

# 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

## Positions Held

- Professor of Geology 2009 to present
- Chair, Department of Geology, Colorado College 2007 - 2010
- Associate Professor of Geology, Colorado College 2001 - 2007
- Visiting Scientist, Lamont-Doherty Earth Observatory, Columbia Univ. 2006
- Visiting Professor, Dept. Geosciences, University of Minnesota 2002 - 2003
- Assistant Professor, Colorado College 1996 - 2001

## 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.
- Antarctic Service Medal, 2003.
- Fulbright International Post-doctoral Fellow, Università di Siena [ Italy ], 1995-96.

## Current Research

- 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, 48 mo. (Antarctic Integrated Systems Science). With R. Bell, H. Fricker, K. Tinto, I. Das, L. Padman and S. Springer.
- SCAR Action Group on the Geological Mapping Update of Antarctica
- Basement-hosted Sand Injectites

## Selected Publications

- The Geology of West Antarctica, in Kleinschmidt, G., *ed.*, Geology of the Antarctic Continent, *Gebrüder Borntraeger Verlagsbuchhandlung*, Stuttgart: (*submitted, invited chapter*). 2017
- Basement-hosted sandstone injectites of Colorado: A vestige of the Neoproterozoic revealed through detrital zircon provenance analysis, *Lithosphere*, v. 6, p. 403-408, doi: 10.1130/L390.1, *see* <http://news.sciencemag.org/earth/2014/09/strange-formation-colorado-rockies-sheds-light-earths-past>. 2014

- Anatectic reworking and differentiation of continental crust along the active margin of Gondwana: a zircon Hf–O perspective from West Antarctica, *in* Harley et al. (eds.), Antarctica and Supercontinent Evolution, Geological Society of London Special Publication, doi: 10.1144/SP383.7. 2013
- Strata, structures and enduring enigmas: A 125th Anniversary appraisal of Colorado Sprir geology: Boulder, CO, Geological Society of America Field Guides, v.33, Chapter 13, doi:10.1130/2013.0033(13). 2013
- Microplate motion, *Nature Geoscience*, doi:10.1038/ngeo835. 2010
- Paleozoic tectonism on the East Gondwana margin: Evidence from SHRIMP U–Pb zircon geochronology of a migmatite–granite complex in West Antarctica, *Tectonophysics*, doi:10.1016/j.tecto.2009.04.021. 2009
- Tectonics of the West Antarctic rift system: New light on the history and dynamics of distributed intracontinental extension (invited paper) *in* Antarctica: A Keystone in a Changing World, Nat. Acad. Sciences, <https://pubs.er.usgs.gov/publication/ofr20071047KP09> 2008
- Kinematic history of the Marie Byrd Land terrane, West Antarctica: Direct evidence from Cretaceous mafic dykes, *in* Terrane Processes at the Margin of Gondwana, Geological Society of London, Special Publication 246, p. 417–438. 2005
- Ross Sea mylonites and the timing of intracontinental extension within the West Antarctic rift system, *Geology*, v. 32(1), p. 57–60. 2004

#### Research metrics and media coverage:

Research Gate, [http://www.researchgate.net/profile/Christine\\_Siddoway2/stats](http://www.researchgate.net/profile/Christine_Siddoway2/stats), or

Google Scholar, <http://scholar.google.com/citations?user=tkrqR1UAAAAJ=en>

Media links:

Nature careers <http://www.nature.com/naturejobs/science/articles/10.1038/nj7591-507a>

2015 Geodesign Summit, <http://video.esri.com/watch/4199/lightning-talk-geodesign-in-undergraduate-education>.

#### Co-Authored Publications, 2010 to present

- 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
- Mid-Cretaceous oblique rifting of West Antarctica: emplacement and rapid cooling of the Fosdick Mountains migmatite-cored gneiss dome, *by* McFadden R. *et al.*, 2015

*Lithos*, doi:10.1016/j.lithos.2015.07.005.

- 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. 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
- Relationship between syndeformational partial melting and crustal-scale magmatism and tectonism across the Wet Mountains, central Colorado, by Levine, J., Siddoway, C. and Mosher, S., *Lithosphere*, doi: 10.1130/L287.1. 2013
- 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
- Separating polymetamorphic events in the Fosdick migmatite–granite complex, West Antarctica, *J. Metamorphic Geology*, by Korhonen et al., 10.1111/j.1525-1314.2011.00961.x. 2011
- Cretaceous oblique extensional deformation and magma accumulation in the Fosdick Mountains migmatite-cored gneiss dome, West Antarctica, by McFadden R., C.S. Siddoway, C. Teyssier, & C.M. Fanning, *Tectonics*, 10.1029/2009TC002492. 2010
- 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
- Multiple generations of granite in the Fosdick Mountains, Marie Byrd Land, West Antarctica: Implications for polyphase intracrustal differentiation in a continental margin setting, by Korhonen, F.J. et al., *Journal of Petrology*, 51 (3) 627-670 2010
- Oblique dilation, melt transfer, and gneiss dome emplacement, by McFadden R. et al., *Geology*, doi: 10.1130/G30493.1. 2010

### Extramural Research Grants – past 7 years

- 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
- ACM Seminar in Advanced Interdisciplinary Learning (SAIL): “Mediterranean Trivium: Earth, Sea and Culture.” With S. Ashley & S. Thakur, \$106,000, 24 mo. 2013
- Collaborative research: Polyphase orogenesis and crustal differentiation in West Antarctica, \$145,260. With M. Brown, University of Maryland. NSF-OPP-0944600 2010

- RUI: Development of an on-line GIS repository of geological data from the Ford Ranges, Marie Byrd Land, and application to Cenozoic paleogeography reconstruction, \$49,545, 24 months. NSF-OPP-0944777. 2010
- Collaborative Research: Formation of basement-involved foreland arches: An Integrated structural and seismic EarthScope experiment, \$ 134,440. With M. Anderson (Colorado College), E. Erslev (U. Wyoming), Anne Sheehan (CU-Boulder), and Kate Miller (UTEP). NSF-EAR- 0843889. 2009

### Invited academic lectures – a selection from the past 7 years

- Ross Ice Shelf, Antarctica: Airborne Geophysical Data for Bathymetry, Crustal Structure and sub-Shelf Ocean Circulation [Colorado State University] 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
- A window on terrestrial paleo-environments of Rodinia, provided by sandstone injectites in Colorado [University of Colorado] April 8, 2015
- [Geodesign in undergraduate education: An optimal platform](#) for inquiry and action [Lightning Talk, Esri Geodesign Summit] 23 January 2015
- On the trail of Colorado's newest, oldest sedimentary rock formation: Eluded at every turn by the Tava sandstone [Denver Museum of Nature and Science] 17 December 2014
- Change from wrench to transtension along the Cretaceous Gondwana margin, recorded in isotopic characteristics of zircon in syntectonic anatectic granites in West Antarctica [Univ. Maryland] 13 April 2012
- A look at the structure of the Rocky Mountain foreland in Wyoming: EarthScope's Bighorns Arch Seismic Experiment [Univ. Calgary] April 8, 2011

### Research Positions

- Visiting scientist, Universita di Aldo Moro di Bari, (Italy) Fall, 2016
- Principal investigator, U.S. Antarctic Program/NSF (7 awards) 1996 to present
- Principal investigator, NSF EarthScope program 2010 - 2013
- Research School Visitor, Australian National University 2006, 2008
- Visiting Scientist, Lamont-Doherty Earth Observatory, Columbia University, New York 2006

- Geologist, National Antarctic Program of Italy research expedition 1996
- Geologist, German National Antarctic Expedition, GANOVEX VII 1992 - 1993

### Teaching Experience, 1996 to present

- Structural Geology, GY315
- Field Analysis of Geological Structures, GY316
- Introduction to Geodesign, GY250/EV260
- Digital Mapping : Applications of Earth Sciences for Society, GY400
- Rocks & Ruins: Natural Catastrophes & Mediterranean Culture, GY250
- Introductory Metamorphic Petrology, GY313
- Regional Studies capstone, GY445 [e.g. Oaxaca, New Zealand, California]
- Antarctica: Geological records of global change [GY100 and GY250]
- Physical Geology, GY140 [taught annually, once taught in Tuscany]
- Undergraduate research mentoring, GY405: (diverse topics & methods)

### Professional Development

- Member-at-Large, GSA Penrose Conferences and Thompson Field Forums Committee 2016-19
- Co-leader, Seminar on Academic Interdisciplinary Leadership, Associated Colleges of the Midwest [in Italy] 2013
- Joint Technical Program Committee, Geological Society of America 2011 - 13
- Associate Editor, Geological Society of America Bulletin 2009 - 12
- Director, Keck Geology Consortium Junior Research project in WY 2010 - 11
- Faculty member, Keck Geology Consortium Junior Research projects 1997 - 1998

### 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
- 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

- 2017-18 Design Review Board
- 2015-6 Chair, Advancement Advisory Committee
- 2012-13 Co-Chair, Strategic Planning Sub-Committee.
- 2011- 14 Chair, Academic Events Committee.
- 2007-10 Chair, Geology Department (3 year term).
- 2008-10 Committee on Assessment.
- 2003-05 Natural Sciences Division Executive Committee (Chair in 2004-05).

### Leadership, Professional Organizations and Polar Research

- 2016-19 Member-at-Large, GSA Penrose / Thompson Field Forums Committee
- 2015 Antarctic Earth Science review panel, National Science Foundation
- 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 Doctoral committee member for Cailey Condit, University of Colorado, Chris Yakymchuk, Univ. Maryland; Rory McFadden, Univ. Minnesota; Jamie Levine, Univ. Texas.
- 2009-12 Associate Editor, Geological Society of America Bulletin (3-year term).
- 2005-10 Integrated Solid Earth Science steering committee.
- 2005-2008 Co-organizer for ISES graduate summer schools at Colorado College.
- 1996 -- Peer review: GSA Bulletin, Geology, Tectonics, Tectonophysics, J. Metamorphic Geology, Earth & Planetary Science Letters, and NSF grant proposals.
- 2004-07 Organizing Committee, 10th Int'l Symposium on Antarctic Earth Sciences [ISAES X], Univ. California-Santa Barbara, [www.isaes2007.geol.ucsb.edu/Committees.html](http://www.isaes2007.geol.ucsb.edu/Committees.html).

## Current Collaborators

- Alexis Ault, Utah State University
- Robin Bell, Lamont Doherty Earth Institute, Columbia University
- Andrea Brogi, Universita di Aldo Morro di Bari, (Italy)
- Simon C. Cox, GNS Science, New Zealand
- Helen Fricker, Scripps Institution of Oceanography

- Domenico Liotta, Università di Aldo Moro di Bari, (Italy)
- Paul Morin, Polar Geospatial Center, University of Minnesota
- Giuseppe Palladino, University of Aberdeen, Scotland
- Laurence Padman, Earth and Space Research Institute, Oregon
- Peter Reiners, University of Arizona
- Christian Teyssier, University of Minnesota
- Basil Tikoff, University of Wisconsin
- Kirsty Tinto, Lamont Doherty Earth Institute, Columbia University
- Chris Yakymchuk, University of Waterloo, Canada