

Omero Felipe (Phil) Orlandini

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EDUCATION

Ph.D. May 2019: "The Cora Lake Shear Zone: A Natural Laboratory in the Lower Continental Crust". Dr. Kevin Mahan, Geological Sciences, University of Colorado, Boulder.

B.A. Chinese History, 2007, University of Colorado, Boulder, Colorado.

PUBLICATIONS

Cone, Kim A., Wendlandt, Richard F., Pfaff, Katharina, **Orlandini, Omero F.**, In Review. A hybrid approach to extracting crystal size distributions from texturally diverse lavas, *American Mineralogist*.

Orlandini, O.F., Kevin H. Mahan, Michael J. Williams, Sean P. Regan, Karl Mueller (2018), Evidence for deep crustal seismic rupture preserved in a granulite-facies intraplate strike slip shear zone, northern Saskatchewan, Canada, *Geological Society of America Bulletin*.

Brownlee, S. J., V. Schulte-Pelkum, A. Raju, K. Mahan, C. Condit, and **O. F. Orlandini** (2017), Characteristics of deep crustal seismic anisotropy from a compilation of rock elasticity tensors and their expression in receiver functions, *Tectonics*, 36, doi:10.1002/2017TC004625.

Regan, S. P., M. L. Williams, K. H. Mahan, G. Dumond, M. J. Jercinovic, and **O. F. Orlandini** (2017). "Neoproterozoic arc magmatism and subsequent collisional orogenesis along the eastern Rae domain, western Churchill Province: Implications for the early growth of Laurentia." *Precambrian Research* 294: 151-174.

Goldfarb, Richard J., Ryan D. Taylor, Gregory S. Collins, Nikolay A. Goryachev, and **Omero Felipe Orlandini** (2014). "Phanerozoic continental growth and gold metallogeny of Asia." *Gondwana Research* 25, no. 1: 48-102.

PUBLICATIONS IN PREPARATION

Orlandini, O.F., Rebekah Simon, Superior Interpolation of Diffraction Data Using Multilayer Neural Networks, *Journal of Microscopy*.

Orlandini, O.F., Kevin H. Mahan, Vera Schulte-Pelkum, Correlation of Seismic Anisotropy to Dominant Deformation Mechanism in the Heterogeneous Deep Crust, *Journal of Geophysical Research: Solid Earth*.

Orlandini, O.F. and Kevin H. Mahan, Rheology and Deformation Mechanisms of a Seismogenic Deep Crustal Shear Zone, *Journal of Structural Geology*.

Condit, C.B., Mahan, K.H., **Orlandini, O.F.**, and Schulte-Pelkum, V., Seismic anisotropy from cores of hydrated, deep crustal mafic shear zones: implications for the relationship between strain, deformation mechanisms, and anisotropy magnitude.

PROFESSIONAL PRESENTATIONS

2019

Thomas Leydier, Philippe Goncalves, Henri Leclere, Juli Albaric, Kevin Mahan, **Omero Felipe Orlandini**, V Schulte-Pelkum, Benjamin Moris-Muttoni, “How does seismic anisotropy evolve as a function of mineralogical and textural changes across ductile shear zones? – an experimental and modelling approach”. *European Geophysical Union Annual Meeting*; poster.

Mahan, K.H., Schulte-Pelkum, V., Condit, C., 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., “Deep crustal structure, processes, and properties from xenoliths, basement exposures, and seismic observations in the northern Rocky Mountains, UA”. *Earthscope Workshop Life and Death of a Craton: A 4D EarthScope perspective on the role of the Wyoming Craton in the evolution of North America*; poster.

Omero F. Orlandini, Rebekah Simon, “Prediction of crystallographic orientations in naturally deformed rocks by deep neural networks (or: the unexpected significance of diffraction image metadata)”. *Machine Learning in Solid Earth Geoscience*; talk.

2018

J Wacholtz, **O Orlandini**, V Schulte-Pelkum, K Mahan, J Caine, “A voyage in the continental crust of central Colorado: linking seismic anisotropy and surface geology”. *American Geophysical Union Annual Meeting*; poster.

O Orlandini, KH Mahan, “Petrology, rheology, and seismic signal of a deep-crustal mechanical anomaly”. *Bayerisches Geoinstitut, Bayreuth Germany*; invited talk.

O Orlandini, KH Mahan, “Dynamic Hardening and Pseudotachylyte Production in the Lower Crust”. *Gordon Research Conference: Rock Deformation*; poster.

S Brownlee, V. Schulte-Pelkum, KH Mahan, **O Orlandini** “Seismic Signatures of Deformed Rocks: Magnitude and Symmetry of Anisotropy in Rocks from the Middle and Lower Crust”. *Gordon Research Conference: Rock Deformation*; poster.

O Orlandini, R Simon, “Superior Interpolation of EBSD Data Using Bayesian Deep Neural Networks”. *Microanalysis Society Electron Backscatter Topical Conference*; poster.

2017

O Orlandini, KH Mahan, V Schulte-Pelkum, TC Brown, “Integrated EBSD Modelling of Seismic Anisotropy for a Major Deep Crustal Shear Zone”. *American Geophysical Union Annual Meeting*; talk.

O Orlandini, KH Mahan, V Schulte-Pelkum, “P/T Conditions of Ductile Overprint on Frictional Melt Veins; Modeling Seismic Anisotropy of a Granulite-Facies Shear Zone”. *European Geophysical Union Summer Field School in Texture Analysis*; poster.

CB Condit, KH Mahan, V Schulte-Pelkum, **O Orlandini**, “Seismic anisotropy from cores of hydrated, deep crustal mafic shear zones: implications for the relationship between strain, deformation mechanisms, and anisotropy magnitude”. *American Geophysical Union Annual Meeting*; poster.

Mahan, Kevin H.; Schulte-Pelkum, Vera; Condit, Cailey; Leydier, Thomas; Goncalves, Philippe; Raju, Anissha; Brownlee, Sarah; **Orlandini, Omero F.**, “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 Geophysical Union Annual Meeting*; talk.

2016

Omero Orlandini, Kevin Mahan, Karl Mueller, Micheal Williams “Frictional melt below the brittle-ductile transition: two explanations from a shear zone in northern Saskatchewan”. *Geological Society of America Annual Meeting*; talk.

2015

Omero Orlandini, Kevin Mahan, Karl Mueller, Michael Williams, “Deep-Crustal Rupture Of An Intraplate Strike-Slip Fault System Recorded By Pseudotachylyte Networks”. *Southern California Earthquake Center Annual Meeting*; poster.

Omero Orlandini, Kevin Mahan, Julien Allaz, Kelly Brenner, Sean Regan, Michael Williams, “Investigation Into The P/T Conditions Of Multiple Frictional Melt Vein Generations Hosted By A Deep-Crustal Shear Zone”. *Geological Society of America Annual Meeting*; poster.

C Condit, **O Orlandini**, KH Mahan, V Schulte-Pelkum, DT Rattanasith, “The role of hornblende in deep crustal seismic anisotropy: an investigation of the importance of deformation mechanisms” *American Geophysical Union Annual Meeting*; poster.

2014

Omero Orlandini, Kevin Mahan, Sean Regan, Michael Williams “Evidence for Cycles of Dynamic Brittle-Ductile Transition During Granulite Facies Shear”. *Gordon Research Seminar and Conference: Rock Deformation*; talk.

Omero Orlandini, Kevin Mahan, Karl Mueller, Sean Regan, Michael Williams “Cora Lake Shear Zone Pseudotachylyte: Deep Rupture Of An Intraplate Strike-Slip Crustal Fault And Implications For Seismology Of Earthquakes”. *Geological Society of America Annual Meeting*; talk.

2013

Omero Orlandini, Kevin Mahan, Sean Regan, Michael Williams, Ana Leite, “Microstructure Of Deep Crustal Pseudotachylyte-Bearing Mylonites”. *Geological Society of America Annual Meeting*; talk.

Omero Orlandini, Kevin Mahan, Sean Regan, Michael Williams, Ana Leite, “Pseudotachylytes Of The Deep Crust: Examples From A Granulite-Facies Shear Zone”. *American Geophysical Union Annual Meeting*; poster.

2012

Omero Orlandini, Kevin Mahan, Sean Regan, Michael Williams, Ana Leite, Laurie Brown, Michael Williams, “Structural Setting And Magnetic Properties Of Pseudotachylyte In A Deep Crustal Shear Zone, Western Canadian Shield”. *American Geophysical Union Annual Meeting*; poster.

TEACHING EXPERIENCE

Instructor of record

2017

Spring; Lecturer and instructor of record for introductory-level large lecture spanning all of earth sciences for non-majors. Solely responsible for curriculum; wrote all homework, quizzes, and exams; created new lectures for full semester.

Teaching Assistant or Graduate Instructor

2019

Spring; Teaching Assistant for Petrology; upper-level thermodynamic systems and optical petrology of mineral assemblages and reactions. Two 4-hour labs per week.

2018

Fall; Teaching Assistant for Mineralogy; upper-level physical properties and chemistry of minerals combined with crystallography. Two 4-hour labs per week, six weeks redesigned and implemented by me.

2016

Summer; Teaching Assistant for Introduction to Field Geology; mid-level general geologic mapping course in faulted sediments and intrusives. Three days a week, eight hours per day mapping with students, and several hours of grading maps and cross-sections.

Spring (short); Teaching Assistant for Active Tectonics field course in Death Valley, CA; advanced field techniques in surface expressions of active brittle deformation and topographic evolution. Eight hours per day of mapping with students for ten days, plus grading throughout semester.

2015

Fall (short); Teaching Assistant for Structural Field Geology course in Moab, UT; advanced geologic structure mapping in surface expressions of active brittle and ductile deformation. Eight hours per day of mapping with students for twelve days, plus grading throughout semester.

Fall; Teaching Assistant for Earth Materials; second-level general geology course covering mineralogy, petrology, and fabrics. Two 3-hour labs per week, seven labs redesigned and implemented as part of team of TAs.

Spring (short); Teaching Assistant for Active Tectonics field course in Death Valley, CA; advanced field techniques in surface expressions of active brittle deformation and topographic evolution. Eight hours per day of mapping with students for ten days, plus grading throughout semester.

Spring; Graduate Instructor for Introduction to Geology Lab; first-level general geology course covering surface processes, rock types and the rock cycle, and natural hazards. Two 4-hour labs per week with materials provided but no lecture component and no faculty oversight.

2014

Fall; Graduate Instructor for Introduction to Geology Lab; first-level general geology course covering surface processes, rock types and the rock cycle, and natural hazards. Two 4-hour labs per week with materials provided but no lecture component and no faculty oversight.

Summer; Teaching Assistant for Introduction to Field Geology; mid-level general geologic mapping course in faulted sediments and intrusives. Three days a week, eight hours per day mapping with students, and several hours of grading maps and cross-sections.

RESEARCH GRANTS

2018

French National Center for Scientific Research Project ‘Seismic Anisotropy Variation Across Crustal Shear Zones’, International Collaborator and author of EBSD sections, €5,000

2017

University of Colorado Geological Sciences Department Thompson Fund Grant, \$1,000

2016

Microanalysis Society Electron Microprobe Analysis Topical Conference Grant, \$750

2015

University of Colorado Undergraduate Research Opportunity Program (as mentor), \$2,313

2013

University of Colorado Geological Sciences Department Shell Research Grant, \$2,000

Geological Society of America Graduate Student Research Grant, \$2,500

AWARDS

2017

American Geophysical Union Outstanding Student Paper Award, \$200

2013

Geological Society of America Structure and Tectonics Division Outstanding Student Research Award, \$500

OUTREACH AND SERVICE**2019**

To date; *Geological Society of America Campus Representative*

2018

To date; *Geological Society of America Campus Representative*

Fall; *CU Geological Sciences ARPAC* – Only graduate student contributor to Academic Review and Planning Advisory Committee re-accreditation of degree program, participation primarily focused on helping to summarize the ~80-page submission and with articulating future departmental goals.

Fall; *Master's Co-supervisor, Benjamin Moris-Muttoni University of Franche-Comté, Besançon, France* – Oversaw student's collection and interpretation of combined EBSD and EPMA data from deformed and metamorphosed rocks (Neves area of the Eastern Tauern Window in the Italian Alps).

Summer; *RESESS program scientific mentor* - Guided the 12-week undergraduate research project for under-represented demographics into seismic anisotropy of the Colorado Front Range area using digital structure and lithologic data combined with finite-element elastic homogenization.

2017

Full year; *Geological Society of America Campus Representative*

Full year; *Geological Sciences Colloquium committee*

2016

Full year; *Geological Society of America Campus Representative*

Full year; *Geological Sciences Colloquium committee* - Founding student member of Geological Sciences weekly Colloquium committee, recruiting and hosting cutting-edge speakers across a wide range of earth science fields.

Fall; *Geological Sciences course fees committee* - Solicited and evaluated applications for additional internal funding for courses for graders, field trips, and funding of the undergraduate tutor program.

Summer; *'Professional Scientist' at Trail Ridge Middle School, Longmont CO* - Lead a classroom of students through a multi-week experiment investigating effects of light, vibrations, and solution chemistry on growth of salt crystals.

2015

Fall; *Geological Society of America Campus Representative* - Nominated Geological Society of America Campus Representative for University of Colorado, distributed monthly information about undergraduate and graduate employment and funding opportunities, as well as organized group housing and published CU-specific presentation schedules for major conferences.

Fall; *Earth Explorers Mentor* – Was the colorfully-dressed PI subject of a short film about frictional melts during earthquake ruptures.

Spring; *Earth Explorers Mentor* - Colorado nonprofit dedicated to demystifying science and technology for youth groups (ages 8-15) traditionally underrepresented in STEM; produced a short film about the mechanics of the earthquake cycle.