

ARYA UDRY, Ph.D.
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Department of Geoscience
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EDUCATION

University of Tennessee (UTK), Knoxville, TN, USA

2010-2014 Ph.D. candidate (Planetary Sciences). Dissertation entitled: “Exploring martian magmas: From the mantle to the regolith” advised by Dr. Hap McSween

University of Lausanne (UNIL), Lausanne, Switzerland

2008-2010 Master’s Degree (Petrology and Geochemistry) entitled: Petrology of mafic-ultramafic complexes within the Archean Lewisian complex of NW Scotland, advised by Dr. Othmar Müntener

2005-2008 Bachelor’s Degree in Geosciences and Environment, subject area Geology

APPOINTMENTS

Department of Geoscience, University of Nevada, Las Vegas, Las Vegas, NV

2014-Present Assistant Professor

TEACHING EXPERIENCE

University of Nevada Las Vegas, Las Vegas, NV (August 2014-present)

- Instructor for GEOL 796 Planetary Science seminar (Graduate level). Q13 GPA = 4.86.
- Instructor for GEOL 470-670 Planetary Geology (Undergraduate-graduate level). Q13 GPA = 4.79
- Instructor for GEOL 427/627 (now 327) Igneous and Metamorphic Petrology (Undergraduate level). Q13 GPA = 4.64; 4.89; 4.71.
- Instructor for GEOL 101 Introductory geology: Exploring Planet Earth (Undergraduate level). Q13 GPA = 4.49; 4.51; 4.21; 4.33.

University of Tennessee, Knoxville, TN (August 2010-2014)

- Lecturer for 101 Geology class (Undergraduate level)
- Teaching assistant for 101 Geology lab courses (Undergraduate level)
- Teaching assistant for 310 Mineralogy lab courses (Undergraduate level)
- Teaching assistant for 530 Petrogenesis lab courses (Graduate level)

University of Lausanne, Lausanne, Switzerland (December 2008-January 2010)

- Teaching assistant for general geology undergraduate courses

CURRENT SUPPORT

NASA Solar System Working Program: Petrogenesis of poikilitic shergottites and implications for martian geochemical reservoirs, PI – Total of \$330,540 (02.22.2019 to 02.21.2022).

NASA Planetary Major Equipment Program: Acquisition of a new laser ablation system at the University of Nevada Las Vegas, PI – Total of \$240,250 (02.22.2019 to 02.21.2022).

NASA Mars Data Analysis Program: Understanding diversity in martian magmatism: Modeling the formation of felsic and alkaline igneous compositions from in-situ data collected on Mars, PI – Total of \$299,570 (04-01-2017 to 04-01-2020).

PREVIOUS SUPPORT

UNLV Faculty Opportunity Awards, Individual Investigator Award: “Towards a better understanding of magmatic processes on Mercury using aubrite meteorites”, PI – **Udry A.** \$19,500 (7-1-2015 to 06-31-2018)

NASA Solar System Working Program: "Whitlockite and merrillite phosphate minerals: Potential recorders of formation and alteration processes from mantle to surface" PI - Hausrath E., Science PI- Adcock C., Collaborator – **Udry A.** (7-31-2015 to 7-30-2017)

PEER-REVIEWED JOURNAL ARTICLES (*: advisees)

19. Rahib R. R.*, **Udry A.**, Howarth G. H., Gross J., Paquet M., Combs L. M.*, Lacznia D. L.*, and Day J. M. D. (2019) Mantle source to near-surface emplacement of enriched and intermediate poikilitic shergottites in Mars *Geochimica et Cosmochimica Acta*, doi.org/10.1016/j.gca.2019.07.034.
18. Combs L. M.*, **Udry A.**, Howarth G. H., Righter M., Lapen T. J., Gross J., Ross K. D., Rahib R. R.*, Day J. M. D. (2019) Petrology of the enriched poikilitic shergottite Northwest Africa 10169: Insight into the martian interior. *Geochimica et Cosmochimica Acta*, doi.org/10.1016/j.gca.2019.07.001.
17. **Udry A.**, Wilbur Z. E.*, Rahib R. R.*, McCubbin F. M., Vander Kaaden K. E., McCoy T. J., Ziegler K., Gross J., DeFelice C., Combs L.*, and Turrin D. B. (2019) Reclassification of four aubrites as enstatite chondrite impact melts: Potential geochemical analogues for Mercury. *Meteoritics and Planetary Sciences*, doi.org/10.1111/maps.13252.
16. Day J.M.D., Tait K., **Udry A.**, Moynier F., Liu Y., and Neal C. (2018) Martian magmatism from plume metasomatized mantle. *Nature Communications*, 9, 4799, DOI: 10.1038/s41467-018-07191.
15. **Udry A.** and Day J. M. D. (2018) 1.34 billion-year-old magmatism on Mars evaluated from the co-genetic nakhlite and chassignite meteorites. *Geochimica et Cosmochimica Acta*, 238, 292–315. doi.org/10.1016/j.gca.2018.07.006.
14. Filiberto J., Gross, J., **Udry, A.**, Trela, J., Wittmann, A., Cannon, K.M., Penniston-Dorland, S., Ash, R.D., Hamilton, V.E., Meado, A. L., Carpenter P., Jolliff, B., and Ferré E. C. (2018) Shergottite Northwest Africa 6963: A Pyroxene-Cumulate Martian Gabbro. *Journal of Geophysical Research*, 123, 1823-1841. doi.org/10.1029/2018JE005635.
13. **Udry A.**, Gazel E., and McSween H. Y. (2018) Formation of evolved rocks at Gale Crater by crystal fractionation and implications for Mars crustal contamination. *Journal of Geophysical Research-Planets*, 123, <https://doi.org/10.1029/2018JE005602>.
12. Bartlett C. L., Hausrath E. M., Adcock C. T., Huang s., Harrold Z., and **Udry A.** (2018) Effects of organic compounds on dissolution of the phosphate minerals chlorapatite, whitlockite, merrillite, and fluorapatite: Implications for interpreting past signatures of organic compounds in rocks, soils and sediments. *Astrobiology*, <https://doi.org/10.1089/ast.2017.1739>.

11. Adcock C. T., **Udry A.**, Hausrath E. M., and Tschauner O. (2018) Craters of the Moon National Monument Basalts as Unshocked Compositional and Weathering Analogs for Martian Rocks and Meteorites, *American Mineralogist*, 103, 502-516.
10. Howarth G. H., **Udry A.**, and Day J. M.D. (2018) Petrogenesis and shock melting effects on the rare earth elements within basaltic shergottite Northwest Africa 8657, *Meteoritics and Planetary Science journal*, 53, 249-267. DOI: 10.1111/maps.12999.
9. Adcock C. T., Tschauner O., Hausrath E. M., **Udry A.**, Luo S. N., Cai Y., Ren M., Lanzirotti A., Newville M., Kunz M., and Lin C. (2017) Shock-transformation of whitlockite to merrillite and the implications for meteoritic phosphate, *Nature Communications*, DOI: 10.1038/ncomms14667.
8. **Udry A.**, Howarth G. H., Lapen T L., and Righter M. (2017) Petrogenesis of the NWA 7320 enriched martian gabbroic shergottite: Insight into the martian crust. *Geochimica et Cosmochimica Acta*, 204, 1-18.
7. Howarth G. H. and **Udry A.** (2017) Trace elements in olivine and the petrogenesis of the intermediate, olivine-phyric NWA 10170. *Meteoritics and Planetary Sciences*, 52, 391-409. doi: 10.1111/maps.12799.
6. **Udry A.**, McSween H. Y. Jr., Hervig R. L., and Taylor L. A. (2016) Lithium isotopes and light lithophile element abundances in shergottites: Evidence for martian magmatic water. *Meteoritics and Planetary Sciences*, 51, 80-104, doi: 10.1111/maps.12582.
5. Balta J. B., Sanborn M. E., **Udry A.**, Wadhwa M., and McSween H. Y. Jr. (2015) Petrology and trace-element geochemistry of Tissint, the newest shergottite fall. *Meteoritics and Planetary Sciences*, 50, 63-85.
4. Vallianatos F., Baziotis I. P., **Udry A.**, and Taylor L. A. (2014) Application of non-extensive statistical physics on Martian nakhlites: A first-order approach on the crystal size distribution of pyroxene using Tsallis entropy. *Europhysics Letters*, 108, doi: 10.1209/0295-5075/108/58002.
3. **Udry A.**, Lunning N. G., McSween H. Y. Jr., and Bodnar R. J. (2014) Petrogenesis of an impact melt clast in the martian meteorite breccia NWA 7034. *Geochimica et Cosmochimica Acta*, 141, 281-293.
2. **Udry A.**, Balta J. B., and McSween H. Y. Jr. (2014) Exploring fractionation models for martian magmas. *Journal of Geophysical Research-Planets*, 119, doi:10.1002/2013JE004445.
1. **Udry A.**, McSween H. Y. Jr., Leccumberi-Sanchez P., and Bodnar R. J. (2012) Paired nakhlites MIL 090030, 090032, 090136, and 03346: Insights into the Miller Range parent meteorite. *Meteoritics and Planetary Sciences* 47, 10, 1575–1589.

WHITE PAPER SIGNATORY

Byrne P. K., Blewett D. T., Chabot N. L., Hauck, S. A., Mazarico E., and Vander Kaaden K. E. (**Udry** included as signatory) (2018) Landed Mercury Exploration and the Timely Need for a Mission Concept Study.

INVITED TALKS

Udry A., Wilbur Z. E., McCubbin F. M., Vander Kaaden K. E., Ziegler K., DeFelice C., McCoy T. J., Gross J., and Turrin B. D. (2019) Aubrite meteorites as geochemical analogues to Mercury, Invited talk at the session “Mercury: The

Continuing and Future Exploration of the Innermost Planet", American Geophysical Conference, December 2019

Udry A. (2019) "Petrological and Geochemical Evidence for Recycling on Venus, Mars, and Mercury" Invited talk at the Gordon Research Conference Interior of the Earth, MT Holyoke, June 2019.

Udry A., Lunning N., McSween H. Y. Jr., and Bodnar R. J. (2015) A vitrophyric clast in the martian NWA 7034 breccia: An analog to Humphrey, 25th Goldschmidt Conference, Abstract #3200, June 2015.

EXTENDED ABSTRACTS (*: advisees)

34. Udry A., Howarth G. H., Herd C. D. K., Lapen T. J., and Day J. M. D. (2019) What have meteorites taught us about the martian interior and surface over the past five years? Ninth International Conference on Mars 2019. Abstract # 6139 (Plenary talk).

33. Payré V., Siebach K. L., Dasgupta R., Morrison S. M., Rampe E. B., and **Udry A.** (2019) Constraints on martian ancient magmatic processes using mineral chemistry of sedimentary rocks in Gale crater, Mars. Ninth International Conference on Mars 2019. Abstract # 6231.

32. Wilbur Z. E.*, **Udry A.**, McCubbin F. M., Vander Kaaden K. E., Zeigler R. A., Ziegler K., and DeFelice C. (2019) Investigating the history of aubrites using X-ray computed tomography and bulk partition coefficients. 82nd Annual Meeting of the Meteoritical Society. Abstract #6180.

31. Rahib R. R.*, **Udry A.**, Howarth G. H., Gross J., Paquet M., Combs L. M.*, Laczniak D. L.*, and Day J. M. D. (2019) Formation and emplacement of poikilitic shergottites. 82nd Annual Meeting of the Meteoritical Society. Abstract #6205.

30. Krämer Ruggiu L., Gattacceca J., Devouard B., **Udry A.**, Debaille V., Rochette P., Lorand J. P., Bonal L., Beck P., Sautter V., Meier M. M. M., Gounelle M., Marrochi Y., Maden C., and Busemann H. (2019) Caleta el Cobre 022: an unusual nakhlite with abundant aqueous alteration. 82nd Annual Meeting of the Meteoritical Society. Abstract #6379.

29. Ostwald A. M.*, **Udry A.**, and Gross J. (2019) Melt Inclusion Analyses to Constrain Parental Magma Compositions of the Nakhlite Meteorites. 82nd Annual Meeting of the Meteoritical Society. Abstract #6106.

28. Ostwald A. M.*, **Udry A.**, and Gross J. (2019) Parental melt of nakhlites as determined from melt inclusions. Lunar and Planetary Science Conference L Houston, Abstract #1431.

27. Rahib R. R.*, **Udry A.**, Howarth G. H., Gross J., Paquet M., Combs L. M.*, Laczniak D. L., and Day J. M. D. (2019) Petrogenesis of enriched and intermediate poikilitic shergottites: from magmatic source to emplacement. Lunar and Planetary Science Conference L Houston, Abstract #1428.

26. Paquet M., Day J. M. D., **Udry A.***, Hattingh R., Kumler B., Rahib R. R.*, Tait K. T., and Neal C. R. (2019) Fractionation of the Highly Siderophile Elements in Shergottite Sulfides. Lunar and Planetary Science Conference L Houston, Abstract #1456.

25. Wilbur Z. E.*, **Udry A.**, Zeigler R. A., McCubbin F. M., Vander Kaaden K. E., Ziegler K., DeFelice C., and McCoy T. J. (2019) The Geochemistry of aubrites: Investigating Reduced Parent Bodies. Lunar and Planetary Science Conference L Houston, Abstract #1648.

24. Wilbur Z. E.*, **Udry A.**, McCubbin F. M., Vander Kaaden K. E., Rahib R. R.*, and McCoy T. J. (2018) Aubrite and enstatite chondrite impact melt meteorites: Analogs to Mercury? Mercury: Current and Future Science Workshop, Abstract #6034.
23. **Udry A.** and Day J. M. D. (2018) Formation and emplacement of the cogenetic nakhlite and chassignite meteorites, Lunar and Planetary Science Conference XLIX Houston, Abstract #1052.
22. Combs L. M.*, **Udry A.**, Howarth G. H., Lapen T. J., Richter M., Gross J., Day J. M. D., and Rahib R. R.* (2018) Petrology of the enriched poikilitic shergottite Northwest Africa 10169: Insight into the martian interior, Lunar and Planetary Science Conference XLIX Houston, Abstract # 1727.
21. Rahib R. R.*, **Udry A.**, Combs L. M.*, Howarth G. H. (2018) Formation and emplacement processes of martian poikilitic shergottite meteorites, Lunar and Planetary Science Conference XLIX Houston, Abstract # 1303.
20. Wilbur Z. E.*, **Udry A.**, McCubbin F. M., Combs L. M.*, Rahib R. R.*, McCoy T. J., and McCoy C. (2018) Aubrite and enstatite chondrite impact melt meteorites as potential analogs to mercury, Lunar and Planetary Science Conference XLIX Houston, Abstract #1355.
19. Adcock C. T., **Udry A.**, Hausrath E. M., and Tschauner O. (2018) Craters of the moon national monument basalts as analogs for martian rocks and meteorites, Lunar and Planetary Science Conference XLIX Houston, Abstract #2397.
18. Day J. M. D., Tait K. T., **Udry A.**, Moynier F., Liu Y., Neal C. R. (2018) Rejuvenated magmatism on Mars, Lunar and Planetary Science Conference XLIX Houston, Abstract #1014
17. Fagan A. L., **Udry A.**, Gannon J. P., Cato M. J., and the Spring 2017 WCU Petrology (GEOL 355) class (2018) Northwest Africa 8632 – Crystal size distribution variation & potential link to Northwest Africa 032, Lunar and Planetary Science Conference XLIX Houston, Abstract #2601.
16. Filiberto J., Gross J., **Udry A.**, Trela J., Wittmann A., Cannon K. M., Penniston-Dorland S., Ash R. D., Hamilton V. E., Meado A. L., Carpenter P., Jolliff B., and Ferré E. C. (2018) Shergottite Northwest Africa (NWA) 6963 a pyroxene-cumulate martian gabbro: constraints on the mineralogy, petrology, and physical properties of the martian crust at depth. Lunar and Planetary Science Conference XLIX Houston, Abstract #2107.
15. Rahib R. R.*, **Udry A.**, Howarth G. H. (2017) Constraining formation and emplacement processes of poikilitic shergottites using quantitative textural analyses, 80th Annual Meeting of the Meteoritical Society, Abstract #6027
14. **Udry A.**, Day J. M. D., and Moynier F. (2017) Magma emplacement on Mars inferred from a comprehensive suite of nakhlites and chassignites. 80th Annual Meeting of the Meteoritical Society, Abstract #6063.
13. **Udry A.**, Day J. M. D., and Moynier F. (2017) Magma emplacement and mantle source compositions inferred from a comprehensive suite of nakhlites and chassignites, Lunar and Planetary Science Conference XLVIII Houston, Abstract # 2289.
12. Howarth G. H. and **Udry A.** (2017) Nickel in olivine and constraining mantle reservoirs for shergottite meteorites, Lunar and Planetary Science Conference XLVIII Houston, Abstract #1375.
11. Combs L. M.*, **Udry A.**, and Day J. M. D. (2016) Petrography and Mineral Chemistry of the New Enriched Lherzolithic Shergottite Northwest Africa

- 10169, Lunar and Planetary Science Conference XLVII Houston, Abstract #2804.
10. **Udry A.**, Howarth G. H. (2016) Petrogenesis of the enriched shergottite Northwest Africa 7320: A new martian gabbroic sample, Lunar and Planetary Science Conference XLVII Houston, Abstract #1730.
 9. Balta J. B., Sanborn M. E., **Udry A.**, Wadhwa M., and McSween H. Y. Jr. (2015) Igneous petrology and geochemistry of the Tissint meteorite, Lunar and Planetary Science Conference XXXXVI Houston, Abstract #1267.
 8. Adcock C. T., Hausrath E. M., Tschauer O., and **Udry A.** (2015) Investigations of shock effects on phosphate minerals in extraterrestrial materials, Lunar and Planetary Science Conference XXXXVI Houston, Abstract #2288.
 7. **Udry A.** and McSween H. Y. Jr. (2014) New investigations of lithium abundances in shergottite pyroxenes and olivines: potential evidence for martian magmatic water, Lunar and Planetary Science Conference XXXXV Houston, Abstract #1973.
 6. **Udry A.**, Lunning N., and McSween H. Y. Jr. (2014) Petrogenesis of a vitrophyre in the martian meteorite breccia NWA 7034, Lunar and Planetary Science Conference XXXXV, Abstract #1948.
 5. Beck A. W., Lunning N. G., De Sanctis M. C., Hiroi T., Plescia J., Viviano-Beck C. E., **Udry A.**, Corrigan C. M., McCoy T. J. (2014) A meteorite analog for olivine-rich terrain in unexpected locations, Lunar and Planetary Science Conference XXXXV, Abstract #2499.
 4. **Udry A.**, Balta J. B., and McSween H. Y. Jr. (2013) Polybaric crystallization of Gusev alkaline basalts, Lunar and Planetary Science Conference XXXXIV, Abstract #1265.
 3. **Udry A.**, Balta J. B., and McSween H. Y. Jr. (2013) CSD measurements on olivine grains in the Tissint meteorite, Lunar and Planetary Science Conference XXXXIV, Abstract #1266.
 2. **Udry A.** and McSween H. Y. Jr. (2012) Paired nakhlites MIL 090030, 090032, 090136, and 03346: new insights into the cumulate pile, Lunar and Planetary Science Conference XXXXIII, Abstract #1047.
 1. **Udry A.**, McSween H. Y. Jr., and Taylor L. A. (2011) Petrology of a New L4 Chondrite NWA 6513, Lunar and Planetary Science Conference XXXXII, Abstract #2001.

ABSTRACTS AND OTHER PUBLICATIONS

16. Wilbur Z. E.*, **Udry A.**, Zeigler R. A., Vander Kaaden K. E., McCubbin F. M., Ziegler K., and Defelice C. (2019) A new look at aubrites: investigating 3D modal mineralogy with X-ray computed tomography, ToScA North America Symposium (Gainesville, FL, March 2019).
15. **Udry A.**, Gazel E., McSween, H. Y. (2018) Formation of felsic martian rocks at Gale Crater through fractional crystallization, Geological Society of America Conference (Indianapolis, IN, November 2018).
14. Rahib R. R.*, **Udry, Arya**, Howarth, G. H., Gross J., Paquet M., Day J. M. D. (2018) Petrogenesis of enriched and intermediate poikilitic shergottites: From magmatic source to emplacement, Geological Society of America Conference (Indianapolis, IN, November 2018).
13. Wilbur Z. E.*, **Udry, Arya**, Coleff D.M., Vander Kaaden K. E., McCubbin, F. M.; Zeigler R. A.; McCoy, T. J., Ziegler K., Gross, J., DeFelice C. (2018) Investigation of aubrites through integration of 3D modal mineralogy with x-

- ray micro-computed Tomography and geochemistry, Geological Society of America Conference (Indianapolis, IN, November 2018).
12. Rahib R. R.*, **Udry A.**, Combs L. M.* (2017) Emplacement of martian poikilitic shergottite meteorites using quantitative textural analyses, 2017 NASA Space Grant and Nevada NASA EPSCoR Statwide Meeting (Las Vegas, NV, November 2017)..
 11. Combs L. M.*, **Udry A.**, Rahib R. R.* (2017) Petrology of the new enriched poikilitic shergottite Northwest Africa (NWA) 10169: Insight into the martian interior, 2017 NASA Space Grant and Nevada NASA EPSCoR Statewide Meeting (Las Vegas, NV, November 2017).
 10. **Udry A.** and Day J. M. D. (2016) Emplacement Processes and Martian Mantle Source Composition of Nakhilites And Chassignites, Geological Society of America Conference (Denver, September 2016).
 9. **Udry A.**, McSween H. Y., Hervig R. L., and Taylor L. A. (2016) Light Lithophile Element and Li Isotope In Situ Analyses in Shergottites: Evidence for Both Martian Magmatic Water And Subsolidus Diffusion, Geological Society of America Conference (Denver, September 2016).
 8. Combs L.*, **Udry A.** Day J., Lapen T. J. (2016) Petrology and mineral chemistry of the martian meteorite Northwest Africa 10169: constraints on enriched poikilitic shergottite petrogenesis Geological Society of America Conference (Denver, September 2016).
 7. Lacznia D.*, Combs L.*, Rahib R.*, and **Udry A.** (2016) Textural Analysis of Enriched Poikilitic Shergottite, Geological Society of America Conference (Denver, September 2016).
 6. Adcock C. T., Hausrath E. M., Tschauner O., and **Udry A.** (2015) Craters of the Moon National Monument as a Terrestrial mars Analog: Phosphate minerals, phosphate-shock recovery experiments, and phosphates in martian meteorites, AGU conference, Abstract #P31A-2028 (San Francisco, CA, December 2015).
 5. **Udry A.**, Lunning N., McSween H. Y. Jr., and Bodnar R. J. (2015) A vitrophyric clast in the martian NWA 7034 breccia: An analog to Humphrey, Invited talk Goldschmidt conference (Prague, Czech Republic, August 2013).
 4. **Udry A.**, Lunning N., and McSween H. Y. Jr. (2013) Unique melt clast in the martian meteorite breccia NWA 7034, Geological Society of America Conference (Denver, October 2013).
 3. **Udry A.**, Balta J. B., and McSween H. Y. Jr. (2013) Exploring fractionation models for some martian primary magmas, Goldschmidt Conference (Florence, Italy, August 2013)
 2. **Udry A.** and McSween H. Y. Jr. (2011) Newly discovered MIL 090030, MIL 090032, and MIL 090136: paired with MIL 03346? Mineralogical Magazine, Vol. 75, p 2045, Goldschmidt conference (Prague, Czech Republic, August 2011).
 1. **Udry A.** and Müntener O. (2009) Petrology of mafic-ultramafic complexes within the Archean Lewisian complex of NW Scotland, Swiss Geosciences Meeting (Neuchatel, Switzerland, November 2009).

SCIENTIFIC SESSIONS ORGANIZED

Udry A. and Gross J. (organizers and chairs) "The evolution of Mars from mantle through crust: New views from petrology and geochemistry" at the Geological Society of America Conference 2016, Denver, CO (sponsored by GSA

planetary Geology division, GSA Mineralogy, geochemistry, petrology, and volcanology)

RESEARCH INTERESTS

Igneous Petrology; Martian magmatic processes and reservoirs; Martian meteorites; Thermodynamical modeling of magmatic processes; Formation of enstatite-rich meteorites and link to Mercury.

INVITED SEMINARS AND COLLOQUIA

- Washington State University, School of the environment, WA, January 2019
- University of Arizona, Lunar and Planetary laboratory, Tucson, AZ, November 2018
- Berkeley University, Space Science Lab, CA, Berkeley, November 2018
- Cornell University, Earth and Atmospheric Science, Ithaca, NY, August 2018
- Los Alamos National Lab, Los Alamos, NM, September 2017.
- Rutgers University, Department of Earth and Planetary Science, Piscataway, NJ, November 2016.
- University of Arizona, Department of Geosciences, Tucson, AZ, January 2016.
- Geological Society of Nevada meeting, Las Vegas, NV, February 2015.

CONTRIBUTIONS TO PROFESSIONAL ORGANIZATIONS

- Member of the NASA Meteoritical Working Group (MWG) and Curation and analysis planning team for extraterrestrial materials (CAPTEM) (2017 – present)
- Guest editor for geoscience journal "Making an Impact: Exploring Advances in Meteorite and Mineralogical Studies in Planetary Science" Special issue (February 2019 – present)
- Reviewer for: Meteoritics and Planetary Science Journal, Geochimica et Cosmochimica Acta, American Mineralogist Letters, American Mineralogist, Journal of Geophysical Research-Planets, Icarus, Earth and Planetary Science Letters (since 2014)
- Funding review panels: Served as a panel reviewer on various NASA funding review panels (2014–present), panel reviewer for the NASA NV Space Grant (Spring 2019)
- Invited panelist on UNLV Graduate College Workshop: “Mysteries unveiled: Logistics of academic job interviewing, negotiating and offer and transitional into a Professorial position.” (Spring 2015)
- Member of the Geological Society of America (GSA) (since 2014)
- Member of the Mineralogical Society of America (MSA) (since 2014)
- Member of the Meteoritical Society (since 2014)
- Member of the American Geophysical Union (AGU) (since 2016)

DEPARTMENT/UNIVERSITY SERVICE:

- Member of the UNLV Sabbatical Committee (2018 – present)
- Panel reviewer for the UNLV Faculty Opportunity Award (Spring 2016)
- Chair of the Department of Geoscience website committee, including complete redesign of the department website (2014 – present)

- Member of the Department of Geoscience Graduate Curriculum Committee (2016 – present)
- Member of the Department of Geoscience Graduate Admission Committee (2014 – present).
- UNLV Department of Geoscience Economic geology search committee member (Spring 2016)
- Judge at the Geosymposium Department of Geoscience Conference (Spring 2016 – Spring 2019)
- In charge of the Petrology – Microscopic lab in the Department of Geoscience (LFG 107) (Fall 2015 – present)

OUTREACH

- Invited speaker at the Las Vegas Ferron Elementary School for Career Day (April 2019)
- Invited speaker for the five-day STEM bootcamp at the University of Minnesota Duluth's Summer Math Prep Program (designed to assist students from under-represented demographics interested in pursuing a career in the STEM field (June 2018)
- Meteoritic research featured in the UNLV 2017 Innovation magazine (2017)
- Honors College Science Tours (Gave a talk and presented the EMIL lab) (Spring 2017)
- Selected for UNLV Scientific Art Exhibit “Inquiry: The art of Scientific discovery” (Spring 2017)
- Invited lecture at Space Camp in Spring Preserve, Las Vegas, NV (Summer 2016)
- Invited talk at "Martian Geology: New discoveries from rover, orbiter, and meteorite data", Science Café, Las Vegas (March 2016)

AWARDS

- Doctoral candidate professional promise award – University of Tennessee (Spring 2014)
- Excellence in Research for a Ph.D. degree award – Planetary Geoscience Institute, University of Tennessee (Spring 2014)
- Doctoral candidate Academic Excellence in Coursework award – University of Tennessee (Spring 2013)

TRAVEL AWARDS

- UNLV travel grant Spring 2019 – LPSC (\$760), Spring 2018 – LPSC (\$600), Spring 2017 – LPSC (\$630), Spring 2016 – LPSC (\$500).

STUDENT ADVISEES

Graduate students supervised

- Amanda Ostwald (Ph.D. student) Fall 2018 – present (primary advisor), In progress. Current title: “Constraining the parental melt compositions and cumulus mineral formation in nakhlite and chassignite meteorites using melt inclusions”
- Rachel Rahib (M.S. student) Spring 2017 – Fall 2018 (primary advisor) – Graduated Fall 2018. Title: “petrogenesis of enriched and intermediate poikilitic shergottites: From magmatic source to emplacement.” Current

position: Chemistry and physics teacher at the Democracy Preparatory high school Academy at Agassi Campus, Las Vegas.

- Logan Combs (M.S. student) August 2015 – Spring 2018 (primary advisor) – Graduated Spring 2018. Title: “Petrology and geochemistry of the enriched poikilitic shergottite Northwest Africa 10169: insight into the martian interior.” Current position: National Park Service as Lead Physical Science technician.
- Christopher McCoy (Ph.D. student) August 2016 – July 2017 (primary advisor)

Undergraduate students supervised

- Zoë Wilbur (B.S. student) Honors senior thesis (advisor) – Fall 2017 – Graduated Fall 2018. Title: “Enstatite-rich meteorites: investigating reduced planetary bodies.” Current position: Ph.D. student at the University of Arizona (Advisor: Dr. Jessica Barnes).
- Dara Laczniak (B.S. student) Independent study (advisor) – Fall 2016 – Graduated Fall 2017. Title: “Textural analysis of enriched poikilitic shergottites NWA 4468, NWA 10169, and NWA 7397.” Current position: Ph.D. student at Purdue University (Advisor: Dr. Michelle Thompson)
- Rachel Rahib (B.S. student) Independent study (advisor) – Fall 2015 – Graduated Fall 2015. Title: “Crystal size distribution analysis of olivine in ilherzolithic shergottite NWA 4468.” Current position: Chemistry and physics teacher at the Democracy Preparatory high school Academy at Agassi Campus, Las Vegas.

Graduate student committees

- Amandee Hua – Ph.D. student (college representative) Department of Chemistry (Advisor: Dr. Clemens Heske).
- Drew Barkoff – Ph.D. student (committee member)
- Ngoc Luu – Ph.D. student (committee member)
- Christopher DeFelice – Ph.D. student (committee member)
- Justin Reppart – M.S. student (committee member)
- Anna Child – M.S. and Ph.D. student (college representative) Astrophysics department (Advisor: Jason Steffen)
- Jeremy Smallwood – M.S. and Ph.D. student (college representative) Astrophysics department (Advisor: Dr. Rebecca Martin)
- Valérie Payré – Ph.D. student at University de Lorraine (Invited committee member) – Graduated Fall 2017
- Kelsy Konkright – M.S. student (committee member) – Graduated Spring 2019
- Stephanie Ralston – M.S. student (committee member) – Graduated Spring 2018
- Alexander Peck – M.S. student (committee member) – Graduated Spring 2018
- Thomas Price – M.S. student (committee member) – Graduated Fall 2017
- Alexander Valentine – M.S. student (committee member) – Graduated Spring 2017
- Courtney Bartlett – M.S. student (committee member) – Graduated Fall 2016
- Seth Gainey – Ph.D. student (committee member) – Graduated Summer 2015

STUDENT AWARDS

- NASA Planetary Sciences Division Travel Grant to Amanda Ostwald for the Meteoritical Society meeting 2019 in Sapporo (Summer 2019) = \$1,800.
- Dwornik Award Honorable Mention Graduate Poster 2019 (Planetary science Award) to Amanda Ostwald, for her LPSC poster (abstract #1431) entitled “Parental Melt of Nakhlites as Determined from Melt Inclusions.” (Spring 2019)
- Bernada French Scholarship (UNLV) to Amanda Ostwald (Fall 2018) = \$1,100
- Alumni Association Scholarship (UNLV Graduate College) to Rachel Rahib (Fall 2018) = \$1,250
- 2018 James F. Adams/GPSA Scholarship (UNLV Graduate College) to Rachel Rahib (Fall 2018) = \$500
- Remote Jacobs- NASA Johnson Space Center graduate assistantship to Rachel Rahib (Fall 2018) = \$27,262.
- 2018 UNLV Office of Undergraduate Research Summer Undergraduate Research Funding (OUR SURF) Scholarship to Zoë Wilbur (Summer 2018)
- 2018 UNLV Geosymposium undergraduate student achievement to Zoë Wilbur (April 2018)
- 2018 UNLV Geosymposium graduate student achievement to Logan Combs (April 2018)
- 2018 Lunar and Planetary Institute (LPI) career Award to Logan Combs for LPSC abstract #1727 entitled “Petrology and geochemistry of the enriched poikilitic shergottite Northwest Africa 10169: insight into the martian interior.” (March 2018) = \$1000
- 2018 Desert Space Foundation Scholarship to Rachel Rahib (Spring 2018) = \$980
- Jacobs-JSC internship to Zoë Wilbur (Spring-Summer 2018) = \$36,877
- First place to Logan Combs for poster entitled” Petrology of the new enriched poikilitic shergottite Northwest Africa (NWA) 10169: Insight into the martian interior at the 2017 NASA Space Grant and Nevada NASA EPSCoR Statewide Meeting (Fall 2017)
- NASA Lunar and Planetary Institute (LPI) travel award to Rachel Rahib for the Meteoritical Society meeting in Santa Fe (July 2017) = \$1,000
- NASA Nevada Space Grant Consortium (NVSGC) fellowship to Logan Combs entitled “Petrology of the new enriched lherzolitic shergottite Northwest Africa (NWA) 10169: Insight into the martian interior” (Fall 2017-Spring 2018) = \$18,000
- NASA Nevada Space Grant Consortium (NVSGC) fellowship to Rachel Rahib entitled “Insight into the martian interior using quantitative textural analyses of poikilitic shergottites” (Fall 2017-Spring 2018) = \$18,000

ACTIVE COLLABORATORS

- Catherine Corrigan – Smithsonian Institution, Washington DC
- Luke Daly – University of Glasgow, Glasgow, Scotland
- James Day – Scripps Institute of Oceanography at the University of California San Diego, La Jolla, CA

- Amy Fagan – Western Carolina University, Cullowhee, NC
- Jérôme Gattacceca – Centre Européen de Recherche et d’Enseignement des Géosciences de l’Environnement, CNRS Centre National de Recherche Spatiale, France
- Esteban Gazel – Cornell University, Ithaca, NY
- Julianne Gross – Rutgers University, Piscataway, NJ
- Geoffrey Howarth – University of Cape Town, Cape Town, South Africa
- Nina Lanza – Los Alamos National Laboratory, Los Alamos, NM
- Thomas Lapen – University of Houston, Houston, TX
- Timothy McCoy – Smithsonian Institution, Washington DC
- Francis McCubbin – NASA Johnson Space Center, Houston, TX
- Pranabendu Moitra – University of Arizona, Tucson, AZ
- Ann Ollila – Los Alamos National Laboratory, Los Alamos, NM
- Valérie Payré – Rice University, Houston, TX
- Minako Richter – University of Houston, Houston, TX
- Mark Salvatore – Northern Arizona University, Flagstaff, AZ
- Susanne Schwenzer – Open University, Milton Keynes, England
- Kathleen Vander Kaaden – Jetts-Jacobs NASA Johnson Space Center, Houston, TX