Siegfried**, T. Black, D. Felikson, B. I. D. Freer, A. Gibbons, S. L. Howard, B. Jelley, M. King, B. Medley, M. Morlighem, C. Sadlik and W. Sauthoff*, in review. ICESat-2 land ice products resolve Greenland and Antarctic ice-sheet height changes on seasonal to multiyear time scales, *Journal of Glaciology*, doi:10.22541/essoar.175882970.07697715/v1.
- [85] *Hills, B., **M. R. Siegfried**, N. Holschuh, H. Verboncoeur* and D. Schroeder, 2026. Resolving radiostratigraphy with squinted synthetic aperture radar focusing, *Journal of Glaciology*, **72**(e10), 1–11, doi:10.1017/jog.2025.10122.
- [84] *Katz, Z. S., **M. R. Siegfried** and L. Padman, 2026. Slip-Event Timing and Ice Velocity Vary at Long-Period Ocean Tidal Frequencies at Whillans Ice Plain, West Antarctica, *Journal of Geophysical Research: Earth Surface*, **131**(1), e2025JF008770, doi:10.1029/2025JF008770.
- [83] *Sauthoff, W., **M. R. Siegfried**, R. A. Venturelli and B. E. Smith, 2026. Dynamic Bound-

- aries of Antarctic Active Subglacial Lakes Reveal Underestimated Water Fluxes and Overestimated Lakebed Active Areas, *Geophysical Research Letters*, **53**(2), e2025GL117121, doi:10.1029/2025GL117121.
- [82] *Willis, R., J. Grimm, F. Stanek, P. Edme, A. Fichtner, B. P. Lipovsky, P. Paitz, F. Walter, **M. R. Siegfried** and E. R. Martin, 2026. Creating a Comprehensive Cryoseismic Catalog at Rhonegletscher: A Scalable Approach Using Distributed Acoustic Sensing and Machine Learning, *Machine Learning: Earth*, accepted.
- [81] Doran, P. T., **M. R. Siegfried**, H. Dugan, K. Hubbard and J. Lawrence, 2026. Glacier surface lowering and subglacial outflow coincide with Blood Falls discharge event in the McMurdo Dry Valleys, *Antarctic Science*, doi:10.1017/S0954102025100527.
- [80] Schroeder, D. M., E. Abrahams, A. L. Broome, W. Chu, R. Culberg, E. J. Dawson, E. J. MacKie, D. F. May, **M. R. Siegfried**, T. O. Teisberg and S. Zhao, 2026. Next generation radar bed measurements should be optimized for assimilation or repeat-pass profiling, *Philosophical Transactions of the Royal Society A*, accepted.
- 2025 [79] *Hills[†], B. H., T. J. Young[†], D. A. Lilien[†], E. Babcock, N. Bienert, D. Blankenship, J. Bradford, G. Brighi, A. Brisbourne, J. Dall, R. Drews, O. Eisen, M. R. Ershadi, T. A. Gerber, N. Holschuh, D. Jansen, T. M. Jordan, N. B. Karlsson, J. Li, C. Martín, K. Matsuoka, D. May, F. M. Oraschewski, J. Paden, N. M. Rathmann, N. Ross, D. M. Schroeder, M. Siegert, **M. R. Siegfried**, E. Smith and O. Zeising, 2025. Radar Polarimetry in Glaciology: Theory, Measurement Techniques, and Scientific Applications for Investigating the Anisotropy of Ice Masses, *Reviews of Geophysics*, **63**(4), e2024RG000842, doi:10.1029/2024RG000842.
- [78] ^Peter, I., E. J. Anderson, **M. R. Siegfried** and N. T. Kurtz, 2025. A Novel Algorithm for Ice-Water Discrimination in Large Lakes using ICESat-2 and Data Driven Machine Learning, *Earth and Space Science*, **12**(6), e2024EA004155, doi:10.1029/2024EA004155.
- [77] ^Sartore, N. B., T. J. Wagner, **M. R. Siegfried**, N. Pujara and L. K. Zoet, 2025. Wave erosion, frontal bending, and calving at Ross Ice Shelf, *The Cryosphere*, **19**, 249–265, doi:10.5194/tc-19-249-2025.
- [76] *Savidge, E., J. Millstein*, T. Snow*, **M. R. Siegfried**, C. Bézu, K. Alley and B. Riel, 2025. Deteriorating Structural Integrity of Pine Island Glacier’s Southern Ice Shelf (2017–23) Identified with Satellite-Derived Surface Deformation, Ice Velocity, and Strain Rates, *Journal of Glaciology*, **71**(e116), 1–9, doi:10.1017/jog.2025.10076.
- [75] *Verboncoeur, H., **M. R. Siegfried**, J. P. Winberry, N. Holschuh, D. Byrne*, W. Sauthoff*, T. C. Sutterley and B. Medley, 2025. Multi-decadal evolution of Cray Ice Rise region, West Antarctica, amid modern ice-stream deceleration, *Journal of Glaciology*, **71**(e3), 1–11, doi:10.1017/jog.2024.79.
- [74] Bingham[†], R. G., J. A. Bodart[†], M. G. P. Cavitte[†], A. Chung[†], R. J. Sanderson[†], J. C. R. Sutter[†], O. Eisen, N. B. Karlsson, J. A. MacGregor, N. Ross, D. A. Young, D. W. Ashmore, A. Born, W. Chu, R. Drews, S. Franke, V. Goel, J. W. Goodge, A. C. J. Henry, A. Hermant, B. H. Hills*, N. Holschuh, M. R. Koutnik, G. J.-M. C. Leysinger Vieli, E. J. MacKie, E. Mantelli, C. Martín, F. S. L. Ng, F. M. Oraschewski, F. Napoleoni, F. Parrenin, S. V. Popov, T. Rieckh, R. Schlegel, D. M. Schroeder, M. J. Siegert, T. O. Teisberg, K. Winter, X. Cui, X. Tang, S. Yan, H. Davis, C. F. Dow, T. J. Fudge, T. A. Jordan, B. Kulesa, K. Matsuoka, C. J. Nyqvist, M. Rahnemounfar, **M. R. Siegfried**, S. Singh, V. Višnjević, R. Zamora and A. Zuhr, 2025. Review article: AntArchitecture – building an age–depth model from Antarctica’s radiostratigraphy to explore ice-sheet evolution, *The Cryosphere*, **19**(10), 4611–4655, doi:10.5194/tc-19-4611-2025.
- [73] Bryant, M. B., A. A. Borsa, E. J. Anderson, C. C. Masteller, R. J. Michaelides*, **M. R. Siegfried** and A. P. Young, 2025. Multiple modes of shoreline change along the Alaskan Beaufort Sea observed using ICESat-2 altimetry and satellite imagery, *The Cryosphere*,

- 19, 1825–1847, doi:10.5194/tc-19-1825-2025.
- [72] Campbell, T. C., M. L. Skidmore, M. O. Patterson, J. E. Dore, D. M. Harwood, A. Leventer, A. B. Michaud, B. E. Rosenheim, **M. R. Siegfried**, A. Steigmeyer, M. Tranter, R. A. Venturelli, J. C. Priscu and the SALSA Science Team, 2025. Dynamic subglacial meltwater history archived in Antarctic subglacial lake sediments , *GSA Bulletin*, doi:10.1130/B37731.1.
- [71] Horgan, H. J., C. Stewart, C. Stevens, G. Dunbar, L. Balfoort, B. E. Schmidt, P. Washam, M. A. Werder, D. Mandeno, J. Marschalek, C. Hulbe, N. Holschuh, R. Levy, B. Hurwitz, S. Jendersie, K. Johnson, J. Lawrence, R. Morgenstern, A. D. Mullen, E. Quartini, W. Sauthoff*, **M. R. Siegfried**, H. Still, S. Thorpe-Loversuch, T. van de Flierdt, R. Venturelli and A. Whiteford, 2025. A West Antarctic grounding-zone environment shaped by episodic water flow, *Nature Geoscience*, **18**(5), 389–395, doi:10.1038/s41561-025-01687-3.
- [70] Roth, D., M. Bezada, G. Jin, C. Masteller, **M. R. Siegfried**, A. Titov and B. Tate, 2025. A River on Fiber: Spatially Continuous Fluvial Monitoring with Distributed Acoustic Sensing, *Seismica*, **4**(2), doi:10.26443/seismica.v4i2.1696.
- [69] Sutterley, T. C., S. L. Howard, L. Padman and **M. R. Siegfried**, 2025. pyTMD: Python-based tidal prediction software, *Journal of Open Source Software*, **10**(116), 8566, doi:10.21105/joss.08566.
- 2024
- [68] *Hills, B. H., **M. R. Siegfried** and D. M. Schroeder, 2024. Entrained Water in Basal Ice Suppresses Radar Bed-Echo Power at Active Subglacial Lakes, *Geophysical Research Letters*, **51**(13), doi:10.1029/2024gl109248.
- [67] *Michaelides, R. J., **M. R. Siegfried**, J. Lovekin, K. Berry, B. Dugan and D. L. Roth, 2024. Wildfire Progression Time Series Mapping With Interferometric Synthetic Aperture Radar (InSAR), *IEEE Geoscience and Remote Sensing Letters*, **21**, 1–5, doi:10.1109/lgrs.2024.3365994.
- [66] Freer, B. I. D., O. J. Marsh, H. A. Fricker, A. E. Hogg, **M. R. Siegfried**, D. Floricioiu, W. Sauthoff*, R. Rigby and S. F. Wilson, 2024. Coincident Lake Drainage and Grounding Line Retreat at Engelhardt Subglacial Lake, West Antarctica, *Journal of Geophysical Research: Earth Surface*, **129**(9), e2024JF007724, doi:10.1029/2024JF007724.
- 2023
- [65] *Savidge, E., T. Snow*, **M. R. Siegfried**, Y. Zheng, A. B. Villas Bôas, G. A. Bortolotto, L. Boehme and K. E. Alley, 2023. Wintertime Polynya Structure and Variability From Thermal Remote Sensing and Seal-Borne Observations at Pine Island Glacier, West Antarctica, *IEEE Transactions on Geoscience and Remote Sensing*, **61**, 1–13, doi:10.1109/tgrs.2023.3271453.
- [64] *Savidge, E., T. Snow* and **M. R. Siegfried**, 2023. Multi-decadal Record of Sensible-Heat Polynya Variability from Satellite Optical and Thermal Imagery at Pine Island Glacier, West Antarctica, *Geophysical Research Letters*, **50**(22), doi:10.1029/2023gl106178.
- [63] **Siegfried**[†], **M. R.**, R. A. Venturelli[†], M. O. Patterson, W. Arnuk, T. D. Campbell, C. D. Gustafson[^], A. B. Michaud, B. K. Galton-Fenzi, M. B. Hausner, S. N. Holzschuh*, B. Huber, K. D. Mankoff, D. M. Schroeder, P. Summers, S. Tyler, S. P. Carter, H. A. Fricker, D. M. Harwood, A. Leventer, B. E. Rosenheim, M. L. Skidmore, J. C. Priscu and the SALSA Science Team, 2023. The life and death of a subglacial lake in West Antarctica, *Geology*, **51**(5), 434–438, doi:10.1130/G50995.1.
- [62] *Snow, T., W. Zhang, E. Schreiber, **M. R. Siegfried**, W. Abdalati and T. Scambos, 2023. Alongshore Winds Force Warm Atlantic Water Toward Helheim Glacier in Southeast Greenland, *Journal of Geophysical Research: Oceans*, **128**, doi:10.1029/2023JC019953.
- [61] Davis, C. L., R. A. Venturelli, A. B. Michaud, J. R. Hawkings, A. M. Achberger, T. J. Vick-Majors, B. E. Rosenheim, J. E. Dore, A. Steigmeyer, M. L. Skidmore, J. D. Barker, L. G. Benning, **M. R. Siegfried**, J. C. Priscu, B. C. Christner and the SALSA Science

- Team, 2023. Biogeochemical and historical drivers of microbial community composition and structure in sediments from Mercer Subglacial Lake, West Antarctica, *ISME Communications*, **3**(1), doi:10.1038/s43705-023-00216-w.
- [60] Robel, A., S. Sim, C. Meyer, **M. R. Siegfried** and C. Gustafson, 2023. Contemporary ice sheet thinning drives subglacial groundwater exfiltration with potential feedbacks on glacier flow, *Science Advances*, **9**(33), doi:10.1126/sciadv.adh3693.
- [59] Rosenheim[†], B. E., A. B. Michaud[†], J. Broda, A. Gagnon, R. A. Venturelli, T. D. Campbell, A. Leventer, M. Patterson, **M. R. Siegfried**, B. C. Christner, D. Duling, D. Harwood, J. E. Dore, M. Tranter, M. L. Skidmore, J. C. Priscu and the SALSA Science Team, 2023. A method for successful collection of multicores and gravity cores from Antarctic subglacial lakes, *Limnology and Oceanography: Methods*, **21**(5), 279–294, doi:10.1002/lom3.10545.
- [58] Ryan, J. C., B. Medley, C. M. Stevens, T. C. Sutterley and **M. R. Siegfried**, 2023. Role of snowfall versus air temperatures for Greenland Ice Sheet melt-albedo feedbacks, *Earth and Space Science*, **10**(11), e2023EA003158, doi:10.1029/2023EA003158.
- [57] Stubblefield, A. G., C. R. Meyer, **M. R. Siegfried**, W. Sauthoff* and M. Spiegelman, 2023. Reconstructing subglacial lake activity with an altimetry-based inverse method, *Journal of Glaciology*, 1–15, doi:10.1017/jog.2023.90.
- [56] Venturelli, R. A., B. Boehman, C. Davis, J. R. Hawkings, S. E. Johnston, C. D. Gustafson, A. B. Michaud, C. Mosbeux, **M. R. Siegfried**, T. J. Vick-Majors, V. Galy, R. G. M. Spencer, S. Warny, B. C. Christner, H. A. Fricker, D. M. Harwood, A. Leventer, J. C. Priscu, B. E. Rosenheim and the SALSA Science Team, 2023. Constraints on the Timing and Extent of Deglacial Grounding Line Retreat in West Antarctica, *AGU Advances*, **4**, e2022AV000846, doi:10.1029/2022AV000846.
- 2022 [55] Gustafson, C. D., K. Key, **M. R. Siegfried**, J. P. Winberry, H. A. Fricker, R. A. Venturelli and A. B. Michaud, 2022. A dynamic saline groundwater system mapped beneath an Antarctic ice stream, *Science*, **376**(6593), 640–644, doi:10.1126/science.abm3301.
- [54] Bienert, N. L., D. M. Schroeder, S. T. Peters, E. J. MacKie, E. J. Dawson, **M. R. Siegfried**, R. Sanda and P. Christoffersen, 2022. Post-Processing Synchronized Bistatic Radar for Long Offset Glacier Sounding, *IEEE Transactions on Geoscience and Remote Sensing*, **60**, 1–17, doi:10.1109/tgrs.2022.3147172.
- [53] Livingstone, S. J., Y. Li, A. Rutishauser, R. J. Sanderson, K. Winter, J. Mikucki, H. Björnsson, J. S. Bowling, W. Chu, C. Dow, H. A. Fricker, M. McMillan, F. Ng, N. Ross, M. J. Siegert, **M. R. Siegfried** and A. J. Sole, 2022. Global synthesis of subglacial lakes and their changing role in a warming climate, *Nature Reviews Earth & Environment*, **3**, 106–124, doi:10.1038/s43017-021-00246-9.
- 2021 [52] **Siegfried, M. R.** and H. A. Fricker, 2021. Illuminating active subglacial lake processes with ICESat-2 laser altimetry, *Geophysical Research Letters*, **48**(14), doi:10.1029/2020GL091089.
- [51] *Michaelides[†], R. J., M. Bryant[†], **M. R. Siegfried** and A. A. Borsa, 2021. Quantifying Permafrost Deformation with ICESat-2, *Earth and Space Science*, **8**(8), e2020EA001538, doi:10.1029/2020EA001538.
- [50] Barcheck, C. G., E. E. Brodsky, P. M. Fulton, M. A. King, **M. R. Siegfried** and S. Tulaczyk, 2021. Migratory earthquake precursors are dominant on an ice stream fault, *Science Advances*, **7**(6), doi:10.1126/sciadv.abd0105.
- [49] Becker, M., S. Howard, H. A. Fricker, L. Padman, C. Mosbeux and **M. R. Siegfried**, 2021. Buoyancy-driven flexure at the front of Ross Ice Shelf, Antarctica, observed by ICESat-2 satellite laser altimetry, *Geophysical Research Letters*, **48**(12), e2020GL091207, doi:10.1029/2020GL091207.

- [48] Horgan, H. J., L. van Haastrecht, R. B. Alley, S. Anandakrishnan, L. H. Beem, K. Christianson, A. Muto and **M. R. Siegfried**, 2021. Grounding zone subglacial properties from calibrated active-source seismic methods, *The Cryosphere*, **15**(4), 1863–1880, doi:10.5194/tc-15-1863-2021.
- [47] MacGregor, J., L. Boisvert, B. Medley, A. Petty, J. Harbeck, R. Bell, B. Blair, E. Blanchard-Wrigglesworth, E. Buckley, M. Christoffersen, J. Cochran, B. Csatho, E. De Marco, R. Dominguez, M. Fahnestock, S. Farrell, S. P. Gogineni, J. Greenbaum, C. Hansen, M. Hofton, J. Holt, K. Jezek, L. Koenig, N. Kurtz, R. Kwok, C. Larsen, C. Leuschen, S. Manizade, S. Martin, T. Neumann, S. Nowicki, J. Paden, J. Richter-Menge, E. Rignot, F. Rodríguez-Morales, **M. R. Siegfried**, B. Smith, J. Sonntag, M. Studinger, K. Tinto, M. Truffer, T. Wagner, J. Woods, D. Young and J. Yungel, 2021. The scientific legacy of NASA’s Operation IceBridge, *Reviews of Geophysics*, **59**(2), e2020RG000712, doi:10.1029/2020RG000712.
- [46] Priscu, J. C., J. Kalin, J. Winans, T. Campbell, **M. R. Siegfried**, M. Skidmore, J. E. Dore, A. Leventer, D. Harwood, D. Duling, R. Zook, J. Burnett, D. Gibson, E. Krula, A. Mironov, J. McManis, G. Roberts, B. E. Rosenheim, B. C. Christner, K. Kasic, H. A. Fricker, W. B. Lyons, J. Barker, M. Bowling, B. Collins, C. Davis, A. Gagnon, C. Gardner, C. Gustafson, O.-S. Kim, W. Li, A. B. Michaud, M. Patterson, M. Tranter, R. Venturelli, T. Vick-Majors and C. Elsworth, 2021. Scientific Access into Mercer Subglacial Lake: Scientific Objectives, Drilling Operations and Initial Observations, *Annals of Glaciology*, **62**(85–86), 340–352, doi:10.1017/aog.2021.10.
- [45] Stubblefield, A. G., T. T. Creyts, J. Kingslake, **M. R. Siegfried** and M. Spiegelman, 2021. Surface expression and apparent timing of subglacial lake oscillations controlled by viscous ice flow, *Geophysical Research Letters*, **48**(17), e2021GL094658, doi:10.1029/2021GL094658.
- 2020 [44] Adusumilli, S., H. A. Fricker, B. Medley, L. Padman and **M. R. Siegfried**, 2020. Inter-annual variations in meltwater input to the Southern Ocean from Antarctic ice shelves, *Nature Geoscience*, **13**(9), 616–620, doi:10.1038/s41561-020-0616-z.
- [43] Begeman, C., S. Tulaczyk, L. Padman, M. King, **M. R. Siegfried**, T. Hodson and H. A. Fricker, 2020. Tidal pressurization of the ocean cavity near an Antarctic ice shelf grounding line, *Journal of Geophysical Research – Oceans*, **125**(4), doi:10.1029/2019JC015562.
- [42] Das, I., L. Padman, R. E. Bell, H. A. Fricker, K. J. Tinto, C. L. Hulbe, C. S. Siddoway, T. Dhakal, N. P. Frearson, C. Mosbeux, S. I. Cordero and **M. R. Siegfried**, 2020. Multidecadal Basal Melt Rates and Structure of the Ross Ice Shelf, Antarctica, Using Airborne Ice Penetrating Radar, *Journal of Geophysical Research – Earth Surface*, **125**(3), doi:10.1029/2019JF005241.
- [41] Elsworth, C., D. M. Schroeder and **M. R. Siegfried**, 2020. Interpreting englacial layer deformation in the presence of complex ice flow history with synthetic radargrams, *Annals of Glaciology*, **61**(81), 206–213, doi:10.1017/aog.2019.41.
- [40] Hawkings, J. R., M. L. Skidmore, J. L. Wadham, J. C. Priscu, P. L. Morton, J. E. Hatton, C. B. Gardner, T. J. Kohler, M. Stibal, E. A. Bagshaw, A. Steigmeyer, J. Barker, J. E. Dore, W. B. Lyons, M. Tranter, R. G. M. Spencer and the SALSA Science Team (incl. **M. R. Siegfried**), 2020. Enhanced trace element mobilization by Earth’s ice sheets, *Proceedings of the National Academy of Sciences*, **117**(50), 31648–31659, doi:10.1073/pnas.2014378117.
- [39] Jordan, T., D. Schroeder, C. Elsworth and **M. R. Siegfried**, 2020. Estimation of ice fabric within Whillans Ice Stream using polarimetric phase-sensitive radar sounding, *Annals of Glaciology*, **61**(81), 74–83, doi:10.1017/aog.2020.6.
- [38] MacKie, E. J., D. M. Schroeder, J. Caers, **M. R. Siegfried** and C. Scheidt, 2020. Antarctic topographic realizations and geostatistical modeling used to map subglacial lakes,

- Journal of Geophysical Research – Earth Surface*, **125**(3), doi:10.1029/2019JF005420.
- [37] Smith, B., H. A. Fricker, A. S. Gardner, B. Medley, J. Nilsson, F. S. Paolo, N. Holschuh, S. Adusumilli, K. Brunt, B. Csatho, K. Harbeck, T. Markus, T. Neumann, **M. R. Siegfried** and H. J. Zwally, 2020. Pervasive ice sheet mass loss reflects competing ocean and atmosphere processes, *Science*, **368**(6496), 1239–1242, doi:10.1126/science.aaz5845.
- [36] Venturelli, R. A., **M. R. Siegfried**, K. Roush, W. Li, J. Burnett, R. Zook, H. A. Fricker, J. Priscu, A. Leventer and B. Rosenheim, 2020. Mid-Holocene grounding line variability in the southern Ross Embayment, *Geophysical Research Letters*, **47**(15), e2020GL088476, doi:10.1029/2020GL088476.
- 2019
- [35] Schroeder, D. M., J. A. Dowdeswell, M. J. Siegert, R. G. Bingham, W. Chu, E. J. MacKie, **M. R. Siegfried**, K. I. Vega, J. R. Emmons and K. Winstein, 2019. Multidecadal observations of the Antarctic ice sheet from restored analog radar records, *Proceedings of the National Academy of Sciences*, **116**(38), 18867–18873, doi:10.1073/pnas.1821646116.
- [34] Smith, B. E., N. Holschuh, A. S. Gardner, S. Adusumilli, K. M. Brunt, B. Csatho, H. A. Fricker, K. Harbeck, A. Huth, T. Neumann, J. Nilsson and **M. R. Siegfried**, 2019. Land ice height-retrieval algorithm for NASA’s ICESat-2 photon-counting laser altimeter, *Remote Sensing of Environment*, **233**, 111352, doi:10.1016/j.rse.2019.111352.
- [33] Tinto, K., L. Padman, C. Siddoway, S. Springer, H. A. Fricker, I. Das, F. C. Tontini, D. Porter, N. Frearson, S. Howard, **M. R. Siegfried** and et al., 2019. Ross Ice Shelf response to climate driven by the tectonic imprint on seafloor bathymetry, *Nature Geoscience*, **12**, 441–449, doi:10.1038/s41561-019-0370-2.
- 2018
- [32] **Siegfried, M. R.** and H. A. Fricker, 2018. Thirteen years of subglacial lake activity in Antarctica from multi-mission altimetry, *Annals of Glaciology*, **59**(76), 42–55, doi:10.1017/aog.2017.36.
- [31] Chu, W., D. M. Schroeder and **M. R. Siegfried**, 2018. Retrieval of Englacial Firn Aquifer Thickness from Ice-Penetrating Radar Sounding in Southeast Greenland, *Geophysical Research Letters*, **45**(21), 11,770–11,778, doi:10.1029/2018GL079751.
- [30] Begeman, C. M., S. M. Tulaczyk, O. J. Marsh, J. A. Mikucki, T. P. Stanton, T. O. Hodson, **M. R. Siegfried**, R. D. Powell, K. Christianson and M. A. King, 2018. Ocean stratification and low melt rates at the Ross Ice Shelf grounding zone, *Journal of Geophysical Research – Oceans*, **123**(10), 7438–7452, doi:10.1029/2018JC013987.
- [29] Adusumilli, S., H. A. Fricker, **M. R. Siegfried**, L. Padman, F. Paolo and S. Ligtenberg, 2018. Variable basal melt rates of Antarctic Peninsula ice shelves, 1994–2016, *Geophysical Research Letters*, **45**(9), 4086–4095, doi:10.1002/2017GL076652.
- [28] Padman, L., **M. R. Siegfried** and H. A. Fricker, 2018. Ocean tide influences on ice sheet processes, *Reviews of Geophysics*, **56**(1), 142–184, doi:10.1002/2016RG000546.
- [27] Paolo, F. S., L. Padman, H. A. Fricker, S. Adusumilli, S. Howard and **M. R. Siegfried**, 2018. Response of Pacific-sector Antarctic ice shelves to the El Niño/ Southern Oscillation, *Nature Geoscience*, **11**, 121–126, doi:10.1038/s41561-017-0033-0.
- 2017
- [26] **Siegfried, M. R.**, B. Medley, K. Larson, H. A. Fricker and S. Tulaczyk, 2017. Snow accumulation variability on a West Antarctic ice stream observed with GPS reflectometry, 2007–2017, *Geophysical Research Letters*, **44**(15), 7808–7816, doi:10.1002/2017GL074039.
- [25] Carter, S. P., H. A. Fricker and **M. R. Siegfried**, 2017. Antarctic subglacial lakes drain through sediment-floored canals: Theory and model testing on real and idealized domains, *The Cryosphere*, **11**, 381–405, doi:10.5194/tc-11-381-2017.
- [24] Damsgaard, A., J. Suckale, J. Piotrowski, M. Houssais, **M. R. Siegfried** and H. A. Fricker, 2017. Sediment behavior controls equilibrium width of subglacial channels, *Journal of Glaciology*, **63**(242), 1034–1048, doi:10.1017/jog.2017.71.
- [23] Key, K. and **M. R. Siegfried**, 2017. The feasibility of ground-based electromagnetic

- methods for mapping the subglacial hydrological structure beneath ice streams, *Journal of Glaciology*, **63**(241), 755–771, doi:10.1017/jog.2017.36.
- [22] Scambos, T. A., R. E. Bell, A. M. Smith, D. G. Vaughan, R. B. Alley, S. Anandakrishnan, D. H. Bromwich, K. M. Brunt, K. Christianson, T. T. Creyts, S. B. Das, R. DeConto, P. Dutrieux, H. A. Fricker, D. Holland, J. MacGregor, B. Medley, D. Pollard, **M. R. Siegfried**, E. J. Steig and P. Yager, 2017. How Much, How Fast? A Review and Science Plan for Research on the Instability of Antarctica’s Thwaites Glacier in the 21st Century, *Global and Planetary Change*, **153**, 16–34, doi:10.1016/j.gloplacha.2017.04.008.
- 2016
- [21] **Siegfried, M. R.**, H. A. Fricker, S. P. Carter and S. Tulaczyk, 2016. Episodic ice velocity fluctuations triggered by a subglacial flood in West Antarctica, *Geophysical Research Letters*, **43**(6), 2640–2648, doi:10.1002/2016GL067758.
- [20] Alley, K. E., T. A. Scambos, **M. R. Siegfried** and H. A. Fricker, 2016. Impacts of warm water on Antarctic ice shelf stability through basal channel formation, *Nature Geoscience*, **9**(4), 290–293, doi:10.1038/ngeo2675.
- [19] Achberger, A. M., B. C. Christner, A. B. Michaud, J. C. Priscu, M. L. Skidmore, T. J. Vick-Majors and the WISSARD Science Team (incl. **M. R. Siegfried**), 2016. Microbial Community Structure of Subglacial Lake Whillans, West Antarctica, *Frontiers in Microbiology*, **7**, 1457, doi:10.3389/fmicb.2016.01457.
- [18] Damsgaard, A., D. L. Eghold, L. H. Beem, S. Tulaczyk, N. K. Larsen, J. A. Piotrowski and **M. R. Siegfried**, 2016. Ice flow dynamics forced by rapid water-pressure variations in subglacial granular beds, *Geophysical Research Letters*, **43**(23), 165–173, doi:10.1002/2016GL071579.
- [17] Hodson, T., R. Powell, S. Brachfeld, S. Tulaczyk, R. Scherer and the WISSARD Science Team (incl. **M. R. Siegfried**), 2016. Physical processes in Subglacial Lake Whillans, West Antarctica: inferences from sediment cores, *Earth and Planetary Science Letters*, **444**, 56–63, doi:10.1016/j.epsl.2016.03.036.
- [16] Marsh, O. J., H. A. Fricker, **M. R. Siegfried**, K. Christianson, K. W. Nicholls, H. F. J. Corr and G. Catania, 2016. High basal melting forming a channel at the grounding line of Ross Ice Shelf, Antarctica, *Geophysical Research Letters*, **43**(1), 250–255, doi:10.1002/2015gl066612.
- [15] Vick-Majors, T. J., A. C. Mitchell, A. M. Achberger, B. C. Christner, J. E. Dore, A. B. Michaud, J. A. Mikucki, A. M. Purcell, M. L. Skidmore, J. C. Priscu and the WISSARD Science Team (incl. **M. R. Siegfried**), 2016. Physiological ecology of microorganisms in Subglacial Lake Whillans, *Frontiers in Microbiology*, **7**, 1705, doi:10.3389/fmicb.2016.01705.
- 2015
- [14] Fisher, A. T., K. D. Mankoff, S. M. Tulaczyk, S. W. Tyler, N. Foley and the WISSARD Science Team (incl. **M. R. Siegfried**), 2015. High geothermal heat flux measured below the West Antarctic Ice Sheet, *Science Advances*, **1**(6), e1500093–e1500093, doi:10.1126/sciadv.1500093.
- [13] Fricker, H. A., **M. R. Siegfried**, S. P. Carter and T. A. Scambos, 2015. A decade of progress in observing and modeling Antarctic subglacial water systems, *Philosophical Transactions of the Royal Society A*, **374**(2059), 20140294, doi:10.1098/rsta.2014.0294.
- [12] Mikucki, J., P. Lee, D. Ghosh, A. Purcell, A. Mitchell, K. Mankoff, A. T. Fisher, S. Tulaczyk, S. P. Carter, **M. R. Siegfried**, H. A. Fricker, T. Hodson, J. Coenen, R. Powell, R. P. Scherer, T. Vick-Majors, A. M. Achberger, B. C. Christner and M. Tranter, 2015. Subglacial Lake Whillans biogeochemistry: a synthesis of current knowledge, *Philosophical Transactions of the Royal Society A*, **374**(2059), 20140290, doi:10.1098/rsta.2014.0290.
- 2014
- [11] **Siegfried, M. R.**, H. A. Fricker, M. Roberts, T. A. Scambos and S. Tulaczyk, 2014.

- A decade of West Antarctic subglacial lake interactions from combined ICESat and CryoSat-2 altimetry, *Geophysical Research Letters*, **41**(3), 891–898, doi:10.1002/2013GL058616.
- [10] Christner, B. C., J. C. Priscu, A. M. Achberger, C. Barbante, S. P. Carter, K. Christianson, A. B. Michaud, J. A. Mikucki, A. C. Mitchell, M. L. Skidmore, T. J. Vick-Majors and the WISSARD Science Team (incl. **M. R. Siegfried**), 2014. A microbial ecosystem beneath the West Antarctic ice sheet, *Nature*, **512**(7514), 310–313, doi:10.1038/nature13667.
- [9] Holt, T. O., N. F. Glasser, H. A. Fricker, L. Padman, A. Luckman, O. King, D. J. Quincey and **M. R. Siegfried**, 2014. The structural and dynamic responses of Stange Ice Shelf to recent environmental change, *Antarctic Science*, **26**(06), 646–660, doi:10.1017/S095410201400039X.
- [8] Purcell, A. M., J. A. Mikucki, A. M. Achberger, I. A. Alekhina, C. Barbante, B. C. Christner, D. Ghosh, A. B. Michaud, A. C. Mitchell, J. C. Priscu, R. Scherer, M. L. Skidmore, T. J. Vick-Majors and the WISSARD Science Team (incl. **M. R. Siegfried**), 2014. Microbial sulfur transformations in sediments from Subglacial Lake Whillans, *Frontiers in Microbiology*, **5**, 594, doi:10.3389/fmicb.2014.00594.
- [7] Tulaczyk, S., J. A. Mikucki, **M. R. Siegfried**, J. C. Priscu, C. G. Barcheck, L. H. Beem, A. Behar, J. Burnett, B. C. Christner, A. T. Fisher, F. H. A., K. D. Mankoff, R. D. Powell, F. Rack, D. Sampson, R. P. Scherer, S. Y. Schwartz and the WISSARD Science Team, 2014. WISSARD at Subglacial Lake Whillans, West Antarctica: scientific operations and initial observations, *Annals of Glaciology*, **55**(65), 51–58, doi:10.3189/2014AoG65A009.
- 2013 [6] Carter, S. P., H. A. Fricker and **M. R. Siegfried**, 2013. Evidence of rapid subglacial water piracy under Whillans Ice Stream, West Antarctica, *Journal of Glaciology*, **59**(218), 1147–1162, doi:10.3189/2013JoG13J085.
- [5] Holt, T. O., N. F. Glasser, D. J. Quincey and **M. R. Siegfried**, 2013. Speedup and fracturing of George VI Ice Shelf, Antarctic Peninsula, *The Cryosphere*, **7**(3), 797–816, doi:10.5194/tc-7-797-2013.
- [4] Horgan, H. J., R. B. Alley, K. Christianson, R. W. Jacobel, S. Anandakrishnan, A. Muto, L. H. Beem and **M. R. Siegfried**, 2013. Estuaries beneath ice sheets, *Geology*, **41**(11), 1159–1162, doi:10.1130/G34654.1.
- [3] Priscu, J. C., A. M. Achberger, J. E. Cahoon, B. C. Christner, R. L. Edwards, W. L. Jones, A. B. Michaud, **M. R. Siegfried**, M. L. Skidmore, R. H. Spigel, G. W. Switzer, S. Tulaczyk and T. J. Vick-Majors, 2013. A microbiologically clean strategy for access to the Whillans Ice Stream subglacial environment, *Antarctic Science*, **25**(5), 637–647, doi:10.1017/s0954102013000035.
- 2012 [2] Taylor, V. F., B. P. Jackson, **M. R. Siegfried**, J. Navratilova, K. A. Francesconi, J. Kirshtein and M. Voytek, 2012. Arsenic speciation in food chains from mid-Atlantic hydrothermal vents, *Environmental Chemistry*, **9**(2), 130–138, doi:10.1071/EN11134.
- 2011 [1] **Siegfried, M. R.**, R. L. Hawley and J. F. Burkhart, 2011. High-Resolution Ground-Based GPS Measurements Show Intercampaign Bias in ICESat Elevation Data Near Summit, Greenland, *IEEE Transactions on Geosciences and Remote Sensing*, **49**(10), 3393–3400, doi:10.1109/TGRS.2011.2127483.
- TECHNICAL REPORTS Smith, B., D. Hancock, K. Harbeck, L. Roberts, T. Neumann, K. Brunt, H. A. Fricker, A. Gardner, **M. R. Siegfried**, S. Adusumilli, B. Csathoó, N. Holschuh, J. Nilsson and F. Paolo, 2021. Algorithm Theoretical Basis Document (ATBD) for Land Ice Along-Track Height Product (ATL06), Release 004, *NASA Goddard Space Flight Center Technical Reference*.
- OTHER PUBLICATIONS Snow, T., C. Holdgraf, W. Sauthoff*, J. Scheick, E. Abrahams, J. Millstein*, S. Bhangarj, C. Boettigerk, J. Colliander, L. A. Lopez Espinosa, E. Holmes, J. H. Kennedy, J. S.

Lowndes, A. I. Mandel, F. Pérez, J-P Swinski, A. Teucher and **M. R. Siegfried**, in review. A path to better science through co-creation and open infrastructure, *Proceedings of the National Academy of Sciences (Commentary)*.

Sauthoff, W., T. Snow, J. D. Millstein*, J. Colliander and **M. R. Siegfried**, 2024. Democratizing Science in the Cloud. *EOS: Earth & Space Science News*, **105**, doi:10.1029/2024EO240385.

Siegfried, M. R., and C. D. Gustafson[^], 2022. Scientists in Antarctica discover a vast, salty groundwater system under the ice sheet – with implications for sea level rise, *The Conversation*, <https://theconversation.com/scientists-in-antarctica-discover-a-vast-salty-groundwater-system-under-the-ice-sheet-with-implications-for-sea-level-rise-182506>.

Padman, L., and **M. R. Siegfried**, 2018. Ocean Tides Affect Ice Loss from Large Polar Ice Sheets, *EOS: Earth & Space Science News*, **99**, doi:10.1029/2018EO092835.

Fricker, H. A., F. Paolo, **M. R. Siegfried**, and S. Adusumilli, 2018. Short-term changes in Antarctica’s ice shelves are key to predicting their long-term fate, *The Conversation*, <https://theconversation.com/short-term-changes-in-antarcticas-ice-shelves-are-key-to-predicting-their-long-term-fate-95207>.

DATA SETS

Siegfried, M. R., R. A. Venturelli, M. O. Patterson, W. Arnuk, T. D. Campbell, C. D. Gustafson, A. B. Michaud, B. K. Galton-Fenzi, M. B. Hausner, S. N. Holzschuh, B. Huber, K. D. Mankoff, D. M. Schroeder, P. T. Summers, S. Tyler, S. P. Carter, H. A. Fricker, D. M. Harwood, A. Leventer, B. E. Rosenheim, M. L. Skidmore, J. C. Priscu and T. S. S. Team, 2023. Data for Siegfried*, Venturelli*, et al., 2023, *Geology*, Zenodo, doi:10.5281/ZENODO.7597019.

Smith, B. E., H. A. Fricker, A. Gardner, **M. R. Siegfried**, S. Adusumilli, B. M. Csathó, N. Holschuh, J. Nilsson, F. S. Paolo and the ICESat-2 Science Team, 2021. ATLAS/ICESat-2 L3A Land Ice Height, Version 4, NASA National Snow and Ice Data Center Distributed Active Archive Center, Boulder, Colorado USA, doi:10.5067/ATLAS/ATL06.004.

PUBLISHED SOFTWARE

Siegfried, M. R., W. Arnuk, R. A. Venturelli and M. O. Patterson, 2023. SiegVent2023-Geology code repository (Version 1.1), Zenodo, doi:10.5281/ZENODO.7605994.

Siegfried, M. R., 2021. mrsiegfried/Siegfried2021-GRL: Initial release with acceptance (Version 1.0), Zenodo, doi:10.5281/ZENODO.4914107.

Arendt, A., B. Smith, D. Shean, A. Steiker, Alek Petty, F. Perez, S. Henderson, F. Paolo, J. Nilsson, M. Becker, Susheel Adusumilli, D. Shapero, B. Wallin, J. Meyer, A. Schweiger, S. Dickinson, N. Hoshuh, **M. R. Siegfried** and T. Neumann, 2019. ICESAT-2HackWeek/ICESat2_hackweek_tutorials (Version 0.1), Zenodo, doi:10.5281/ZENODO.3360994.

EXPANDED ABSTRACTS

* indicates student or postdoctoral advisee

- [12] *Abrahams, E., T. Snow*, F. Perez and **M. R. Siegfried**, 2024. A Scalable Data Augmentation Strategy Enhancing Tile-Position Invariance in Small Object Segmentation for Earth Observation, *International Conference on Learning Representations: Machine Learning 4 Remote Sensing (ICLR: ML4RS 2024)*, doi:10.48550/arXiv.2404.10927.
- [11] *Byrne, D., J. Klemm*, **M. R. Siegfried**, D. Castelletti, R. Michaelides* and D. M. Schroeder, 2024. Radar Altimetry Simulation to Identify Sub-Footprint Ice-Sheet Surface Change, *IGARSS 2024: 2024 IEEE International Geoscience and Remote Sensing Symposium*, doi:10.1109/IGARSS53475.2024.10641847.
- [10] Medley, B., S. Bhushan, T. Black, T. Dixon, D. Felikson, A. Gardner, R. Michaelides, P. Milillo, J. Millstein*, A. Petty, D. Shean, **M. R. Siegfried**, B. Smith, T. Sutterley and T. Teisberg, 2024. Cryospheric Science Activities Supporting Development of

NASA's Surface Topography and Vegetation Observing System, *IGARSS 2024: 2024 IEEE International Geoscience and Remote Sensing Symposium*.

- [9] Michaelides, R. J., **M. R. Siegfried**, S. Batzli, J. A. Villegas Bravo, D. Losos and W. C. Straka III, 2024. Robust Wildfire Time Series Imaging with Spaceborne Interferometric Synthetic Aperture Radars, *IGARSS 2024: 2024 IEEE International Geoscience and Remote Sensing Symposium*.
- [8] *Sauthoff, W., **M. R. Siegfried** and B. E. Smith, 2024. Evolving Outlines of Antarctic Active Subglacial Lakes using an Image Processing Algorithm on Gridded Altimetry Data, *IGARSS 2024: 2024 IEEE International Geoscience and Remote Sensing Symposium*, doi:10.1109/IGARSS53475.2024.10642198.
- 2023 [7] Bradford, J. H., **M. R. Siegfried**, V. Follingstad*, K. Hughson, A. Routt, B. Schmidt, A. Kubas, E. Quartini, A. Mullen and A. Swidinsky, 2023. Mapping the internal structure Arctic pingos using ground-penetrating radar: Results from the Pingo Canadian Landmark, *Seventh International Conference on Engineering Geophysics*.
- [6] Bryant, M., E. Anderson, A. Borsa, C. Masteller, R. Michaelides*, **M. R. Siegfried** and A. Young, 2023. Integrating ICESat-2 elevation observation and satellite optical imagery to measure coastal topography and retreat rates on the Alaskan Beaufort Sea coast, *IGARSS 2023: 2023 IEEE International Geoscience and Remote Sensing Symposium*.
- [5] Michaelides, R. and **M. R. Siegfried**, 2023. Studying permafrost-wildfire interactions in the age of NISAR, *IGARSS 2023: 2023 IEEE International Geoscience and Remote Sensing Symposium*.
- 2021 [4] **Siegfried, M. R.**, D. M. Schroeder, W. Sauthoff* and B. E. Smith, 2021. Investigating a large subglacial lake drainage in East Antarctica with ice-penetrating radar, *SEG Annual Meeting* (invited contribution).
- [3] *Klemm, J. and **M. R. Siegfried**, 2021. Open Source Visualization for Radar Altimetry Waveforms, /textitIEEE International Symposium on Antenna Technology and Applied Electromagnetics.
- [2] Summers, P. T., D. M. Schroeder and **M. R. Siegfried**, 2021. Constraining ice sheet basal sliding and horizontal velocity profiles using a stationary phase sensitive radar sounder, *IGARSS 2021: 2021 IEEE International Geoscience and Remote Sensing Symposium*.
- 2020 [1] Bienert, N., D. M. Schroeder, S. T. Peters and **M. R. Siegfried**, 2020. Processing-based synchronization approach for bistatic glacial tomography, *IGARSS 2020: 2020 IEEE International Geoscience and Remote Sensing Symposium*.

Winner of the IEEE GRSS Symposium Prize Paper Award

MENTORING **Postdoctoral Scholars**

Shane Grigsby, 2019–2021

(post Mines: R&D Scientist, National Geospatial Intelligence Agency)

Roger Michaelides, 2020–2022

(post Mines: Asst. Professor, Washington University in St. Louis)

Tasha Snow, 2021–2024

(post Mines: Asst. Researcher, NASA Goddard/U. Maryland)

Benjamin Hills, 2023–2025

(post Mines: Senior Geophysicist, Vista Clara, Inc.)

Joanna Millstein, 2023–present

Graduate Students

Jared Klemm (PhD), Geophysics, 2020–2021

(post Mines: Software Engineer II, Atmospheric and Environmental Research)

Kayla Hubbard (MS-NT), Hydrologic Science & Engineering, 2020–2021

(post Mines: Science Assistant, Arctic Sciences Section, National Science Foundation)

Elena Savidge (PhD), Geophysics, 2020–2024
(post Mines: Trottier Space Institute Postdoctoral Fellow, McGill University)
 Wilson Sauthoff (PhD), Hydrologic Science & Engineering, 2020–present
 Hannah Verboncoeur (PhD), Geophysics, 2021–present
 Bailey Mullett (MS-NT), Hydrologic Science & Engineering, 2022–2024
(post Mines: Project Hydrogeologist, Flo Americas Ltd.)
 Gabriel Thomas (MS), Hydrologic Science & Engineering, 2022–2024
co-advised with Kamini Singha
 Rachel Willis(PhD), Geophysics, 2023–2025
 Zachary Katz (PhD), Geophysics, 2023–present
 Samara Omar (PhD), Geophysics, 2024–present
co-advised with Jeff Shragge
 Rohaiz Haris, Geophysics, 2024–present
 Marianna Marquardt, Geophysics, 2024–present

Undergraduate Research

Matt Oleszko, Geophysics, 2019–2021
(post-Mines step: Radar Processing Engineer, The Aerospace Corporation)
 Anna Valentine, Geophysics, 2020–2021
(post-Mines step: PhD student at Dartmouth College)
 Becca Prentice, Geophysics, 2020–2022
(post-Mines step: PhD student at Stanford University)
 Stephanie Holzschuh, Applied Math and Statistics, 2020–2021
(post-Mines step: Data Engineer at Chevron)
 Michael Field, Geophysics, 2021–2022
(post-Mines step: PhD student at University of Florida)
 Cash Koning, Geophysics, 2020–2023
(post-Mines step: Polar Engineer, Earthscope Consortium)
 Venezia Follingstad, Geophysics, 2021–2023
(post-Mines step: PhD student at University of Oregon)
 Ashleigh Miller, Geophysics, 2022–2023
(post-Mines step: PhD student at Georgia Tech)
 Mia Jungman, Geophysics, 2023–2024
 Duncan Byrne, Geophysics, 2023–2025
(post-Mines step: PhD student at University of Colorado, Boulder)
 Anastasia Horne, Applied Math & Statistics, 2023–2025
(post-Mines step: Research Mathematician, Army Corps of Engineers)
 Lucas Holt, Geophysics, 2024–2025
 Jack Logan, Geophysics, 2024–present

Senior Design

Hannah Haugen, 2021 *(post-Mines: M.S. student at U. Arizona)*
 Bailey Mullett, 2022 *(post-Mines: M.S. student at Colorado School of Mines)*
 Venezia Follingstad, 2022 *(post-Mines: PhD student at U. Oregon)*
 Cash Koning, 2022 *(post-Mines: Polar Engineer, Earthscope Consortium)*
 Dawn Lipfert, 2024 *(post-Mines: Geophysicist, Collier Geophysics)*

Visiting Students

Emma Pearce (PhD), University of Leeds, 2019
 Joanna Millstein (PhD), MIT, 2021–2023
 Ellie Abrahams (PhD), University of California Berkeley, 2022
 Eojin Lee (UG), Columbia University, 2022–2023
 Sawyer Kaarto (UG), Red Rocks Community College, 2022

Dissertation Committee Membership

Colin Beyers (2025–present) Mines, Department of Geophysics
 Joe Ruggiero (2025–present) Mines, Department of Geology & Geological Engineering

Jason Drebber (2024–present) Mines, Department of Geology & Geological Engineering
 Kate Hulse (2024–present) Mines, Department of Civil & Environmental Engineering
 Ellie Longar (2024–present) Mines, Department of Geology & Geological Engineering
 Ellie Miller (2024–present) Mines, Department of Geology & Geological Engineering
 Nicolas Sartore (2024–present) U. Wisconsin, Dept. of Atmospheric & Oceanic Sciences
 Isabelle Peter (2024–present) Mines, Department of Civil & Environmental Engineering
 Ryan Peterson (2024–present) Mines, Department of Applied Mathematics
 Nicholas Dorogy (2023–present) Mines, Department of Geophysics
 Ari Koshkin (2023–2025) Mines, Hydrologic Science & Engineering
 Ahmad Tourei (2023–2025) Mines, Hydrologic Science & Engineering
 Melody Zhang (2021–present) Mines, Department of Geology & Geological Engineering
 Devon Dunmire (2020–2022) U. Colorado Boulder, Atmospheric & Ocean Sciences
 Chloe Gustafson (2020) Columbia U., Lamont-Doherty Earth Observatory

Masters Thesis Committee Membership

Rishi Banerjee (2023–2024) U. Manitoba, Earth Observation Science

TEACHING EXPERIENCE

Colorado School of Mines, Golden, CO

Instructor of Record

GPGN486: Geophysics Field Camp	Summer 2026
GPGN470/570: Applications of Remote Sensing	Spring 2026
CSCI303: Data Science	Spring 2026
GPGN486: Geophysics Field Camp	Summer 2025
GPGN470/570: Applications of Remote Sensing	Spring 2025
GPGN573: Polar Cryosphere in the Earth System	Fall 2024
GPGN486: Geophysics Field Camp	Summer 2024
GPGN470/570: Applications of Remote Sensing	Spring 2024
CSCI303: Data Science	Spring 2024
GPGN486: Geophysics Field Camp	Summer 2023
GPGN470/570: Applications of Remote Sensing	Spring 2023
GPGN598b: Polar Cryosphere in the Earth System	Fall 2022
GPGN486: Geophysics Field Camp	Summer 2022
GPGN470/570: Applications of Remote Sensing	Spring 2022
GPGN599: Ice Dynamics at Whillans Ice Stream	Spring 2022
GPGN470/570: Applications of Remote Sensing	Spring 2021
GPGN101: Geophysics & Society	Spring 2021
GPGN599: Antarctic groundwater modeling	Spring 2021
GPGN470/570: Applications of Remote Sensing	Spring 2020
GPGN101: Geophysics & Society	Spring 2020
GPGN498A/C: Geophysical Remote Sensing	Spring 2019

Co-Instructor

GEGN584: Field Methods in Hydrology	Fall 2023
GEGN584: Field Methods in Hydrology	Fall 2022
GPGN498: Electrical & Electromagnetic Methods & Applications	Spring 2022
GPGN486: Geophysics Field Camp	Summer 2021
GPGN486: Geophysics Field Camp	Summer 2019
Cryospheric Science with ICESat-2 Hackweek 2019, U. Washington	July 2019

Scripps Institution of Oceanography, La Jolla, CA

Co-Instructor

SIO115: Ice and the Climate System	Winter 2017
GMT Workshop for geodynamics REU students	June 2016

Teaching Assistant

Remote Sensing

Spring 2013

Instructors: Dr. David Sandwell, Dr. Helen Fricker

Dartmouth College, Hanover, NH*Teaching Assistant*

Dartmouth College Field Program

Fall 2009

Glaciology, Quaternary Geology, Structure and Geologic Mapping

Instructors: Dr. Bob Hawley, Dr. Erich Osterberg, Dr. Meredith Kelly

Ecological Agriculture

Summer 2009

Instructors: Dr. Jill Mikucki, Dr. Sarah Smith

Glaciology

Spring 2009

Instructor: Dr. Robert Hawley

Polar Geobiology

Fall 2009

Instructor: Dr. Jill Mikucki

Introduction to Computer Science

Spring 2006

Instructor: Dr. Thomas Cormen

Laboratory Teaching Assistant

Mineralogy

Summer 2007

Instructor: Dr. Ed Meyer

Grader

Differential Equations

Winter 2008

INVITED
TALKS

Approaches and Capabilities for International Polar Year 5

National Academies' Exploring Key Research Topics for IPY5

20 May 2025

New insights into ice-sheet change from six years of high resolution ICESat-2 laser altimetry

AGU Fall Meeting

11 Dec. 2024

Past/ongoing en- and subglacial work: Glaciology

US Ice Drilling Program En- and Subglacial Access Working Group Meeting

8 Dec. 2024

Big Data, meet Long Data: Examining decadal-scale variability of ice-ocean-freshwater processes in Antarctica

Mines Research Council Seminar

13 Mar. 2024

Big Data, meet Long Data: Examining decadal-scale variability of ice-ocean-freshwater processes in Antarctica

Caltech Division of Geological and Planetary Sciences Seminar

4 Mar. 2024

Centering community at scientific meetings: 30 years of the West Antarctic Ice Sheet Workshop

AGU Fall Meeting 2023

11 Dec. 2023

Cryosphere@Mines

Finnish Ambassador Visit to Colorado School of Mines

13 Jun. 2023

Subglacial Secrets: What drilling holes through the Antarctic ice sheet can teach us about the past, present, and future of ice

Osher Lifelong Learning Institute, University of Denver

4 May 2023

Source to sink: Tracing freshwater beneath the Antarctic ice sheet

Colorado School of Mines Department of Geophysics Heiland Lecture

7 Mar. 2023

Technology at the coast: Probing for ice-water-ocean-Earth processes

*National Academies's Future Directions for Southern Ocean and Antarctic**Nearshore and Coastal Research Community Workshop*

9 Feb. 2023

Glaciology at Mines

Colorado School of Mines Student Society of Geophysicists

16 Sep. 2022

Glaciology at Mines

Tulane University Research Experiences for Undergraduates

15 Jul. 2022

Twelve years of exploring subglacial Antarctica <i>Dartmouth College Journeys</i>	18 Jun. 2022
Process2Paleo: Connecting modern observations to the geologic record to explore the life and death of a subglacial lake <i>Scripps Polar Hour</i>	28 Oct. 2021
Slippery when wet: Exploring the hydrosphere beneath the Antarctic ice sheet <i>Colorado State Antarctic Lecture Series</i>	19 Oct. 2021
Glaciology data volumes and data rates in Antarctica <i>2021 Antarctic Subsea Cable Workshop</i>	28 Jun. 2021
What lies beneath: Exploring the hydrosphere beneath the Antarctic ice sheet <i>Delaware County Institute of Science</i>	8 Feb. 2021
(Seminar on SALSA subglacial lake results) <i>British Antarctic Survey</i>	Jun. 2020
[seminar canceled due to COVID19] (Seminar on ICESat-2 results) <i>Newcastle University</i>	Jun. 2020
[fellowship delayed to COVID19; seminar canceled] (Seminar declined due to COVID) <i>Stanford Geophysics Seminar</i>	4 Jun. 2020
Antarctica at Depth: New observations of subglacial water beneath ice streams <i>CU Boulder INSTAAR Noon Seminar</i>	16 Mar. 2020
[canceled due to COVID19] U.S. work in the Ross Sea Sector <i>International Ross Sea Region Collaboration Workshop, Korea</i>	21 Jul. 2019
Antarctica at Depth: Drilling for Subglacial Access <i>U.S. Ice Drilling Program's School of Ice</i>	24 June 2019
SALSA – A Field Debrief <i>Stanford University Cryospheric Scientists</i>	12 Feb. 2019
Slippery When Wet: Dynamic subglacial hydrology and the Antarctic ice sheet <i>Department of Geosciences Research Seminar, Boise State University</i>	26 Apr. 2018
Building a “Long Data” perspective to examine decadal-scale variability in Antarctica <i>Geophysics Seminar, Colorado School of Mines</i>	4 Apr. 2018
Deep, Dark, and Wet: Dynamic subglacial hydrology in Antarctica <i>Earth & Planetary Science Seminar, Washington University in St. Louis</i>	1 Feb. 2018
Piecing together a “Long Data” perspective to examine Antarctic ice-sheet variability <i>Earth and Climate Seminar, University of Maine</i>	25 Oct. 2017
Piecing together a “Long Data” perspective in Antarctica to understand ice-sheet variability <i>SIO Research Seminar, Scripps Institution of Oceanography</i>	31 Aug. 2017
Subglacial hydrology, basal processes, and velocity transients in Antarctica <i>Ice Sheet System Model Workshop</i>	23 Jun. 2016
Antarctic subglacial hydrology: A review <i>IDPO Subglacial Access Working Group Workshop</i>	21 May 2016
Episodic hydrology, episodic ice streams: Unraveling the impact of active subglacial lakes in Antarctica <i>Earth Section Seminar, University of California, Santa Cruz</i>	10 May 2016
Unraveling the impact of dynamic subglacial lake drainage in Antarctica <i>Geophysics Seminar, Scripps Institution of Oceanography</i>	22 Apr. 2016
Planes, penguins, and cookies: Scientific outreach from Antarctica <i>GPS and the Cryosphere, 2016 UNAVCO Science Workshop</i>	29 Mar. 2016
Dynamic subglacial hydrology in Antarctica: timescales, evolution, and impacts <i>Geophysics Seminar, Stanford University</i>	1 Mar. 2016
Extending the episodic hydrology record across Antarctica <i>West Antarctic Ice Sheet Workshop</i>	19 Sep. 2015

Peering under the ice to the Antarctic Slip 'n' Slide

UCSD Extension: Environmental Leadership & Sustainability

06 Jul. 2015

Investigating coupled subglacial hydrologic and ice dynamic evolution using ground- and satellite-based observations

Center for Climate Sciences Research Seminar, NASA-JPL

19 Jun. 2015

Using CryoSat-2 to retrieve dynamic surface changes (& observations of stick-slip motion)

IGPP Geodesy Seminar, Scripps Institution of Oceanography

22 Apr. 2015

A decade of progress observing and modeling Antarctic subglacial water systems

Subglacial Antarctic lake exploration: first results and future plans, The Royal Society

[H. Fricker invited; M.R.S. presented]

30 Mar. 2015

Understanding the Antarctic Slip 'n' Slide

Scripps Donor Brunch, Scripps Institution of Oceanography

1 Mar. 2015

Highlights and reflections on The Workshop and beyond

CMBC Brown Bag, Scripps Institution of Oceanography

3 Jun. 2014

Instability of the Amundsen Sea Embayment

Climate Journal Club, Scripps Institution of Oceanography

22 May 2014

WISSARD: Progress, Pictures, and Prospects

Scripps Polar Seminar, Scripps Institution of Oceanography

4 Jun. 2013

GLAS accuracy and elevation change at Summit, Greenland

Geolunch Brown Bag Series, Dartmouth College

11 May 2010

PROFESSIONAL **Committee Service**

SERVICE

- NASA SWOT Mission, Science Team, Member, 2024–present
- EDGE Mission Science Team (in Phase A of NASA's ESE competition), 2023–present
- Ice Drilling Program Science Advisory Board, Member, 2023–present
- NASA Surface Topography and Vegetation Mission Incubation, Science Team, 2023–2025
- NASA ICESat-2 Mission, Science Team, Member, 2021–present
- IRIS/UNAVCO, Polar Science Technology, Co-Chair, 2021–present
- IRIS/UNAVCO, Polar Science Technology Committee, Member, 2018–2020
- NASA IceBridge Mission, Science Team, Member, 2017–2020
- American Meteorological Society Committee on Polar Meteorology and Oceanography, Member, Jan. 2017–2020
- OpenAltimetry User Working Group, Member, Jun. 2017–present
- NASA ICESat-2 Science Definition Team, Participant, 2011–2020

Editorial Service

- Scientific Editor, *Journal of Glaciology*, 2019–present
- Section Editor for Cryosphere, *Encyclopedia of Ocean Sciences*, 3rd Ed.

Referee Service

- Journals: *Nature*, *Nature Geoscience*, *Nature Communications*, *Geophysical Research Letters*, *Journal of Glaciology*, *Annals of Glaciology*, *The Cryosphere*, *IEEE Transactions on Geoscience and Remote Sensing*, *IEEE Geoscience and Remote Sensing Letters*, *Remote Sensing of Environment*, *International Journal of Remote Sensing*, *Journal of Applied Remote Sensing*
- Proposals: *NASA Earth Science* (panel member, *ad hoc*), *NASA Earth Science Data Systems* (panel member), *NASA Planetary Science* (panel member), *NASA Science Mission Directorate* (panel member), *NSF Antarctic Sciences* (*ad hoc*), *Royal Society of New Zealand* (*ad hoc*), *UK Natural Environment Research Council* (*ad hoc*), *Netherlands Space Office* (*ad hoc*)

Conference Service

- Organizing Committee: *West Antarctic Ice Sheet Workshop*, 2019–present.
- Local Organizing Committee: *International Symposium on Five Decades of Radioglaciology*

- (International Glaciological Society, Stanford, CA, 24–28 Jun. 2019); *International Symposium on Interactions of Ice Sheet and Glaciers with the Ocean* (IGS/FRISP, La Jolla, CA, 10–15 Jul. 2016); *Ice Sheet System Model Workshop* (JPL/ NASA, La Jolla, CA, May 2016), *Scripps Student Symposium* (SIO, La Jolla, CA, 24 Sep. 2015); *ICESat-2 Science Definition Team Meeting* (NASA, La Jolla, CA, 24–25 Feb. 2015); *Sea Level Change Team PI Meeting* (NASA, La Jolla, CA, 14–16 Oct. 2014), *West Antarctic Ice Sheet Workshop* (NSF/NASA, Julian, CA, 24–27 Sep. 2014); *International Symposium on Interactions of Ice Sheet and Glaciers with the Ocean* (IGS/FRISP, La Jolla, CA 5–10 Jun. 2011)
- Session Chair: *Archives and Observations From Sub-Ice Environments* (AGU Fall Meeting 2021, 2022, 2023, 2024); *Sub-Ice-Sheet and Sub-Ice-Shelf Environments: Bridging the Gap Between Modern Observations and Geologic Records* (AGU Fall Meeting 2019, 2020); *Cryosphere/Sea-Level* (2018 UNAVCO Science Workshop); *Advances in understanding processes at the beds of glaciers and ice sheets* (AGU Fall Meeting 2015, 2016, 2017); *IgniteIGS—Early career perspectives on the future of ice-ocean research* (IGS La Jolla 2016); *Greenland Run-off* (IGS La Jolla 2016)
 - Judging: *Flash Freeze Cryosphere Innovation Award for Students* (AGU Fall Meeting 2017); *Outstanding Student Presentation Award* (AGU Fall Meeting 2017)

White Papers

- *CryoCloud: Accelerating Discovery for NASA Cryosphere Communities with Open-Cloud Infrastructure*, submitted to NASA NNH23ZDA005L: Request for Information: Scientific Data and Computing Architecture to Support Open Science, 2023. [available [here](#)]
- *2021 Antarctic Subsea Cable Workshop Report: High-Speed Connectivity Needs to Advance US Antarctic Science*, submitted to National Science Foundation Office of Polar Programs, 2021.
- *Dive, Dive, Dive: Accessing the Subsurface of Ocean Worlds*, submitted to the NASA Planetary Science Decadal Survey, 2020.
- *Early Career Community Vision For Future Magnetotelluric Facility*, submitted to the National Science Foundation in preparation for a competition for a future unified geophysical facility, 2020.
- *An Early Career Investigator Community Vision for the Future NSF Geophysical Facility: Instrumentation Services Needs*, submitted to the National Science Foundation in preparation for a competition for a future unified geophysical facility, 2020.
- *Assessment of East Antarctic Ice Sheet sensitivity to warming and its potential for contributions to sea level rise*, submitted to U.S. Ice Drilling Program Subglacial Access Working Group, 2019.
- *Access Drilling Priorities in the Ross Ice Shelf Region*, submitted to U.S. Ice Drilling Program Subglacial Access Working Group, 2019.
- *How much, how fast? A decadal science plan quantifying the rate of change of the West Antarctic Ice Sheet now and in the future*, submitted to NSF Office of Polar Programs, 2016.

UNIVERSITY SERVICE

Colorado School of Mines

Mines Finance, Administration, and Operations Roundtable, 2025–present
 Mines University Handbook Committee, 2024–present
 Mines Geophysics Undergraduate Advisory Committee, 2022–present (chair, 2025–present)
 Mines Geophysics Field Camp Director, 2021–present
 Mines Geophysics ReImagine Committee, 2021–present
 Mines Geophysics Safety Committee, 2021–present
 Geophysics GP100@100 Fundraising , 2021–present
 Geophysics Diversity, Inclusion, & Access Committee, committee chair, 2019–2025
 Mines Diversity Council, 2019–2025
 Mines Field Session Compensation Task Force, 2022, 2025

Geophysics Graduate Advisory Committee, member, 2019–2022

Faculty Search Committee: Computational Science & Data Analytics Cluster, 2020–21

Applied Data Science & Machine Learning, subcommittee chair

Computation Hydrology, subcommittee member

#idigmines, department representative, 2019–2020

Faculty Search Committee: Geophysical Data Science, 2019–2020

Stanford University

Postdoctoral Scholar Committee for School of Earth Strategic Plan, member, 2017

Scripps Institution of Oceanography

Leadership Committee for Peer Mentor Program, founding student member, 2014–2016

Scripps Polar Seminar, lead organizer, 2013–2016

Scripps Earth Section Seminar, co-organizer 2012–2013

Dartmouth College

Faculty Search Committee: Geomorphology, student representative, 2008

Faculty Search Committee: Remote Sensing student representative, 2007

SIGNIFICANT FIELD EXPERIENCE	Pingo Canadian Landmark, Surface Geophysics	2023
	<i>Mines Lead</i>	
	Alaskan North Slope, Surface Geophysics	2021
	<i>Mines Lead</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2019–2020
	<i>Expedition Lead, Field Medic</i>	
	Greenland, Airborne Geophysics (Operation IceBridge)	2019
	<i>Mission Science Team member visit</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2018–2019
	<i>Expedition Lead, Field Medic</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2017–2018
	<i>Expedition Lead, Field Medic</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2016–2017
	<i>Expedition Lead, Field Medic</i>	
	Ross Ice Shelf, Antarctica, Airborne Geophysics	2015
	<i>Flight Scientist, Data Engineer</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2014–2015
	<i>Expedition Lead, Field Medic</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2013–2014
	<i>GPS Team Leader, Field Medic</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2012–2013
	<i>Surface Geophysics Team Leader, Field Medic</i>	
	Whillans Ice Plain, West Antarctica, Surface Geophysics	2011–2012
	Northern New Mexico, Southern Colorado, Geology and Geomorphology	2010
	<i>Field Trip Organizer and Leader</i>	
	Cherryfield, Maine, Fluvial Geomorphology & Riparian Habitat Surveying	2009
	Banff National Park, Alberta, Canada, Glaciology	2008
	Montana, Idaho, Eastern Washington, Geology	2008
	Ischia Island, Italy, in situ Geochemical Analysis	2008
	Puerto Rico, Soil and Water Sampling	2007
	Western United States, Dartmouth Earth Sciences Field Camp	2006
	Hawaii, Volcanology and Remote Sensing	2006
HONORS AND AWARDS	Colorado School of Mines	
	Diversity Progress Report President's Choice Award, 2023	

Mines Research Council's Excellence in Research Award (Junior Faculty), 2022–2023
 Mines Earth & Society Programs Outstanding Assistant Professor Award, 2022–2023
 University Public Policy Fellow, inaugural cohort, 2022–2023
 Outstanding Mines Faculty Award, 2021–2022
 Department of Geophysics T.K. Young Geophysics Leadership Award, 2021

National Science Foundation

Mentor for NSF-OPP Postdoctoral Research Fellow, 2023
 NSF CAREER Award recipient, 2022
 Mentor for NSF Graduate Research Fellowship Program recipient (H. Verboncoeur), 2022

National Aeronautics and Space Administration

Mentor for NASA FINESST Graduate Fellowship Program recipient (Z. Katz), 2025
 Robert H. Goddard Award as part of the Operation IceBridge Science Team, 2020
 Group Achievement Award as part of the ICESat-2 Mission Science Team, 2020

National Sciences and Engineering Research Council of Canada

Mentor for NSERC Graduate Scholarship–Doctoral Recipient (E. Savidge), 2021

American Geophysical Union

Editors' Citation for Excellence in Refereeing, Geophysical Research Letters, 2019

West Antarctic Ice Sheet Workshop

Mentor for Best Student Presentation recipient (H. Verboncoeur), 2021
 Best Student Presentation recipient, 2013

Scripps Institution of Oceanography

Student Video Challenge award winner, 2014
 Director's Cabinet Quarterly Meeting invited presenter, May 2014

Pontifical Academy of Sciences/Pontifical Academy of Social Sciences

Sustainable Humanity, Sustainable Nature: Our Responsibility
 Joint Workshop invited observer, May 2014

United States Congress

Antarctic Service Medal recipient, 2012

Dartmouth College

NASA Space Grant Graduate Student Award, 2010
 Assistant Curator for Dana Collection of Minerals, 2007–2008

PROFESSIONAL American Geophysical Union, 2008–present

MEMBERSHIPS International Glaciological Society, 2010–present

Society for Advancement of Chicanos/Hispanics and Native Americans in Science
 2019–present

Institute of Electrical and Electronics Engineers, 2020–present

American Meteorological Society, 2017–2019

Sigma Xi, 2023–present