

# John M. Keller

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Astrophysical and Planetary Sciences  
Fiske Planetarium

## EDUCATIONAL PREPARATION

- 2006            **University of Arizona**, PhD Planetary Science.  
*Dissertation: Part I: Greenhouse Effect Concept Inventory, Part II: Distribution of Chlorine Measured by the Mars Gamma Ray Spectrometer. Advisors: Dr. William V. Boynton and Dr. Edward E. Prather.*
- 1999            **University of Colorado**, MS Astrophysics and Planetary Sciences.  
*Research Focus: Astronomy Education. Advisors: Dr. Katherine Garmany, Dr. Clark Chapman.*
- 1992            **Stanford University**, MA Education.  
*Earned California Single Subject Teacher Credentials in Physical Science and Life Science.*
- 1991            **Stanford University**, BS Biological Sciences.  
*Attended Stanford Overseas Studies Programme in Oxford with focus on History of Science.*

## EMPLOYMENT

### **Director, Fiske Planetarium**

*University of Colorado, Boulder, CO, 1/2018-present*

### **Senior Instructor**

*University of Colorado, Boulder, CO, 1/2018-present*

### **Co-Director, Center for Excellence in Science and Mathematics Education (CESaME)**

*California Polytechnic University, San Luis Obispo, CA, 1/2010-9/2017.*

### **Associate Professor**

*California Polytechnic University, San Luis Obispo, CA, 9/2012-present.*

### **Assistant Professor**

*California Polytechnic University, San Luis Obispo, CA, 1/2007-9/2012.*

### **Research Associate/Teaching Associate**

*Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, 10/2001 – 12/2006.*

### **Astronomy Education Coordinator**

*Desert Sun Science Center, Idyllwild, CA, 7/1999-10/2001 & 8/1997-6/1998.*

### **Research Assistant/Teaching Assistant**

*University of Colorado, Boulder, CO, 8/1996-5/1997 & 8/1998-5/1999.*

### **Science Teacher**

*Los Altos High School, Los Altos, CA, 8/1991-6/1996.*

## PUBLICATIONS

- G. Benedetti-Rossi, B. Sicardy, M. W. Buie, J. L. Ortiz, R. Vieira-Martins, **J. M. Keller**, F. Braga-Ribas, J. I. B. Camargo, M. Assafin, N. Morales, R. Duffard, A. Dias-Oliveira, P. Santos-Sanz, J. Desmars, A. R. Gomes-Júnior, R. Leiva, J. Bardecker, J. K. Bean Jr., A. M. Olsen, D. W. Ruby, R. Sumner, A. Thirouin, M. A. Gómez-Muñoz, L. Gutierrez, L. Wasserman, D. Charbonneau, J. Irwin, S. Levine, and B. Skiff (2016), "Results from the 2014 November 15th multi-chord stellar occultation by the TNO (229762) 2007 UK126," *The Astronomical Journal*, 152(6): 156.
- Buie, M.W., and **J.M. Keller** (2016), "The Research and Education Collaborative Occultation Network: A system for coordinated TNO occultation observations," *The Astronomical Journal*, 151:73, doi:10.3847/0004-6256/151/3/73.
- Karunatillake, S., O. Gasnault, S.W. Squyres, **J. M. Keller**, D.M. Janes, W.V.Boynton, and H.E. Newsom (2012), "Martian case study of multivariate correlation and regression with planetary datasets," *Earth, Moon, and Planets*, DOI: 10.1007/s11038-012-9395-x.
- Lorenz, R.D., B.K. Jackson, J.W. Barnes, J. Spitale, and **J.M. Keller**, "Ice rafts not sails: Floating the rocks at Racetrack Playa," *American Journal of Physics*, 79(1): 37-42, 2011.
- Baker, W., and **J.M. Keller** (2010), "Science Teacher and Researcher (STAR) Program: Strengthening STEM Education through Authentic Research Experiences for Preservice and Early Career Teachers," *Peer Review*, publication of the American Association of Colleges and Universities (AAC&U), Spring 2010, Vol 12, No 2, Pages 22-26.
- Karunatillake, S., S.W. Squyres, O. Gasnault, **J. M. Keller**, D.M. Janes, W.V.Boynton, and M.J. Finch (2010), "Recipes for spatial statistics with global datasets: A Martian case study," *Journal of Scientific Computing*, DOI: 10.1007/s10915-010-9412-z
- Dohm, J.M., R.C. Anderson, N.G. Barlow, H. Miyamoto, A.G. Davies, G.J. Taylor, V.R. Baker, W.V. Boynton, **J.M Keller**, K. Kerry, D. Janes, A.G. Fairen, D. Schulze\_Makuch, M. Glamoclija, L. Marinangeli, G.G. Ori, R.G. Strom, J.P. Williams, J.C. Ferris, J.A.P Rodriguez, M.A. de Pablo, and S. Karunatillake (2008), "Recent geological and hydrological activity on Mars : The Tharsis/Elysium corridor," *Planetary and Space Science* , 56, p 985-1013.
- Boynton, W.V., G.J. Taylor, L.G. Evans, R.C. Reedy, R.D. Starr, D.M. Janes, K.E. Kerry, D.M. Drake, K.J. Kim, R.M.S. Williams, K. Crombie, J.M. Dohm, V. Baker, A.E. Metzger, S.K. Karunatillake, **J.M. Keller**, J.R. Arnold, J. Brückner, P.A.J. Englert, O. Gasnault, A.L. Sprague, S.W. Squyres, J.I. Trombka, L. d'Uston, and H. Wänke (2007), "Concentration of H, Si, Cl, K, Fe, and Th in the low and mid latitude regions of Mars," *J. Geophys. Res.*, 112, E12S99, doi:10.1029/2007JE002887.
- Dohm, J. M., N. G. Barlow, R. C. Anderson, J. P. Williams, H. Miyamoto, J. C. Ferrish, R. G. Strom, G. J. Taylor, A. G. Fairén, V. R. Baker, W. V. Boynton, **J. M. Keller**, K. Kerry, D. Janes, J. A. P. Rodriguez, and T. M. Hare (2007), Possible ancient giant basin and related water enrichment in the Arabia Terra province, Mars, *Icarus*, 190(1), doi:10.1016/j.icarus.2007.03.006.
- Karunatillake, S., **J. M. Keller**, S. W. Squyres, W. V. Boynton, J. Brückner, D. M. Janes, O. Gasnault, and H. E. Newsom (2007), Chemical compositions at Mars landing sites subject to Mars Odyssey Gamma Ray Spectrometer constraints, *J. Geophys. Res.*, 112, E08S90, doi:10.1029/2006JE002859.

Newsom, H. E., L. S. Crumpler, R. C. Reedy, M. T. Petersen, G. C. Newsom, L. G. Evans, G. J. Taylor, **J. M. Keller**, D. M. Janes, W. V. Boynton, William V., K. E. Kerry, and S. Karunatillake (2007), Geochemistry of Martian soil and bedrock in mantled and less mantled terrains with gamma ray data from Mars Odyssey,

**Keller, J. M.**, Boynton, W. V., Karunatillake, S., Baker, V. R., Dohm, J. M., Evans, L. G., Finch, M. J., Hahn, B. C., Hamara, D. K., Janes, D. M., Kerry, K. E., Newsom, H. E., Reedy, R. C., Sprague, A. L., Squyres, S. W., Starr, R. D., Taylor, G. J., Williams, R. M. S. (2006), Equatorial and midlatitude distribution of chlorine measured by Mars Odyssey GRS, *J. Geophys. Res.*, 111, E03S08, doi:10.1029/2006JE002679 [printed 112(E3), 2007].

Karunatillake, S.K., S.W Squyres, G.J. Taylor, **J.M. Keller**, O. Gasnault, L.G. Evans, R.C. Reedy, R.D. Starr, W.V. Boynton, D.M. Janes, K.E. Kerry, J.M. Dohm, A.L. Sprague, D. (2006), Composition of northern low-albedo regions of Mars: Insights from the Mars Odyssey Gamma Ray Spectrometer, *J. Geophys. Res.*, 111, E03S05, doi:10.1029/2006JE002675, [printed 112(E3), 2007].

Taylor, G.J., W. Boynton, J. Brückner, H. Wänke, G. Dreibus, K.E. Kerry, **J.M. Keller**, R.C. Reedy, L.G. Evans, R.D. Starr, S.W. Squyres, S.K. Karunatillake, O. Gasnault, S. Maurice, C. d'Uston, P. Englert, J.M. Dohm, V. Baker, D. Hamara, D.M. Janes, A.L. Sprague, K.J. Kim, and D.M. Drake (2006), Bulk composition and early differentiation of Mars, *J. Geophys. Res.*, 111, E03S10, doi:10.1029/2005JE002645, [printed 112(E3), 2007].

Taylor, G. J., J. D. Stopar, W. V. Boynton, S. Karunatillake, **J. M. Keller**, J. Brückner, H. Wänke, G. Dreibus, K. E. Kerry, R. C. Reedy, L. G. Evans, R. D. Starr, L. M. V. Martel, S. W. Squyres, O. Gasnault, S. Maurice, C. d'Uston, P. Englert, J. M. Dohm, V. R. Baker, D. Hamara, D. Janes, A. L. Sprague, K. J. Kim, D. M. Drake, S. M. McLennan, and B. C. Hahn (2006), Variations in K/Th on Mars, *J. Geophys. Res.*, 111, E03S06, doi:10.1029/2006JE002676 [printed 112(E3), 2007].

Hahn, B.C., S.M. McLennan, G.J. Taylor, W.V. Boynton, J.M. Dohm, M.J. Finch, D.K. Hamara, D.M. Janes, S. Karunatillake, **J.M. Keller**, K.E. Kerry, R.M.S. Williams (2007), "Mars Odyssey Gamma-Ray Spectrometer Elemental Abundances and Apparent Relative Surface Age: Implications for Martian Crustal Evolution," *J. Geophys. Res.*, 112, E03S11, doi:10.1029/2006JE002821.

## **EDUCATIONAL MATERIALS**

**Keller, J. M.**, S. Buxner, H. Enos, and W. V. Boynton, "Buried Water Ice on Mars Curriculum," accepted through NASA Education Review process and recommended for wide distribution.

**Keller, J.M.**, J. Forde, W.V. Boynton, H. Enos (2005), "GRS Simulator," Web Animation, <http://grs.lpl.arizona.edu/content/learning/simulator>.

**Keller, J.M.**, M. Quinn, J. Forde, W.V. Boynton, H. Enos (2004), "The Gamma Ray Spectrometer Measures Water and Carbon Dioxide Ice on Mars," Web Sonification, <http://grs.lpl.arizona.edu/content/learning/sonif>.

Pendleton, Y., **J.M. Keller**, L. Smith, J. Cruikshank, & C. Chang (1995), "Windows on Orion: A Multi-Wavelength View of the Stars," ExInEd Electronic Picturebooks, Association of Universities for Research in Astronomy, <http://www.stsci.edu/exined-html/exined.home.html>.

## ARTICLES

**Keller, J.M.,** B. Rebar, S. Elrod (2010), "CSU Science Teacher and Researcher (STAR) Program: Developing 'Teacher-Researchers' Through Paid Summer Research Experiences for Pre-Service and Early Career Science and Math Teachers," 2010 Cosmos in the Classroom, Earth and Space Science: Making Connections in Education and Public Outreach, Astronomical Society of the Pacific/Geological Society of America, Boulder, CO (ASP Conference Series, Volume 443, pp 137-141)

**Keller, J.M.,** E.E. Prather, and T.F. Slater (2004), "The Invisible Universe Online: A Distance Learning Course on Astronomical Origins for Teachers," ASP Conf. Ser. 319: NASA Office of Space Science Education and Public Outreach Conference.

**Keller, J.M.,** and T.F. Slater (2003), "The Invisible Universe Online: Design of a Distance-learning Astronomy Course for Secondary Science Teachers," Astronomy Education Review, 2: 1-15.

**Keller, J.M.,** and T.F. Slater (2003), "The Invisible Universe Online: Evaluation Summary of a Distance-learning Astronomy Course for Secondary Science Teachers," Astronomy Education Review, 2: 16-45.

**Keller, J.M.,** and S. Williams (1995), "Bringing Students Together: The Impact of the FOSTER Program for Teachers," ASP Conf. Ser. 73: From Gas to Stars to Dust.