

Christine Smith Siddoway

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Education

- B.A. Carleton College, Northfield, Minnesota, 1984
- M.Sc. University of Arizona, 1989
- Ph.D. University of California-Santa Barbara, 1995

Current Position

- Professor of Geology 2009 to present

Honors

- Thomas M. McKee Professor in the Natural Sciences, Colorado College, 2016-19.
- Fellow, Geological Society of America, elected 2009.
- John D. and Catherine T. MacArthur Assistant Professor, Colorado College, 1998-2000.
- Fulbright International Post-doctoral Fellow, Università di Siena [Italy], 1995-96.
- Antarctic Service Medal, 1993.

Research metrics [Research Gate](#) [Google Scholar](#) [OrCID iD](#)

Media coverage: [YouTube](#) [Science News](#) [Nature Careers](#) [ArsTechnica](#) [Wikipedia](#)

Current Research

- Ice sheet erosional Interaction with Hot geotherm ([ICL-Hot](#)) in West Antarctica, NSF 1917176.
- IODP379 Amundsen Sea West Antarctic Ice Sheet History, Subaward of OCE 14-50528, LDEO, Columbia University.
- [Testing the linchpin of WAIS collapse](#) in Plio - Pleistocene and Late Pliocene strata of Resolution Drift, Amundsen Sea, Antarctica, NSF 1939146.
- A systems approach to understanding the Ross Ocean and ice Shelf Environment, and Tectonic setting Through Aerogeophysical surveys and modeling [[ROSETTA-Ice](#)].
- Cryogenian paleoenvironments of Colorado and relation to the Great Unconformity.

Selected Publications, 2010 to present

- Siddoway, C., The Geology of West Antarctica, in press, in Kleinschmidt, G., ed., 2020
Geology of the Antarctic Continent (Chap. III, invited). Stuttgart: *Gebrüder Borntraeger Verlagsbuchhandlung*
- Flowers, R. M., Macdonald, FA., Siddoway, C.S., & Havranek, R., Diachronous 2020
development of the Great Unconformity prior to Snowball Earth, Proceedings of the National Academy of Sciences, doi: [10.1073/pnas.1913131117](https://doi.org/10.1073/pnas.1913131117).
- Jordan, T.A., Riley, T.R. and Siddoway, C., Geology of West Antarctica, Nature 2020
Reviews Earth and Environment, 10.1038/s43017-019-0013-6, <https://rdcu.be/b0OL8>.
- Siddoway, C. *et al.*, Basement-hosted sand injectites: Use of field examples to advance 2019
understanding of hydrocarbon reservoirs in fractured crystalline basement rocks, in Geological Society of London Special Publication 493, doi: 10.1144/SP493-2018-140.

- Tinto, K., Padman, L., Siddoway, C., and 17 others, Ross Ice Shelf response to climate driven by the tectonic imprint on seafloor bathymetry, *Nature Geoscience*, doi: 10.1038/s41561-019-0370-2. 2019
- Colleoni, F., De Santis, L., Siddoway, C. & 5 others, Spatio-temporal variability of processes across Antarctic ice-bed-ocean interfaces, *Nature Communications*, doi: 10.1038/s41467-018-04583-0, <https://rdcu.be/ZLBl> . 2018
- Basement-hosted sandstone injectites of Colorado: A vestige of the Neoproterozoic revealed through detrital zircon analysis, *Lithosphere*, v. 6, p. 403-408, [Media synopsis](#) 2014
- Mid-Cretaceous oblique rifting of West Antarctica: emplacement and rapid cooling of the Fosdick Mountains migmatite-cored gneiss dome, *Lithos*, [10.1016/j.lithos.2015.07.005](https://doi.org/10.1016/j.lithos.2015.07.005) 2015
- Anatectic reworking and differentiation of continental crust along the active margin of Gondwana: a zircon Hf–O perspective from West Antarctica, Geological Society of London Special Publication, doi: 10.1144/SP383.7. 2013
- Microplate motion, *Nature Geoscience*, doi:10.1038/ngeo835. 2010

Other co-Authoring Publications

- Single-crystal hematite (U-Th)/He dates and fluid inclusions document widespread Cryogenian sand injection in crystalline basement, by Jensen, J., Siddoway, C., Reiners, P., Ault, A. & Steele-McInnis, M., *Earth and Planetary Science Letters*, doi: 10.1016/j.epsl.2018.08.021. 2018
- Geologic slip rate estimates for the Alpine Fault at Maruia River (Calf Paddock), New Zealand, by Langridge et al., *NZ Journal of Geology & Geophysics*, 10.1080/00288306.2016.1275707. 2017
- From source to sink: Petrogenesis of Cretaceous anatectic granites from the Fosdick migmatite–granite complex, West Antarctica, by Brown *et al.*, *J. Petrology*, <https://doi.org/10.1093/petrology/egw039>. 2016
- Paleozoic evolution of West Marie Byrd Land, West Antarctica: Geological Society of America Bulletin, doi:10.1130/B31136.1, by Yakymchuk et al., *GSA Bulletin*, [dx.doi.org/10.1016/j.gr.2012.08.002](https://doi.org/10.1016/j.gr.2012.08.002). 2015
- Crustal Structure of the Bighorn Mountains Region: Precambrian Influence on Laramide Shortening and Uplift, by Worthington et al., *Tectonics*, doi:10.1002/2015TC003840. 2015
- Geological Heritage beyond Natural Spaces: The Red Rocks Amphitheatre (Morrison, Colorado, U.S.A.), an example of syncretism between Urban Development and Geoconservation, by Carreras, J., Druguet, E., & Siddoway, C., *GeoHeritage Journal* (Springer Verlag), doi: 10.1007/s12371-012-0062-4. 2012
- Organizing Melt Flow Through the Crust, by Brown, M., Korhonen, F.J. & Siddoway, C.S., Mineralogical Association of Canada, *Elements*, v. 7, 261–266. 2011
- Tectonic implications of a Proterozoic mid-crustal section, Wet Mountains, Colorado, U.S.A., by Jones et al., *Lithosphere*, v. 2, p. 119-135, doi:10.1130/L78.1. 2010
- Oblique dilation, melt transfer, and gneiss dome emplacement, by McFadden R. *et al.*, *Geology*, doi: 10.1130/G30493.1. 2010

Extramural Research Grants – current and over past 5 years

- Collaborative Research: Advancing an Integrated System Understanding of Ross Ice Shelf Evolution Over the Past Two Millennia with Data Analysis and Modeling *pending*
- Collaborative Research: Ice sheet erosional Interaction with Hot geotherm (ICI-Hot) in West Antarctica, \$199,793, 36 mo., NSF-Antarctic Geology. 2019-22
- Collaborative Research: Testing the linchpin of WAIS collapse with diatoms and IRD in Pleistocene and Late Pliocene strata of the Resolution Drift, Amundsen Sea 2020-22
- IODP 379 Amundsen Sea West Antarctic Ice Sheet History, \$67,390, Subaward GG009393 FROM OCE 14-50528, LDEO, Columbia University. 2018-19
- Collaborative Research: A systems approach to understanding the Ross Ocean and ice Shelf Environment, and Tectonic setting Through Aerogeophysical surveys and modeling (ROSETTA-ICE), \$ 155,138, 36 mo., NSF-AISS-1443497. 2015-19

Invited academic lectures – a selection from the past 5 years

- Café Scientifique – UC Colorado Springs, Tavakaiv Quartzite: An uncommon rock record of ‘Snowball Earth’ times, on Pikes Peak Nov. 12, 2019
- Lamont-Doherty Earth Observatory, Subglacial geology and its influence on icesheet origins and processes, West Antarctica Nov. 6, 2019
- University of Minnesota, A “rosetta stone” for Antarctic tectonics: New gravity and magnetics data for the Ross Ice Shelf region Oct. 4, 2018
- Geol. Society of America K-12 Earth Science Teachers Workshop, 2018, On the trail of Tavakaiv Quartzite: Colorado's newest/oldest sedimentary formation (a scientific research real roller coaster!) Aug. 1- 2, 2018
- Colorado State University, Ross Ice Shelf, Antarctica: Airborne Geophysical Data for Bathymetry, Crustal Structure and sub-Shelf Ocean Circulation Nov. 2, 2017
- A hematite (U-Th)/He minimum age for Cryogenian Tava sandstone, Colorado, and variations in detrital zircon provenance that illuminate the paleogeography of the region [GSA Annual mtg] Sept. 28, 2016
- Laurentia paleogeography illuminated by detrital zircon age spectra from Neoproterozoic sandstones in Colorado [New Mexico Tech] September 2, 2015

Research Positions, past 10 years

- Shipboard Scientist, [IODP 379](#) Amundsen Sea. Spring, 2019
- Research visitor, University of Wisconsin Spring, 2017
- Visiting scientist, Universita di Aldo Morro di Bari, (Italy) Fall, 2016
- Principal investigator, U.S. Antarctic Program/NSF (7 awards) 1996 to present
- Principal investigator, NSF EarthScope program 2010 - 2013

Courses taught at present

- Structural Geology, GY315
- Field Analysis of Geological Structures, GY316
- Introduction to Geodesign, GY250/EV260/AS210
- Regional Studies capstone, GY445 [e.g. Oaxaca, New Zealand, California, Scotland]
- Physical Geology, GY140 [taught annually]
- Undergraduate research mentoring, GY405 (diverse topics & methods)

Affiliations/Memberships

- Geological Society of America, elected Fellow in 2009. 1984 -
- American Geophysical Union 1986 -
- Association of Women Geologists 1996 -
- Rocky Mountain Association of Geologists 2009 -

Research Interests

- Tectonic development of West Antarctica and New Zealand within Gondwana
- Migmatites and the role of melt in crustal deformation
- Rocky Mountains geological structures, with a current emphasis on Neoproterozoic fault initiation
- GIS for Earth Sciences investigation for solutions for Society and Environment, including Geodesign
- Proterozoic geology of western North America
- Consequences of catastrophic geological events upon past civilizations
- Geodesign as a platform for undergraduate geospatial/urban environment preparation

Academic / Professional Service

Colorado College

- 2020-23 Chair, Geology Department (3 year term).
- 2019-20 Natural Sciences Division Executive Committee.
- 2007-10 Chair, Geology Department (3 year term).

Leadership, Professional Organizations and Polar Research

- 2016-19 Fellowships & Membership Committee; Penrose / Thompson Field Forums Committee, Geological Society of America
- 2000 - National Science Foundation proposal review; Antarctic Earth Science panel (2015)
- 2012-14 Joint Technical Program Committee, Geological Society of America. Representative for Structural Geology and Tectonics Division for 125th Anniversary meeting of the GSA in Denver CO.
- 2005-13 External member, PhD committees of Jaquie Baughman & Cailey Condit, U.Colorado, Chris Yakymchuk, U. Maryland; Rory McFadden, Univ. Minnesota; Jamie Levine, Univ. Texas.
- 2009-12 Associate Editor, Geological Society of America Bulletin (3-year term).

Current Collaborators

- Robin Bell, Lamont Doherty Earth Institute, Columbia University
- Andrea Brogi, Università di Aldo Moro di Bari, Italy
- Aaron Cavosie, Curtin University, West Australia
- Florence Colleoni, Istituto Nazionale di Oceanografia Sperimentale, Italy
- Karsten Gohl, Alfred Wegener Institute, Germany
- Keiji Horikawa, University of Toyama, Japan
- Nels Iverson, New Mexico Tech
- Domenico Liotta, Università di Aldo Moro di Bari, Italy
- Laurie Padman, Earth Space Research
- Giuseppe Palladino, University of Aberdeen, Scotland
- Reed Scherer, Northern Illinois University
- Christian Teyssier, University of Minnesota
- Basil Tikoff, University of Wisconsin
- Kirsty Tinto, Lamont Doherty Earth Institute, Columbia University
- Stuart Thomson, University of Arizona
- Julia Wellner, University of Houston