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Education

PhD *Geosciences*	2005 University of Massachusetts-Amherst ***Thesis Title:*** *Exhumation of exposed deep continental crust, western Canadian Shield: Integrating structural analysis, petrology, and in situ geochronology* ***Advisor:*** *M.L. Williams*
MSc *Geology*	2000 University of Utah ***Thesis Title:*** *Wall rock deformation and emplacement of the McDoogle pluton, central Sierra Nevada, California* ***Advisor:*** *J.M. Bartley*
BSc *Geological Engineering*	1996 Auburn University

Post-graduate and Professional Appointments

Professor (Fall 2022-present)	University of Colorado Boulder
Associate Professor (Fall 2016-2022)	University of Colorado Boulder
Adjunct Faculty (Spring 2017-present)	Utah State University
Assistant Professor (Fall 2010-2016)	University of Colorado Boulder
Research Associate (2007 – 2010)	University of Colorado Boulder
Postdoctoral Scholar (2005-2007) ***Mentor:*** *B. Wernicke*	California Institute of Technology

----------RESEARCH----------

Professional Peer-reviewed Publications (CU undergraduate student^, CU graduate student*, CU postdoctoral fellow°, graduate student at other institution[#], undergraduate student at other institution[$])

[61] Velázquez Santana, L.C.°, Patascil, J.^, Hudgins, T. and Mahan, K.H., **In Review**, Incremental Assembly of the Utuado Pluton, Puerto Rico: Evidence from Enclaves and Amphibole Geochemistry, submitted to *Journal of the Geological Society of London.*

[60] Litton, S.[#], Newell, D., Mahan, K.H., Gasnier, B.[#] and Goncalves, P., **2025**, Xenolith hydrogen isotope evidence for lower crustal hydration during cycles of flat slab subduction, Geology, https/doi.org/10.1130/G53815.1.

[59] Mahan, K.H., Condit, C.B., Flowers, R.M., Courtney-Davies, L., Bridges, J.[$], and Godana, K.[$],

2025, Late-stage dextral transpression in the Paleoproterozoic Big Sky Orogen of southwestern Montana: Implications for shear zone heterogeneity and evolution of the northern Wyoming craton, *Journal of the Geological Society of London,* Thematic Collection- Exploring strain partitioning and kinematic evolution of the lithosphere: honouring the career and contributions of Micah Jessup, edited by Grambling, T.A., Newell, D.L., Grambling, N.L., and Cottle, J. DOI:10.1144/jgs2024-252.

[58] Frothingham, M.*, Mahan, K.H., Schulte-Pelkum, V., Goncalves, P., and Zucali, M., **2023**, Confronting solid-state shear bias: Magmatic fabric contribution to crustal seismic anisotropy, *Geophysical Research Letters*, doi:10.1029/2022GL102399.

[57] Sui, S.#, Shen, W., Mahan, K.H., and Schulte-Pelkum, V., **2023**, Seismologically constrained crustal composition of the continental U.S., *GSA Bulletin*, v. 135, p. 2038-2056, https://doi.org/10.1130/B36229.1

[56] Baird, G.B., Grover, T.W., Mahan, K.H., Raschke, M.B., Frothingham, M.G., Möller, A., Chumley, A.S., Hooker, J.C., Kelly, N.M., and Allaz, J.M., **2022**, Paleoproterozoic tectonics in the Northern Colorado Front Range, GSA Field Guides, https://doi.org/10.1130/2022.0064(03).

[55] Frothingham, M.*, Schulte-Pelkum, V., Mahan, K.H., Merschat, A., Mather, M., and Cabrera, Z., **2022**, Don't judge an orogen by its cover: Kinematics of the Appalachian Decollement from seismic anisotropy, *Geology,* doi.org/10.1130/G50323.1.

[54] Dumond, G., Mahan, K.H., Goncalves, P., Williams, M.L., and Jercinovic, M.J., **2022**, Monazite as a monitor of shear strain in orogenic crust, John G. Ramsay special issue in *Journal of Structural Geology*, v. 161, https://doi.org/10.1016/j.jsg.2022.104672.

[53] Frothingham, M.*, Mahan, K.H., Schulte-Pelkum, V., and Caine, J.S., **2022**, From crystals to crustal-scale seismic anisotropy: Bridging the gap between rocks and seismic studies with digital geologic map data in Colorado, *Tectonics*, v. 41, e2021TC006893, https://doi.org/10.1029/2021TC006893.

[52] Provow, A.W.#, Newell, D.L., Dehler, C.M., Ault, A.K. Yonkee, W.A., Thomson, S.N., and Mahan, K.H., **2021**, Revised maximum depositional age for the Ediacaran Browns Hole Formation: Implications for western Laurentia Neoproterozoic stratigraphy, *Lithosphere*, https://doi.org/10.2113/2021/1757114.

[51] Mahan, K.H., Frothingham, M.*, and Alexander, E.°, **2021**, Virtual mapping and analytical data integration: A teaching module using Precambrian crystalline basement in Colorado's Front Range (USA), Special issue on Virtual Geological Education Resources, *Geoscience Communication* and *Solid Earth*, v. 4, p. 421-435, https://doi.org/10.5194/gc-4-421-2021.

[50] Leydier, T.#, Goncalves, P., Albaric, J., LeClere, H., Mahan, K.H., and Faulkner, D., **2021**, Seismic properties across an amphibolite- to greenschist-facies strain gradient (Neves area, eastern Alps, Italy): new considerations for shear zone imaging, *Tectonophysics*. v. 816, doi.org/10.1016/j.tecto.2021.229005.

[49] Orlandini, O.F.* and Mahan, K.H., **2020**, Rheological evolution of a pseudotachylyte-bearing deep crustal shear zone in the western Canadian Shield, *Journal of Structural Geology, v. 141, doi: 10.1016/j.jsg.2020.104188*.

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[47] Levandowski, W., Jones, C., Butcher, L.A.*, and Mahan, K.H., **2018**, Lithospheric density models

reveal evidence for Cenozoic uplift of the Colorado Plateau and Great Plains by lower crustal hydration, *Geosphere*, v. 14, p. 1150-1164, doi:10.1130/GES01619.1.

[46] Condit, C.B.*, Mahan, K.H., Curtis, K.C.^, and Möller, A., **2018**, Dating metasomatism: Monazite and zircon growth during amphibolite-facies albitization, *Minerals*, Special Issue on "Application of Electron Microprobe Methods in Trace Element Analysis and Geochronology", v. 8, doi:10.3390/min8050187.

[45] Condit, C.B.* and Mahan, K.H., **2018**, Fracturing, fluid flow, and shear zone development: Relationship between chemical and mechanical processes in Proterozoic mafic dikes from southwestern Montana, USA, *Journal of Metamorphic Geology*, v. 36, p. 195-223, doi: 10.1111/jmg.12289.

[44] Brownlee, S., Schulte-Pelkum, V., Raju, A.^**,** Mahan, K.H., Condit, C.*, and Orlandini, O.F.*, **2017**, Characteristics of deep crustal seismic anisotropy from a compilation of rock elasticity tensors and their expression in receiver functions, *Tectonics*, v. 36, doi: 10.1002/2017TC004625, *also featured in EOS.*

[43] Regan, S.P.[#], Williams, M.L., Chiarenzelli, J.R., Grohn, L.[$], Mahan, K.H., and Gallagher, M., **2017**, Isotopic evidence for Neoarchean continuity across the Snowbird Tectonic Zone, western Churchill Province, Canada, *Precambrian Research*, v. 300, p. 201-222.

[42] Schulte-Pelkum, V., Mahan, K.H., Shen, W., and Stachnik, J., **2017**, The distribution and composition of high-velocity lower crust across the continental U.S: comparison of seismic and xenolith data and implications for lithospheric dynamics and history, *Tectonics*, v. 36, doi: 10.1002/2017TC004480, *received Editor's Highlight*.

[41] Williams, M.L., Jercinovic, M.J., Mahan, K.H., and Dumond, G., **2017**, Electron Microprobe Petrochronology, *Reviews in Mineralogy and Geochemistry*, MSA, v. 83, p. 153-182, DOI: 10.2138/rmg.2017.83.5.

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----------Promotion to Associate Professor----------

[37] Condit, C.B.*, Mahan, K.H., Ault, A., and Flowers, R.M., **2015**, Foreland-directed propagation of high-grade tectonism in the deep roots of a Paleoproterozoic collisional orogen, SW Montana, USA, *Lithosphere,* v. 7, p. 625-645, doi:10.1130/L460.1.

[36] Jones, C., Mahan, K.H., Butcher, L.*, Levandowski, W.*, and Farmer, G.L., **2015**, Continental uplift through crustal hydration, *Geology*, v. 43, p. 355-358, doi:10.1130/G36509.1.

[35] Leslie, S.R.*, Mahan, K.H., Regan, S.[#], Williams, M.L., and Dumond, G., **2015**, Contrasts in

sillimanite deformation in felsic tectonites from anhydrous granulite- and hydrous amphibolite-facies shear zones, western Canadian Shield, *Journal of Structural Geology*, v. 71, p. 112-124, doi:10.1016/j.jsg.2014.12.002.

[34] Johnson, J.E. [$], West, D.P., Jr., Condit, C.*, and Mahan, K.H., **2014**, The Spanish Creek mylonite: A zone of high strain in the northern Madison Range, SW Montana, *Rocky Mountain Geology*, v.49, p. 91-114, doi:10.2113/gsrocky.49.2.91.

[33] Regan, S.P. [#], Williams, M.L., Leslie, S.*, Mahan, K.H., Jercinovic, M.J., and Holland, M.E. [$], **2014,** (2014 Editor's Choice), The Cora Lake shear zone, Athabasca granulite terrane (Snowbird Tectonic Zone), an intraplate response to far-field orogenic processes during amalgamation of Laurentia, *Canadian Journal of Earth Science*, v. 51, p. 877-901, doi: 10.1139/cjes-2014-0015.

[32] Williams, M.L., Dumond, G., Mahan, K.H., Regan, S.P. [#], Holland, M. [$], **2014**, Garnet-forming reactions in felsic orthogneiss: Implications for densification and strengthening of the lower continental crust, *Earth and Planetary Science Letters*, v. 405, p. 207-219, doi:10.1016/j.epsl.2014.08.030.

[31] Schulte-Pelkum, V. and Mahan, K.H., **2014**, Imaging faults and shear zones using receiver functions, *Pure and Applied Geophysics*, Topical Volume on Crustal Fault Zones, v. 171, p. 2967-2991, doi:10.1007/s00024-014-0853-4.

[30] Schulte-Pelkum, V. and Mahan, K.H., **2014**, A method for mapping crustal deformation and anisotropy with receiver functions and first results from USArray, *Earth and Planetary Science Letters*, v. 402, p. 221-233, doi:10.1016/j.epsl.2014.01.050.

[29] Dumond, G., Mahan, K.H., Williams, M.L., and Jercinovic, M.J., **2013**, Transpressive uplift and exhumation of continental lower crust revealed by syn-kinematic monazite reactions, *Lithosphere*, v. 5, p. 507-512, doi:10.1130/L292.1.

[28] Mahan, K.H., Allaz, J.M., Baird, G.B., and Kelly, N.M., **2013**, Proterozoic metamorphism and deformation in the northern Colorado Front Range, in Abbott, L.D., and Hancock, G.S., eds., Classic Concepts and New Directions: Exploring 125 Years of GSA Discoveries in the Rocky Mountain Region, *Geological Society of America Field Guide* 33, p. 1-20, doi:10.1130/2013.0033(06).

[27] Karlstrom, K.E., Ilg, B.R., Hawkins, D., Williams, M.L., Dumond, G., Mahan, K., and Bowring, S.A., **2012**, Vishnu basement rocks of the Upper Granite Gorge: Continent formation 1.84 to 1.66 billion years ago, *Geological Society of America Special Paper* 489, p. 7-24, doi: 10.1130/2012.2489(01).

[26] Mahan, K.H., Schulte-Pelkum, V., Blackburn, T.J. [#], Bowring, S.A., and Dudas, F.O., **2012**, Seismic structure and lithospheric rheology from deep crustal xenoliths, central Montana, USA. *Geochemistry Geophysics Geosystems*, v. 13, Q10012, doi:10.1029/2012GC004332.

[25] Barnhart, K.R.*, Mahan, K.H., Blackburn, T.J. [#], Bowring, S.A., and Dudas, F.O., **2012**, Deep crustal xenoliths from central Montana: Implications for the timing and mechanisms of high-velocity lower crust formation. *Geosphere*, v. 8, p. 1408-1428, doi: 10.1130/GES00765.1

[24] Ault, A.*, Flowers, R.M., and Mahan, K.H., **2012**, Quartz shielding of sub-20 um zircons from radiation damage-enhanced Pb loss: an example from a granulite facies mafic dike, northwestern Wyoming craton. *Earth and Planetary Science Letters*, v. 339-340, p. 57-66, doi:10.1016/j.epsl.2012.04.025.

[23] Ward, D.*, Mahan, K., and Schulte-Pelkum, V., **2012**, Roles of quartz and mica in seismic anisotropy of mylonites, *Geophysical Journal International*, v. 190, p. 1123-1134, doi:10.1111/j.1365-246X.2012.05528.x.

[22] Bartley, J.M., Glazner, A.F., and Mahan, K.H., **2012**, Formation of pluton roofs, floors, and walls by crack opening at Split Mountain, Sierra Nevada, California, *Geosphere*, v. 8, p. 1086-1103, doi:10.1130/GES00722.1.

[21] Blackburn, T.J.[#], Bowring, S.A., Perron, J.T.[#], Mahan, K.H., Dudas, F.O., and Barnhart, K.R.*, **2012**, An exhumation history of continents over billion-year time scales, *Science*, v. 335, p. 73-76, doi: 10.1126/science.1213496.

[20] Blackburn, T.J.[#], Shimizu, N., Bowring, S.A., Schoene, B., Mahan, K.H., **2012**, Zirconium in rutile speedometry: New constraints on lower crustal cooling rates and residence temperatures, Earth and Planetary Science Letters, v. 317-318, p. 231-240, https://doi.org/10.1016/j.epsl.2011.11.012.

[19] Mahan, K.H., Smit, A., Williams, M.L., Dumond, G., Van Reenen, D.D., **2011**, Heterogeneous strain and polymetamorphism in high-grade terranes: Insight into crustal processes from the Athabasca Granulite Terrane, western Canada and Limpopo Complex, southern Africa, *in* Van Reenen, D.D., Kramers, J.D., McCourt, S., and Perchuk, L.L., eds., Origin and Evolution of High-Grade Gneiss Terranes, with Special Emphasis on the Limpopo Complex of Southern Africa *Geological Society of America Memoir 207, p.* 269-287, doi: 10.1130/2011.1207(14).

[18] Blackburn, T.J.[#], Bowring, S., Schoene, B., Mahan, K.H., Dudas, F., **2011**, U-Pb Thermochronology: creating a temporal record of lithosphere thermal evolution, *Contributions to Mineralogy and Petrology,* v. 162, p. 479-500, doi:10.1007/s00410-011-0607-6.

[17] Mahan, K.H., Wernicke, B., Jercinovic, M.J., **2010**, Th-U-total Pb geochronology of authigenic monazite in the Adelaide rift complex, South Australia, and implications for the age of the type Sturtian and Marinoan glacial deposits. *Earth and Planetary Science Letters*, v. 289, p. 76-86.

----------Tenure-track appointment----------

[16] Mahan, K.H., Guest, B., Wernicke, B., Niemi, N.A., **2009**, Low-temperature thermochronologic constraints on the kinematic history and spatial extent of the Eastern California shear zone. *Geosphere*, v. 5, p. 1-13, doi: 10.1130/GES00226.1.

[15] Williams, M.L., Karlstrom, K.E., Dumond, G., Mahan, K.H., **2009**, Perspectives on the architecture of continental crust from integrated field studies of exposed isobaric sections, *in* Crustal Cross Sections from the Western North American Cordillera and Elsewhere: Implications for Tectonic and Petrologic Processes (eds. Miller, R.B. and Snoke, A.W.), *Geological Society of America Special Paper* 456, p. 219-241.

[14] Mahan, K.H., Goncalves, P., Flowers, R., Williams, M.L., Hoffman-Setka, D.[#], **2008**, The role of heterogeneous strain in development and preservation of a polymetamorphic record in high-pressure granulites, *Journal of Metamorphic Geology,* v. 26, p. 669-693, doi:10.1111/j.1525-1314.2008.00783.x.

[13] Hetherington, C.J., Williams, M.L., Jercinovic, M.J., Mahan, K.H., **2008**, Understanding geologic processes with xenotime: Composition, chronology, and a protocol for electron probe microanalysis, *Chemical Geology*, v. 254, p. 133-147, doi:10.1016/j.chemgeo.2008.05.020.

[12] Flowers, R.M., Bowring, S.A., Mahan, K.H., Williams, M.L., Williams, I.S., **2008**, Stabilization and reactivation of cratonic lithosphere from the lower crustal record in the western Canadian shield, *Contributions to Mineralogy and Petrology*, v. 156, p. 529-549, doi:10.1007/s00410-008-0301-5.

[11] Dumond, G.[#], Mahan, K.H., Williams, M.L., Karlstrom, K., **2007**, Crustal segmentation,

composite looping pressure-temperature paths, and magma-enhanced metamorphic field gradients: Upper Granite Gorge, Grand Canyon, USA, *Geological Society of America Bulletin*, v. 119, p. 202-220, doi:10.1130/B25903.1.

----------Initial CU appointment----------

[10] Mahan, K.H., **2006,** Retrograde mica in deep crustal granulites: implications for crustal seismic anisotropy, *Geophysical Research Letters*, v. 33, L24301, doi:10.1029/2006GL028130.

[9] Mahan, K.H., Goncalves, P., Williams, M.L., Jercinovic, M.J., **2006**, Dating metamorphic reactions and fluid flow: Application to exhumation of high-P granulites in a crustal-scale shear zone, western Canadian Shield, *Journal of Metamorphic Geology,* v. 24, p. 193-217.

[8] Mahan, K.H., Williams, M.L., Flowers, R.M., Jercinovic, M.J., Baldwin, J.A., 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, *Contributions to Mineralogy and Petrology*. v. 152, p. 223-242.

[7] Flowers, R.M., Mahan, K.H., Bowring, S.A., Williams, M.L., Pringle, M.S., Hodges, K.V., **2006**, Multistage exhumation and juxtaposition of lower continental crust in the western Canadian Shield: Linking high-resolution U-Pb and $^{40}Ar/^{39}Ar$ thermochronology with P-T-D paths, *Tectonics*, v. 25, TC4003, doi:10.1029/2005TC001912.

[6] Baldwin, J.A., Bowring, S.A., Williams, M.L., Mahan, K.H., **2006**, Geochronological constraints on the crustal evolution of felsic high-pressure granulites, Snowbird tectonic zone, Canada, *Lithos,* v. 88, p. 173-200.

[5] Williams, M.L., Jercinovic, M.J., Goncalves, P., Mahan, K.H., **2006**, Format and philosophy for collecting, compiling, and reporting microprobe monazite ages, *Chemical Geology,* v. 225, p. 1-15.

[4] Mahan, K.H., Williams, M.L., **2005**, Reconstruction of a large deep-crustal exposure: Implications for the nature of the Snowbird Tectonic Zone and early growth of Laurentia, *Geology*, v. 33, p. 385-388.

[3] Karlstrom, K.E., Whitmeyer, S.J., Dueker, K., Williams, M.L., Bowring, S.A., Levander, A., Humphreys, E.D., Keller, G.R., Andronicos, C., Bolay, N., Boyd, O., Chamberlain, K., Christensen, N., Crowley, J., Crosswhite, J., Coblentz, D., Eshete, T., Erslev, E., Farmer, L., Flowers, R., Fox, O., Heizler, M., Jessup, M., Johnson, R., Kelley, S.A., Kirby, E., Magnani, M.B., Mahan, K., Matzal, J., McCoy, A., Meyer, G., Miller, K., Morozova, E., Pazzaglia, F., Prodehl, C., Read, A., Quezeda, O., Roy, M., Rumpel, H., Selverstone, J., Sheehan, A., Stevens, L., Shaw, C.A., Shoshitaishvili, E., Smithson, S., Snelson, C., Timmons, M., Trevino, L., Tyson, A., Wagner, S., Wan, X., Wisniewski, P., Yuan, H., and Zurek, B., **2005**, Synthesis of results from the CD-ROM Experiment: 4-D image of the lithosphere beneath the Rocky Mountains and implications for understanding the evolution of continental lithosphere, *AGU Geophysical Monograph Series* 154, p. 421-441.

[2] Mahan, K.H., Williams, M.L., Baldwin, J.A., **2003**, Contractional uplift of deep crustal rocks along the Legs Lake shear zone, western Churchill Province, Canadian Shield. *Canadian Journal of Earth Sciences*, v. 40, p. 1085-1110.

[1] Mahan, K.H., Bartley, J.M., Coleman, D.S., Glazner, A.F., Carl, B.S., **2003**, Sheeted intrusion of the synkinematic McDoogle pluton, Sierra Nevada, California, *Geological Society of America Bulletin*, v. 115, p. 1570-1582.

Other Publications (CU undergraduate student^, CU graduate student*, CU postdoctoral fellow°, graduate student at other institution#, undergraduate student at other institution$)

[9] Mahan, K.H., Frothingham, M.*, and Alexander, E.°, **2021**, Supporting materials for "Virtual mapping and analytical data integration: A teaching module using Precambrian crystalline basement in Colorado's Front Range (USA)", *CU Scholar*, https://doi.org/10.25810/07VS-QG71

[8] Mahan, K.H., Frothingham, M.G.*, and Alexander, E.°, **2021**, Remote mapping and analytical data integration: Coal Creek quartzite and Ralston shear zone, Colorado, *in* Teaching with Online Field Experiences, Exemplary Collection, NAGT/SERC website: https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237694.html

[7] Barnhart, K.R., Mahan, K.H., Blackburn, T.J., Bowring, S.A., and Dudas, F.O., **2020**, Mineral compositions for metamorphosed lower crustal xenoliths, central Montana, USA, DOI: 10.1594/IEDA/111447, Date Available: 2020-01-08 URL: https://doi.org/10.1594/IEDA/111447

[6] Mahan, K.H., Schulte-Pelkum, V., Blackburn, T.J., Bowring, S.A., and Dudas, F.O., **2020**, Mineral compositions for metamorphosed lower crustal xenoliths, central Montana, USA, DOI: 10.1594/IEDA/111444, Date Available: 2020-01-08 URL: https://doi.org/10.1594/IEDA/111444

[5] Ault, A.K., Flowers, R.M., and Mahan, K.H., **2019**, Silicate mineral compositions from a granulite facies mafic dike, northern Madison Range, Montana, DOI: 10.1594/IEDA/111290, Date Available: 2019-03-21, URL: http://dx.doi.org/10.1594/IEDA/111290

[4] Condit, C.B., Mahan, K.H., Ault, A., and Flowers, R.M., **2019**, Silicate mineral compositions for metamorphic schist and amphibolite, northern Madison Range, southwestern Montana, DOI: 10.1594/IEDA/111272, Date Available: 2019-02-07, URL: http://dx.doi.org/10.1594/IEDA/111272

[3] Huntington, K.W., and Klepeis, K.A., with 66 community contributors including Mahan, K.H., **2018**, Challenges and opportunities for research in tectonics: Understanding deformation and the processes that link Earth systems, from geologic time to human time. A community vision document submitted to the U.S. National Science Foundation. University of Washington, 84 pp., https://doi.org/10.6069/H52R3PQ5.

----------Promotion to Associate Professor----------

[2] Blackburn, T.J.#, Bowring, S., Burdick, S., van der Hilst, R., Mahan, K.H., Barnhart, K.*, **2010**, U-Pb thermochronology:4-Dimensional Imaging of the North American Lithosphere, *inSights: the EarthScope newsletter*, Spring 2010. Reviewed internally by EarthScope personnel. View and download pdf here: http://www.earthscope.org/assets/uploads/pages/Sp10_Thermochron.pdf

----------Tenure-track appointment----------

[1] Mahan, K.H., Williams, M.L., Baldwin, J.A., Bowring, S.A., **2001**, Juxtaposition of deep crustal and middle crustal rocks across the Legs Lake shear zone in northern Saskatchewan. In *Summary of Investigations, Vol. 2*. Saskatchewan Geological Survey, Saskatchewan Energy Mines, 2001-4.2. Reviewed internally by Saskatchewan Geological Survey personnel. View and download pdf here:

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Invited Presentations since promotion to Associate Professor

Rheological heterogeneity in deep continental crust: Examples from the Canadian Shield, Northern Rockies, and European Alps**,** *University of Akron*, October **2023**

Rheological heterogeneity in deep continental crust: Examples from the Canadian Shield, Northern Rockies, and European Alps**,** *University of Texas-Austin*, November **2021**

Deep crustal structure and deformation processes recorded in Precambrian basement exposures in southwest Montana, USA, *Texas A&M University*, October 25, **2019**

Deep crustal structure of the Rocky Mountain region from seismic observations, xenoliths, and local studies of exhumed terranes, *University of Michigan*, January 26, **2018**

Seismic anisotropy in localized shear zones versus distributed tectonic fabrics: Examples from geologic and seismic observations in western North America and the European Alps, *Pierre et Marie Curie Université, France*, February 23, **2017**

Deep crustal structure, processes, and properties from xenoliths and seismic observations in the Rocky Mountains, USA, *Université de Bourgogne Franche-Comté, France,* March 29, **2017**

Seismic anisotropy in localized shear zones versus distributed tectonic fabrics: Examples from geologic and seismic observations in western North America and the European Alps, *Université de Bourgogne Franche-Comté, France,* March 13, **2017**

Deep crustal structure, processes, and properties from xenoliths and seismic observations in the Rocky Mountains, USA, *University of Tübingen, Germany*, November 16, **2016**

Deep crustal structure, processes, and properties from xenoliths and seismic observations in the Rocky Mountains, USA, *Utah State University*, February 8, **2016**

International meeting abstracts since promotion to Associate Professor (2016) [common abbreviations: GSA-Geological Society of America, AGU-American Geophysical Union; CU undergraduate student^, CU graduate student*, CU postdoctoral fellow°, graduate student at other institution#, undergraduate student at other institution$]

[173] Wickland, T.D., McCrory, H., Mahan, K.H., Farmer, L., Allaz, J.M., Courtney-Davies, L., Newell, D.L. and Goncalves, P., **2025**, Plumbing the depths of the Colorado Plateau crust using mafic xenoliths hosted in shallow intrusions, southeastern Utah, USA, GSA annual meeting, San Antonio, TX.

[172] Holyoke, C.W., Razo, M., Wehner, K., and Mahan, K.H., **2025**, Melt-induced strengthening of quartzites due to dehydration of quartz grains, AGU annual meeting, New Orleans, LA.

[171] Hernandez, M.A., Newell, D.L., Mahan, K.H., Goncalves, P., Sims, J.R. and Warren, A.M., **2025**, Hydration of lower crust and its contribution to uplift of the Colorado Plateau, GSA annual meeting, San Antonio, TX.

[170] Ross, C., Kortyna, C., Mahan, K., Metcalf, J.R., and Flowers, R.M., **2025**, Using in situ He mapping to explore how crystal defects affect He distribution in zircon and implications for (U-Th)/He thermochronology, AGU annual meeting, New Orleans, LA.

[169] Marble, E., Flynn, C. and Mahan, K.H., **2025**, Stress estimates in a lower crustal, pseudotachylyte bearing shear zone using dynamically recrystallized quartz and plagioclase paleo-piezometry, GSA annual meeting, San Antonio, TX.

[168] Flynn, C., Marble, E., Oatman, R., Mahan, K.H. and Holyoke, C., **2025**, Lithologic heterogeneity and strain rate controls on stress amplification and seismic failure in a regional-scale, lower crustal shear zone; Western Churchill Province, Canada, GSA annual meeting, San Antonio, TX.

[167] Velázquez Santana, L.C.°, Patacsil, J.^, and Mahan, K.H., **2025**, Multi-level construction and magma hybridization in the Utuado pluton, Puerto Rico fossil island arc, GSA annual meeting, San Antonio, TX.

[166] Sims, J.R.*, Mahan, K.H., Schulte-Pelkum, V., Litton, S.D.[#], Goncalves, P., and Newell, D.L., **2024**, Evaluating crustal hydration as a surface uplift mechanism for the Colorado Plateau from xenolith and seismic studies, AGU annual meeting, Washington D.C.

[165] Newell, D.L., Litton, S.D.[#], Mahan, K.H., Gasnier, B.[#], and Goncalves, P., **2024**, Xenolith hydrogen isotope evidence for lower crustal hydration of the Colorado Plateau by subducting slab-derived fluids, GSA annual meeting, Anaheim, CA.

[164] Velázquez Santana, L.C.°, Patacsil, J.^, Mahan, K.H., and Krekeler, M., **2024**, Multi-stage magmatic evolution of the Utuado pluton, Puerto Rico: Evidence from amphibole petrography and thermobarometry, GSA annual meeting, Anaheim, CA.

[163] Patacsil, J.^, Velázquez Santana, L.C.°, Mahan, K.H., and Krekeler, M., **2024**, Microtextural Analyses of Intergranular and Poikilitic Mafic Enclaves from the Utuado Pluton, Puerto Rico, GSA annual meeting, Anaheim, CA.

[162] Flynn, C.*, Mahan, K.H. , Shinevar, W. J. , Holyoke, C., Lipper, C.^ , and Sims, J.*, **2024**, Mechanisms of episodic brittle failure in deep continental crust; testing models in the Western Churchill Province, Canada, Granulites and Granulites conference, Lake Maggiore, Italy.

[161] Lipper, C.[^], Flynn C.[*], Mahan K.H., Gestos, A., and Holyoke, C. **2024**, Reconstructing strain patterns in a deep crustal shear zone in the Canadian Shield: Evidence from kinematic vorticity analysis of host mylonite and sheared pseudotachylyte, Granulites and Granulites conference, Lake Maggiore, Italy.

[160] Mahan K.H., Sims J.R.[*], Gasnier B.[#], Litton S.D.[#], Lipper C.[^], Newell D.L., Goncalves P., and Farmer L., **2024**, Hydration of lower continental crust and impacts on Colorado Plateau elevations: Insights from xenolith studies from the Navajo Volcanic Field (Colorado, Utah, Arizona, New Mexico) and the Henry Mountains, Utah, USA, Granulites and Granulites conference, Lake Maggiore, Italy.

[159] Goncalves, P., Leydier, T., Albaric, J., Trap, P., and Mahan, K.H., **2024**, Concomitant brittle-ductile deformation, fluid-flow and metamorphism during continental subduction : a slow earthquake rock record in the Suretta nappe (Central Alps, Switzerland)?, EGU General Assembly.

[158] Dumond, G., Govind, Joshi[#], Goncalves, P., Mahan, K.H., Regan, S.P., Williams, M.L., and Jercinovic, M.J., **2023**, Exploring Strain Partitioning and Kinematic Evolution of the Lithosphere: In Honor of Micah Jessup, GSA meeting, Pittsburgh, PA.

[157] Mahan, K.H., Gasnier, B., Litton, S.D.[#], Goldenberg-Araujo, B.^, Lipper, C.^, Goncalves, P., Newell, D.L., and Farmer, L., **2023**, Impacts of Laramide crustal hydration on Colorado Plateau elevations: Updates from crustal xenolith studies from the Navajo Volcanic Field (Colorado, Utah, Arizona, New Mexico) and the Henry Mountains, Utah, USA, GSA meeting, Pittsburgh, PA.

[156] Schulte-Pelkum, V., Frothingham, M., Becker, T.W., Mahan, K. and Caine, J.S., Structural inheritance in the lithosphere from seismic imaging, **2022**, GSA annual meeting, vol. 54, no. 5, https://doi.org/10.1130/abs/2022AM-380358.

[155] Frothingham, M.G.*, Mahan, K.H., Schulte-Pelkum, V., Goncalves, P., and Zucali, M., **2022**, Confronting shear bias: Magmatic fabric influence on crustal seismic anisotropy, GSA annual meeting, vol. 54, no. 5, https://doi.org/10.1130/abs/2022AM-382432.

[154] Caso, F.[#], Zucali, M., Mahan, K.H., Visalli, R., and Ortolano, G., **2022**, Understanding the hidden tectono-metamorphic evolution of Precambrian rocks: Integration of quantitative microstructural and microchemical analysis on the Boulder Creek batholith rocks (Front Range, Colorado, USA), YORSGET-Young Researchers in Structural Geology and Tectonics meeting, 18-23 June, Sicily, Italy.

[153] Caso, F.[#], Zucali, M., and Mahan, K.H., **2022**, Microstructural and chemical analysis of biotite-gneiss from the Boulder Creek batholith (Front Range, Colorado, USA), EGU Deformation, Rheology, and Tectonics meeting, Sicily, Italy.

[152] Alexander, E.°, Mahan, K.H., Goncalves, P., Newell, D., and Gomez, Z.C., **2021**, Modeled influence of lithology, fluid volume, and vertical permeation of metasomatic fluids on isostatic uplift of the Colorado Plateau, AGU annual fall meeting.

[151] Frothingham, M.G.*, Schulte-Pelkum, V., Mahan, K.H., and Merschat, A., **2021**, East-dipping seismically anisotropic foliation above the Appalachian decollement inferred from azimuthally varying Ps receiver functions at SESAME stations in the Blue Ridge and Piedmont terranes: Implications for Alleghanian deformation patterns in the Appalachian orogen, USA, AGU annual fall meeting. **OUTSTANDING STUDENT PRESENTATION AWARD.**

[150] Gomez, Z.C. [$], Alexander, E.°, Mahan, K.H., Goncalves, P., and Newell, D., **2021**, Impact of metasomatism on Colorado Plateau lower crustal density: Insights from xenoliths from the Moses Rock and Mule Ear diatremes, Navajo Volcanic Field, AGU annual fall meeting.

[149] Mahan, K.H., Bridges, J., Godana, K., and Condit, C.B., **2020**, Late-stage dextral transpression in the Paleoproterozoic Big Sky Orogen of southwestern Montana: Implications for shear zone heterogeneity and evolution of the northern Wyoming craton, GSA annual meeting (online).

[148] Condit, C.B., Pec, M., Mahan, K.H., Chin, E.J., Mitroi, T., and Seltzer, C., **2020**, Integrating experimental and geologic observations to provide constraints on viscous rheology: assessing the role of calcic-amphibole in lithospheric strength, AGU annual fall meeting (online).

[147] Frothingham, M.G.* and Mahan, K.H., **2020**, Virtual field course on geologic mapping and analytical data integration in deformed crystalline basement exposed in the Front Range, Colorado, GSA annual meeting (online).

[146] Godana, K.[$], Bridges, J. [$], Condit, C.B., and Mahan, K.H., **2020**, Using monazite geochronology to constrain timing of deformation within the Hell Roaring Creek shear zone, SW Montana, AGU annual fall meeting (online).

[145] Bridges, J. [$], Godana, K., [$], Condit, C., and Mahan, K., **2020**, A petrochronological comparison of Neoarchean-Paleoproterozoic monazite from southwestern Montana, GSA annual meeting (online).

[144] Gomez, Z.C. [$], Mather, M. [$], Frothingham, M.G.*, Schulte-Pelkum, V., and Mahan, K.H., **2020**, Newly digitized structural data from the southern Appalachians and comparisons to subsurface anisotropy from seismic stations, Annual AGU fall meeting (online).

[143] Frothingham, M.*, Mahan, K.H., Schulte-Pelkum, V, and Caine, J. S., **2019**, Linking lithology,

structure, and rock properties to observed seismic anisotropy in Colorado Rocky Mountain crust, GSA annual meeting, Phoenix, AZ.

[142] Leydier-Antonini, T.[#], Goncalves, P., Leclère, H., Albaric, J., Mahan, K., Orlandini, O.F., Schulte-Pelkum, V., and Moris-Muttoni, B., **2019**, How does seismic anisotropy evolve as a function of mineralogical and textural changes across ductile shear zones? – an experimental and modelling approach, European Geosciences Union General Assembly, April 7-12, Vienna, Austria.

[141] Schulte-Pelkum, V., Monsalve, G., Orlandini, O., Condit, C.B., Sheehan, A.F., Mahan, K.H., Shearer, P.M., Wu, F.T., and Rajaure, S., **2019**, Seismic Observations of Processes in Collisional Continental Lithosphere: Rheological Changes, Phase Changes, and Deformation, AGU Fall meeting, San Francisco, CA.

[140] Condit, C.B., Pec, M., and Mahan, K.H., **2019**, Amphibole rheology: Insights from naturally deformed deep crustal rocks and high temperature deformation experiments, GSA annual meeting, Phoenix, AZ.

[139] Mahan, K.H, Orlandini, O.F., Dumond, G., Regan, S.P., and Williams, M.L., **2019**, Rheological heterogeneity in lower continental crust: Examples from the Athabasca granulite terrane, Canada, *Deformation, Rheology, and Tectonics (DRT)* conference, Tuebingen, Germany.

[138] Mahan, K.H., Schulte-Pelkum, V., Condit, C.B., Barnhart, K.R., Butcher, L., Blackburn, T.J., Bowring, S.A., Jones, C., Flynn, C., Orlandini, O.F., Ault, A., Möller, A., Flowers, R.M., Farmer, L., **2019**, Deep crustal structure, processes, and properties from xenoliths, basement exposures, and seismic observations in the northern Rocky Mountain region, EarthScope Synthesis Workshop on Wyoming Craton, Jan 11-13, Bozeman, MT.

[137] Schulte-Pelkum, V., Mahan, K.H., Shen, W., and Stachnik, J., **2019**, Deformation and structural evolution of the deep crust and lithosphere from EarthScope seismic data and geological ground truth, EarthScope Synthesis Workshop on Wyoming Craton, Jan 11-13, Bozeman, MT.

[136] Mahan, K.H., Flynn, C.*, Condit, C.B., and Schulte-Pelkum, V., **2018**, Oblique view through Big Sky orogenic crust in southwestern Montana and potential relations to geophysical structure of northern Wyoming cratonic margin, AGU annual fall meeting, Washington, D.C.

[135] Orlandini, O.F.* and Mahan, K.H., **2018**, Dynamic hardening and pseudotachylyte production in the lower crust, Gordon Conference on Rock Deformation, Proctor Academy, New Hampshire.

[134] Flynn, C.^, Mahan, K.H., and Allaz, J.M., **2018**, Establishing the contiguity of exhumed orogenic crustal cross section in southwestern Montana, USA, AGU annual fall meeting, Washington, D.C.

[133] Wachholtz, J.[$], Schulte-Pelkum, V., Mahan, K.H., Orlandini, O.F.*, and Caine, J.S., **2018**, A voyage into central Colorado crust: Linking seismic anisotropy and surface geology, AGU annual fall meeting, Washington, D.C.

[132] Schulte-Pelkum, V., Mahan, K.H., Condit, C.B., Shen, W., and Stachnik, J., **2018**, Mapping modification of deep crustal structure in the Wyoming province using xenoliths, crystalline basement exposures, and receiver functions (Invited), AGU annual fall meeting, Washington, D.C.

[131] Condit, C.B., French, M.E., Mahan, K.H., Lee, C.A., Hayles, J.A., and Yeung, L.Y., **2018**, Fluid infiltration promotes both ductile and brittle deformation within the deep crust: Examples from Southwestern Montana and the Central Alps, AGU annual fall meeting, Washington, D.C.

[130] Orlandini, O.F.*, Mahan, K.H., Schulte-Pelkum, V., and Brown, T.C., **2017**, Integrated EBSD Modelling of Seismic Anisotropy for a Major Deep Crustal Shear Zone, AGU annual meeting, New Orleans, LA.

[129] Provow, A.#, Newell, D., Ault, A., Dehler, C., Yonkee, A., and Mahan, K.H., **2017**, Documenting and characterizing fluid-rock interaction in Neoproterozoic siliciclastic rocks, GSA annual meeting, Seattle, WA.

[128] Condit, C.B.*, Mahan, K.H., Orlandini, O.F.*, and Schulte-Pelkum, V., **2017**, Seismic anisotropy from cores of hydrated, deep crustal mafic shear zones: implications for the relationship between strain, deformation mechanisms, and anisotropy magnitude, AGU annual meeting, New Orleans, LA.

[127] Schulte-Pelkum, V., Mueller, K., Brownlee, S., Becker, T.W., Mahan, K.H., **2017**, Constraints on seismic anisotropy in ductile rock fabric and application to imaging fault roots in southern California, Southern California Earthquake Center Annual Meeting, Palm Springs, CA.

[126] Brownlee, S., Schulte-Pelkum, V., Raju, A.*, Condit, C., Mahan, K.H., and Orlandini, O.F.*, **2017**, Seismic anisotropy in the continental crust: Using rock elastic tensors to inform seismic inversion, AGU annual meeting, New Orleans, LA.

[125] Mahan, K.H., Goncalves, P., Orlandini, O.F.*, Leydier, T.*, Condit, C., and Moris-Muttoni, B.*, **2017**, Relationships among transient brittle and ductile deformation and metamorphic reactions in crustal shear zones, GSA annual meeting, Seattle, WA.

[124] Regan, S.P., Grohn, L.J., Williams, M.L., Chiarenzelli, J., Jercinovic, M.J., Cousens, B., Aspler, L.B., and Mahan, K.H., **2017**, The Snowbird Tectonic Zone LIP: implications for an aborted rift origin, GSA annual meeting, Seattle, WA.

[123] Schulte-Pelkum, V., Mahan, K.H., Brownlee, S., Becker, T. and Russo, R., **2017**, Fault roots, shear zones, and lithospheric deformation from receiver functions and rock sample anisotropy, with quantitative comparisons to other structural, stress, and strain observables, EarthScope National Meeting, Alaska.

[122] Mahan, K.H, Schulte-Pelkum, V., Condit, C., Leydier, T., Goncalves, P., Raju, A., Brownlee, S., and Orlandini, O.F., **2017**, Detecting localized shear zones versus distributed tectonic fabrics with crustal seismic anisotropy using examples from western North America and the European Alps, 21st International Conference on Deformation mechanisms, Rheology, and Tectonics (DRT), April 30-May 4, Inverness, Scotland.

[121] Williams, M.L., Jercinovic, M.J., Dumond, G., and Mahan, K.H., **2017**, Electron microprobe petrochronology, European Geosciences Union General Assembly, April 23-28, Vienna, Austria. INVITED.

[120] Goncalves, P., Leydier, T., Mahan, K., Albaric, J., Trap, P., and Marquer, D., **2017**, The role of chemical processes and brittle deformation during shear zone formation and its potential geophysical implications, European Geosciences Union General Assembly, April 23-28, Vienna, Austria.

[119] Mahan, K.H, Schulte-Pelkum, V., Condit, C., Leydier, T., Goncalves, P., Raju, A., Brownlee, S., and Orlandini, O.F., **2017**, Seismic anisotropy in localized shear zones versus distributed tectonic fabrics: examples from geologic and seismic observations in western North America and the European Alps, European Geosciences Union General Assembly, April 23-28, Vienna, Austria.

[118] Orlandini, O.F.*, Mahan, K.H., Mueller, K., Williams, M.L., and Regan, S.P.#, **2016**, Frictional melt below the brittle-ductile transition: Two explanations from a shear zone in northern Saskatchewan, GSA annual meeting, Denver, CO.

[117] Condit, C.B.* and Mahan, K.H., **2016**, Fracturing, fluid flow, and deep crustal shear zone nucleation in Paleoproterozoic metagabbro, SW Montana, GSA annual meeting, Denver, CO.

[116] Regan, S.P.#, Williams, M.L., Grohn, L.J., Chiarenzelli, J., Mahan, K.H., Cousens, B., Aspler,

L.B., and Jercinovic, M.J., **2016**, Two transects across the Snowbird Tectonic Zone, western Churchill Province,: Exploring the continuity of the Rae-Hearne boundary and its role during the growth of Laurentia, GSA annual meeting, Denver, CO.

[115] Orlandini, O.F.*****, Allaz, J., and Mahan, K.H., **2016**, Using electron microprobe techniques to illuminate anomalous fault behavior in the deep crust, Electron probe microanalyzer Topical Conference, Madison, WI.

[114] Regan, S.[#], Williams, M.L., Mahan, K.H., Jercinovic, M.J., Chiarenzelli, J.R., and Aspler, L., **2016**, A transect across the Rae-Hearne boundary: implications for Neoarchean growth and Paleoproterozoic disruption of the western Churchill Province, Geological Association of Canada-Mineralogical Association of Canada annual meeting, Yukon.

[113] Schulte-Pelkum, V., Condit, C., Brownlee, S., Mahan, K.H., and Raju, A., **2016**, Expression of Lithospheric Shear Zones in Rock Elasticity Tensors and in Anisotropic Receiver Functions and Inferences on the Roots of Faults and Lower Crustal Deformation, AGU Fall meeting, San Francisco, CA.

[112] Schulte-Pelkum, V., Mahan, K.H., Shen, W., and Stachnik, J., **2016**, Contrasts in lower crustal structure and evolution between the northern and southern Rocky Mountains from xenoliths and seismic data, AGU Fall meeting, San Francisco, CA.

[111] Schulte-Pelkum, V., Mahan, K.H., Shen, W., and Stachnik, J., **2016**, Proterozoic assembly signature and its overprint in lower crustal seismic velocity structure across North America, GSA annual meeting, Denver, CO.

Note: 110 additional career presentations prior to promotion to Associate Professor, including forty-seven 1st-authored by graduate students and two 1st-authored by undergraduate students.

Regional Meeting Abstracts (CU undergraduate student^, CU graduate student*****, CU postdoctoral fellow°, graduate student at other institution[#], undergraduate student at other institution[$])

[28] Wehner, K.[#], Shelleman, M.W., Mahan, K.H., and Holyoke, C., **2025**, Effect of melt on quartzite strength, North-Central section of GSA Joint Northeastern/North-Central section meeting, Erie, PA.

[27] Litton, S.[#], Newell, D.L., Mahan, K.H., Goncalves, P., and Gasnier, B.[#], **2023**, Hydrogen stable isotope constraints on hydration of Colorado Plateau lower crust from Oligocene-Miocene Navajo Volcanic Field xenoliths, Rocky Mountain GSA meeting, Ft. Collins, CO.

[26] Baird, G.B., Grover, T.W., Mahan, K.H., **2023**, Paleoproterozoic crust generation in the northern Colorado Front Range, Rocky Mountain GSA meeting, Ft. Collins, CO.

[25] Goldenberg-Araujo, B.^, Lipper, C.^, Mahan, K.H., Goncalves, P., Newell, D.L., Litton, S.[#], Abbott, L.D., Farmer, L., and Frothingham, M.*, **2023**, Exploring possible crustal xenolith localities in the Southern Rocky Mountain region: Henry Mountains, Utah and Elk Range, Colorado, Rocky Mountain GSA meeting, Ft. Collins, CO.

[24] Goldenberg-Araujo, B.^, Lipper, C.^, Mahan, K.H., Goncalves, P., Newell, D.L., Litton, S.[#], Abbott, L.D., Farmer, L., and Frothingham, M.*, **2023**, Exploring possible crustal xenolith localities in the Southern Rocky Mountain region: Henry Mountains, Utah and Elk Range, Colorado, Houston Expo.

[23] Mather, M.[$], Gomez, Z.C. [$], Frothingham, M.G.*****, Schulte-Pelkum, V., and Mahan, K.H., **2021**,

Mapping the deformation patterns of the Greenville 1x2 degree quadrangle in the southern Appalachians surface in comparison to seismic anisotropy to predict subsurface dipping faults, SE section GSA meeting, Online.

[22] Cabrera, Z.G. **$**, Mather, M. **$**, Frothingham, M. *****, Schulte-Pelkum, V., and Mahan, K.H., **2020**, Mapping the deformation patterns of the southern Appalachian Mountains subsurface continental crust through seismic anisotropy, Annual RESESS Intern Colloquium, Remote.

[21] Chumley, A.S. **$**, Baird, G.B., Kelly, N.M., Mahan, K.H., Zaggle, R.H., and Allaz, J.M., **2017**, Geochemistry of the Big Thompson Canyon Paleoproterozoic granitoids, northern Colorado Front Range: implications for tectonic activity and crustal growth at ~1.7 Ga, Rocky Mountain GSA section meeting, Calgary, Alberta, Canada.

Note: 20 additional career presentations prior to promotion to Associate Professor, including eight 1st-authored by graduate students and three 1st-authored by undergraduate students.

Internal Research and Educational Grant Funding

Current grants [total CU funding-% administered by Mahan]

[9] Natural Sciences Core Facilities support program: *Support for GEOL EMP and CUBES-SIL lab managers*, 8/1/23-7/30/26, Lead Faculty: Katie Snell, Co-I: Mahan, Bell, and Maloney. No salary. [$75K -50%]

Past grants [total CU funding-% administered by Mahan]

[8] COSINC Material Characterization Award *Magmatic Fabric Influence on Crustal Seismic Anisotropy*, 9/21-3/22, Lead Faculty: Mahan, Co-PI: PhD student M. Frothingham, No Salary. [$0.5K equivalent instrument time; $3.5K equivalent of staff assisted usage -100%]

[7] CU ODECE, A&S, and Geol. Sci., *Graduate student summer GRA fellowship for UNAVCO RESESS Program*, 6/21-8/23, Lead Faculty: Mahan, [~$19K -administered by GEOL].

[6] CU Core Research Facilities assistance program: *PC Replacement and Software Upgrade for JEOL 8230 Electron Microprobe*, 7/21-6/22, Co-PIs: Bell, A. and Mahan, K.H. No Salary. [$7.3K – 100%].

[5] CU Core Research Facilities assistance program: *Supplement for annual service contract for JEOL 8230 Electron Microprobe*, 1/1/22-12/31/22, Co-PIs: Bell, A. and Mahan, K.H. No Salary. [$5K – 100%].

[4] CU ODECE, A&S, and Geol. Sci., *Graduate student summer GRA fellowship for UNAVCO RESESS Program*, 6/18-8/20, Lead Faculty: Mahan, [~$18K -administered by GEOL].

----------Promotion to Associate Professor----------

[3] CU Arts and Sciences Support of Education Through Technology (ASSETT) grant: *Improving student access to CU's Electron Microprobe Laboratory*, 5/15-5/16, [$1.25K -100%]

[2] CU Renovation and Infrastructure Improvement: Microprobe and Raman lab renovation, Lead Faculty Member: K.H.Mahan [$117K-100%]. July 2015-Dec 2017.

[1] UNAVCO RESESS (NSF-funded*), Subaward to the University of Colorado for Contributions to the UNAVCO RESESS Program*, 9/11-8/14, Sole PI: Mahan, [$36.9K-100%].

External Research Grant Funding

Pending Research grant proposals [total CU funding-% administered by Mahan]

[20] NSF Chemical Evolution of the Solid Earth and Volcanology (Proposal 2535103): *Collaborative Research: The Role of Plutonism in Crustal Differentiation within Island Arcs: A Case Study from Puerto Rico*, 01/01/26-12/31/28, Lead PI: Valasquez Santana. Co-I: Mahan. [$591K – 100% to CU Boulder].

Current Research grants [total CU funding-% administered by Mahan]

[19] NSF Tectonics (EAR 2234125): *Roles of lithology and water on deep continental crustal rheology from a natural setting and laboratory experiments*, 8/1/23-7/31/26, Lead PI: Mahan (University of Colorado). Co-I: C. Holyoke (Univ. of Akron). [$464.5K-100%].

[18] NSF Infrastructure and Facilities (EAR 2049743): *Updating of Geophysics Computer Facility, University of Colorado/CIRES*, 6/1/21-5/31/24. No-cost extension to 5/31/26. $74,410. Co-PIs: C. Jones, A. Sheehan, V. Schulte-Pelkum, K. Mahan. No salary. [$74.4K – 10%].

[17] NSF Tectonics/Petrology&Geochemistry (EAR 1937343): *Collaborative Research: Quantifying crustal hydration effects in the Colorado Plateau from xenoliths*, 7/1/20-6/30/23, No-cost extension to 6/30/26. Lead PI: Mahan (University of Colorado). Co-I: D. Newell. [$281K-100%].

Past funded grants [total CU funding-% administered by Mahan]

[16] NSF-EarthScope (EAR 1735890): *Building a continent: Integration of surface geology, rock physics, and seismic observations to investigate the tectonic history of the contiguous United States*, 9/1/17-8/31/20, NCE through 8/31/23, Lead PI: V. Schulte-Pelkum, Co-PI: Mahan, [$284K-44%].

[15] ISRD-RCN "Shadow a Beamline User" at APS 6BM-B Beamline - A Large Volume High Pressure Synchrotron Facility for Mineral and Rock Physics [RCN is NSF-funded].

[14] CNRS-INSU France: *Seismic anisotropy variation across crustal shear zones*, Lead PI: Philippe Goncalves, Co-PI: Henri Leclere, Mahan (international collaborator). Extension to 2019 with additional €5K [Total €10K-0%].

[13] NSF-Tectonics (CAREER EAR 1252295)*: Evolutionary processes in crustal seismic anisotropy: Repair and upgrade of EBSD detector and software, 7/1/20*17-6/30/2018, no-cost extension to 12/31/2020, Sole PI: Mahan, [$36K-100%].

[12] Mobilité Internationale des Chercheurs from Région Bourgogne-Franche-Comté [France]: *L'Origine de l'Anisotropie Sismique dans les Zones de Cisaillement*, Nov. 1, 2016 – Feb. 28, 2017, Convention #2016Y-04300, [€24K-100%].

----------Promotion to Associate Professor----------

[11] NSF-Tectonics (CAREER: EAR 1252295): *Evolutionary processes in crustal seismic anisotropy*, Sole PI: Mahan, 7/1/2013-6/30/2018, no-cost extension to 12/31/2020, [$497K-100%].

[10] NSF-Geophysics (EAR 1344582): *Role of hot crust in mountain building: Testing the alpha-beta quartz transition as a crustal geothermometer*, 4/1/14-3/31/16, no-cost extension to 6/30/19, PI: V. Schulte-Pelkum (CU), Co-PI: Mahan, [$84K- 28%].

[9] NSF-MRI: Supplemental request to *Acquisition of an Electron Microprobe for Major and Trace Element Analysis*, 11/1/15-8/31/17, no-cost-extension to 8/31/18, Lead PI: Mahan, Co-PI: J. Allaz, L.Farmer, [$99.3K-100%].

[8] NSF MRI (EAR 1427626): *Acquisition of an Electron Microprobe for Major and Trace Element Analysis*, 9/1/14-8/31/17, no-cost-extension to 8/31/18, Lead PI: Mahan, Co-PI: J. Allaz, L.Farmer, [$800K from NSF + $240K from CU-100%].
[7] NSF-EarthScope (EAR 1251193): *Crustal deformation across the U.S. from harmonic analysis of receiver functions*, 5/1/13-4/30/15, no cost extension to 4/30/18, PI: V. Schulte-Pelkum (CU), Co-PI: Mahan, [$205K-9%].
[6] USGS-MRERP, *Investigation of REE-minerals near Jamestown, CO: Mineral characterization and genesis*, 5/1/14-3/31/16, Lead PI: J. Allaz, Co-PIs: A.Skewes, K.H.Mahan, M.Raschke, C.Stern (All CU), [$47K-5%].
[5] NSF Earthscope (EAR 1053291): *Lowrider: The Where, When, and How of Continental Crustal Underplating*, $90K total ($20K Mahan's portion), 5/11-4/13, no-cost extension to 4/14, PI: V. Schulte-Pelkum (CU), Co-PI: Mahan, [$90K-22%].
[4] NSF Tectonics: *Collaborative Research: An exhumed field example of heterogeneous lower crustal flow*, 6/10-6/12, no-cost extension to 5/14, PI: Mahan**,** Co-PIs: V. Schulte-Pelkum (CU), M. Williams (UMass), [$234.6K-80%].
[3] USGS EDMAP: *Hell Roaring creek shear zone, Gallatin Peak quadrangle, N. Madison Range, Montana*, 6/12-6/13, no-cost extension to 9/13, Sole PI: Mahan, [$12. 3K-100%].

----------Tenure-track appointment (initial award date)----------

[2] NSF Earthscope (EAR 0746246): *Collaborative Research: Thermal Evolution of North American Lower Crust: U-Pb Thermochronological and Petrological Constraints on the Physical Properties of Continental Lithosphere*, 4/08-4/10, no-cost extension to 3/31/12, PI: S. Bowring (MIT), Co-PI: Mahan, [$109K-100%].
[1] NSF Geophysics: *SGER: Integrated petrophysical and seismological investigation of crustal fabric and seismic anisotropy of a major crustal suture zone, the Cheyenne Belt, Wyoming*, 9/07-2/10, PI: Mahan, Co-PI's: A. Sheehan and V. Schulte-Pelkum (both CU), [$69K-50%].

----------Initial CU appointment----------

Professional Development Research Activities

Spring 2025	Undergraduate Research Opportunities Program (UROP) Mentor Award
Fall 2024-Spr 2025	Excellence in Leadership (ELP) program participant and graduate
Fall 2024	"I'm sure they didn't mean it" – Bridging the Gap Between Intent Versus Impact - Academic Leaders Institute (ALI) Workshop
Fall 2023	Ground School for Pilot in Command (drones), CU Flight Operations, Division of Public Safety.
Fall 2019	Workshop participant: *Field Safety Leadership: Planning, conducting, and evaluating safe, healthy, and effective activities*
Fall 2018-Spr 2019	Hosted visiting professor, Dr. Philippe Goncalves (Université de Bourgogne Franche-Comté, France)
Spring 2017	Workshop participant: *MTEX introductory course and users meeting*, Chemnitz, Germany

----------Promotion to Associate Professor----------

Spring 2015	Workshop participant: *Photogrammetry: 3-D Digital Data Collection in the Lab and Field*
Fall 2012	Workshop participant: Oxford Instruments, *HKL Channel 5 EBSD data acquisition/processing*
Fall 2010	Workshop participant: Oxford Instruments, *Advanced techniques for EBSD analysis in the Earth Sciences*

----------Tenure-track appointment----------

Mar 2009	Workshop participant, *Deep Continental Drilling of the Alpine Fault, South Island, New Zealand*
Jan 2009	Workshop participant, *QEMSCAN® quantitative mineralogy*, Colorado School of Mines
Summer 2008	Participant, *Limpopo Belt Field Conference and workshop, South Africa*
2007	NSF-EarthScope workshop participant, *Geoswath Northern Rockies*

----------Initial CU appointment----------

2005	GSA Short Course, *Quantitative P-T-t Paths from Integrated Thermodynamic Modeling and Metamorphic Textures*
2005	GSA Field Forum, *Rethinking the assembly and evolution of plutons: field tests and perspectives*
2005	Integrated Solid Earth Sciences Forum III: *Growth of a Continent in Space and Time*
2004	Integrated Solid Earth Sciences Forum II: *EarthScope and Rheology of Continental Lithosphere*
2004	Rocky Mountain Earthscope Workshop I: *New Collaborations/ Advancing Understanding of Past/Present Geological/Geophysical Processes*
1998	GSA Workshop participant, *Deformation Mechanisms and Microstructures*

----------TEACHING----------

Brief Descriptions of Courses Taught

GEOL 1010 Introduction to Geology (3 cr)
Introductory geology for majors and nonmajors. Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. Meets MAPS requirement for natural science: nonlab. Approved for arts and sciences core curriculum: natural science.

GEOL 1040 Geology of Colorado (3 cr)
Introductory geology for majors and nonmajors with an emphasis on the geological history of Colorado

GEOL 3120 Introduction to Structural Geology (4 cr w/ 3-hr lab) [**modified for remote delivery 2020**] An upper level undergraduate course for Geological Sciences majors. Designed to introduce how and why rocks experience deformation and the basic principles of stress versus

strain relationships. *Re-designed an all-remote option for this course in 2020 which required major restructuring and redevelopment.*

GEOL 2005 Introduction to Earth Materials (4-cr w/ 2-hr lab) **[co-developed 2014]**
Introduces classification, origins, and utilization of solid Earth materials. This course is significantly different from the GEOL 3230 below, although it has a similar name. The lecture material, lab content, and assignments are almost completely redone as the student audience is at a lower level and the course is designed for all majors rather than those in a specific track. *I co-designed this course with another faculty member in Spring 2014.* It is now part of the current required core curriculum for Geology majors (a Tier 2 "Trunk" course).

GEOL 3230 Introduction to Earth Materials (3-cr w/ 2-hr lab) **[co-developed 2011]**
Specifically designed for now defunct Environment Science-track majors. Introduced classification, origins, and utilization of solid Earth materials. *I co-designed and co-taught 1/3rd of this course with two other faculty members in Spring 2011.*

GEOL 4719/5719 Field Analysis and Tectonics of Crystalline Rocks (2-cr) **[developed 2008, 2020, 2024]** Cross-listed for graduate students. It is field-based and fulfills one of the field module course requirements for the Geological Sciences major. *I designed and first taught it during summer session A in 2008. Designed an all-remote option for this course in 2020 which required major development. I also developed a Global Intensive component to include a 10-day trip in French Alps for 2024. The Alps-based course will run every other year – next one in Spring 2026.*

GEOL 4120/5120 Advanced Structure and Tectonics (3-cr) **[developed 2011, 2020]**
Graduate structural geology course. Introduces concepts and methods for analyzing deformation in crystalline solids, and other topics in tectonics. *I developed the original version in 2011 as a 2-credit course with a focus on microstructural processes and modified it in 2020 to cover a broader range of topics.*

GEOL 5703 Tectonics Seminar (1 cr)
Graduate reading seminar. Covers a wide range of topics related to crust, mantle, and whole Earth tectonics, with a focus on recent professional literature. *I first ran this seminar in Fall 2012.*

GEOL 5700 Deep Crustal Processes and Properties Seminar (1 cr) [**co-developed in 2011**]
Graduate reading seminar. Processes and properties that are characteristic of deep continental crust, with emphasis on cross-disciplinary discussion among geologists and geophysicists. *I co-developed and taught this course in Spring 2011.*

GEOL 5102 Intro to Geological Faculty II (1 cr)
This class introduces new graduate students to the faculty members in the department and their research, provides a platform for building professional relationships with faculty and peers, orients students to the graduate program structure (including milestones like comprehensive exams and important deadlines), and offers information about various support services. The goal is to help new students transition smoothly into our graduate program, ensuring they feel integrated and ready to begin their studies. *I first co-taught in Spring 2025.*

Teaching - courses taught since promotion to Assoc. Professor (2016)

Spring 2026	GEOL 1040 Geology of Colorado [3 cr] (90 enrolled)
Fall 2025	GEOL 3120 Introduction to Structural Geology [4 cr] (22 enrolled)
Summer 2025	GEOL 4862 Independent Study: Raman Spectroscopy [1 cr] (1 enrolled)
Spring 2025	GEOL 5102 Intro to Geological Faculty II [1 cr] (15 enrolled) – co-taught
Spring 2025	GEOL 4120/5120 Advanced Structure and Tectonics [3 cr] (8 enrolled)
Fall 2024	GEOL 2005 Introduction to Earth Materials, [4 cr] (16 enrolled)
Spring 2024	GEOL 2005 Introduction to Earth Materials, [4 cr] (20 enrolled)
Spring 2024	GEOL 4719/5719 Field Analysis/Tectonics, Crystalline [2 cr] (8 enrolled)
Fall 2023	on sabbatical
Spring 2023	research semester
Fall 2022	GEOL 3120 Introduction to Structural Geology [4 cr] (16 enrolled)
Spring 2022	GEOL 5862-900 Independent Study: Collisional Orogens [2 cr](1 enrolled)
Spring 2022	GEOL 1040 Geology of Colorado [3 cr] (90 enrolled)
Fall 2021	GEOL 2005 Introduction to Earth Materials, [4 cr] (15 enrolled)
Spring 2021	GEOL 4719/5719 Field Analysis/Tectonics, Crystalline [2 cr] (10 enrolled)
Fall 2020	GEOL 3120 Introduction to Structural Geology [4 cr] (29 enrolled)
Summer 2020	GEOL 4719 Field Analysis/Tectonics, Crystalline [2 cr] (6 enrolled)
Spring 2020	GEOL 4120/5120 Advanced Structure and Tectonics [3 cr] (5 enrolled)
Fall 2019	GEOL 2005 Introduction to Earth Materials, [4 cr] (29 enrolled)
Spring 2019	GEOL 5703 Tectonics Seminar [1 cr] (5 enrolled)
Fall 2018	GEOL 3120 Introduction to Structural Geology [4 cr] (51 enrolled)
Sum 2018	GEOL 4725 Field Analysis/Tectonics of Crystalline [2 cr] (9 enrolled)
Fall 2017	GEOL 2005 Introduction to Earth Materials, [4 cr] (40 enrolled)
	GEOL 1010 Introduction to Geology [3 cr] (160 enrolled)
Spring 2017	on sabbatical
Fall 2016	on sabbatical

Note: Supervised thesis/dissertation credit hours continuously since 2008. Twenty-seven additional course teachings (8 different courses) at CU prior to promotion to Assoc. Professor.

Postdoctoral scholars, Graduate and Undergraduate students

Postdoctoral scholar advisor or co-advisor - current

[4] Liannie Valasquez Santana, PhD Miami Univ.-Ohio 2023 (2024-present), *Petrological & Geochemical Investigations into Island Arc Magmatism*

Postdoctoral scholar advisor or co-advisor – past

[3] Catherine Ross, PhD UT-Austin 2022 (2024-2025), *Using in situ He mapping to explore how crystal defects affect He distribution in zircon and implications for (U-Th)/He thermochronology*, Lead advisor: Becky Flowers. Now Asst Prof at Baylor University.

[2] William Shinevar, PhD WHOI 2021 (2024) *Numerical modeling of deep crustal shear zone Rheology,* Lead advisor: Vera Schulte-Pelkum

[1] Ellen Alexander, PhD UCLA 2019 (2020-2022) *Quantifying crustal hydration effects in the Colorado Plateau from xenoliths*

Graduate advisor - current

[10] Tyler Wickland, 2020-present, *Plumbing the depths of the Colorado Plateau crust using mafic xenoliths hosted in shallow intrusions, southeastern Utah, USA*

[9] Jacob Sims, 2023-present, *Evaluating crustal hydration as a surface uplift mechanism for the Colorado Plateau from xenolith and seismic studies*

[8] Corey Flynn, 2023-present, *Rheologic Heterogeneity as a Stress Riser Leading to Episodic Seismicity in the Lower Crust*

Graduate advisor – past (Year of graduation)

[7] Michael Frothingham, PhD (2023) *Crystal to Crustal Scale Seismic Anisotropy: Implications for Continental Tectonism.* Current – USGS-Denver.

[6] Omero Felipe Orlandini, PhD (2019) *Origin and characteristics of fault-related pseudotachylyte in a high-pressure granulite-facies shear zone, western Canadian shield.* Current -Electric Power Engineers, Austin, TX.

[5] Cailey B. Condit, PhD (2017) *Fluid enhanced deformation and metamorphism in exhumed lower crust from the Northern Madison Range, southwestern Montana, USA*. Current - Asst Prof. at Univ. of Washington.

----------Promotion to Associate Professor----------

[4] Lesley Butcher, MSc (2013) *Constraining the evolution of the continental lower crust of the Colorado Plateau from crustal xenoliths.*

[3] Shannon Leslie, MSc (2012) *Contrasts in sillimanite deformation in felsic tectonites from Anhydrous granulite- and hydrous amphibolite-facies shear zones, western Canadian Shield.*

[2] Dustin Ward, MSc (2010) *The relative influence of quartz and mica on crustal seismic anisotropy.*

[1] Katy Barnhart, MSc (2010) *Deep crustal xenoliths from the Great Falls Tectonic Zone, Montana: Investigating the timing and mechanisms of high-velocity lower crust formation.*

Undergraduate advisor – past (Year of project completion) [Institution if different from CU]

[28] Emma Marble, Undergrad Research (2025), *Stress estimates in a lower crustal, pseudotachylyte bearing shear zone using dynamically recrystallized quartz and plagioclase paleo-piezometry*

[27] Soren Rollin, Undergrad Research (2025-present), *Hydrothermal vein formation in Boulder Creek granodiorite near the Great Unconformity, Boulder County, CO*

[26] Lark Jones, Undergrad Research (2024-2025), Honors thesis: *The potential for pre-Laramide inheritance in the Livingston fault, Boulder County, CO*

[25] Julia Patacsil, Undergraduate Research (2024-present), *Investigating the Formation of Magmatic Systems in Puerto Rico*

[24] Holly McCrory, Undergraduate Research (2024-present), *Deep Crustal Study of Strength Properties and Deformation History of the Colorado Plateau*

[23] Christina Lipper, Undergraduate Research (2023-present), *Micro-CT analysis of naturally and experimentally deformed fault-related pseudotachylyte*

[22] Breno Araujo-Goldenberg, Undergraduate Research (2022), *Origin of xenoliths in Oligocene granitoids from the Henry Mountains, Utah*

[21] Christina Lipper, Undergraduate Research (2022-2023), *Origin of xenoliths in Oligocene granitoids from south-central Colorado*
[20] Shea Burnham, Undergraduate research, Honors student (2021) *REE mineralization in Paleoproterozoic rocks near Jamestown, Colorado*
[19] Zulliet Gomez, Undergraduate RESESS summer intern (2020) [SUNY-Oneonta] *Newly digitized structural data from the southern Appalachians and comparisons to subsurface anisotropy from seismic stations*
[18] Makayla Mather, Undergraduate RESESS summer intern (2020) [University of North Dakota] *Mapping the deformation patterns of the Greenville 1x2 degree quadrangle in the southern Appalachians surface in comparison to seismic anisotropy*
[17] Keneni Godana, Undergraduate RESESS summer intern (2020) [University of Chicago] *Using monazite geochronology to constrain timing of deformation within the Hell Roaring Creek shear zone, SW Montana*
[16] Jae Bridges, Undergraduate RESESS summer intern (2020) [Oregon State University] *A petrochronological comparison of Neoarchean-Paleoproterozoic monazite from southwestern Montana*
[15] Brooke Holman (2020)– Undergrad research assistant
[14] Porsche Adams-Wootton, Undergraduate research (2020) *Timing of shear zone development in Pre-Cambrian basement, southwest Montana*
[13] Corey Flynn, Undergraduate research (2018) *Contiguity of an exhumed orogenic crustal cross-section from monazite geochronology in high-grade quartzites in the Northern Madison Range, southwest Montana, USA*
[12] Jordan Wachholtz, Undergraduate RESESS summer intern (2018) [University of Nevada-Las Vegas], *A voyage into central Colorado crust: Linking seismic anisotropy and surface geology*
[11] Kelly Curtis, Honors thesis (2017), *summa cum laude*, *Using zircon morphology to understand metasomatic fluid alteration during the Big Sky Orogeny*
[10] Anissha Raju, Honors thesis (2017) *Characterization of Elastic Tensors of Crustal Rocks with respect to Seismic Anisotropy,* co-advised with V. Schulte-Pelkum

----------Promotion to Associate Professor----------

[9] Kelly Brenner, Undergraduate research (2016), UROP award recipient, *Evolving microstructures associated with deep crustal pseudotachylyte, western Canadian Shield*
[8] Corey Jarrett, Undergraduate research (2015) *Ultramafic tectonites in the Northern Madison Range, Southwest Montana*
[7] Diana Rattanasith, Undergraduate RESESS summer intern (2014) [UC-Santa Cruz] *Monazite occurrence and textures in the Big Thompson Metamorphic Suite, Front Range, CO*
[6] Chris Blade, Undergraduate research (2014), *Finite strain analysis across the margin of a kilometer-scale mid-crustal shear zone, southwest Montana*
[5] Diana Rattanasith, Undergraduate RESESS summer intern (2013) [UC-Santa Cruz] *Textural evolution and seismic anisotropy development: Example from sheared metagabbro, Gallatin Canyon, southwest Montana*
[4] Ana Leite, Undergraduate research, exchange student from Brazil (2012) *Kinematics of pseudotachylite generation in deep-crustal shear zone, northern Saskatchewan, Canada*
[3] Mario Guzman, Undergraduate research, (2012) *Granulite-Amphibolite transition during*

synkinematic hydrous retrogression of the Mary granite, Athabasca Granulite Terrane, northern Saskatchewan, Canada

[2] Andrew Parker, Undergraduate research (2011) *Deformation fabric & petrologic contrasts across the Cheyenne Belt, WY*

[1] Sophie Koprwoski, Undergraduate research, exchange student from UK (2010) *Alumino-silicate polymorph stability (kyanite, andalusite, or sillimanite?) across the N. Madison Range, SW Montana*

Member of dissertation/thesis committee (exclusive of students supervised) since promotion to Assoc. Professor

[33] Paige McDowell , MSc – proto-committee
[32] Bianca Artigas, MSc – proto-committee
[31] John Allard, PhD – proto-committee
[30] Micah Hernandez, MSc student, Utah State University
[29] Lindsay Harrison, PhD 2025
[28] Tyler Wickland, PhD; Chair of committee but later switched to primary advisor
[27] Lydia Pinkham, MSc 2023 (Aaron Bell and Carolyn Crow co-advisors); Chair of committee
[26] Jefferson Yarce, PhD 2020
[25] Simone Mueller, MA 2019, University of Northern Colorado
[24] Ashley Provow, MSc, 2019, Utah State University
[23] Sean Regan, PhD 2016, University of Massachusetts-Amherst

Note: Twenty-two additional graduate student thesis/dissertation or PhD qualifying exam committees before tenure.

Professional Development Teaching Activities since promotion to Professor

2023	Workshop participant: *Inclusive Graduate Education Network (IGEN) Equity in Graduate Admissions*

Professional Development Teaching Activities since promotion to Assoc. Professor

2019	Workshop participant: *Focusing the Lens on Field Safety* (Univ. Iowa)
2018	CU FTEP Seminar: *Flipping the Classroom for Skeptics*

Diversity in STEM Education Activities

Fall 2020-2023	Lead faculty on securing 3-yr financial commitment from CU's ODECE, College of A&S, and Dept. of Geol. Sci. to support summer GRA fellowship for RESESS program *(2021-2023).*
Sum 2020-2023	Principal Investigator –NSF Tectonics/Petrology & Geochemistry award with funding for RESESS program (through 2023)
2017-present	Co-Principal Investigator –NSF EarthScope award with funding for RESESS program (through 2021)

2017	Lead faculty on securing 3-yr financial commitment from CU's ODECE, College of A&S, and Dept. of Geol. Sci. to support summer GRA fellowship for RESESS program *(2018-2020).*
2012-present	Leader – Annual summer Geology and Geomorphology fieldtrip for RESESS interns (2020 cancelled due to pandemic)
2013	Principal Investigator –NSF CAREER award with funding for RESESS program (2013-2020)
	----------Promotion to Associate Professor----------
Summer 2012-2014	Principal Investigator –Departmental subaward for RESESS program
2008-2020	Graduate and undergraduate faculty advisor for minority and exchange students including 1 Native American MSc student, two international exchange students (UK and Brazil), and 7 Research Experiences in Solid Earth Science for Students (RESESS) summer interns [2 Laotian-American, 2 Native American, 2 LatinX, 1 LGBTQ]

----------SERVICE----------

Service – Department of Geological Sciences, since promotion to Assoc. Professor

2025	Member, Geological Sciences retreat and strategic planning committee
2024-present	Member, SamPLER facility committee
2024	Chair of committee for promotion of Dr. Aaron Bell to Asst. Research Professor
2022, 2024-present	Ex Officio member, Graduate Admissions Committee
2022, 2024-present	Chair, Graduate Curriculum Committee
2022, 2024-present	Associate Chair for Graduate Studies
2022	PUEC committee member, Jen Stempien reappointment
2022	Peer teaching review – Jen Stempien
2021-2023	Member, Executive committee
2020-2023	Chair, SamPLER facility committee
2012-present	Faculty Director, Electron Microprobe Analytical Facility
2020	Member, Adhoc committee for future of Benson chair
2020	Working Group Member, GEOL Fall 2020 class organization
2019-2020	Member Undergraduate curriculum committee
2019-2020	Member, Benson Chair faculty search committee
2018-2020	Member, SamPLER facility committee
2018-2019	Member, Space and Facilities committee
2018-2019	Member, Graduate Curriculum committee
2017-2019	Chair, Graduate Admissions committee
2017-2019	Member, Department Action Team: Assessment of Undergraduate Curriculum
2017-2018	Chair, Space and Facilities committee
2017-2018	Member, Rock Physics faculty search committee
2016-2017	on sabbatical

Service – University of Colorado

2023, 2024	Reviewer for CU internal Major Research Instrumentation (MRI) grant proposal selection
2021	Reviewer for CU Core Facilities internal grant program
2019-present	Advisory Committee Member, Colorado Shared Instrumentation in Nanofabrication and Characterization (COSINC), College of Engineering and Applied Science
2020	Working Group Member, Best practices for Lab and Field courses in Fall 2020, College of A&S
2017-2019	Reviewer for CU internal Major Research Instrumentation (MRI) grant proposal selection
2014-2018	BFA Diversity Committee member

Service – Agency Reviews and Panels, external faculty reviews, textbook reviews, since promotion to Assoc. Professor

2017-present	External reviewer: NSF Tectonics, NSF Geophysics, NSF Major Research Instrumentation, NSF Petrology and Geochemistry, NSF EarthScope
2025	External reviewer for faculty member at Univ. Wisconsin-Madison
2025	External reviewer for Univ. Vermont endowed chair position
2021	External reviewer for faculty member at Louisiana State University
2019	External reviewer for faculty member at Colorado School of Mines
2019	Chile's National Fund for Scientific and Technological Development (FONDECYT)
2018	Participant on NSF Tectonics program review panel, Washington, D.C.
2018	Canada's Natural Sciences and Engineering Research Council NSERC
2017	External reviewer for faculty member at National Taiwan University
2017	Reviewer for an Earth Materials textbook
2017	External reviewer: M.J. Murdock Charitable Trust

Note: Multiple external reviews for NSF Tectonics, NSF Geophysics, NSF Antarctic Earth Sciences, Canada's Natural Sciences and Engineering Research Council NSERC, and South African National Research Foundation prior to promotion to Assoc. Professor.

Service – Professional Research, Education, and local communities

2019-present	Volunteer firefighter, Sugarloaf Fire Protection District, Boulder County CO 2025-present Assistant Chief for SLFPD 2024 Battalion 2 Chief 2022-2024 Battalion 2 Captain
2004-Present	Peer reviewer for research journal articles: *Geology, Journal of Geology, Geological Society of America Bulletin, South African Journal of Geology, Gondwana Research, Earth and Planetary Science Letters, Journal of the Geological Society (London), Lithos, Journal of Metamorphic Geology, Precambrian Research, Contributions to Mineralogy*

	and Petrology, Lithosphere, Geosphere, Tectonics, Geological Society of London Special Publications, Geophysical Journal International, Geoscience Frontiers, Geological Society of America's Maps and Charts, Rocky Mountain Geology, American Rock Mechanics Association 53rd annual Rock Mechanics/Geomechanics Symposium, Minerals, Canadian Journal of Earth Science, Solid Earth, Tectonophysics, Earth Science Reviews, Philosophical Transactions A., Elements, and GSA Today.
2026	Advising member of 2-day workshop for StraboMicro development, a free online community tool for analyzing, collaborating on, and publishing microstructural geological data (NSF-sponsored)
2023-2024	Member, EarthScope Consortium Engagement Activities Advisory Committee
2022-2024	Member, GSA Structure and Tectonics Division Outstanding paper award committee
2023	Session Co-Convener, *Crust formation, deformation, metamorphism, plutonism, and thermal evolution of the Rocky Mountains: Proterozoic to Present*, GSA Rocky Mountain section meeting, Ft. Collins, CO
2022	Co-leader, Field trip – *Paleoproterozoic tectonics in the Northern Colorado Front Range*, GSA Annual meeting, Denver
2022	Session Co-Convener, *From Outcrops to the Base of the Crust: Integrated Geophysical and Geological Illumination of Earth's Tectonic Fabrics to Refine Understanding of Crustal Evolution and Natural Resources*, GSA Annual meeting, Denver
Spring 2021-2022	Co-Field Trip chair for Geological Society of America annual meeting, Denver, 2022
2019-2022	Member, UNAVCO Education and Outreach Advisory Committee
2020	Session Co-Convener, *Granulite terranes and evolution of continental lower crust: Insights from the Canadian Shield and beyond,* GSA Annual meeting, ONLINE
2020	Session Co-Convener, *Assembling Laurentia: Turning points in Paleoproterozoic tectonic Evolution*, GSA Annual meeting, ONLINE
2020	Co-leader for Non-Field Camp Capstone Experiences working group; part of Designing Remote Field Experiences project (sponsored by National Association of Geoscience Teachers and International Association for Geoscience Diversity)
2020	Scientific Mentor or Co-Mentor for four (4) RESESS underrepresented minority interns
2020	Member, UNAVCO RESESS intern selection committee
2019	Session Co-Convener*, Life and Death of Cratons: Craton Interactions with Collision, Subduction, and Volcanism - Global Perspectives and the Wyoming Province as an Example,* AGU Fall meeting, San Francisco, CA.
2019	Session Co-convener: *Origin and Evolution of Proterozoic Lithosphere in the Western United States*, GSA Annual meeting, Pheonix, AZ
2019	Co-organized CU-hosted international workshop: *Crustal Seismic anisotropy*, Boulder, CO [9 participants; 4 from CU, 1 from Wayne State Univ., 1 from Univ. Milan (Italy), 3 from Université de Bourgogne Franche-Comté (France)]
2019	Poster session judge for Research Experiences in Solid Earth Science for

	Students (RESESS), underrepresented minority undergraduates
2018	Member of UNAVCO search committee for Education specialist (including RESESS program manager)
2018	Advisory participant for developmental testing of a new field digital structural geology data collection tool called *StraboSpot,* Eastern California.
2017-2018	Vice-Chair, Rocky Mountain Section of the Geological Society of America
2017	Advisory participant for developmental testing of a new field digital structural geology data collection tool called *StraboSpot,* Idaho batholith, Idaho.
2016-2017	Contributing writer to Future Directions in Tectonics and Structural Geology white paper
2015-2018	Member-at-Large, Geological Society of America Research Grants Committee
2013-2017	Secretary, Rocky Mountain Section of the Geological Society of America
	----------Promotion to Associate Professor----------
2015	Session co-convener: *Crustal structure and evolution across the continental US from 10 years of Earthscope investigations: What have we learned and what are the open questions?*, Fall AGU meeting
2015-2016	Member of Workshop Organizing Committee, *Future Research Directions in Structural Geology & Tectonics*, Madison, WI, May 2016
2014	Co-leader of Fieldtrip: *Proterozoic Metamorphism and Deformation in the Colorado Front Range*, associated with Structure and Tectonics Forum, Golden, CO.
2013	Co-leader of Fieldtrip: *Powderhorn carbonatite complex, Gunnison County, CO*, associated with Geological Society of America Rocky Mountain section annual meeting, Gunnison, CO.
2013	Session co-convener, *REE deposits in the Rocky Mountains*, Geological Society of America Rocky Mountain section annual meeting, Gunnison, CO.
2012	Participant, EarthCube (NSF) Cyberinfrastructure workshop, Tectonics working group
2011	Session co-convener, *Geological, Geophysical, and Geodetic Constraints on Flow and Stress in the Continental Lithosphere*, AGU Fall meeting
2011	Sloan Faculty rep., 2011 Institute for Learning and Mentoring, The Compact for Faculty Diversity, Atlanta, GA
2011	Poster session judge for Research Experiences in Solid Earth Science for Students (RESESS), underrepresented minority undergraduates
	----------Tenure-track appointment----------
2009	Co-organizer, Pardee Keynote Symposium: *Crustal Tectonic Deformation as Revealed by Seismic Anisotropy*, GSA Annual Meeting, Portland, OR
2007	Session co-convener, *Linking Precise Dates to Accurate Ages in Continental Tectonics*, AGU Fall meeting
2007	Participant, "Ask a Scientist Night", Hillview Middle School, Whittier, CA
2006	Session co-convener, *Crustal fabric, seismic anisotropy, and deformation*, AGU Fall meeting

2005 Participant, “Ask a Scientist Night”, Hillview Middle School, Whittier, CA

Professional Society Membership

Geological Society of America
American Geophysical Union
Mineralogical Society of America
National Association of Geoscience Teachers