

## Kelly E. Miller

6220 Culebra Rd  
San Antonio, TX 78238

## Curriculum Vitae

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

### Education

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- 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

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

### Journal Publications

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- Miller K. E.**, et al. (2017) Formation of unequilibrated R chondrite chondrules and opaque phases. *GCA*, 209, 24-50.
- 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.
- Burton, McLain, Glavin, Elsila, Davidson, **Miller**, et al. (2015) Amino acid analyses of R and CK chondrites. *Meteoritics and Planetary Science*, **50**, 470-482.

### Conference Abstracts

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- Miller, K. E., et al. (2017) Contributions from cometary dust to Titan's N<sub>2</sub> atmosphere. *48<sup>th</sup> 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 79<sup>th</sup> Annual Meeting*.
- Miller, K. E., et al. (2016) Chondrules and opaque phases in unequilibrated R chondrites: A comprehensive assessment of their formation. *47<sup>th</sup> Lunar and Planetary Science Conference*.
- Miller, K. E., et al. (2015). The nature of primitive R chondrite material: Characterization of an R3.2 clast in Mount Prestrud 95404. *46<sup>th</sup> Lunar and Planetary Science Conference*.

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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. *45<sup>th</sup> Lunar and Planetary Science Conference*.

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

### Research Experience

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- 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 <sup>31</sup>P 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 Ca<sup>2+</sup> chelator  
- Characterized synthesis products using NMR and FT-IR spectroscopy

### Laboratory Techniques

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Electron microprobe analysis

SIMS

Solution and laser ablation ICP-MS

Optical microscopy

Chronopotentiometry

Cyclic voltammetry

NMR

## Teaching Experience

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- 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

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- 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 5<sup>th</sup> grade class at Chaparral Elementary School on a biweekly basis, Claremont, CA
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### Professional Development

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- 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
- 2017 Planetary Science Summer Seminar student for mission to Centaurs
- 2016 Establishing and Sustaining an Undergraduate Research Program, AGU Workshop, San Francisco, CA
- 2015 8<sup>th</sup> NAIC/NRAO School on Single Dish Radio Astronomy and 1<sup>st</sup> ALMA Interferometry School, Green Bank, WV  
Grad Slam public speaking contestant, Tucson, AZ  
ALMA Workshop, Star and Planet Formation Conference, Oracle, AZ
- 2014 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

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- 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

### Other Presentations

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- 2017 Volatile Element Distribution During Planet Formation: Lessons from the Rumuruti Chondrites. *Colloquium at Purdue University, West Lafayette, IN.*
- 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)

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- 2014 Miller, K.E., et al. The nature of primitive R chondrite material: Characterization of an R3.2 clast in Mount Prestrud 95404. *46<sup>th</sup> LPSC, Houston, TX.*
- 2014 Miller, K.E., et al. Copper sulfides and aqueous alteration in the Rumuruti chondrites. *LPL Conference 2014, Tucson, AZ.*
- 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. *45<sup>th</sup> LPSC, Houston, TX.* (poster)
- Planetary geology field trips at LPL. *LPL Advisory Board meeting, Tucson, AZ.*
- 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.*
- 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  
Meteoritical Society

Sigma Xi  
American Geophysical Union

## Field Experience

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- 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