Dr. Rebecca M. Flowers
Curriculum Vitae

Professor of Earth Science, University of Colorado Boulder
Director, CU TRaIL (Thermochronology Research and Instrumentation Lab)
Department of Geological Sciences
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I develop and apply geochronology methods – radiometric dating techniques that can decipher the time records stored in rocks - and combine them with geological observations to address an array of Earth science problems. I and my research team have tackled questions ranging from the origins of the Great Unconformity and the Grand Canyon to the genesis of iron ores and diamond-bearing kimberlites to the impact histories of the Moon and Mars. I established and lead the Thermochronology Research and Instrumentation Lab (TRaIL), which has produced data for >260 scientists and students worldwide and generates thousands of analyses annually. Our lab is innovating new geochronology methods on a variety of minerals, including those used to date, locate, and understand the origins of critical mineral deposits. Our instrumentation includes an ASI Alphachron quadrupole He system, an Agilent 7900 quadrupole ICP-MS, an ESI NWR193UC excimer laser, a KLA ZETA-20 optical profiler, and a custom, in-house-built He extraction and measurement system.

EDUCATION

2005 **PhD,** Geology and Geochemistry, Massachusetts Institute of Technology
2000 **MSc,** Geology, University of Utah
1998 **BSc,** Geology, College of William & Mary

PROFESSIONAL EXPERIENCE

2020-present **Professor**, Dept of Geological Sciences, University of Colorado Boulder
2014-2020 **Associate Professor**, Dept of Geological Sciences, University of Colorado Boulder
2016-2017 **Visiting Professor**, Dept of Geosciences, University of Tübingen, Germany
2007-2014 **Assistant Professor**, Dept of Geological Sciences, University of Colorado Boulder
2005-2007 **Postdoctoral Scholar**, Division of Geological and Planetary Sciences, Caltech

AWARDS AND HONORS

2024 Fellow of the Geological Society of America
2022 Geosphere Exceptional Reviewer
2019 CU ASSETT Faculty Fellow
2018 CU Research & Innovation (RIO) Faculty Fellow
2017-2018 EarthScope Distinguished Speaker
2016-2017 Alexander von Humboldt Research Fellowship
2015-2016 Mineralogical Society of America Distinguished Lecturer
2010-2015 NSF CAREER award
1999-2003 NSF Graduate Research Fellowship

RESEARCH

PUBLICATIONS

denotes *graduate student advisee, **undergraduate student advisee, §postdoc mentee

Near Submission

Biddle, J.M., Sinoplu, O., Fosdick, J.C., Milanesio, D., Otamendi, J.E., Metcalf, J.R., **Flowers, R.M.**, Thomson, S.N., and Peterman, E.M., near submission, Testing monazite (U-Th)/He dating and multichronometer thermal history modeling to resolve Paleozoic basement exhumation in the Sierras Pampeanas, Argentina: *Chemical Geology*.

*Diaz, C.A., **Rollin, S.M., **Flowers, R.M.**, Crow, C.A., Metcalf, J.R., near submission, Non-Mercurian origin of ungrouped achondrite NWA 7325 from phosphate (U-Th)/He thermochronology: a test of planetary derivation: *Meteoritics and Planetary Science*.

In Review

*Diaz, C.A., **Flowers, R.M.,** Crow, C.A., Metcalf, J.R., Economos, R., and Erickson, T.M., in review, Phosphate (U-Th)/He thermochronology of Apollo 14 impact melt breccia 14311 reveals late-stage impact history: *Earth and Planetary Science Letters*.

Rosenberger, A.E., Long, S.P., **Flowers, R.M.,** Thomson, S.N., Metcalf, J.R., and Soignard, E., in review, Heat input during the Great Basin ignimbrite flareup did not drive the initial extension of the Nevadaplano: insights from the cooling history of the Northern Snake Range, Nevada: *Geosphere*.

Fuentes, A.J., §Courtney-Davies, L., **Flowers, R.M.,** Wieser, P., Gleeson, M. Adamson, M.N., Zhang, Y., and Swanson-Hysell, N.L., in review, Revealing detrital and authigenic hematite within sedimentary rocks through single grain U-Pb geochronology: *Geochemistry, Geophysics, Geosystems.*

*Peak, B.P. and **Flowers, R.M.,** in review, Detrital zircon double dating reconstructs the missing Grenville foreland and Great Unconformity exhumation: *Tectonics*.

Penserini, B.D., Morell, K.D., **Flowers, R.M.,** Yanites, B.J., and Kumar, A., in review, Quaternary slip along the Himalayan crest as a novel driver of drainage capture: *Tectonics*.

In Press

93. Henry, R.E., §Courtney-Davies, L., and **Flowers, R.M**., in press, Red beryl gemstone is a U-Pb geochronometer and implications for Be exploration: *Geology*.

92. Flowers, R.M., Macdonald, F.A., and Anderson R.S., in press, Snowball refrigeration of Earth's crust mimics glacial erosion: *Science*.

Published

91. Flowers, R.M. and Arrowsmith, J.R., 2026, Strategic micro-awards train the next generation and grow a cross-disciplinary scientific community: The AGeS program example: *Earth and Space Science*, 13, e2025EA004884, https://doi.org/10.1029/2025EA004884.

90. Metcalf, J.R. and **Flowers, R.M.,** 2026, Technical note: Design, construction, automation, and first-principles calibration of a low volume He measurement line: *Geochronology*, v. 8, p. 447-462, https://doi.org/10.5194/gchron-8-447-2026.

89. *Diaz, C.A., **Flowers, R.M.**, Crow, C.A., Metcalf, J.R., and Economos, R., 2026, Heterogeneous ejection temperatures recorded in a "low-shock" Martian meteorite by (U-Th)/He thermochronology and a high-pressure phosphate polymorph: *Earth and Planetary Science Letters*, v. 679, https://doi.org/10.1016/j.epsl.2026.119826.

88. Crow, C.A. Erickson, T.M., Economos, R., Lehman-Franco, K., Boyce, J.W., Richards, A.M.., *Diaz, C.A., **Flowers, R.M.,** Brounce, M., Schoene, B., and Benowitz, J.A., 2026, Three-body evidence of ca. 3.7 Ga to 3.2 Ga bombardment across the inner solar system: *Geology*, v. 54, no. 8, https://doi.org/10.1130/G54386.1.

87. McDermott, R., Kreiner, D.C., Jones III, J.V., Regan, S.P., Metcalf, J.R., **Flowers, R.M.**, 2026, Integrating detrital magnetite geochemistry and (U-Th)/He chronometry as a sediment provenance tool in geologic and metallogenic terranes: *Chemical Geology*, https://doi.org/10.1016/j.chemgeo.2026.123448.

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85. Flowers, R.M. and *Peak, B.P., 2025, Context matters: Modeling themochronologic data in geologic frameworks using the Great Unconformity as a case study: *Earth and Planetary Science Letters-Frontiers Article,* https://doi.org/10.1016/j.epsl.2024.119061.

84. *Zeigler, S.D., **Flowers, R.M.,** Pearson, D.G., §Courtney-Davies, L., Kjarsgaard, B.A, Richardson, S.H., **Berkhahn, K., Metcalf, J.R., and Cabral-Neto, I., 2025, Paired megacrystic zircon (U-Th)/He and U/Pb dating reveals kimberlite eruption ages, protracted emplacement histories, and insights into megacryst genesis: *Chemical Geology*, https://doi.org/10.1016/j.chemgeo.2025.123033.

83. Fuentes, A.J., §Courtney-Davies, L., **Flowers, R.M.,** Zhang, Y., and Swanson-Hysell, N.L., 2025, Evolution of iron formation to ore during Ediacaran to early Paleozoic tectonic stability: *Earth and Planetary Science Letters,* v. 671, https://doi.org/10.1016/j.epsl.2025.119621.

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68. Lamont, E.A., Sousa, F.J., Meigs, A.J., Jayangondaperumal, R., **Flowers, R.M.,** Anilkumar, A., Woodring, D., and Sobel, E.R., 2023, Accretion of the NW Himalayan foreland pre-dates Late Cenozoic climate change: Terra Nova, v. 35, p. 41-48, http://doi.org/10.1111/ter.12627.

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57. Flowers, R.M., Macdonald, F.A., Siddoway, C.S., and *Havranek, R., 2020, Diachronous development of Great Unconformities before Neoproterozoic Snowball Earth: *Proceedings of the National Academy of Sciences,* v. 117 (19), www.pnas.org/cgi/doi/10.1073/pnas.1913131117.

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24. Moser, D.E., Cupelli, C.L., Barker, I., **Flowers, R.M.,** Bowman, J.R, Wooden, J., and Hart, R.J., 2012, Reply to the discussion by Rajesh and Knoper on "New shock phenomena for dating and reconstruction of large impact basins revealed by zircon microstructural (EBSD, CL), U-Pb and (U-Th)/He analysis of the Vredefort dome": *Canadian Journal of Earth Sciences*,v. 49, p. 863-864, https://doi.org/10.1139/e2012-014.

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19. Flowers, R.M., 2010, The enigmatic rise of the Colorado Plateau, Research Focus: *Geology*, v. 38, p. 671-672, https://doi.org/10.1130/focus072010.1.

18. Flowers, R.M., Schmitt, A., and Grove, M., 2010, Decoupling of U-Pb dates from chemical and crystallographic domains in granulite-facies zircon: *Chemical Geology*, v. 270, p. 20-30, https://doi.org/10.1016/j.chemgeo.2009.11.002.

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13. Flowers, R.M., Wernicke, B.P., and Farley, K.A., 2008, Unroofing, incision and uplift history of the southwestern Colorado Plateau from apatite (U-Th)/He thermochronometry: *GSA Bulletin*, v. 120, p. 571-587, https://doi.org/10.1130/B26231.1.

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11. Flowers, R.M., Shuster, D.L., Wernicke, B.P., and Farley, K.A., 2007, Radiation damage control on apatite (U-Th)/He dates from the Grand Canyon region, Colorado Plateau: *Geology*, v. 35, p. 447-450, https://doi.org/10.1130/G23471A.1.

10. Flowers, R.M., Bowring, S.A., and Reiners, P.W., 2006, Low long-term erosion rates and extreme continental stability documented by ancient (U-Th)/He dates: *Geology*, v. 34, p. 925-928, https://doi.org/10.1130/G22670A.1.

9. Flowers, R.M., Bowring, S.A., and Williams, M.L., 2006, Timescales of high-pressure, high-temperature metamorphism and mafic dike anatexis, Snowbird tectonic zone, Canada: *Contributions to Mineralogy and Petrology*, v. 151, p. 558-581, https://doi.org/10.1007/s00410-006-0066-7.

8. Flowers, R.M., Mahan, K.H., Bowring, S.A., Williams, M.L., Pringle, M.S., and Hodges, K.V., 2006, Multistage exhumation and juxtaposition of lower continental crust in the western Canadian

Shield: Linking high-resolution U-Pb and $^{40}Ar/^{39}Ar$ thermochronometry with P-T-D paths: *Tectonics*, 25, https://doi.org/10.1029/2005TC001912.

7. Mahan, K.H., Williams, M.L., **Flowers, R.M.,** Jercinovic, M.J., Baldwin, J.A., and Bowring, S.A., 2006, Geochronological constraints on the Legs Lake shear zone with implications for regional exhumation of lower crust, western Churchill Province, Canadian Shield, Canada: *Contributions to Mineralogy and Petrology*, v. 152, p. 223-242, https://doi.org/10.1007/s00410-006-0106-3.

6. Shuster, D.L., **Flowers, R.M.**, and Farley, K.A., 2006, The influence of natural radiation damage on helium diffusion kinetics in apatite: *Earth and Planetary Science Letters*, v. 249, p. 148-161, https://doi.org/10.1016/j.epsl.2006.07.028.

5. Flowers, R.M., Bowring, S.A., Tulloch, A.J., and Klepeis, K.A., 2005, Tempo of burial and exhumation within the deep roots of a magmatic arc, Fiordland, New Zealand: *Geology*, v. 33, p. 17-20, https://doi.org/10.1130/G21010.1.

4. Flowers, R.M., Royden, L.H., and Bowring, S.A., 2005, Isostatic constraints on lithospheric thermal evolution: Application to the Proterozoic orogen of the southwestern United States, *in* Karlstrom, K.E. and Keller, R.G., eds., The Rocky Mountain region – An evolving lithosphere: Tectonics, geochemistry and geophysics: *American Geophysical Union Monograph 154,* p. 125-138, https://doi.org/10.1029/154GM10.

3. Flowers, R.M., Royden, L.H., and Bowring, S.A., 2004, Isostatic constraints on the assembly, stabilization, and preservation of cratonic lithosphere: *Geology*, v. 32, p. 321-324, https://doi.org/10.1130/G20177.2.

2. Flowers, R.M., Moser, D.E. and Hart, R.J., 2003, Evolution of the amphibolite- granulite facies transition exposed by the Vredefort impact structure, Kaapvaal Craton, South Africa: *Journal of Geology*, v. 111, p. 455-470, https://doi.org/10.1086/375282.

1. Moser, D.E., **Flowers, R.M.** and Hart, R.J., 2001, Birth of the Kaapvaal tectosphere 3.08 billion years ago: *Science*, v. 291, p. 465-468, https://doi.org/10.1126/science.291.5503.465.

Other Publications

2. Flowers, R.M., Arrowsmith, R., Metcalf, J.R., Rittenour, T., and Schoene, B.S., 2014, New EarthScope Geochronology Graduate Student Research and Training Program, *inSights the EarthScope Newsletter,* Fall 2014, p. 3.

1. Flowers, R.M., 2009, Pushing back the Age of the Grand Canyon: *OUTCROP*, Newsletter of the Rocky Mountain Association of Geologists, v. 58, no. 9, p. 8, 12-13.

GRANT FUNDING

28. Moore Foundation, Awarded by CU Arts & Sciences, PI
$93,750, 09/2026-05/2028
"One-year of postdoctoral scientist funding in support of technique development in the CU TRaIL"

27. NSF Tectonics, EAR-2333105, co-PI (lead-PI: E. Cassel; co-PI: R. Cecil)
$386,491 to CU*,* 8/15/24-8/14/27

"Collaborative Research: Development of topography in the northern Sierra Nevada: Reconciling differences in uplift history and causes through multi-source thermochronologic data"

26. NSF Instrumentation and Facilities, EAR-2311978, lead-PI (co-PI: J. Metcalf)
$865,370 to CU, 07/15/2023- 06/30/2028
"Laboratory Technician Support: Advancing and Broadening Access to Laser-Ablation (U-Th)/He Thermochronology"

25. NASA Solar System Workings, 80NSSC20K0148, co-PI (lead-PI: C. Crow; co-PIs: J. Boyce, M. Brounce, R. Economos, B. Schoene)
$192,651 to Flowers, 1/1/20-12/31/23
"Collaborative Research: Building a Global Record of Lunar Magmatism and Impact Processes: A Consortium Study of Apollo Regolith Apatite"

24. NSF Petrology & Geochemistry, Geophysics, EAR-1844182, lead-PI (co-PI: S. Zhong)
$388,842 to CU, 7/1/19-6/30/22
"Deciphering lithospheric and deeper mantle contributions to the surface history of the North American Arctic from the unique mantle to surface record of kimberlites"

23. NSF Frontier Research in Earth Sciences, **EAR-2218547, lead-PI** (co-PIs: R. Arrowsmith, L. Arthurs, V. McConnell)
$528,702 to CU; **$2,485,259** total consisting mostly of funds to support three micro-award programs, 8/1/22-7/31/27. Terminated on 4/25/25 during U.S. federal transition.
"Collaborative Research: Human Infrastructure for a National Geochronology Consortium: Micro-funding an inclusive community grassroots effort to better understand the Earth system"

22. NSF Geobiology & Low Temperature Geochemistry, EAR-2203532, co-PI (lead-PI: P. Martin; co-PI: N. Swanson-Hysell)
$80,155 to CU, 12/1/21-11/30/22
"Collaborative Research: EAGER: Developing new high spatial resolution hematite (U-Th)/(He-Pb) double dating techniques to date ancient oxidation"

21. CU College of Arts & Sciences Renovation Fund Award, lead-PI (co-PI: J. Metcalf)
$99,863, 1/1/20-12/31/20
CU TRaIL (U-Th)/He lab renovation

20. NSF Sedimentary Geology & Paleobiology, EAR-1822119, lead-PI (co-PI: F. Macdonald)
$229,950 to CU, 9/1/18-8/31/20
"Collaborative Research: Did the formation of the Great Unconformity trigger oxygenation and the Cambrian explosion?"

19. NSF Instrumentation & Facilities, EAR-2126925, lead-PI (co-PI: J. Metcalf)
$68,695, 9/1/21-8/31/22
Supplement to "Acquisition of a 193 nm excimer laser-ablation system, hardware for a custom quadrupole He system, and an optical profiler for in situ (U-Th)/He and U-Pb geo- and thermochronology at the University of Colorado Boulder"

18. NSF Instrumentation & Facilities, EAR-1920648, lead-PI (co-PI: J. Metcalf)
$499,562 to CU, 9/1/19-2/28/22

"Acquisition of a 193 nm excimer laser-ablation system, hardware for a custom quadrupole He system, and an optical profiler for in situ (U-Th)/He and U-Pb geo- and thermochronology at the University of Colorado Boulder"

17. NSF Frontier Research in Earth Sciences, EAR-1925489, co-PI (lead-PI: F. Macdonald; co-PIs: J. Chiang, O. Jagoutz, L. Lisiecki, N. Swanson-Hysell)
$279,152 to CU, 8/1/19-7/31/22
"Collaborative Research: Do arc-continent collisions in the tropics set the Earth's climate state?"

16. NSF Tectonics, Petrology & Geochemistry, EAR-1759200, lead-PI (co-PIs: R. Arrowsmith, V. McConnell)
$94,964 to CU; $850,400 total consisting mostly of student award funds, 9/1/18-7/31/21
"Collaborative Research: AGeS2 (Awards for Geochronology Student research) Program: Democratizing access to geochronology and promoting interdisciplinary science"

15. NSF Tectonics Program, EAR-1450181, lead-PI (co-PI: S. Zhong)
$296,833, 8/1/15-7/31/18
"Hypsometric history of the North American continental interior and implications for mantle dynamics"

14. NSF Instrumentation and Facilities Program, EAR-1559306, lead-PI (co-PI: J. Metcalf)
$183,646, 8/1/16-7/31/18
"Acquisition of a quadrupole ICPMS system for (U-Th)/He thermochronology and trace element analysis at the University of Colorado Boulder"

13. CU Renovation and Infrastructure Improvement Award, lead-PI (co-PI: J. Metcalf)
$62,688, 8/1/16-7/31/17
Renovation of the (U-Th)/He lab at the University of Colorado Boulder

12. NSF EarthScope, lead-PI (co-PIs: R. Arrowsmith, J. Metcalf, T. Rittenour, B. Schoene)
$69,681 ($11,369 to CU), 8/1/17-7/31/18
Supplement to "Collaborative Research: Earthscope geochronology: A student research and training program and EarthScope Institute"

11. Alexander von Humboldt Fellowship for Experienced Researchers, sole-PI
$39,550 EUR, 7/10/16-7/9/17
"Influence of rock strength variations on the exhumation history of cratons"

10. NSF EarthScope Program, EAR-1358514, lead-PI (co-PIs: R. Arrowsmith, J. Metcalf, T. Rittenour, B. Schoene)
$348,407 ($56,845 to CU), 8/1/14-7/31/17
"Collaborative Research: Earthscope geochronology: A student research and training program and EarthScope Institute"

9. NASA Cosmochemistry Program, NNX14AG31G, co-PI (lead-PI: S. Mojzsis; co-PI: J. Metcalf)
$390,001, 1/1/14-12/31/16
"Coupled U-Pb and (U-Th)/He geochronology of lunar zircons"

8. NSF CIDER program, co-PI (with S. Zhong and T. Becker)
$18,750, 2014-2015
Funds to convene workshop in spring 2015 at CU-Boulder entitled "Integrating Dynamic Topography with Surface and Geological Processes"

7. ACS Petroleum Research Fund, New Directions Grant 53526-ND8, sole-PI
$100,000, 6/1/13-8/31/15
"Quantitative constraints on thermal histories in carbonates and marine shales: Conodont (U-Th)/He thermochronometry"

6. NSF Tectonics Program, EAR-1321735, co-PI (lead-PI: A. Duvall; co-PI: G. Tucker)
$419,519, 9/1/13-8/31/17, with no-cost extension
"Collaborative Research: Tracing the geomorphic signature of strike-slip faulting in Marlborough Hill Country, South Island, NZ"

5. NSF Instrumentation and Facilities Program, EAR-1126991, sole-PI
$320,000, 9/15/11-8/31/15
"Early Career: Acquisition of a He system for (U-Th)/He thermochronology at the University of Colorado, Boulder"

4. NSF Directorate for Education and Human Resources, sole-PI
$35,000, 6/15/16-7/31/17
"Enhanced Experience Supplement to "CAREER: Evolution of the southern African Plateau using advances in (U-Th)/He thermochronometry, and enhancing student critical thinking in science"

3. NSF Tectonics Program, EAR-0951518, sole-PI
$531,933, 6/15/10-6/14/15
"CAREER: Evolution of the southern African Plateau using advances in (U-Th)/He thermochronometry, and enhancing student critical thinking in science"

2. ACS Petroleum Research Fund, New Investigator Grant 47476-G8, sole-PI
$50,000, 3/1/08-2/28/10
"Evolution of the Rio Grande Rift in the heart of the southern Rockies: Cooling and unroofing history of the Gore Range, Colorado"

1. NSF Tectonics Program, EAR-071145, sole-PI
$193,144, 9/1/07-8/31/12
"Quantifying the stability of continents using advances in apatite (U-Th)/He, $^{4}He/^{3}He$ and U/Pb thermochronometry"

INVITED TALKS

Invited Talks in Departmental Seminars and to Public Groups

93. Purdue University, Dept of Earth, Atmospheric, and Planetary Sciences, Crough Endowed Lecture, scheduled for October 2026

92. University of Wyoming, Dept of Geology and Geophysics, 2026

91. University of Colorado Boulder, Geology Club, 2025

90. University of Colorado Boulder, Alumni Advisory Board, Dept of Geological Sciences, 2025

89. Colby College, Geology Dept, virtual, 2023

88. Stony Brook University, Dept of Geosciences, virtual, 2021

87. East Carolina University, Dept of Geology, virtual, 2021

86. University of Texas at Arlington, Dept of Earth and Environmental Sciences, virtual, 2021

85. Science from Your Sofa, College of Arts & Sciences, University of Colorado Boulder, virtual, 2021

84. Commencement Speaker, Dept of Geological Sciences, University of Colorado Boulder, 2021

83. University of California Santa Barbara, Dept of Earth Science, 2020

82. Colorado Scientific Society, 2020

81. University of Colorado Boulder, Dept of Geological Sciences, Promotion Talk, 2019

80. Utah State University, Geology Dept, Forster Lecturer selected by graduate students, 2019

79. Utah State University, Geology Dept, Brownbag seminar, 2019

78. Yale University, Dept of Geology & Geophysics, 2018

77. College of William & Mary, Geology Dept, 100 years of Women Geoscience Celebration, 2018

76. University of Puerto Rico, Dept of Geology, 2018

75. Appalachian State University, Dept of Geological and Environmental Sciences, 2018

74. Lawrence University, Dept of Geology, 2018

73. Harvard University, Earth & Planetary Sciences, 2017

72. EAR, National Science Foundation Headquarters, Arlington, VA – Future of the AGeS (Awards for Geochronology Student research) program, 2017

71. University of Alberta, Dept of Earth and Atmospheric Sciences – Grace Anne Stewart speaker selected by graduate students, 2017

70. Montana State University, Dept of Geology, 2017

69. Southern Methodist University, Roy Huffington Dept of Earth Sciences, 2017

68. University of Potsdam, Institute of Earth and Environmental Science, 2017

67. GFZ German Research Center, Earth Surface Process Modeling Group, 2017

66. University of Bristol, School of Earth Sciences, 2017

65. Cardiff University, School of Earth and Ocean Sciences, 2017

64. University of Franche-Compte, Institute of the Environment, 2017

63. University of Tuebingen, Dept of Geologie and Geodynamik, 2016

62. University of Illinois Champaign-Urbana, Dept of Geology, 2016

61. Grand Valley State University, Dept of Geology, 2016

60. Bowling Green State University, Dept of Geology, 2016

59. University of Arizona, Dept of Geosciences, 2016

58. New Mexico State University, Dept of Geological Sciences, 2016

57. Texas Tech, Dept of Geosciences, 2016

56. University of Idaho, Dept of Geological Sciences, 2015

55. Idaho State University, Dept of Geosciences, 2015

54. University of Montana, Dept of Geosciences, 2015

53. Collegiate Peaks Forum Series, Buena Vista, CO; Southwest Seminars, Santa Fe, NM, 2014

52. Rice University, Dept of Earth Sciences, 2014

51. University of Houston, Dept of Earth and Atmospheric Sciences, Brownbag seminar, 2014

50. Utah State University, Dept of Geology, 2014

49. UNAVCO, Boulder, CO, 2014

48. University of North Carolina Chapel Hill, Dept. of Geological Sciences, 2014

47. University of Northern Colorado, Dept of Earth and Atmospheric Sciences, 2014

46. Café Scientifique, University of Colorado, Colorado Springs, 2013

45. University of Utah, Dept. of Geology and Geophysics, 2013

44. University of Colorado Boulder, Dept of Geological Sciences, Tenure Talk, 2013

43. Princeton University, Dept. of Geosciences, 2013

42. University of Oregon, Dept. of Geological Sciences, Colloquium talk, 2013

41. University of Oregon, Dept. of Geological Sciences, Brownbag seminar, 2013

40. New Mexico Tech, Dept. of Earth and Environmental Science, Colloquium talk, 2013

39. New Mexico Tech, Dept. of Earth and Environmental Science, Brownbag seminar, 2013

38. U.S. Geological Survey, Lakewood, CO, 2013

37. University of the Witwatersrand, School of Geosciences, South Africa, 2013

36. Academy for Lifelong Learning, Denver, CO, 2012

35. University of Wyoming, Dept. of Geology and Geophysics, 2012

34. Southern Methodist University, Dept. of Earth Sciences, 2012

33. Colorado State University, Dept. of Geosciences, 2012

32. Colorado College, Geology Department, 2012

31. Colorado Scientific Society, Lakewood, Colorado, 2012

30. University of Nevada, Las Vegas, Dept. of Geoscience, 2011

29. The University of the Free State, Dept. of Geology, South Africa, 2011

28. Nelson Mandela Metro University, Dept. of Geosciences, South Africa, 2011

27. University of Colorado Boulder, Dept of Geological Sciences, Reappointment Talk, 2010

26. Stanford University, Dept. of Geological and Environmental Sciences, 2010

25. University of Texas, Austin, Jackson School of Geological Sciences, Colloquium talk, 2009

24. University of Texas, Austin, Jackson School of Geological Sciences, Brownbag seminar, 2009

23. Boston University, Dept. of Earth Sciences, 2009

22. Colorado School of Mines, Dept. of Geology and Geological Engineering, 2009

21. Four Corners Geological Society, Colorado, 2009

20. University of New Mexico, Dept. of Earth and Planetary Sciences, 2008

19. University of Florida, Dept. of Geological Sciences, 2008

18. University of Montana, Dept. of Geosciences, 2008

17. University of Wyoming, Dept. of Geology and Geophysics, 2008

16. Colorado State University, Dept. of Geosciences, 2008

15. University of Colorado, Boulder, Dept. of Geological Sciences, 2007

14. University of California, Davis, Dept. of Geology, 2007

13. California Institute of Technology, Geoclub Seminar, 2007

12. University of North Dakota, Dept. of Geology and Geological Engineering, 2006

11. North Dakota State University, Dept. of Geosciences, 2006

10. University of Colorado, Boulder, Dept. of Geological Sciences, 2006

9. University of Arizona, Dept. of Geosciences, 2006

8. University of Tennessee, Knoxville, Dept. of Earth and Planetary Sciences, 2006

7. University of Texas, El Paso, Dept. of Geological Sciences, 2006

6. University of Calgary, Dept. of Geology and Geophysics, 2005

5. California Institute of Technology, Geoclub Seminar, 2005

4. University of California, Los Angeles, Dept. of Earth and Space Sciences, 2005

3. University of California, Santa Cruz, Dept of Earth Sciences, 2005

2. University of Texas, El Paso, Dept. of Geological Sciences, 2005

1. Vanderbilt University, Dept. of Earth and Environmental Sciences, 2005

Invited and Keynote Talks at Meetings

denotes *graduate mentee and **undergraduate mentee
GSA – Geological Society of America; AGU – American Geophysical Union; GAC-MAC – Geological Association of Canada-Mineralogical Association of Canada

21. Flowers, R.M., 2026, From micron- to mountain-scales: Advances in (U-Th)/He and U/Pb chronology unlock geological problems: National GSA meeting, Denver, CO, October 2026. Session: “From mantle to mountains: understanding interactions between deep Earth and surface processes from geologic data and modeling."

20. Flowers, R.M. and Arrowsmith, J.R., 2025, Building a collaborative scientific community: Lessons from the AGeS program: TIMES (Time Integrated Matrix for Earth Sciences) Workshop, Carnegie Science, Washington D.C., August 2025.

19. Flowers, R.M., Macdonald, F.A., Peak, B.A., Siddoway, C.S., Sturrock, C.P., Havranek, R., and Ketcham, R.A., 2022, Development of the Great Unconformities: How old are they? National GSA meeting, Denver, CO, October 2022.

Pardee session: "The Proterozoic-Phanerozoic Transition: Laying the Foundation for the Modern Earth System"

18. Flowers, R.M., Arrowsmith, R., McConnell, V., Metcalf, J.R., Rittenour, T., Schoene, B.S., Eriksson, S., 2019, The AGeS2 (Awards for Geochronology Student research 2) program: An update and seeking community input on its future**:** National GSA meeting, Phoenix, AZ, September 2019.
Session: "Diversifying Geochronology: Innovations in techniques, applications, and perspectives"

17. Flowers, R.M., Bowring, S.A., Zhong, S., Macdonald, F.A., 2019, Deep-time (U-Th)/He thermochronology, the missing sedimentary record, and the Great Unconformity: Gordon Research Conference on "Geochronology: Timing, tempo, and drivers of biotic evolution", Waterville, NH, August 2019.
Session: "Supercontinents and biogeography"

16. Flowers, R.M., *Baughman, J.S., *Robinson, K.H., and Metcalf, J.R., 2018, Titanite and rutile (U-Th)/He thermochronology: Diffusion kinetics, radiation damage effects, and utility: 2018 International Conference on Thermochronology, Quedlinburg, Germany. September 2018.
Session: "Noble gas diffusion applied to thermochronology"

15. Flowers, R.M., *Baughman, J.S., *Johnson, J.E., and Metcalf, J.R., 2017, The expanding temperature sensitivity range of (U-Th)/He thermochronology from improved understanding of the "big three" (apatite, zircon and titanite): approaches and examples: National GSA meeting, Seattle, WA, October 2017.
Session: "Improvements and Challenges in Geochronology: Organizing the Past while Planning for the Future"

14. Flowers, R.M., Arrowsmith, R., Metcalf, J.R., Rittenour, T., Schoene, B.S., Hole, J., Pavlis, T., Wagner, L., Whitmeyer, S., and Williams, M.L., 2015, Geology, Geochronology, and EarthScope: The EarthScope AGeS program and a new idea for a 4D-Earth initiative: Fall AGU meeting, San Francisco, CA, December 2015.
Session: "Crustal structure and evolution across the continental US from 10 years of Earthscope investigations: What have we learned and what are the open questions?"

13. Flowers, R.M., *Baughman, J.S., *Johnson, J.E., *Landman, R.L., *Stanley, J.R., **Weisberg, W.R., and Metcalf, J.R., 2015, Expanding the temperature sensitivity range and applicability of the (U-Th)/He system: some examples National GSA meeting, Baltimore, MD, November 2015.
Session: "Novel Methods, Applications, and Data Interpretations in Thermochronology"

12. Flowers, R.M., *Ault, A.K., Zhong, S., and Bowring, S.A., 2015, Exploring relationships between kimberlite distributions, mantle dynamics, and the hypsometric history of the North American cratonic interior: Spring
AGU/GAC-MAC Joint Assembly meeting, Montreal, Canada, May, 2015.
Session: "Origin of cratonic mantle lithosphere, diamonds, and deeply sourced volatile-rich melts: Processes and timescales"

11. Flowers, R.M. and Farley, K.A., 2014, Grand Canyon, models, and the interpretation of thermochronology data: Thermo2014, 14th International Conference on Thermochronology, Chamonix, France, September 2014.
Session: "Landscape evolution on different timescales"

10. Flowers, R.M., 2013, Kimberlites, thermochronology, and the Phanerozoic elevation change histories of cratons: Keynote speaker, post-AGU Cooperative Institute for Dynamic Earth Research symposium, Berkeley, CA, December 2013.

9. Flowers, R.M., Blackburn, T.J., Kelley, S.A., and *Ault, A.K., 2013, Evidence for post-100 Ma deposition, erosion and vertical motion of North American interior regions lacking preserved Cretaceous cover: Invited Speaker, Fall AGU meeting, San Francisco, CA, December 2013.
Session: "Origin, evolution, and impacts of high topography in continental interiors"

8. Flowers, R.M. and Farley, K.A., 2013, Constraints on an ancient Grand Canyon and the topographic evolution of the southwestern Colorado Plateau from thermochronometry: Invited Speaker, National GSA meeting, Denver CO, October 2013.
Session: "Paleotopography"

7. Flowers, R.M., *Ault, A.K., Kelley, S.K., Zhang, N., and Zhong, S., 2011, Deciphering the history and causes of the cryptic rise and fall of continental interiors using low temperature thermochronology: Invited Speaker, Fall AGU meeting, San Francisco, CA, December 2011.
Session: "The long road to flat – Towards understanding the drivers and quantifying change in 'dead' orogens"

6. Flowers, R.M., *Ault, A.K., Kelley, S.A., Zhang, N., and Zhong, S., 2011, Testing mantle dynamic models from thermochronology constraints on the rise and fall of continental interiors: Invited Speaker, Special meeting on Dynamic Topography organized by the Royal Astronomical Society, Geological Society and the British Geophysical Association, September 2011.

5. Flowers, R.M., 2010, Interpretation of apatite (U-Th)/He thermochronometry data from cratonic rocks: Invited speaker, Thermo2010, 12th International Conference on Thermochronology, Glasgow, Scotland, August 2010.
Session: "Interpretation of thermochronology data: Limitations and potential"

4. Flowers, R.M., 2010, Deciphering unroofing, paleotopography and elevation gain of cratonic plateaus using (U-Th)/He thermochronometry: case studies from the Colorado Plateau and southern Africa: Keynote speaker, Structural Geology and Tectonics Forum, Madison, WI, May 2010.
Session: "Exhumation and large scale tectonics"

3. Flowers, R.M., Wernicke, B.P., and Farley, K.A., 2009, Constraints on Early Tertiary incision and uplift of the Grand Canyon region of the Colorado Plateau from apatite (U-Th)/He thermochronometry: Invited speaker, AGU Joint Assembly, Toronto, Canada, May 2009.
Session: "Surface geological and tectonic constraints on time-dependent mantle convection"

2. Flowers, R.M., 2008, High to low temperature geo- and thermochronology and the reactivation and stability of continental lithosphere, western Canadian shield: Keynote speaker, Goldschmidt international geochemistry meeting, Vancouver, Canada, July 2008.
Session: "4D structure of the continental crust: greenstones to granulites"

1. Flowers, R.M. and Kelley, S., 2008, Thermal histories in sedimentary basins from integrated low-temperature thermochronometry: An example from the High Plains of New Mexico and western Texas: Invited speaker, Goldschmidt international geochemistry meeting, Vancouver, Canada, July 2008.
Session: "Sedimentary basin development and evolution"

I am an author on 12-18 abstracts per year submitted to national and international meetings.

ADVISING AND TEACHING

ADVISING

Current Graduate Student Advisees (3)
Paige McDowell, MSc, Fall 2025-present.

PhD Student Advisees

9. John Allard III, PhD, anticipated 2030, Uplift and erosion history of the northern Sierra Nevada.

8. Connor Diaz, PhD, anticipated 2027, *NSF Graduate Research Fellow.* Deciphering the impact histories of lunar and meteorite samples using phosphate (U-Th)/He thermochronology

7. Spencer Zeigler, PhD, 2025, *NSF Graduate Research Fellow,* Kimberlites, cratons, and chronometers. Now Postdoctoral Fellow at Western University, Canada.

6. Barra Peak, PhD, 2024, *CU Chancellors Fellow*, Continental breakup, mountain building, and the Great Unconformity: The exhumation history of North America's most iconic erosional surface using zircon (U-Th)/He thermochronology. Now Postdoctoral Fellow at University of Lancaster.

5. Colin Sturrock, PhD, 2021, Deciphering burial and erosion histories across the interior of the Canadian shield and implications for mantle dynamics. Now at Ormat Technologies.

4. Jaclyn Baughman, PhD, 2018, Bridging high and low temperature thermal histories across the Kaapvaal craton, southern Africa from advances in titanite and zircon (U-Th)/He thermochronology. Now Assistant Professor at Humboldt State University.

3. Jessica Stanley, PhD, 2015, Discerning erosion patterns and mantle sources of topography across the southern African Plateau from the shallow and deep records of kimberlites. ***NSF Graduate Research Fellow.*** Now Associate Professor at University of Idaho.

2. Rachel Landman, PhD 2015, Thermochronologic investigations of Cenozoic unroofing and surface uplift in the southern Rocky Mountains and High Plains.

1. Alexis Ault, PhD, 2012, Constraints on craton stability from thermochronologic and geochronologic studies of the Slave and Wyoming cratons. ***NSF Graduate Research Fellow.*** Awarded a CAREER grant and the International Early Career Thermochronology Prize. Now Full Professor at Utah State University.

Past MSc Student Advisees

8. Kaitlyn Kinnear, MSc, anticipated 2028, co-advised with Prof Kevin Mahan.

7. Hugo Rainey, MSc, anticipated 2028, co-advised with Prof Kathryn Snell.

6. Paige McDowell, MSc, anticipated 2027. Development of laser-ablation (U-Th)/He dating of oxide minerals: a case study with rutile.

5. Morgan Baker, MSc, 2022, Correcting for systematic error and estimating uncertainties of alpha-ejection corrections and eU values for the zircon (U-Th)/He method. Now in permanent lecturer position at Appalachian State University.

4. Katherine Robinson, MSc, 2019, Development of rutile (U-Th)/He thermochronology. Now a Sponsored Project Specialist at CU JILA.

3. Rachel Havranek, MSc, 2017, Coupling vertical transect zircon (U-Th)/He and Raman spectroscopy data to constrain Colorado Front Range evolution. Now postdoc at University of Utah.

2. Josh Johnson, MSc, 2015, "Inverted" zircon and apatite (U-Th)/He dates and interpretation of high-damage zircon from the southern Rocky Mountains, Front Range, Colorado. Now at Idaho Conservation League, Ketchum, Idaho.

1. Rachel Landman, MSc, 2010, Tertiary cooling history of the Gore Range: a northern Rio Grande Rift flank uplift, central Colorado.

Postdoctoral Researchers

3. Dr. Liam Courtney-Davies, 2023-2025. PhD from University of Adelaide, Australia. Now assistant professor at San Diego State University.

2. Dr. Catherine Ross, 2024-2025. NSF Postdoctoral Fellow. PhD from UT Austin. Now assistant professor at Baylor University.

1. Dr. Peter Martin, 2020-2022. PhD from Caltech. Now at KoBold Metals.

Research Associates in Lab Group

3. Dr. James Metcalf, 2012-present. PhD from Stanford University.

2. Dr. Cullen Kortyna, 2024-present. PhD from UT-Austin.

1. Dr. Jeff Benowitz, Jan 2022-April 2022. PhD from University of Alaska Fairbanks.

Geochronology Mentor for AGeS Students

7. Aurora Rosenberger, WSU PhD student, 2024 AGeS project: "Investigating temporal connections between normal faulting, ductile stretching, and detachment faulting in the Snake Range core complex, Nevada"

6. Anthony Fuentes, UC Berkeley PhD student, 2024 AGeS project: "Towards Resolving the Red Bed Controversy: Developing the Capacity for Detrital Hematite U/Pb Geochronology"

5. Brian Penserini, UCSB PhD student, 2021 AGeS project: "Testing Multiple Hypotheses for Large-Scale Capture Events using low-T Thermochronometry, Sutlej River, western Himalaya".

4. Nicolas Perez-Consuegra, Syracuse PhD student, 2020 AGeS project: ;"Using apatite 4He/3He and (U-Th)/He thermochronology to unravel the timing and mechanism of incision of the Cauca River Canyon in the northern Andes".

3. Ellen Lamont, Oregon State University PhD student, 2019 AGeS project: "Evaluating Late Cenozoic Mountain Range Evolution in India's Himalayan Fold-and-Thrust Belt".

2. Matthew Morriss, University of Oregon PhD student, 2016 AGeS project: "Thermochronometric constraints on the age of Hells Canyon, testing lithospheric foundering in NE Oregon".

1. Mariana Bonich, Syracuse University PhD student, 2015 AGeS project: "Deciphering novel methods to link source rock to sediment sink: Overcoming the 'stepladder effect'".

RESESS (Research Experiences in Solid Earth Science for Students) Underrepresented Undergraduate Interns in TRaIL

7. Kaden Berkhahn, 2023, RESESS summer intern in collaboration with PhD student Spencer Zeigler and postdoc Dr. Liam Courtney-Davies.

6. Addison Curtis, 2022, RESESS summer intern in collaboration with PhD student Barra Peak.

5. Haley May, 2018, RESESS summer intern in collaboration with PhD student Colin Sturrock.

4. Fatima Niazy, 2017, RESESS summer intern in collaboration with Dr. Lon Abbott and Dr. Jim Metcalf.

3. Wes Weisberg, 2014-2016, RESESS summer intern in collaboration with Dr. Jim Metcalf.

2. Brandt Scott, 2015, RESESS summer intern in collaboration with Dr. Jim Metcalf.

1. Cristina Lugo-Centeno, 2012, RESESS summer intern in collaboration with Dr. Alison Duvall.

Undergraduate Students

- >40 CU undergraduate students have worked and been mentored in the CU TRaIL Lab. Supported by CU UROP, GEOL Mentoring program, and grant funding.
- Four recipients of NSF Graduate Research Fellowship (Sabrina Kainz in 2023, Spencer Zeigler in 2020, Coleman Hiett in 2019, Ryan Stoner in 2018).

COURSES

GEOL 1010, Introduction to Geology. 3 credits. Introductory Earth science class that provides a broad overview of the field of geology to nonmajors. Fall 2007-2009, Spring 2011,13,15.

GEOL 2005, Introduction to Earth Materials. 4 credits. Undergraduate class required of all majors that provides an introduction to the classification, composition, and properties of the materials that compose the Earth, their economic benefits, how these materials are studied, and how they are used to interpret Earth history and processes. First co-developed and taught in spring 2014. I now teach this course every spring. Spring 2014-16, Spring 2018-23. Spring 2025-26.

GEOL 3090, Developing Scientific Writing Skills. 3 credits. Undergraduate course focused on finding, reading, and critically assessing primary scientific papers, placing the findings of others into the broader scientific context, and reviewing and revising newly written material. Fully developed this class. Fall 2011-13, Fall 2018.

GEOL 4500, Critical Thinking. 3 credits. Undergraduate course that introduced students to critical thinking by examining how we resolve the timing of events and rates of processes in Earth science. Fully developed this class. Met the previous Critical Thinking requirement for Arts & Sciences majors at CU-Boulder. Spring 2009.

GEOL 4700/5700, Problems in the Rockies. 3 credits. Interdisciplinary seminar for upper-level undergraduate and graduate students focused on methods and approaches to tectonic problems and their application to the Rocky Mountain region. Co-taught with Prof Peter Molnar. Spring 2008.

GEOL 4960, Writing in Geosciences. 1 credit. Undergraduate writing course that introduced undergraduates to scientific writing. Taught once in Fall 2009. This experience led me to subsequently develop a 3-credit writing course for undergraduates (GEOL 3090).

GEOL 5215, Geochronology. 2 or 3 credits. Graduate course that provides an overview of geochronologic and thermochronologic methods used to constrain tectonic, magmatic, metamorphic, sedimentary, and geomorphic processes. Cutting-edge aspects of these methods and emerging techniques are particularly emphasized. Fully developed this class. Spring 2009,12. Fall 2015, 17, 20, 22, 24, 25.

GEOL 5216, Geochronology Reading Seminar. 1 credit. Graduate course focused on learning key aspects of a selected geochronology topic. This is accomplished by reading, critically evaluating, and discussing peer-reviewed scientific papers that include geochronology data, methods, and interpretations relevant to the chosen topic. Spring 2020-23. Spring 2026.

GEOL 5003, Graduate Writing Seminar. 2 credits. This class is aimed at improving graduate student writing, editing, and reviewing skills, while meeting student writing goals. Includes discussion of materials about effective writing, and peer-editing of text that students are producing for their graduate research endeavors. Fully developed for the first time in GEOL. Spring 2018. Fall 2019-22, Fall 2024-26.

SCIENCE EDUCATION ACTIVITIES

Participant, CU Boulder Science Education Initiative (SEI). Involved for 3 different classes in GEOL.

Participant, multi-institutional NSF-funded GARNET Project. Involved for 2 classes in GEOL.

Participant, NAGT (National Association of Geoscience Teachers) Temporal Journal Learning Club. Monthly virtual discussions of readings that explored the cognitive underpinnings of understanding geologic time, 2011.

SERVICE

NATIONAL AND INTERNATIONAL PROFESSIONAL SERVICE

Leadership and Committee Service

2024-2026 Geological Society of America (GSA) Joint Technical Program Committee for the GSA National Meetings, Structural Geology & Tectonics Division Representative.

2022-2025 Lead-PI and co-director of the AGeS^3 (Advancing Geochronology Science, Spaces, & Systems) Initiative. AGeS^3 was funded by an NSF FRES award, continued its partnership with GSA, and made a total of 86 strategic micro-awards of $8-$18k each through a trio of micro-funding programs (AGeS-Grad, AGeS-DiG, AGeS-TRaCE). During AGeS^3, the AGeS lab network grew to 70+ labs and 120+ geochronologists.

2025 American Geophysical Union (AGU) Search Committee for Editor-in-Chief of the journal *Tectonics.*

2019-2023 GSA Geochronology Division Leadership. Past Chair, Chair, First Vice Chair, Second Vice Chair.

2018-2022 Lead-PI and co-director of AGeS2 (Awards for Geochronology Student research program). AGeS2 was funded by a multi-programmatic NSF award, included a new partnership with GSA, continued to grow the AGeS lab network, supported 52 graduate student geochronology projects averaging ~$8.2k each, and launched the pilot AGeS-DiG (Diversity in Geochronology) program, which funded 6 projects of ~$14k each to support cohorts of underrepresented minority students in geochronology.

2021 NSF Review Panel member.

2020 NSF Review Panel member.

2019 NASA Review Panel member.

2014-2018 Lead-PI, co-founder, and co-director of AGeS1 (Awards for Geochronology Student research program). AGeS1 was funded by an NSF EarthScope award, established the AGeS

lab network, and supported 25 collaborative geochronology projects between graduate students and labs averaging ~$8.2k each.

2015-2018 Member, GSA Student Research Grant Committee.

2017 Member, GSA position statement panel on “Removing Barriers to Career Progression for Women in the Geosciences”.

2015-2017 Secretary, GSA Structural Geology and Tectonics Division.

2017 NSF PIRE Site Visit Review Panel member.

2012-2015 NSF EarthScope Steering Committee.

2013-2014 Associate Editor, *Geosphere.*

2012-2014 Colorado Scientific Society, Counselor.

2013 Instructor at CIDER (Cooperative Institute for Dynamic Earth Research) Summer Program at UC Berkeley.

2011-2012 AGU Tectonophysics Program Committee.

2008 NSF Review Panel Member

Meeting, Workshop, Short Course, and Session Organizer

2025 Organizer, 2025 Virtual AGeS Community Symposium, 100 attendees. May 6-7, 2025.

2024 Organizer, 2024 Virtual AGeS Community Symposium, >100 attendees. May 6-7, 2024.

2014-2023 Standing Committee for the International Thermochronology Conferences.

2022 Instructor and organizer, 1.5-day GSA short course “AGeS Geochronology”, Boulder, CO, USA.

2022 Co-organizer, 1.5 day workhop for NSF FRES project COOL (Context of Long-term Climate and Tectonics), Boulder, CO, USA.

2019-2021 Organizing Committee, Thermo2021, 17th International Conference on Thermochronology, Santa Fe, NM.

2015 Co-organizer, 2-day NSF CIDER workshop, "Linking dynamic topography with the observational record" in the Dept of Geological Sciences at CU-Boulder.

2014 Instructor and organizer, 2-day GSA short course “EarthScope Institute: Geochronology and the Earth Sciences”, Vancouver, Canada.

2013 Organizer, 1.25-day short course, “An introduction to low temperature thermochronology”, at the African Earth Observatory Network, Port Elizabeth, South Africa.

2013 Instructor and organizer, 1-day GSA short course at the CU-Boulder TRaIL, "An introduction to the theory and methods of (U-Th)/He thermochronology", Boulder, CO, USA.

2013 Organizing committee, NSF EarthCube Geochronology workshop.

2007, '09, '14 Convener, Technical session at AGU Fall Meetings

2010, 2013 Convener, Technical session at GSA National Meetings

2010, '11, '13 Convener, Technical session at Goldschmidt Conferences

Panelist/Round Table Discussions

2023 Leader of "Power Hour" at the 2023 Gordon Research Conference on Geochronology. The Power Hour is a forum for conversations about barriers to inclusivity.

2018 Panelist, two separate round tables on "Diffusion" and "Reproducibility" at the 16th International Conference on Thermochronology, Quedlinburg, Germany.

2016 Panelist, "'Insights into the Writing & Publishing Process" at the Career Development Workshop for NSF Geoscience Postdoctoral Researchers, NOAA, Boulder, CO.

2014 Panelist, "Developing synergies between disciplines" at the Challenges and Opportunities in Geochronology Workshop, pre-Goldschmidt Meeting.

2014 Panelist, two separate round tables on "Diffusion" and "Databases" at the 14th International Conference on Thermochronology, Chamonix, France.

Referee for Journals, Proposals, and Books

Referee for academic journals (35 different journals, typically 8-12 manuscript reviews/year): *American Journal of Science, Analytical Chemistry, Chemical Geology, Contributions to Mineralogy and Petrology, Earth and Planetary Science Letters, Earth Surface Processes and Landforms, Geochemistry-Geophysics-Geosystems, Geochimica et Cosmochimica Acta, Geochronology, Geologica Carpathica, Geochemical Perspectives Letters, Geological Society of America Bulletin, Geology, Geomorphology, Geophysical Research Letters, Geosphere, Geostandards and Geoanalytical Research, Journal of African Earth Sciences, Journal of the Geological Society, Journal of Geophysical Research-Earth Surface, Journal of Metamorphic Geology, Journal of Geology, Journal of Structural Geology, Lithos, Lithosphere, Mountain Geologist, Nature, Nature Communications, Nature Geoscience, Nature-Scientific Data, New Mexico Geological Society Guidebook, Precambrian Research, Proceedings of the National Academy of Sciences, Science, Science Advances, Scientific Data, Scientific Reports, Tectonics, Tectonophysics, Terra Nova.*

Referee for National Science Foundation proposals (16 different NSF programs): Antarctic Earth Sciences, Arctic Research Opportunities, EarthCube, EarthScope, Frontiers in Earth Science Research, Geoinformatics, Geomorphology, Geophysics, Instrumentation and Facilities, Integrated Earth Systems, Major Research Instrumentation, Marine Geology and Geophysics, Petrology and Geochemistry, Postdoctoral Fellowship, Sedimentary Geology and Paleobiology, Tectonics.

Referee for other programs: American Chemical Society Petroleum Research Fund, Canadian NSERC program, Department of Energy, Dutch Council for Earth and Life Sciences, W.M. Keck Foundation proposals.

Referee for book: "Geochronology and Thermochronology" by Reiners, Carlson, et al.

PUBLIC OUTREACH AND RESEARCH DISSEMINATION TO PUBLIC

2026 Interview with reporter for the *New York Times* for an article about scientific research that has been impacted by termination of NSF grants.

2026 Interview with reporter for *Scientific American* magazine for a feature article on the origin of the Grand Canyon and how thermochronology is used to investigate this landscape.

2026 Consulted for redesigning of a free interactive educational web-based simulation called "Radioactive Dating Game" aimed at secondary and university-level students. This activity is one of the PhET Interactive Simulations developed by the Physics Department of CU-Boulder.

2026 Interview with reporter for *Discover* magazine for an article about the age and origins of the Great Unconformity entitled "1.3 Billion Years Vanished From the Grand Canyon's Rock Record — a Cold Case That Has Puzzled Geologists Since the 1860s", July 17, 2026

2026 Interview with reporter for *Science* magazine about the age and origins of the Grand Canyon.

2026 TRaIL collaborator Prof Lon Abbott (CU) and former CU TRaIL student Sabrina Kainz have been working with nonprofit La Veta Trails to create a La Veta Trails Geoheritage Website. The Geoheritage Project is a partnership between La Veta Trails and the University of Colorado Thermochronology Research and Instrumentation Laboratory (CU TRaIL), uniting scientific research with community engagement to deepen our sense of place and encourage environmental stewardship through educational trail experiences. Marilyn Russell (President of La Veta Trails) and Sabrina Kainz will give a noontime keynote address describing the project at the national Geological Society of America conference in Denver on October 13.

2024-26 Lab outreach to North Glenn High School. SNODASE (Students of Northglenn Date Ancient Snowball Earth) is a problem-based learning curriculum in which the geology classes at Northglenn High School directly participate in geologic sample collection, sample preparation, and geochronologic analysis in Flowers' geochronology lab at the University of Colorado. The students then create posters and present the results and interpretations to CU scientists in a final research symposium. Over 160 high school students have engaged with this program. Spearheaded by research associate Cullen Kortyna.

2025 Filming and interviews for PBS documentary series "Transparent Earth" by producer and director Sarah Burns about Snowball Earth research.

2025 Interview and discussions with artist Nina Elder (www.ninaelder.com) about serving as a collaborating scientist on an art exhibit focused on absence and unconformities.

2025 Interviewed for children's book by Emily Starr (www.starrmatica.com) entitled *"Nature's Hidden Library"*, provided a review of part of the book for accuracy, and will be a featured scientist in the back matter of the book.

2024 Coauthor on an article in The Conversation with >79,000 reads about research lead by Dr. Liam Courtney-Davies on Snowball Earth and the Neoproterozoic Tavakaiv sandstone injectites in Colorado, November 2024.

2024 Research on the Snowball Earth and Neoproterozoic Tavakaiv sandstone injectites in Colorado lead by postdoc Dr. Liam Courtney-Davies featured in numerous popular science articles, including ArsTechnica, Science Daily, and CU Boulder Today, November 2024.

2024 Thermochronology research on the erosion history of Colorado's High Plains lead by former CU undergraduate student Sabrina Kainz featured in multiple articles, including the Denver Gazette's "Origins of Colorado's Spanish Peaks near Walsenburg Explained" and BNN Newsroom's "Unlocking Colorado's Geological Mysteries: CU Boulder Study Sheds Light on Spanish Peaks" March 4, 2024.

2023 Interviewed for geochronology article on livescience.com "How do we know how old Earth is?", April 15, 2023.

2023 Great Unconformities research featured in GSA Science Communication blog "Is 'The Great Unconformity' a Misnomer?", March 22, 2023.

2022 Work on the Great Unconformities featured in AGU *Eos* article "The Great Unconformity or Great Unconformities?", December 23, 2022.

2022 Feature on new Geochronology exhibit in CU-Boulder Earth Sciences Map Library, October 13, 2022.

2022 Press release about AGeS3 FRES grant to advance geochronology by CU Boulder College of Arts & Sciences Magazine, Sept 22, 2022.

2022 Co-host "Every Rock Has A Story" Youtube video, Episode #68, Grand Canyon, 10 min, October 6, 2022.

2021 Geology Bites podcast on "Deciphering the Thermal History of Rocks", 31 min.

2021 Gneiss Chats podcast interview, "Thermochronology", the Traveling Geologist. 43 min.

2021 Public interest in research on the Great Unconformity in the Grand Canyon. Coverage from various media outlets.

2020 Public interest in research on the Great Unconformity in Colorado. Coverage from CNN and other media outlets.

2018 Science Coach in American Chemical Society, American Association of Chemistry Teachers program. Serve as mentor for high school science teacher Susan Kelly.

2017 Presentation on Geologic Time to first and second graders at Flatirons Elementary School.

2012 Public interest in Grand Canyon research. Coverage from hundreds of media outlets, including the front page of *NY Times*, *Washington Post*, and *LA Times*, as well as reports on *NPR* and *PBS NewsHour*.

2010 Filmed for National Geographic "Naked Science" documentary on the origin and evolution of the Grand Canyon.

2008 Grand Canyon research included in an annual review for the 2009 Britannica Book of the Year in Geology & Geochemistry.

2008 Public interest in Grand Canyon region research. Coverage from Science, Nature, MSNBC, National Geographic.com, Earth Magazine, Science Spin, and other media outlets.

UNIVERSITY SERVICE

2021-22 CU Arts & Sciences Council
2021-22 CU Arts & Sciences Council Planning Committee
2022 CU Arts & Sciences Search Committee for Award Administrator
2020 Reviewer for CU Graduate School Research Grants
2018-19 CU Arts & Sciences Search Committee for Post-Award Administrator
2015-16 CU Arts & Sciences Council
2015-16 CU Arts & Sciences curriculum committee

DEPARTMENT SERVICE

2025-26 Chair, SamPLE prep lab committee
2025-26 Member, Executive committee
2025-26 Member, Salary equity and grievance committee
2025-26 Member, Analytical facilities and space committee
2024 Chair, targeted hire search committee for Earth and Mineral Materials
2024 Member, Primary unit evaluation committee for junior faculty member
2024 Member, SamPLE prep lab committee
2019-23 Member, Analytical facilities and space committee
2019-23 Member, Graduate curriculum committee
2019-23 Member, SamPLE prep lab committee
2020-23 Member, Graduate admissions committee
2018-19 Member, New chair committee
2018-19 Chair, Salary equity and grievance committee
2017-19 Chair, SamPLE prep lab commitee
2017-18 Member, Futures committee
2017-18 Member, Executive committee
2017-18 Member, Salary equity and grievance committee
2015-16 Member, Search committee, Geobiology faculty member
2014-15 Member, Executive committee
2013-15 Member, Graduate curriculum committee
2012-13 Member, new chair committee
2012-13 Member, Salary equity and grievance committee
2012-13 Member, Undergraduate curriculum committee
2010-12 Member, Analytical facilities and space committee
2009 Colloquium organizer
2008-09 Member, Executive committee
2007-08 Member, Graduate curriculum committee

MEMBERSHIPS

American Association for the Advancement of Science
American Geophysical Union
Geological Society of America
Mineralogical Society of America