

# **GARY S. MICHELFELDER, Ph.D.**

Associate Professor of Geology  
Missouri State University  
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## **EDUCATION**

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**Doctor of Philosophy in Earth Sciences, 2015**, Montana State University, Bozeman, MT  
**Area of Focus:** Trace Element and Isotope Geochemistry/Igneous Petrology/ Volcanology  
**Dissertation Title:** The Magma Chamber Evolution of Cerro Uturuncu, Central Andes Volcanic Zone, Southwest Bolivia, **Advisor:** Dr. Todd Feeley

**Masters of Science in Geology, 2009**, New Mexico State University, Las Cruces, NM  
**Thesis Title:** Geochemistry and Petrology of the Sierra Cuchillo Laccolith, Sierra County, New Mexico, **Advisor:** Dr. Nancy McMillan

**Bachelors of Science in Geology, 2007**, Eastern Michigan University, Ypsilanti, MI  
Minor: Military Science

**Diploma, 2007**, U.S. Army Engineer School, Ft Leonard Wood, MO

## **TEACHING/ RESEARCH POSITIONS**

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*2019- Present | Associate Professor of Geology, Missouri State University*  
*2014- 2019 | Assistant Professor of Geology, Missouri State University*  
*2013-2014 | Visiting Assistant Professor of Geology, Missouri State University*  
*2009-2013 | Graduate Assistant- Montana State University, Bozeman, MT*  
*2008-2009 | Graduate Assistant- New Mexico State University, Las Cruces, NM*

## **PROFESSIONAL EXPERIENCE**

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*2003- Present | Commissioned Officer- Army National Guard (various locations MO, MT, NM, MI)*  
*2008-2009 | Geosciences Intern- Kegan Geochemical Consulting, Las Cruces, NM*  
*2007-2009 | Geotechnical Engineer- Advanced Testing and Materials, Las Cruces, NM*  
*2006-2007 | Environmental Scientist 1- The Mannik and Smith Group, INC, Canton, MI*  
*2000-2003 | Non-commissioned Officer- U.S. Army, (Ft. Bliss, TX)*

## **Certifications**

- Proactive Advisor- 2020
- Master Advisor- 2018
- Applied Suicide Intervention Skills Training (ASIST) - 2018
- Defense Support of Civil Authorities (DSCA) Level 2 - 2017
- 100-700 level FEMA Emergency Response Coordinator Course – 2017
- FEMA Volcanic Crisis Awareness (AWR-233)- 2012
- Composite Risk Management Certification- 2009

## **Professional Development:**

- Ethics on the Edge: Scientific Integrity and Geoethics for a Changing World. GSA Short Course, 2016
- Getting Started in Undergraduate Research for New, Future and Current Faculty. GSA Short Course, 2013
- Diffusion in Minerals and Melts, Mineralogical Society of America Short Course, 2010

## **AWARDS**

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- CNAS Faculty Excellence in Research Award, Missouri State University- 2021; 2016

## **CURRENT PROFESSIONAL AFFILIATIONS**

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- Member, Society of Economic Geologists- 2019-present
- Member, Tobacco Root Geological Society- 2019-present
- Member, International Association of Volcanology and Chemistry of the Earth's Interior, 2013-present
- Member, American Geophysical Union, 2009-present
- Member, Geological Society of America, 2006-present
- Member, Mineralogical Society of America, 2009-present
- Member, New Mexico Geological Society, 2007-present

## **PUBLICATIONS (Peer Reviewed; \*Student Author)**

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- **Michelfelder, G.S.**; and Feeley, T.C., *submitted*, Sr and O Isotope Systematics in the Central Andes: Resolving Crustal and Mantle Contributions to the Evolution of the Altiplano Puna Magma Body: Manuscript to be submitted to *Frontiers in Earth Sciences*, Special Collection on Central Andes Volcanism.
- **Michelfelder, G.S.**, Stearn, M.M, and Benz, B., *submitted*, Pumice Compositions and Mineral Chemistry from Bimodal Pumices Erupted from Lascar Volcano, Chile: Manuscript to be submitted to *Volcanica*.
- Reinier, C., **Michelfelder, G.S.**, and Horkley, L.K., *submitted*, Understanding the storage conditions of monogenetic volcanoes from St. Paul Island, Bering Sea Volcanic Zone, Alaska: Insights from olivine diffusion chronometry: Manuscript to be submitted to the *Geology*.
- **Michelfelder, G.S.**; O'Dowd, C.\*; and Oehring, B.\*; *in review*, Formation of Hybrid Arc Andesites in the Mogollon Datil Volcanic Field, New Mexico. Manuscript submitted to *Geochemistry, Geophysics, Geosystems*.
- **Michelfelder, G.S.**; O'Dowd, C.L.\*; Quick, J.D.\*; Humphreys, M.\*; Rentz, S.P.\*; Salings, E.E.\*; and Hoffman, M.\*; *in review*, The Role of Crustal Thickness on Magma Composition in the Mogollon Datil Volcanic Field, New Mexico: Manuscript submitted to *GSA Bulletin*.
- **Michelfelder, G.S.**; Wilder, A.D.\*; Benz, B.E.\*; Sundell, T.\*; and Feeley, T.C., *in review*, Petrology and Geochemistry of the Lazufre Volcanic Complex, Chile: Manuscript to be submitted to *Frontiers in Earth Sciences*, Special Collection on Central Andes Volcanism.
- **Michelfelder, G.S.**, *in press*, Petrology and Volcanology of the Mesoproterozoic Igneous Rocks of the St. Francois Mountains, Southeast Missouri: Submitted to *GSA South Central/ North Central Section Meeting Field Guide*.
- **Michelfelder, G.S.**, Horkley, L.K., Reinier, C.\* and Hudson, S.R\*, *in press*, Variation in Olivine Trace Element Contents Reveal the Signature of Deep Mantle Melting During the Eruption of the McCartys Flow, Zuni-Bandera Volcanic Field, New Mexico: 2021 New Geological Society Fall Field Conference Field Guide.
- Rentz, S.P., **Michelfelder, G.**, Coble, M.A., and Salings, E., **2019**, U-Pb zircon geochronology of calc-alkaline ash flow tuff units in the Mogollon Datil Volcanic Field,

southern New Mexico: Geological Society of America Special Paper 528, p. 409–434.  
[doi.org/10.1130/2018.2538\(19\)](https://doi.org/10.1130/2018.2538(19))

- Hoffman, M.\* and **Michelfelder, G.S., 2018**, Andesite hybridization of the Mogollon Datil volcanic Field: Insights from oxygen isotope values from the Uvas Volcanic Field and the Rubio Peak Formation: New Mexico Geological Society Guidebook: Las Cruces Country III, vol. 69, Mack, G.H.; Hampton, B.A.; Ramos, F.C.; Witcher, J.C.; and Ulmer-Scholle, D.S. (eds.), p 189-196.
- Hoover, D.B.; Karfunkel, J.; Walde, D.; Moraes, R.A.V.; **Michelfelder, G.S.**; Renger, F.E.; Ribeiro, L.C.B.; and Krambrock, K.; **2018**, [The Alto Paranaiba Region, Brazil: A Continuing Source for Pink Diamonds?](#): The Australian Gemologist, Vol. 26, No. 9&10, p. 196-204.
- Karfunkel, J.; Hoover, D. B.; Ribeiro, L. C. B.; Pollmann, H.; Walde, D. H. G.; Krambrock, K.; Moraes, R.; **Michelfelder, G.S.**; Quintao, D. A.; and Mertmann, D.; **2018**; Riesendiamanten, Supervulkane und mögliches regionales Aussterben: Fallstudie aus der Oberen Kreide von West Minas Gerais, Brasilien. Der Aufschluss, v. 8, p. 98 – 110.
- Pritchard, M.; de Silva, S.; West, M.; **Michelfelder, G.S.**; and 27 others, **2018**, PLUTONS: Imaging Deep Active Magma Intrusions in the Central Andes. Geosphere, v. 14, no. 3, p. 954-982. [doi: 10.1130/FES01578.1](https://doi.org/10.1130/FES01578.1)
- Hoover, D.B., Karfunkel, J., Ribeiro, L.C.B., **Michelfelder, G.S.**, Moraes, R.A.V., Krambrock, K., Quintao, D., Walde, D., **2017**, [Diamonds of the Alto Paranaiba, Brazil: Nixon's prediction verified?](#) Australian Gemologist, v. 26, no. 5-6, p. 88-99.
- Karfunkel, J.; Hoover, D.B.; Fernandes, A.F.; Sgarbi, G.N.C.; Krambrock, K.; Walde, D.; **Michelfelder, G.S., 2015**, Origin of Diamonds Southeast of Coromanel (Minas Gerais, Brazil): A Different Hypothesis. Neues Jahrbuch für Geologie und Paläontologie (Journal of Geology and Paleontology), v. 277, no. 2, p. 237-250.  
<https://doi.org/10.1127/njgpa/2015/0499>
- **Michelfelder, G.S.**; Feeley, T.C. and Wilder, A.D., **2014**, The Volcanic Evolution of Cerro Uturuncu: A High-K, Composite Volcano in the Back-Arc of the Central Andes of SW Bolivia. International Journal of Geosciences, v. 5, p. 1263-1281.  
<http://dx.doi.org/10.4236/ijg.2014.511105>
- **Michelfelder, G.S.**; Feeley, T.C.; Wilder, A.D., and Klemetti, E.W. **2013**, Modification of the continental crust by subduction zone magmatism and vice-versa: across-strike geochemical variations of silicic lavas from individual eruptive centers in the Andean Central Volcanic Zone. Geosciences, v. 3, p. 633-667; [doi: 10.3390/geosciences3040633](https://doi.org/10.3390/geosciences3040633).
- **Michelfelder, G.S.**; and McMillan, N.J.; **2012**, [Geochemistry, origin, and U-Pb zircon ages of the Sierra Cuchillo laccolith, Sierra County, New Mexico](#). New Mexico Geological Society Fall Field Conference Guidebook vol. 63 Geology of the Warm Springs Region, Lucas, S. G., McLemore, V. T., Lueth, V. W., Spielmann, J. A., and Krainer, K. [eds], p. 249-260.

#### **PUBLICATIONS IN PREPERATION (Peer Reviewed; \*Student Author)**

- **Michelfelder, G.S.**, and Hoffman, C.F., *in prep*, The Relationship of Epithermal Au-Ag-Cu Bearing Fluids to Arc Derived Magmatism in the Mogollon Datil Volcanic Field, New Mexico: Manuscript to be submitted to Economic Geology.

- **Michelfelder, G.S.**; and Feeley, T.C., *in prep*, Sr and O Isotope Systematics in the Central Andes: Resolving Crustal and Mantle Contributions to the Evolution of the Altiplano Puna Magma Body: Manuscript to be submitted to *Frontiers in Earth Sciences*, Special Collection on Central Andes Volcanism.
- **Michelfelder, G.S.**, Stearn, M.M, and Benz, B., *in prep*, Pumice Compositions and Mineral Chemistry from Bimodal Pumices Erupted from Lascar Volcano, Chile: Manuscript to be submitted to *Volcanica*.
- Reinier, C., **Michelfelder, G.S.**, and Horkley, L.K., *in prep*, Understanding the storage conditions of monogenetic volcanoes from St. Paul Island, Bering Sea Volcanic Zone, Alaska: Insights from olivine diffusion chronometry: Manuscript to be submitted to the *Geology*.
- Reinier, C., **Michelfelder, G.S.**, Horkley, L.K., and Ramos, F.C., *in prep*, Mantle source variation of monogenetic volcanic systems in the Pribilof Islands, Bering Sea, Alaska: Insight from Sr and Pb isotope ratios of clinopyroxene and olivine melt inclusions: Manuscript to be submitted to *GSA Bulletin*.
- **Michelfelder, G.S.**, Reinier, C., Horkley, L.K., and Feeley, T.C., *in prep*, Melt-rock Reactions Recorded in Lherzolite Xenoliths from St. George Island, Alaska: Implications for Magma Heterogeneity of Monogenetic Volcanic Fields: Manuscript to be submitted to *Journal of Petrology*.
- Bohannon, L.A.; **Michelfelder, G.S.**; Ramos, F.C.; and Shaulis, B.; *in prep*, Wall-rock influence on granitic melt composition at the Mt. Princeton Pluton, Colorado: Insights from zircon geochemistry and alkali feldspar isotope variation: Manuscript to be submitted to *Lithos*.
- Bohannon, L.A.; **Michelfelder, G.S.**; and Shaulis, B., *in prep*, Deciphering the complexity of U-Pb zircon geochronology in “cold” granitoids: A statistical model to determine inheritance versus crystallization of zircon: Manuscript to be submitted to *Computer and Geosciences*.
- Salings E.\*; **Michelfelder, G.S.**; and Rentz, S.P.\*, *in revision*, The subvolcanic plumbing system of the Bursum caldera: Insights from plagioclase CSD from the Bloodgood Canyon tuff. Submitted to *Journal of Volcanology and Geothermal Research*.

#### **PUBLICATIONS (Research Notes; Editor Panel Peer Reviewed)**

- **Michelfelder, G.S.**; Wilder, A.D.\*; Grunder, A. and Larsen, P. **2016**. Dedication: In Memory of Todd Christian Feeley (1961-2015). *Geosphere*, 12, 4, 1-3.  
<https://doi.org/10.1130/GES01346.1>

#### **Extended Abstracts/ Peer Reviewed Conference Presentations (\*Student Author)**

- **Michelfelder, G.S.**, Benz, B., Wilder, A.D., and Sundell, T., **2018**, Petrology, Mineral Chemistry, and Geothermobarometry of Andesites from the Lazufre Complex, Central Andes, Chile: Insights into the Pre-eruptive Magma Plumbing System. Abstracts and Programs, State of the Arc (SOTA) 7, 1-8 September 2018, San Pedro de Atacama, Chile.
- Feeley, T.C; and **Michelfelder, G.S.**, 2014, Across-strike geochemical variations of silicic lavas erupted from individual eruptive centers in the Andean Central Volcanic zone: evidence for modification of the continental crust by subduction zone magmatism

and vice-versa. Resumes Expandidos XIX Congreso Geológico Argentino, 2 -6 June 2014, Córdoba, Argentina. [DOI: 10.13140/2.1.1913.5044](https://doi.org/10.13140/2.1.1913.5044)

### **Select Abstracts/ Conference Presentations (Since 2015)**

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- **Michelfelder, G.S.**, Buckley, K.L.\*, Laviada-Garmon, D.\*, and Williams, B.\*, 2021, Magma Accumulation and Evolution in the Andean Central Volcanic Zone: A Mineral-Scale Perspective of Magma Homogenization: Geological Society of America Abstracts with Programs, v. 53, no. 4. doi: 10.1130/abs/2021CD-363238
- **Michelfelder, G.S.**, Bohannon, L.\* and Richey, A.\*, 2021, Thermal Gradients and Magma Host Rock Equilibration Inferred from Inclusions in the Ring Plutons of the Butler Hill Caldera, St. Francois Mountains, Missouri: Geological Society of America Abstracts with Programs. v. 53, no. 3. doi: 10.1130/abs/2021NC-362658
- **Michelfelder, G.S.**, Hudson, S.R.\*, Reinier, C.\*, and Horkley, L.K., 2021, Variation in Olivine Trace Element Contents Reveal the Signature of Deep Mantle Melting during the Eruption of the Mccartys Flow, Zuni-Bandera Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. v. 53, no. 3. doi: 10.1130/abs/2021NC-362759
- **Michelfelder, G.S.**, Reinier, C.\*, and Feeley, T.C., 2021, Melt-Rock Reactions Recorded in Lherzolite Xenoliths from St. George Island, Alaska: Implications for Magma Heterogeneity of Monogenetic Volcanic Fields: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362654
- Reinier, C.\*, and **Michelfelder, G.S.**, 2021, Bimodal and Texturally Distinct Olivine Phenocrysts in Small Volume Monogenetic Volcanoes from the Pribilof Islands, Alaska: Implications for Mantle Melting and Magma Storage: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362837
- Bohannon, L.\* and **Michelfelder, G.S.**, 2021, Disequilibrium Melting of the Continental Crust During Emplacement of the Mt. Princeton Batholith, Central Colorado Volcanic Field: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362923
- Laviada-Garmon, D.\*, **Michelfelder, G.S.**, and Buckley, K.L.\*, 2021, Plagioclase Zoning as an Indicator of Magma Processes at Ollagüe Volcano, Andean Central Volcanic Zone, Chile: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362929
- Buckley, K.L.\*, **Michelfelder, G.S.**, and Laviada-Garmon, D.\*, 2021, Textural and Chemical Variation in Plagioclase Phenocrysts from the Polán Stage and Aucanquilcha Stage of the Aucanquilcha Volcanic Complex, Chile: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362951
- Williams, B.\*, **Michelfelder, G.S.**, and Laviada-Garmon, D.\*, 2021, Plagioclase Zoning as an Indicator of Magma Processes at San Pedro Volcano, Central Volcanic Zone, Chile: Geological Society of America Abstracts with Programs, v. 53, no. 3. doi: 10.1130/abs/2021NC-362943
- LaRue, K.\* and **Michelfelder, G.S.**, 2020, Petrology and Geochemistry of the 1.32 Ga Graniteville Granite, St Francois Mountains, Southeast Missouri: Geological Society of America Abstracts with Programs. Vol. 52, No. 1, [doi: 10.1130/abs/2020SC-343650](https://doi.org/10.1130/abs/2020SC-343650)
- **Michelfelder, G.S.** and LaRue, K.\*, 2020, Magma-Wall Rock Interaction in the St Francois Mountains, Missouri: Unravelling Magmatic Architecture using Microstructures and Trace Element Geochemistry: Geological Society of America Abstracts with Programs, Vol. 52, No. 1, [doi: 10.1130/abs/2020SC-343245](https://doi.org/10.1130/abs/2020SC-343245)
- **Michelfelder, G.**; Benz, B.E.\*, Stearn, M.\*, 2019, Sr and O Isotope Systematics in the Central Andes: Resolving Crustal and Mantle Contributions to the Evolution of the Altiplano Puna Magma Body: AGU Fall Meeting Abstract V51H-0145.

- Benz, B.E.\* and **Michelfelder, G.S.** 2019, The Pre-Eruptive Plumbing System of the Lazufre Complex, Central Andes, Chile: Insights from Geothermobarometry and Mineral Chemistry: AGU Fall Meeting Abstract V51H-0146.
- Bohannon, L.A.\*, Hoffman, C.F.\*, **Michelfelder, G.S.**, and Peitz, M.R.\*, 2019, Volcanic Stratigraphy, Structure and Geochronology of Intra-Caldera Fill Ignimbrites of the 28 Ma Bursum Caldera, Mogollon Datil Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-338635
- Hoffman, C.F.\*, Mickus, K.L.; **Michelfelder, G.S.**, 2019, Magnetic and Vlf-Em Surveys of the Mogollon Mining District, Catron County, NM: Recommendations for Future Mineral Exploration: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-331607
- Hoffman, C.F.\*, **Michelfelder, G.S.**, Bohannon, L.A., and Peitz, M.R., 2019, Geologic Map of the Bearwallow Mountain 7.5' Quadrangle, Catron County, New Mexico: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-331940
- Humphreys, M. \*, **Michelfelder, G.S.**, Hoffman, M., and Rentz, S.P., 2019, Mineral Chemistry and Petrology of Rubio Peak Formation, Mogollon Datil Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-331934
- Hudson, S.R.\*, and **Michelfelder, G.S.**, 2019, Petrography and Petrology of the Alkaline and Tholeiitic Lavas from the La Tetra Area, Zuni-Bandera Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-334691
- Sifuentes, C.C.\*, and **Michelfelder, G.S.**, 2019, Chemical Composition of Waste Rock Dumps and other Mining-Related Features Associated with the Mogollon Mining District, New Mexico: Geological Society of America Abstracts with Programs. Vol. 51, No. 5, ISSN 0016-7592, doi: 10.1130/abs/2019AM-335492
- O'Dowd, C.L.\*, and **Michelfelder, G.S.**, 2019, Petrogenetic Evolution of Intermediate Magmas from the Mogollon-Datil Volcanic Field During Arc-Rift Transition: Insights from Whole-Rock Geochemistry of the Bearwallow Mountain Andesite: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, ISSN 0016-7592, doi: 10.1130/abs/2019SC-326509
- Hoffman, C.F.\*; **Michelfelder, G.S.**, 2019, Timing and Source of Hydrothermal Fluids in the Mogollon Mining District, Catron County, NM: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, ISSN 0016-7592, doi: 10.1130/abs/2019SC-326678
- Humphreys, M.\*; **Michelfelder, G.S.**, and Benz, B.E., 2019, Petrology and U-Pb Zircon Geochronology of Oligocene and Miocene Rhyolite Tuffs from the Northern Mogollon-Datil Volcanic Field: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, ISSN 0016-7592, doi: 10.1130/abs/2019SC-326702
- Stearn, M.M.\*, and **Michelfelder, G.S.**, 2019, Pumice Compositions and Mineral Chemistry of Bimodal Pumice Erupted from Lascar Volcano, Central Volcanic Zone, Chile: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, ISSN 0016-7592, doi: 10.1130/abs/2019SC-327403
- Benz, B.E.\*, and **Michelfelder, G.S.**, 2019, Mineral Chemistry and Geothermobarometry of Andesites from the Lazufre Complex, Central Andes, Chile: Insights into the Pre-Eruptive Magma Plumbing System: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, ISSN 0016-7592, doi: 10.1130/abs/2019SC-327021
- O'Dowd, C.L.\* and **Michelfelder, G.S.**, 2019, Petrogenetic Evolution of Intermediate Magmas from the Mogollon-Datil Volcanic Field During Arc-Rift Transition: Insights from Whole-Rock Geochemistry of the Bearwallow Mountain Andesite: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, doi: 10.1130/abs/2019SC-326509

- Humphreys, M.\*, **Michelfelder, G.S.**, and Benz, B.E.\*, 2019, Petrology and U-Pb Zircon Geochronology of Oligocene and Miocene Rhyolite Tuffs from the Northern Mogollon-Datil Volcanic Field: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, doi: 10.1130/abs/2019SC-326702
- Stearn, M.M.\* and **Michelfelder, G.S.**, 2019, Pumice Compositions and Mineral Chemistry of Bimodal Pumice Erupted from Lascar Volcano, Central Volcanic Zone, Chile: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, doi: 10.1130/abs/2019SC-327403
- Benz, E.\* and **Michelfelder, G.S.**, 2019, Mineral Chemistry and Geothermobarometry of Andesites from the Lazufre Complex, Central Andes, Chile: Insights Into the Pre-Eruptive Magma Plumbing System: Geological Society of America Abstracts with Programs. Vol. 51, No. 2, doi: 10.1130/abs/2019SC-327021
- Quick, J.D.\*, **Michelfelder, G.S.**, and Benz, B.E.\*, 2018, Textural and Geochemical Variation of the Oligocene Kneeling Nun Tuff, Mogollon-Datil Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-322520
- Sundell, T.\* and **Michelfelder, G.S.**, 2018, Chemical Imaging of Diamonds by Time Of Flight Secondary Ionization Mass Spectrometry: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-323826
- Benz, B.E.\*, and **Michelfelder, G.S.**, 2018, Petrology, Mineral Chemistry, and Geothermobarometry of Andesites from the Lazufre Complex, Central Andes, Chile: Insights into the Pre-Eruptive Magma Plumbing System: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-324713
- O'Dowd, C.L.\*, and **Michelfelder, G.S.**, 2018, Petrology and Geochemistry of the Bearwallow Mountain Andesite, Mogollon-Datil Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-320684
- **Michelfelder, G.S.**, O'Dowd, C.L.\*., and Benz, B.E.\*., 2018, The Pre-Eruptive Plumbing System of Intermediate Magmas from the Mogollon-Datil Volcanic Field: Insights from Pyroxene and Plagioclase Mineral Chemistry and Geothermobarometry: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-324816
- Humphreys, M.\*, **Michelfelder, G.S.**, and Benz, B.E.\*, 2018, U-Pb Geochronology and Petrology of Oligocene and Miocene Rhyolite Tuffs from the Northern Mogollon-Datil Volcanic Field: Geological Society of America Abstracts with Programs. Vol. 50, No. 6, doi: 10.1130/abs/2018AM-320725
- Sundell, T.\*, **Michelfelder, G.S.**, Wilder, A.D. and Salings, E.\*, 2017, [Along and Across Arc Variation of the Central Andes by Single Crystal Trace Element Analysis](#): American Geophysical Program with Abstracts, Abstract #V43A-0506.
- **Michelfelder, G.S.**, Sundell, T.\*, Benz, B.\*, and Zerilli, M. \*, 2017, Field Volcanology in the Central Andes: A Capstone Volcanology and Igneous Petrology Field Course: Geological Society of America Abstracts with Programs, v. 49, no. 6. doi: [10.1130/abs/2017AM-305736](#)
- Cruzan, J.D.\*, **Michelfelder, G.S.**, Salings, E.\*, Sundell, T.\*, Quick, J.D. \*, Benz, B.E.\*, 2017, What's The Difference? A Petrographic and Geochemical Comparison of the Bloodgood Canyon Tuff and the Tuff of Triangle C Ranch: Geological Society of America Abstracts with Programs. v. 49, no. 6, doi: [10.1130/abs/2017AM-305565](#)
- Quick, J.D.\*, Sundell, T.\*, **Michelfelder, G.S.**, Cruzan, J.D.\*, O'Dowd, C.L.\*, Benz, B.E.\*, 2017, The Petrology and Geochemistry of the Kneeling Nun Tuff, Mogollon-Datil Volcanic Field, New Mexico: Geological Society of America Abstracts with Programs. v. 49, no. 6, doi: [10.1130/abs/2017AM-305932](#)
- Zerilli, M.\*, Salings, E.\*, **Michelfelder, G.S.**, 2017, The Pre-Eruptive Magmatic Conditions of the Bloodgood Canyon Tuff: Insights from Alkali Feldspar and Quartz Crystal Size Distributions and Mineral Chemistry: Geological Society of America Abstracts with Programs. v. 49, no. 6, doi: [10.1130/abs/2017AM-306473](#)

- Benz, B.E.\*, **Michelfelder, G.S.**, Quick, J.D.\*, Sundell, T.\*, 2017, Petrology and Geochemistry of Rhyolite Tuffs of the Bell Top Formation, Dona Ana County, New Mexico: Geological Society of America Abstracts with Programs. v. 49, no. 6. [doi: 10.1130/abs/2017AM-306518](https://doi.org/10.1130/abs/2017AM-306518)
- Oehring, B.\*, **Michelfelder, G.S.**, 2017, Intermediate Volcanic Rocks of the Western Mogollon-Datil Volcanic Field, Southern New Mexico: A Change in Magmatic Source after Ignimbrite Flare-Up: Geological Society of America Abstracts with Programs. v. 49, no. 6, [doi: 10.1130/abs/2017AM-306916](https://doi.org/10.1130/abs/2017AM-306916)
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- **Michelfelder, G.S.**, Wilder, A.D., and Salings, E., 2017, Geochemical and Isotopic Data from Micron to Across-Arc Scale in the Andean Central Volcanic Zone: Resolving Crustal Magmatic Differentiation and Modification Processes: IAVCEI Scientific Assembly Program with Abstracts, Abstract #1215.
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- **Michelfelder, G.S.**, Wilder, A.D.\*, and Feeley, T.C., 2015, [Sr and O Isotope Geochemistry of Volcán Uturuncu, Andean Central Volcanic Zone, Bolivia: Resolving Crustal and Mantle](https://doi.org/10.1130/abs/2015AM-306518)

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  - Salings, E.\*, **Michelfelder, G.S.**, Rentz, S.\*, Sikes, E.\*, 2015, [Preliminary Geochemical and Petrologic Assessment of the Fanney Rhyolite and the Bloodgood Canyon and Apache Springs tuffs, Mogollon-Datil Volcanic Field, New Mexico](#), AGU Fall Meeting, 11-14 December. Abstract #V51G-3115.
  - Salings, E.\*, **Michelfelder, G.S.**, and Sikes, E.\*, 2015, [Trace element variation in plagioclase phenocrysts from ignimbrites from the Mogollon-Datil volcanic field, southern New Mexico, USA: Insights into the processes and timescales of magmatism](#). Geological Society of America Abstracts with Programs. v. 47, no. 7, p. 577.
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  - Cousins, J.\*, Sholtis, M.\*, and **Michelfelder, G.S.**, 2015, [The effects micro-inclusions on internal structure of zoned garnet: an example from the Tocantins rhodanite garnets, Tocantins State, Brazil](#). Geological Society of America Abstracts with Programs. v. 47, no. 7, p. 758.
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  - Rentz, S., **Michelfelder, G.S.**, Salings, E., and Sikes, E. 2015, [Examining ash fall sequences in calc-alkaline subduction related volcanism, southern New Mexico](#). Geological Society of America Abstracts with Programs. v. 47, no. 7, p.577
  - **Michelfelder, G.S.**, Wilder, A.D.\*, and Feeley, T.C., 2015, Sr and O Isotope Geochemistry of Volcán Uturuncu, Andean Central Volcanic Zone, Bolivia: Resolving Crustal and Mantle Contributions to Continental Arc Magmatism. GeoPRISMS Theoretical and Experimental Institute on Subduction Zone Processes, Redondo Beach, CA, October 12-14, 2015.
  - **Michelfelder, G.S.**, Salings, E.\*, and Sikes, E.\* , 2015, Trace element variation in plagioclase phenocrysts from ignimbrites from the Mogollon-Datil volcanic field, southern New Mexico, USA: Insights into the processes and timescales of magmatism. AGU Joint Assembly in Montreal, Quebec, Canada.

## INTERNAL AND OTHER FUNDING

Descriptive Title of Project	Status	Research/ Teaching	Type	Award Period	Requested Amount	PI/Co- PI
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Petrologic Imaging of Magma Accumulation in the Andean Central Volcanic Zone	Funded	Research	Sabbatical	2021		PI 100% effort
Trace Element and Isotopic Responses to Disequilibrium Melting in Granitic Systems	Funded	Research	Faculty Research Grant	2020-2021	\$7500	PI 100% effort
Understanding the transition between rhyolite and andesite magmatism in the Mogollon Datil Volcanic field New Mexico	Funded	Research	Faculty Research Grant	2018-2019	\$7500	PI, 100% effort
Geochemical Variation of Basalts in the Mogollon-Datil Volcanic Field New Mexico	Funded	Research	Faculty Research Grant	2014-2015	\$7500	PI, 100% effort
International Study Away Exploratory Travel Grant: Central Andes Chile:	Funded	Teaching	Curriculum Innovation Grant	2017	\$4034	PI, 100% effort
Integrating Innovative and Collaborative Technology in the Classroom	Funded	Teaching	Study Away Exploratory Grant	2015-2016	\$3870	Co-PI, 75% effort

**EXTERNAL FUNDING – In Review or Funded**

Agency	Descriptive Title of Project	Status	Sub. Date	Requested Amount	PI/Co-PI
NASA	Open System Processes Recorded by Plagioclase Disequilibrium in the Central Andes Volcanic Zone	<b>In Review</b>	6/30/2021	\$19,633	PI
NSF	MRI: Acquisition of a Single Crystal X-ray Diffractometer for Research and Teaching at Missouri State University	<b>Funded (2021-2024)</b>	1/10/2021	\$342,000	Co-PI
NASA	Disequilibrium Mantle Melting as a Process of Earth Differentiation	<b>Funded (2020-2021)</b>	6/10/2020	\$7,925	PI
NSF	EAR-2006374: RUI: Tracking magma accumulation and evolution in the Andean Central Volcanic Zone	<b>Funded (2020-2023)</b>	11/1/2019	\$238,718	PI
NASA	Mantle Source Variation of Intraplate Monogenetic Volcanism	<b>Funded (2019-2020)</b>	6/15/2019	\$3,473	PI
USGS	Geologic Map and Stratigraphy of Rocks from the Bearwallow Mountain Quadrangle, New Mexico	<b>Funded (2019-2020)</b>	11/1/2018	\$8466	PI
NASA	Petrologic Imaging of an Active Pluton in the Andean Central Volcanic Zone	<b>Funded (2018-2019)</b>	7/9/2018	\$14,100	PI

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NSF	CHE-1828069: MRI: Acquisition of an Inductively Coupled Plasma Mass Spectrometer (ICP-MS) System at Missouri State University	<b>Funded (2018-2021)</b>	2/5/2018	\$156,918	Co-PI
DOE	CNMS2017-362: Internal carbon isotope and trace element variation within diamonds: An assessment of changing mantle conditions during diamond ascent	<b>Funded (2017-2018)</b>	5/10/2017	\$18,000	PI

**SERVICE**

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**Conference Sessions Organized:**

- 2021 GSA North Central-South Central Joint Section Meeting: T15. Granites and Rhyolites as a Record of Crustal Magmatic Processes; T16. Ultramafic and Mafic Magmatism
- 2020 GSA South Central Section Meeting: T2. Recent Progress in Granites, Rhyolites, and Associated Magmatism
- 2019 GSA NC-SC-RM Section Meeting: Cenozoic magmatic and tectonic processes of Colorado-New Mexico: Understanding voluminous volcanism during the transition from Laramide contraction to Rio Grande rift extension
- 2015 Fall AGU Meeting: Session 9834: Where Arc Magmas Reside: Comparing the Volcanic and Plutonic Records
- 2014 Fall AGU Meeting: Session 2264: Stow or Blow? Intrusions and Eruptions of Magma in the Continents

**Volumes Edited:**

- Frontiers in Earth Sciences (Volcanology), Special Volume: **The volcanism of the Central Volcanic Zone of the Andes, 2021-2022**
- Geosphere, Special Volume: **PLUTONS: Investigating the Relationship between Pluton Growth and Volcanism in the Central Andes, 2015-2018** (<https://pubs.geoscienceworld.org/geosphere/pages/plutons>)

**Professional Service:**

- Member, American Geophysical Union Spilhaus Award Selection Committee, 2018-present
- Commissioned Officer, Army National Guard, 2003-present
- Reviewer for research papers to a variety of international journals, e.g., Lithosphere, Geosphere, J. of Petrology, Cont. to Min. Pet., Elements, etc. about 2-3 reviews per year
- Reviewer for National Science Foundation proposals, 1-2 per year
- Panelist, National Defense Science and Engineering (SMART) Graduate Fellowship Program- 30 proposals reviewed in 2017; 9 proposals reviewed in 2018

**University/ College/ Department Service:**

- University/College:
  - Member, Programs and Delivery Committee, 2019-present
  - Member, Study Away Advisory Committee, 2018-present
  - Department Coordinator, Masters of Natural and Applied Sciences (MNAS), 2018-2020

- Judge, Science Olympiad, 2014- present
- Member, CNAS Budget Committee, 2015-2018
- Department Committees:
  - Seminar Series Coordinator, 2016-2018
  - Search committee member for faculty hires, 2014-present
  - Graduate Faculty, 2013-present
  - Other ad hoc committees as required

## **CURRENT STUDENTS**

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### **Graduate – Masters of Science (Thesis Chair or Co-Chair)**

- *Nathaniel Lenhard (2021-present)*- TBD
- *Cesar Andres Bucheli Olaya (2021-present)*- TBD
- *Bennett Van Horn (2021-present)*- Oxygen Isotope variation as a record of magma plumbing system evolution in the Andean Central Volcanic Zone
- *Sarah Rasor (2021- present)*- Timescales of Magma Storage at Uturuncu Volcano, Central Andes, Bolivia
- *Anna Richey (2021-present; Accelerated)*- Open System Processes Recorded by Plagioclase Disequilibrium in the Central Andes Volcanic Zone
- *Chris Willingham (2021-present)*- Moderately volatile element fractionation during Earth differentiation
- *Kasey Buckley (2020-present)*- Timescales of magma storage at Aucanquilcha Volcano, Central Andes, Chile
- *Drew Laviada-Garmon (2020-present)*- Timescales of magma storage at Ollagüe Volcano, Central Andes, Chile
- *Loren Bohannon (2019-present; Accelerated)*- Trace Element and Isotopic Responses to Disequilibrium Melting in Granitic Systems: An Example from the Mt Princeton Batholith, Colorado
- *Clayton Reinier (2020-present)*- Disequilibrium Mantle Melting as a Process of Earth Differentiation: An Example Using Olivine Chemistry and Isotopic Ratios from the Pribloff Islands, Alaska
- *William “Bo” Masner (2014-present)* - U-Pb Detrital Apatite Geochronology and Sedimentary Architecture of the Crystal Mountain Sandstone near Mt. Ida, Arkansas

### **Graduate – Master of Science (Thesis Committee Member)**

- *Jordan Cruzan (2019-present)*- Tracing Detrital Zircon Provenance Through U-Pb and Rare Earth Element Signatures and Abundances in an Active Back-Arc Setting
- *Tessa Mills (2019-present)*- Geological Map of Porters Gap 7.5 Minute Quadrangle, and Gravity and Magnetic Analysis of Piedmont, North Eastern Alabama
- *Mark Brown (2016-present)* - Mapping & Geochronology of the 7.5-minute Pollock Mountain Quadrangle, West-Central Idaho

### **Undergraduate**

- *Anna Richey*- Trace element mineral chemistry and magma residence times from San Pedro Volcano, Central Andes, Chile

## **FORMER STUDENTS**

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### **Graduate – Masters of Science**

- **Charles Hoffman (M.S. 2020)** - Water-Rock Interaction and Geochemistry of Hypogene Ore and Gangue Mineral Deposits of the Mogollon Mining District, New Mexico
- **Madelaine Stearn (M.S. 2020)** – Mineral Chemistry of Lascar Volcano Pumices, Central Andean Volcanic Zone, Chile
- **Brooke Benz (M.S. 2020)** - Magma Residence Times and Processes Associated with the Development of the Lazufre Volcanic Complex, Chile
- **Conor O’Dowd (M.S. 2019)** - Petrology and Geochemistry of the Bearwallow Mountain Andesite, Mogollon Datil Volcanic Field, New Mexico
- **Tyler Sundell (M.S. 2018)** - Diamond Intragranular  $\delta^{13}\text{C}$  Variability Measured by Time-of-Flight Secondary Ionization Mass Spectrometry
- **Shannon Rentz (M.S. 2017)** - Petrology, Geochemistry and U-Pb Zircon Geochronology of Rhyolite Ash Flows from the Western Mogollon Datil Volcanic Complex, New Mexico
- **Max Hoffman (M.S. 2017)** - Crustal Contamination and Magma Sources of Volcanic Rocks from Southern New Mexico: Insights from Oxygen Isotopes
- **Emily Salings (M.S. 2017; MNAS)** - Petrology and Geochemistry of the Bloodgood Canyon tuff, Western Mogollon Datil Volcanic Field, New Mexico
- **Grant Spoering (M.S. 2017)** - U-Pb detrital zircon geochronology of glacial tills near St Louis, Missouri (Co-Advised with Charles Rovey)

**Graduate – Masters of Science (Thesis Committee Member)**

- **Adelie Ionescu (M.S. 2021)**- Geology of the Clairmont Springs 7.5-Minute Quadrangle and Geochronology of the Alabama Blue Ridge
- **Derek Spurgeon (M.S. 2021)**- Report on Geologic Map and Cross Section of the Jacksonville 7.5 Minute Quadrangle and U–Pb and (U–Th)/He Constraints on Sediment Routing and Uplift in the Southern Appalachian Valley and Ridge Province
- **Sourav Krishna Nandi (M.S. 2018)** - Geology of the Purgatory Saddle 7.5 Minute Quadrangle, and Gravity and Magnetic Analysis of Accreted Terrane Boundary, Western Idaho
- **Wesley Weichert (M.S. 2017)** - Cyclostratigraphic Trends of  $\delta^{13}\text{C}$  in Upper Cambrian Strata, Great Basin, USA: Implications for Astronomical Forcing

**Undergraduate (since 2015)**

- **Brianna Williams**- Plagioclase mineral chemistry from San Pedro Volcano, Central Andes, Chile
- **Connor Pardee**- Trace Element Variation in the Mt Princeton Batholith, Colorado
- **Sarah Hudson**- Olivine Mineral Chemistry and Diffusion Chronometry of the McCarty Flow, Zuni-Bandera Volcanic Field, New Mexico
- **Kimberly LaRue**- Petrology of the Graniteville Granite, St Francois Mountains, SE Missouri
- **Mary Humphreys**- Petrology and U-Pb zircon geochronology of the La Jencia and Vicks Peak tuffs, Mogollon Datil Volcanic Field, New Mexico
- **Daniel Quick**- The petrology and geochemistry of the Kneeling Nun Tuff, Mogollon-Datil volcanic field, New Mexico