

Kevin M. Cannon

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Education

2012–2017: Brown University, Providence, RI

M.Sc., Geological Sciences, 2014

Ph.D., Geological Sciences, May 2017

Advisor: J. Mustard

2012: Queen's University, Kingston, Ontario

B.Sc., honors, Geological Sciences

Advisor: R. Peterson

Professional Experience

2017–present: University of Central Florida, Orlando, FL

Postdoctoral Scholar

Advisor: D. Britt

Research

Grants Pending

2018: “Physical Properties of Carbonaceous Chondrite Matrix Material During Melting and Aqueous Alteration” NASA Emerging Worlds program; Co-I/Science PI.

2018: “Lunar-Polar Gas-Dynamic Mining Outpost (LGMO): First Step in Exploration and Industrialization of the Moon” NASA NIAC program; Co-I.

2018: “Center for Lunar and Asteroid Surface Science” NASA SSERVI program; Collaborator.

2019: “Understanding Cohesion of Martian Soils” NASA SSW Program; Co-I.

Refereed Publications

11. Jawin, E., J. W. Head, and **K. M. Cannon**. The Moon's Most Explosive Volcanic Eruption: Using Spectral Modeling to Assess the Aristarchus Pyroclastic Deposit. *JGR Planets*, *under revision*.

10. Metzger, P. T., D. T. Britt, S. Covey, C. Schultz, **K. M. Cannon**, K. D. Grossman, G. D. Mantovani, and R. P. Mueller. Measuring the Fidelity of Asteroid Regolith and Cobble Simulants. *Icarus*, 321, 632-646.
9. **Cannon, K. M.**, D. T. Britt, T. M. Smith, R. F. Fritsche, and D. Batchelder (2019), Mars Global Simulant MGS-1: A Rocknest-based open standard for basaltic martian soil simulants. *Icarus*, 317, 470-478.
8. Tarnas, J., J. F. Mustard, B. Sherwood Lollar, M. S. Bramble, **K. M. Cannon**, A. M. Palumbo, and A.-C. Plesa (2018), Radiolytic H₂ production on Noachian Mars: Implications for Habitability. *EPSL*, 502, 133-145.
7. Filiberto, J., J. Gross, A. Udry, J. Trela, A. Wittmann, **K. M. Cannon**, S. Penniston-Dorland, R. Ash, V. E. Hamilton, A. L. Meado, P. Carpenter, B. Jolliff, and E. C. Ferré (2018), Shergottite Northwest Africa 6963: A Pyroxene-Cumulate Martian Gabbro. *JGR Planets*, 123, 1823-1841.
6. **Cannon, K. M.**, S. W. Parman, and J. F. Mustard (2017), Primordial Clays on Mars Formed Beneath a Steam or Supercritical Atmosphere. *Nature*, 552, 88-91.
5. **Cannon, K. M.**, J. F. Mustard, S. W. Parman, E. C. Sklute, M. D. Dyar, and R. F. Cooper (2017), Spectral Properties of Martian and other Planetary Glasses, and their Detection in Remotely Sensed Data, *JGR Planets*, 122.
4. **Cannon, K. M.**, and J. F. Mustard (2015), Preserved glass-rich impactites on Mars. *Geology*, 43, 635-638.
3. **Cannon, K. M.**, J. F. Mustard, and M. R. Salvatore (2015), Alteration of immature sedimentary rocks on Earth and Mars: Recording aqueous and surface-atmosphere processes. *EPSL*, 417, 78-86.
2. **Cannon, K. M.**, J. F. Mustard, and C. B. Agee (2015), Evidence for a Widespread Basaltic Breccia Component in the Martian Low-Albedo Regions from the Reflectance Spectrum of Northwest Africa 7034. *Icarus*, 252, 150-153.
1. **Cannon, K. M.**, B. Sutter, D. W. Ming, W. V. Boynton, and R. C. Quinn (2012), Perchlorate induced low temperature carbonate decomposition in the Mars Phoenix Thermal and Evolved Gas Analyzer (TEGA). *GRL*, 39, L13203.

Book Chapters

1. **Cannon, K. M.**, M. Battler, J. G. Spray, P. T. Metzger, and D. T. Britt. Simulating Lunar, Martian, and Asteroid Regoliths. *In: Civilization in Space: Mining & Resources, under review.*

Recent Conference Presentations from 54 Total: 12 First Author Oral Presentations, 14 First Author Posters, and 28 Others

5. **Cannon, K. M.** (2018), Ancient Hydrated Silicates in the Martian Deep: Crustal Density, Water Budget, and Astrobiology. AGU Fall Meeting, Paper #P23B-05.
4. Krantz, J. A., **K. Cannon**, and S. W. Parman (2018), Sequestration of Xe in an Early, Hydrated Martian crust. AGU Fall Meeting, Paper #P44B-02.
3. Tarnas, J. D., J. F. Mustard, B. S. Lollar, M. Bramble, **K. Cannon**, A. M. Palumbo, and A.-C. Plesa (2018), H₂ and CH₄ Production, Storage, and Release Over ~4.5 Gyr of Martian History: Implications for Atmospheric Warming, Habitability, and ISRU. AGU Fall Meeting, Paper #P24D-03.
2. Neish, C. D., **K. M. Cannon**, L. L. Tornabene, M. Zanetti, E. Pilles, and K. E. Young (2018), Evidence for Glass-Rich Surfaces on Lunar Impact Melt Deposits. GSA Annual Meeting, Paper #18-2.
1. **Cannon, K. M.**, and D. T. Britt (2018), Colloidal Dispersions in the Early Solar System. Lunar and Planetary Science Conference XLIX, Abstract #1188.

Teaching

Courses Taught

Fall 2016: GEOL 2330 Advanced Remote Sensing (Brown University). Selected student evaluation comments:

“In all seriousness, this is one of the best courses I've taken at Brown. Kevin's spin on GEOL2330 was academically stimulating and elucidating about a particular topic in geoscience, perhaps on par to a level I've only experienced once or twice in seminars led by perhaps one faculty member”

“This is one of the few classes that i have ever taken where not only were the objectives clearly and effectively stated in the syllabus, but they were all actually met throughout the timeline of the course.”

“I couldn't think of a better design course. Each set of readings and and labs led into the next. building off of one an other beautifully.”

Training

2015-16: Sheridan Center for Teaching and Learning Certificate IV

Year-long teaching observation and consultation program.

2013-14: Sheridan Center for Teaching and Learning Certificate I

Year-long seminar in reflective teaching.

Teaching Assistantships

Spring 2014: GEOL 1330 Global Environmental Remote Sensing (Brown University)

Independently ran 3 lab sections (10 students each), graded labs and final projects.

Received an overall assessment of 1.16 on a scale from 1 (best) to 5.

Fall 2010 and Fall 2011: GEOL 232 Mineralogy (Queen’s University)

Independently ran weekly lab section (15-20 students), graded labs and lab exams.

Nominated by students for a department teaching award.

Invited Talks and Outreach

October 2018: Daytona State College, ‘Celestial harvest: Extracting space resources and learning to live off the land on the Moon and Mars’.

August 2018: Florida Institute of Technology, ‘The Evolution and Exploration of Mars’.

November 2017: SpaceVision 2017 Ignite, ‘X Mars the Spot’ panel.

Selected Academic Honors and Awards

University of Central Florida

Preeminent Postdoctoral Program

Brown University

2017: Dwornik Award for Best Oral Presentation, Runner-up

2017: LPI Career Development Award

2014-17: NASA Earth and Space Science Fellowship

2014-17: NSERC PGS-D Postgraduate Scholarship

2012: Brown University First Year Fellowship

2012: NSERC PGS-M Postgraduate Scholarship

Queen's University

2012: Medal for highest academic standing in Geology graduating class

2011: Brian and Debra Heald Teaching Assistant Award

2011: Leonard G. Berry Memorial Award

2011: Geological Association of Canada Student Prize

2011: ESRI Canada Student Scholarship Award

2010: Mineralogical Association of Canada Undergraduate Student Award

Professional Activities

2017-: Panelist, NASA Review Panels

2015: Executive Secretary, NASA Review Panel

2015-: Reviewer for: American Mineralogist, EPSL, Icarus, JGR Planets, PSS, MAPS, Adv. Space Research

Instrument and Analysis Techniques

Laboratory reflectance spectroscopy measurements

Hyperspectral imaging analysis and scripting

X-ray diffraction, X-ray fluorescence

1-atm furnace, mineral and rock synthesis

Hydrothermal bombs/cells

Thermogravimetry and Evolved Gas Analysis

Scanning Electron Microscopy