Ryan E. McKeon

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APPOINTMENTS:

Special Instructor: Department of Geography, Dartmouth College, September 2016 - Present
Research Physical Scientist: Biogeochemical Sciences Branch, Cold Regions Research and Engineering Laboratory, Engineer Research Development Center, US Army, June 2015 – June 2016
Visiting Scholar: Department of Earth Sciences, Dartmouth College, June 2015 – Present
Postdoctoral Scholar of Geochemistry: Division of Geological and Planetary Sciences, California Institute of Technology, Advisor: Ken Farley, June 2012 – December 2014
Visiting Professor: Department of Geology, Colorado College – April to May 2014
Research Assistant: Earth and Environmental Sciences Dept. Lehigh University – Spring 2012
Graduate Teaching Assistant: Earth and Environmental Sciences Dept. Lehigh University - Fall 2011
College of Arts and Sciences Summer Fellow: Earth and Environmental Sciences Dept., Lehigh University - June to August 2011
Graduate Teaching Assistant: Earth and Environmental Sciences Dept. Lehigh University - Fall 2010 to Summer 2011
Research Assistant: Earth and Environmental Sciences Dept., Lehigh University - Fall 2009 to Summer 2010
College of Arts and Sciences Fellow: Earth and Environmental Sciences Dept., Lehigh University - Fall 2008 to Summer 2009
Graduate Teaching Assistant: Department of Earth Sciences, Montana State University - Fall 2006 to Spring 2008

EDUCATION:

Lehigh University: Bethlehem, PA
Ph.D., Earth and Environmental Sciences, May 2012
Dissertation Title: *Apatite U-Th/He thermochronometry in slowly eroding landscapes: Addressing age dispersion to understand Appalachian topographic development*
Advisors: Peter Zeitler and Frank Pazzaglia

Montana State University: Bozeman, MT
Master of Science, Earth Sciences, May 2009
Thesis Title: *The interaction between tectonics, topography, and climate in the San Juan Mountains, southwestern Colorado*
Advisor: David Lageson

The Colorado College: Colorado Springs, CO
Bachelor of Arts, Geology, May 2003
Senior Project Title: *Testing the "glacial buzzsaw" hypothesis in the mountains of the western United States*
Advisor: Eric Leonard

PUBLICATIONS:

F.J. Cooper, B.A. Adams, J.D. Blundy, K.A. Farley, **Ryan .E. McKeon**, A. Ruggiero, "Aridity-induced Miocene canyon incision in the Central Andes". *Geology*, 44, 8, p. 675-678.

Amidon, William, Roden-Tice, Mary, Anderson, Alyssa, **McKeon, Ryan E.,** Shuster, David, 2016, "Late Cretaceous unroofing of the White Mountains, NH: An episode of passive margin rejuvenation?" *Geology,* 44, 6, p. 415-418.

McKeon, Ryan E., Jones, Sandra L., 2016, "A review of geomorphic controls on aerosol dust emission". Report ERDC/CRREL-SR-18368, US Army Engineer Research Development Center, Hanover, NH.

Farley, Ken A., **McKeon, Ryan E**., 2015, "Direct dating and thermochronology of Banded Iron Formation- associated hematite, Gogebic iron range, Michigan, U.S.A." *Geology,* 43, 12, p. 1083-1086.

McKeon, Ryan E., Zeitler, Peter K., Pazzaglia, Frank J., Idleman, Bruce, Enkelmann, Eva, 2014, "Decay of an old orogen: inferences about Appalachian landscape evolution from low-temperature thermochronology". *Geological Society of America Bulletin,* 126, 1-2, p. 31-46. doi: 10.1130/B30808.1

Fox, Matthew, **McKeon, Ryan E.,** Shuster, David L., 2014, "Incorporating 3-D parent nuclide zonation for apatite $^{4}He/^{3}He$ thermochronometry: An example from the Appalachian Mountains" *Geochemistry, Geophysics, Geosystems,* 15, 11, p. 4217-4229. doi: 10.1002/2014GC005464.

Karlstrom, K.E, Coblentz, D., Dueker, K., Ouimet, W., Kirby, E., Van Wijk, J., Schmandt, B., Kelley, S., Lazear, G., Crossey, L. J., Crow, R., Aslan, A, Darling, A., Aster, R., MacCarthy, J., Hansen, S.M., Stachnik, J., Stockli, D., Hoffman, M., **McKeon, RE.,** Feldman, J., Heizler, M., Donahue, M.S., and the CREST working group, 2012, Mantle-driven dynamic uplift of the Rocky Mountains and Colorado Plateau and its surface response: toward a unified hypothesis. *Lithosphere*, 4, 1, p. 3 - 22 DOI: 10.1130/L150.1.

Kulo, V., Bodzin, A., **McKeon, RE**., Anastasio, D., Peffer, T., & Sahagian, D. 2013. The Isle of Navitas: Towards a better understanding of energy and decision-making using GIS. In Atkinson, R.K. (Ed.), *Learning Environments: Technologies, Challenges and Impact Assessment.* Chapter 3, p. 49-67, Nova Publishers, New York.

Kulo, V., Bodzin, A., **McKeon, RE.,** Cirucci, L., Anastasio, D., Sahagian, D., & Peffer, T. 2013. The Isle of Navitas: Planning for energy use with Web GIS. *Science Scope, February, p. 30-37.*

Manuscripts in Preparation

McKeon, Ryan E., "Long-term landscape evolution in the Appalachians revisited: Cutting the cord with the Paleozoic Orogen." Invited paper for *Earth Science Reviews*

McKeon, Ryan E., Zeitler, Peter K., Pazzaglia, Frank J., Idleman, Bruce, Enkelmann, Eva, Laucks, Jeremy, "Slow long-term exhumation of the northern New England Appalachians from detrital Apatite U-Th/He thermochronology and radiation damage modeling". *In preparation for Lithosphere*

McKeon, Ryan E., Zeitler, Peter K., Idleman, Bruce, "Effects of physical and chemical abrasion on apatite U-Th/He Thermochronometry". *Geochimica et Cosmochimica Acta – in revision*

INVITED SEMINARS:

Department Seminar, Department of Earth and Environmental Sciences, Boston College: *Long-term Landscape Evolution in the Appalachians Revisited: Cutting the cord with the Paleozoic Orogen.* – scheduled for April 2016

Pardee Keynote Symposia, Geological Society of America Annual Meeting, Baltimore: *Long-term Landscape Evolution in the Appalachians Revisited: Cutting the cord with the Paleozoic Orogen.* – November 2015

Department Seminar, Department of Geology, Middlebury College: *Thermochronology of the Northern Appalachians.* – February 2015

Department Seminar, Department of Earth Sciences, Dartmouth College: *Shouldn't the Appalachians be flatter by now? New perspectives on an old mountain range from low-temperature thermochronology.* – February 2015

Tectonics Observatory Seminar, Division of Geological and Planetary Science, California Institute of Technology: *The extreme stability of cratons as seen through hematite U-Th/He and Ne systematics and $^{4}He/^{3}He$ multi-domain modeling.* – November 2013

Geology Club Seminar, Division of Geological and Planetary Science, California Institute of Technology: *Decay of an old orogen: Inferences about Appalachian landscape evolution from U-Th/He thermochronometry.* – January 2013

Brown Bag Lunch Seminar, Berkeley Geochronology Center: *How old is the Appalachian Landscape?* – July 2011

ABSTRACTS AND PRESENTATIONS (as First Author):

McKeon, Ryan E., Farley, Ken A., *Exploring MDD Behavior in Hematite: What Causes it and what can we do with it.* Geological Society of America Annual Meeting, Baltimore, MD – November 2015 (*poster*)

McKeon, Ryan E., Shuster, David L., *The influence of slow cooling and zonation on apatite 4He/3He thermochronometry*. Thermo2014 14th International Conference of Thermochronology, Chamonix, France – September 2014 (*talk*)

McKeon, Ryan E., Farley, Kenneth A., *Ne and He MDD Geochronology of hematite from a Michigan BIF*. Goldschmidt, Sacramento, CA – June 2014 (*poster*)

McKeon, Ryan E., Groff, Matthew* *Using detrital apatite U-Th/He thermochronometry to understand Appalachian landscape evolution*. Geological Society of America Meeting, Charlotte, NC – November 2012 (*talk*)

McKeon, Ryan E., *Decay of an old orogen: Inferences about Appalachian landscape evolution from U-Th/He thermochronometry*. Meeting of Young Researchers in Earth Science (MYRES 5), Salt Lake City – August 2012 (*poster*)

McKeon, Ryan E., Zeitler, Peter K., Pazzaglia, Frank J., *Teasing out an unsteady past in the southern Appalachians using apatite U-Th/He thermochronology*. AGU Fall Meeting 2011, San Francisco – December 2011 (*talk*)

McKeon, Ryan E., *How old are the Appalachians? Preliminary insights from new applications of apatite U-Th/He thermochronology*. Eastern North America Earthscope and GeoPRISMS Workshop, Bethlehem, PA – October 2011 (*talk*)

McKeon, Ryan E., Zeitler, Peter K., Pazzaglia, Frank J., *Long-Term landscape evolution from apatite U-Th/He thermochronology in slowly eroding landscapes: Problems and potential from the southern Appalachians, U.S.A.* European Geosciences Union General Assembly 2011, Vienna, Austria - April 2011. (*poster*)

McKeon, Ryan E., *How old are the Appalachians? Preliminary insights from new applications of apatite U-Th/He thermochronology*. 2011 Academic Symposium, Lehigh University - March 2011. (poster)

McKeon, Ryan E., Zeitler, Peter K., Pazzaglia, Frank J., *The effect of radiation damage on detrital apatite (U-Th)/He thermochronometry: A case study from New England, USA*. Thermo2010 12th International Conference of Thermochronology, Glasgow, Scotland - August 2010. (*poster*)

McKeon, Ryan E., Zeitler, Peter K., Idleman, Bruce, Enkelmann, Eva, Exploring the potential of whole rock shale (U-Th)/He thermochronometry. American Geophysical Union Fall Meeting, San Francisco, CA - December 2009 (*poster*).

McKeon, Ryan E., Kulo, Violet, Anastasio, David, Bodzin, Alec, Peffer, Tamara, Sahagian, Dork, *The Isle of Navitas: Towards a better understanding of energy and decision making using GIS*. Geological Society of America Meeting, Portland, OR - October 2009 (*poster*).

McKeon, Ryan E., Kelley, Shari A., Lageson, David R., *The interaction between tectonics, topography, glacial erosion in the San Juan Mountains, southwestern Colorado*. Geological Society of America Meeting, Houston, TX - October 2008 (*poster*).

McKeon, Ryan E., et al., *Structural Style and Sediment Dispersal in an Active Fold-and-Thrust Salient, Sulaiman Range, Pakistan.* Geological Society of America Meeting, Denver, CO - October 2007 (*poster - lead author and presenter for class project*).

McKeon, Ryan E., Leonard, Eric M., Sak, Peter, *Testing the "Glacial Buzzsaw" hypothesis in the mountains of the western United States*. Geological Society of America Meeting, Seattle, WA - October 2003 (*poster*).

* = Student Collaborators

ABSTRACTS AND PRESENTATIONS (Coauthored):

Rood, DH, Amidon, WA, **McKeon, RE**, Baldwin, J, Gray, B, Page, W, Farley, KA, *Paleoseismic assessment of the Hat Creek fault using cosmogenic ^{3}He surface exposure dating in basalt, northeastern California: A proof of concept study*. American Geophysical Union Fall Meeting – December 2015 *(talk)*

Larsen, IJ, Simon, ET, **McKeon, RE**, Farley, KA, Lamb, MP, *Reconstruction of Mega-Flood hydraulics from strath terraces in the Channeled Scablands, eastern Washington*, USA. American Geophysical Union Fall Meeting – December 2014 (*talk*)

Larsen, IJ, Simon, ET, **McKeon, RE**, Farley, KA, Lamb, MP, *Quaternary history of canyon carving in the channeled scablands*. Geological Society of America Meeting, Vancouver, B.C. – October 2014 (*talk*)

Farley, KA, **McKeon, RE**, Cox, S., *$^{4}He/^{3}He$ and (U-Th)/^{21}Ne thermochronometry of polycrystalline minerals as illustrated by hematite* (Keynote Lecture). Thermo2014 14th International Conference of Thermochronology, Chamonix, France – September 2014 (*talk*)

Pazzaglia, FJ, Berti, C, **McKeon, RE,** Gunderson, K, Semmens, K, *Tectonic Geomorphology and EarthScope in eastern North America*. Geological Society of America Meeting, Minneapolis, MN – October 2011.

Teletzke, A, Kulo, V, Bodzin, A, Anastasio, D, Sahagian, D, **McKeon, RE**, *Designing learning activities to teach "spatially" with web GIS*. Geological Society of America Meeting, Minneapolis, MN – October 2011.

Donahue M.S., Karlstrom, K.E., Gonzales, D., Pecha, M., **McKeon, R.E.**, *Multi-stage uplift of the Rocky Mountains: new age constraints on the Telluride Conglomerate and regional compilation of apatite fission track ages. Eos Trans. AGU*, Fall Meet. Suppl., 2011.

Pazzaglia, FJ, Zeitler, PK, **McKeon, RE,** Idleman, BD, Berti, C, *Unsteady rock uplift and erosion in a decaying orogen in response to surface and dynamic mantle processes* (Invited). *Eos Trans. AGU*, Fall Meeting 2010.

Kelley, SA, Karlstrom KE, Stockli, D, **McKeon, RE,** Hoffman, M, Lee, J, Pederson, J, Coblentz, D, *A summary and evaluation of thermochronologic constraints on the exhumation history of the Colorado Plateau- Rocky Mountain region*. Colorado River Evolution II Workshop, Flagstaff, AZ – May 2010.

Karlstrom, K., Coblentz, D., Ouimet, W., Kirby, E, Van Wijk, J., Schmandt, B., Crossey, L., Crow, R., Kelley, S., **McKeon, RE**., Aslan, A, Darling, A., Dueker, K., Aster, R., Lazear, G., Hilton, D., *Dynamic uplift of the Colorado Rockies and western Colorado Plateau in the last 6 Ma driven by mantle flow: Evidence from the Colorado River region, Eos Trans. AGU*, Fall Meet. Supplement, 2009.

Kelley, SA, **McKeon, RE**, 2009, *Thermal and exhumation history of Proterozoic basement and Oligocene plutonic rocks, southwestern Colorado*. Geological Society of America Abstracts with Programs, vol. 41, no. 7, p. 136.

AWARDS AND HONORS:

2011
CAS Graduate Student Representative to the 2011 Academic Symposium at Lehigh University
Best Talk - EES Department Graduate Student Symposium
2010
Runner-up Best Student Poster - Thermo2010 12th International Conference of Thermochronology
Runner-up Best Poster - EES Department Graduate Symposium
2009
Student Research Grant Award - Structural Geology and Tectonics Division of the Geological Society of America
Outstanding Mention - Research Grant Proposal, Geological Society of America
2007
Best Poster - Earth Sciences Department, Montana State University, Student Research Colloquium

TEACHING EXPERIENCE:

Colorado College
GY320 – Surface Processes and Geomorphology – Co-taught with Eric Leonard (Spring 2014 – 15 students)
Caltech
Ge 116 – Analytical Methods – 2 week introduction to ICP-MS and Noble Gas Mass Spectrometry
Introductory Seminars on MATLAB and LabVIEW programming laguages
Lehigh University (TA)

EES 115 - Surficial Processes with Frank Pazzaglia (Fall 2011 - 18 students)
EES 341 - Lehigh Field Camp (lead Geology TA) - (Summer 2011 - 30 students)
EES 223 - Structural Geology and Tectonics with David Anastasio (Spring 2011 - 11 students)
EES 004 - Science of Environmental Issues - 1 section (Spring 2011 - 31 students)
EES 115 - Surficial Processes with Frank Pazzaglia (Fall 2010 - 16 students)
Montana State University (TA)
GEOL 101 - Physical Geology - Head TA (Fall 2007 and Spring 2008), TA (Spring 2007) 60 students each semester in 3 lab sections.
GEOL 315 - Structural Geology with David Lageson (Fall 2006 - 17 students)
GPHY 111 - Physical Geography - 1 section (Fall 2006 - 19 students)

PROFESSIONAL EXPERIENCE:

Laboratory Equipment – Extensive experience with noble gas analysis and maintenance on Quadrupole and Magnetic Sector mass spectrometers. Extensive experience with both laser and resistance furnace heating of samples and gas extraction systems including cryogenic traps. Additionally I have extensive experience with LA-ICPMS and solution ICPMS.

Programming and Computing – I am proficient programming in LabVIEW, which I use to automate sample analysis, reduce data, and for computational modeling. I also program in MATLAB, which I use primarily to make figures and for some computational modeling. I have extensive experience with ArcGIS including raster analysis, data organization/archiving, and map generation. I have a lot of experience with excel and have used IsoPlot and ArArCalc.

Reviewer For – Geology, Geochimica et Cosmochimica Acta, American Chemical Society Petroleum Research Fund Proposals, National Science Foundation Proposals

Mentoring -
Undergraduate Student Research Project – At Lehigh University - Active in all phases of helping guide an EES major through their project, including hypothesis formation, technical and regional background, grant writing, lab techniques, presentation, etc.

Session Convener -
American Geophysical Union Fall Meeting 2011 - Title: The Long Road to Flat - Towards understanding the drivers and quantifying change in orogens - Earth and Planetary Surface Processes division - 27 Abstracts submitted.

Field Trip Leader –
Kirk Bryan Field Trip 2012 – GSA Annual Meeting in Charlotte, NC – Co-Leader of a day long field trip for the Quaternary Geology/Geomorphology Division entitled: *Piedmont Potpourris: New Perspectives on An Old Landscape (and Some of its Younger Parts).*

Short Courses and Seminars Attended -

Getting Started in Undergraduate Research for New and Future Faculty – Short Course at the 2012 GSA Annual Meeting in Charlotte, NC.
Teacher Development Seminar Series - Participated and completed the two semester seminar series to improve teaching skills in graduate students and young faculty - Lehigh University (Spring-Fall 2010)
Structural Interpretation of Seismic Data - Exxonmobil Sponsored Short Course offered at the 2009 GSA Annual Meeting in Portland, OR.
Departmental Responsibilities (During Graduate School) -
Student Rep. to Faculty Meetings - Earth and Environmental Sciences Department - Lehigh University (Fall 2011 – Spring 2012)
Student Rep. to the Graduate Instruction Committee - Earth and Environmental Sciences Department Lehigh University: Assisted in reformatting the Qualifying Exam for Ph.D program in EES among other tasks (Fall-Spring 2009-2010)
Tectonics Group Organizer – EES Department Lehigh University (Fall 2009 – Spring 2012) – Weekly seminar where students and faculty lead discussions about their research or recent impactful papers.
Graduate Student Research Symposium - Organizer, Master of Ceremonies, Marketer - EES Department - Lehigh University (Spring 2008 and 2009)
Student Rep. to Faculty Meetings - Earth Sciences Department - Montana State University (Fall 2007 - Spring 2008)
Student Research Colloquium - Organizer, Master of Ceremonies, Session Chair - Earth Sciences Department - Montana State University (Spring 2007 and 2008)

Labs Visited -
Berkeley Geochronology Center - Berkeley, CA - Collaborating with David Shuster and Greg Balco on apatite 4He/3He thermochronology of Appalachian samples (July - August 2011).
Arizona Radiogenic Helium Dating Lab - University of Arizona - Tucson, AZ - Collaborating with Peter Reiners on Appalachian bedrock and detrital U-Th/He analyses and learning U and Th dissolution and analysis using ICP-MS (June - July 2010).
KU U-Th/He Laboratory - University of Kansas - Lawrence, KS - Collaborating with Daniel Stockli and Shari Kelley (of New Mexico Tech) on apatite U-Th/He analysis of sample from the San Juan Mountains for my masters thesis.

Miscellaneous -
Curriculum Development - Co-Created GIS-based capstone project for energy education curriculum for Lehigh Valley 8th grade students (See Isle of Navitas abstract above) Lehigh University (Spring-Fall 2009)
Visiting Geologist to Elementary Schools - VT (Fall 2003 and Spring 2011), MT (Fall 2007)
Community Education Field Trip Leader to Hyalite Canyon - Bozeman, MT (Fall 2007)
Science Olympiad Event Coordinator - Bozeman, MT (Fall 2006 and Fall 2007)

AFFILIATIONS:
Geological Society of America (2006 to Present)
American Geophysical Union (2008 to Present)

FUNDING:

At Caltech

Coauthored NSF Proposals

Applying geochronology in the 3rd dimension to understand rift evolution in the 4th dimension – Will Amidon (Middlebury College), Ken Farley, **Ryan McKeon** – submitted to GeoPRISMS Program July 2013 – Resubmitted to EAR Tectonics July 2014.

Combined helium and neon chronometry of hematite from the Transvaal Supergroup, South Africa – Ken Farley and **Ryan McKeon** – submitted to Sedimentary Geology and Paleobiology Program July 2013 – Resubmitted to Sedimentary Geology Program July 2014.

At Lehigh University

Geological Society of America - $3750

Department of Earth and Environmental Sciences Palmer Grant – $6000

At Montana State University

Sigma Xi - $600

Colorado Scientific Society - $1200

American Alpine Club - $1000

Wyoming Geologic Society - $500