

Kelly E. Miller

6220 Culebra Rd
San Antonio, TX 78238

Curriculum Vitae

E-mail: kmiller@swri.edu
Cell: (520)288-2599

Education

- August 2016 Ph.D., University of Arizona, Tucson, AZ
Planetary Science, minor in Geoscience
Advisor: Dante Lauretta, Ph.D.
Dissertation: The R chondrite record of volatile-rich environments in the early Solar System
- M.S., University of Arizona, Tucson, AZ
Planetary Science
En route to Ph.D.
- May 2008 B. A., *cum laude*, Scripps College, Claremont, CA
Honors Chemistry, minor in Asian studies
Advisors: Katie Purvis-Roberts, Ph.D., Mary Hatcher-Skeers, Ph.D.
Thesis topic: Effect of methylation on DNA backbone conformations

Awards and Honors

- 2016 Meteoritical Society Wiley Award for Student Presentation
- 2014 – 2016 NASA Earth and Space Sciences Fellow
- 2014 Galileo Circle Scholar

Journal Publications

- Miller K. E., et al. Formation of unequilibrated R chondrite chondrules and opaque phases. In press at *GCA*.
- Waite, Glein, Perryman, Teolis, Magee, Miller G., Grimes, Perry, **Miller K. E.**, et al. (2017) Cassini finds molecular hydrogen in the Enceladus plume: Evidence for hydrothermal processes. *Science*, **356**, 155-159.
- Miller K. E., et al. Hydrothermal formation of copper sulfides in the R chondrites. In preparation for *GCA*.
- Burton, McLain, Glavin, Elsil, Davidson, **Miller**, et al. (2015) Amino acid analyses of R and CK chondrites. *Meteoritics and Planetary Science*, **50**, 470-482.

Conference Abstracts

- Miller, K. E., et al. (2017) Contributions from cometary dust to Titan's N₂ atmosphere. *48th Lunar and Planetary Science Conference*
- Miller, K. E., et al. (2016) Copper sulfides in the R chondrites: Evidence of hydrothermal alteration in low petrologic types. *The Meteoritical Society 79th Annual Meeting*.
- Miller, K. E., et al. (2016) Chondrules and opaque phases in unequilibrated R chondrites: A comprehensive assessment of their formation. *47th Lunar and Planetary Science Conference*.

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Miller, K. E., et al. (2015). The nature of primitive R chondrite material: Characterization of an R3.2 clast in Mount Prestrud 95404. *46th Lunar and Planetary Science Conference*.

Miller K. E., et al. (2014) Trace elements in the Rumuruti chondrites. *Goldschmidt Conference*.

Miller K. E., et al. (2014) Conditions for formation of chalcopyrite in the Rumuruti chondrites. *45th Lunar and Planetary Science Conference*.

Miller K. E., et al. (2013) Chalcopyrite in the R chondrite PRE 95411. *Goldschmidt Conference*.

Research Experience

- 2016 – present Postdoctoral Researcher at Southwest Research Institute, San Antonio, TX
Supervisor: Christopher R. Glein
- Studying the role of inherited and indigenous organic molecules in the chemistry of Titan's atmosphere
 - Utilizing Cassini and Rosetta data to understand the role of comets in building planetary bodies in the outer Solar System
- 2011 – 2016 Research Assistant, LPL, University of Arizona, Tucson, AZ
Advisor: Dante Lauretta, Ph.D.
- Utilized EMPA, SIMS, and ICP-MS plus data from TEM for meteorite analyses
 - Developed thermodynamic models of meteorite formation
- 2008 Research Assistant, SETI, Mountain View, CA
Supervisor: Richard Quinn, Ph.D.
- Replicated electrochemical data from Phoenix Mars Lander in laboratory setting
 - Repaired and maintained laboratory equipment
- 2007 – 2008 Research Assistant, Joint Science Dept., Claremont Colleges, Claremont, CA
Advisor: Mary Hatcher-Skeers, Ph.D.
- Cleaned and prepared DNA samples
 - Collected and analyzed ³¹P NMR data on DNA backbone conformations
- 2007 (summer) REU Research Assistant, SETI, Mountain View, CA
Supervisor: Richard Quinn, Ph.D.
- Determined detection limits for Phoenix Mars Lander chronopotentiometry probes
- 2006 (summer) REU Research Assistant, Chemistry Dept., California State University, Los Angeles, CA
Supervisor: Alison McCurdy, Ph.D.
- Tested synthesis pathway for photo-responsive Ca²⁺ chelator
 - Characterized synthesis products using NMR and FT-IR spectroscopy

Laboratory Techniques

Electron microprobe analysis

SIMS

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Solution and laser ablation ICP-MS

Optical microscopy

Chronopotentiometry

Cyclic voltammetry

NMR

Teaching Experience

- 2013 (spring) Teaching Assistant, LPL, University of Arizona, Tucson, AZ
PTYS 214 Astrobiology: A Planetary Perspective
Supervisor: Ilaria Pascucci, Ph.D.
- 2012 (fall) Teaching Assistant, LPL, University of Arizona, Tucson, AZ
PTYS 206 Our Golden Age of Planetary Exploration
Supervisor: Steve Kortenkamp, Ph.D.
- 2010 – 2011 Native English Teacher, GEPIK, Jungang Elementary School, Pyeongtaek, South Korea
- 2009 – 2010 Native English Teacher, GEPIK, Seongho Middle School, Osan, South Korea
- 2007 – 2008 Teaching Assistant, Joint Science Dept., Claremont Colleges, Claremont, CA
116L – 117L Organic Chemistry Laboratory
Supervisors: Kersey Black, Ph.D., Thomas Poon, Ph.D.
- 2005 – 2007 Teaching Assistant, Joint Science Dept., Claremont Colleges, Claremont, CA
14L – 15L General Chemistry Laboratory
Supervisors: Anthony Fucaloro, Ph.D., Thomas Davis

Outreach Experience

- 2017 Founded monthly after-school STEM club for girls at Briscoe Middle School, San Antonio, TX
- 2015 Tucson Hebrew Academy STEM Festival Volunteer, Tucson, AZ
Speaker for Ms. Delgado's middle school class, Tucson, AZ
Reviewer for undergraduate research conference talks, Tucson, AZ
- 2014 Art of Planetary Science volunteer, Tucson, AZ
Summer Science Saturday volunteer, Tucson, AZ
Updated descriptions for LPL impact and igneous samples outreach kit
Meteorite Outreach training, Tucson, AZ
Guest speaker at Tanque Verde High School, Tucson, AZ
- 2013 OSIRIS-REx Ambassador at Boys and Girls Club, Tucson, AZ
Co-founded Starlight Science Cinema summer series, Tucson, AZ
Science in the City volunteer, Tucson, AZ
- 2012 OSIRIS-REx Ambassador at Flandrau Science Center, Tucson, AZ
OSIRIS-REx Ambassador training, Tucson, AZ
Fun Fest volunteer, Tucson, AZ
- 2006 Guest teacher for 5th grade class at Chaparral Elementary School on a biweekly basis, Claremont, CA
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Professional Development

- Panel member for NASA ROSES proposal review
Executive Secretary for multiple NASA ROSES proposal reviews
Judge for multiple rounds of GPSC Travel Grants at University of Arizona, Tucson, AZ
Judge for Stephen E. Dworkin Award at Lunar and Planetary Science Conference, The Woodlands, TX
- 2016 Establishing and Sustaining an Undergraduate Research Program, AGU Workshop, San Francisco, CA
- 2015 8th NAIC/NRAO School on Single Dish Radio Astronomy and 1st ALMA Interferometry School, Green Bank, WV
Grad Slam public speaking contestant, Tucson, AZ
- 2014 ALMA Workshop, Star and Planet Formation Conference, Oracle, AZ
Future Faculty Program, University of Tennessee, Knoxville, TN
LPL Conference coordinator, Tucson, AZ
- 2012 – 2014 Journal club student coordinator, LPL, University of Arizona, Tucson, AZ
- 2012 NASA Astrobiology Institute Scholar, Santander, Spain
- 2007 – 2008 President of Women in Science Club, Scripps College, Claremont, CA

Competitive Scholarships

- 2016 Graduate and Professional Student Council Travel Grant recipient
Small Bodies Assessment Group Early Career Travel Grant recipient
MetSoc Student Travel Grant recipient
- 2015 Curson Travel Award recipient
- 2013 Goldschmidt Travel Grant recipient

Research Presentations Without Publicly Available Abstracts

- 2016 Decoding the R chondrite record of a volatile-rich environment. *Solar System Symposium, Hokkaido, Japan.*
- 2015 The Rumuruti chondrites: Records of a volatile-rich environment in the early solar system. *Lecture seminar, Southwest Research Institute, San Antonio, TX*
The Rumuruti Chondrites: Records of a Volatile-Rich Environment in the early solar system. *Lecture seminar, Department of Geoscience, University of Wisconsin, Madison, WI*
Miller, K.E., et al. Sulfide chondrules in an R chondrite clast: A new chondrule-forming environment? *Gordon Research Conference: Origins of Solar Systems 2015, South Hadley, MA.* (poster)
Miller, K.E., et al. The nature of primitive R chondrite material: Characterization of an R3.2 clast in Mount Prestrud 95404. *46th LPSC, Houston, TX.*
- 2014 Miller, K.E., et al. Copper sulfides and aqueous alteration in the Rumuruti chondrites. *LPL Conference 2014, Tucson, AZ.*

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- Miller K.E., et al. Trace elements in the Rumuruti chondrites. *Goldschmidt 2014, Sacramento, CA.* (poster)
- Miller K.E., et al. Conditions for formation of chalcopyrite in the Rumuruti chondrites. *45th LPSC, Houston, TX.* (poster)
- 2013 Miller K.E., et al. Chalcopyrite in the R chondrite PRE 95411. *Goldschmidt 2013, Florence, Italy.* (poster)
- Miller, K.E., Lauretta, D.S. Trace element distribution in meteoritic sulfides via laser ablation ICP-MS. *Graduate Student Colloquium, Tucson, AZ.*

Other Presentations

- 2014 Planetary geology field trips at LPL. *LPL Advisory Board meeting, Tucson, AZ.*
- 2012 A review of Ciesla and Sandford's "Organic synthesis via irradiation and warming of ice grains in the solar nebula." *Graduate Student Colloquium, Tucson, AZ.*
- A review of Herd et al.'s "Origin and evolution of prebiotic organic matter as inferred from the Tagish Lake meteorite." *Graduate Student Colloquium, Tucson, AZ.*
- Meteorites as a source of extraterrestrial organic material. *Snyder Research Group meeting, Tucson, AZ.*

Professional Memberships

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| Geological Society of America | Sigma Xi |
| Meteoritical Society | American Geophysical Union |

Field Experience

- May 16-30, 2014 Volcano National Park, Hawai'i
- Compared radar and visual remote sensing data sets with ground observations
 - Collected samples for geochemical analyses
 - Conducted comparative study of lava morphologies in IR
- Sept. 26-30, 2013 Northern New Mexico and Southern Colorado
- Studied lava flows in the El Malpais region and the K/T boundary
- Mar. 28-31, 2013 Mojave Desert
- Studied dunes and volcanic processes
 - Compared radar remote sensing data with ground observations
- Oct. 26-28, 2012 Tucson local geology
- Studied formation and evolution of mountain ranges surrounding Tucson
- Sept. 21-23, 2012 Surfaces class field trip, Northern Arizona
- Studied SP Crater, Grand Falls, Meteor Crater as examples of topics discussed in lectures
- Sept. 23-25, 2011 Canyon de Chelly and Painted Desert
- Studied sedimentary and metamorphic processes in northern Arizona