

STUART J. ROBBINS  
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*Laboratory for Atmospheric and Space Physics · UCB 392 · University of Colorado · Boulder, CO 80309*

**EDUCATION:**

Graduate Education, 2005-2011: University of Colorado; Boulder, CO

Ph.D. in Geophysics; Spring 2011

M.S. in Astrophysics, Geophysics concentration; Spring 2008

Undergraduate Education, 2001-2005: Case Western Reserve University; Cleveland, OH 3.73 G.P.A. *cum laude*

B.S. in Astronomy, double minors in Geology and Physics

**SELECTED RESEARCH EXPERIENCE:**

SwRI-Boulder – April 2011 - present

NLSI-CLOE / Independent Contractor

**Research Title:** Moon Zoo Science Lead (to 2012), CosmoQuest Moon Mappers Science co-Lead (since 2012)

Moon Zoo is a citizen science internet project where tens of thousands of volunteers examine high-resolution LROC images of the lunar surface and identify features of interest (specific tasks are craters and boulders, but users can identify "miscellaneous" objects). As Science Lead, I was in charge of coordinating multiple teams (science, programming, EPO) and reducing the volunteer data to a usable dataset.

I left Moon Zoo in 2012 to work on CosmoQuest Moon Mappers, a new, separate project from Moon Zoo that launched January 9, 2012. Its focus initially is on engaging volunteers in crater identification and correcting the results of automated crater-finding algorithms. As Science co-Lead, I am in charge of coordinating with the programming and EPO groups, leading science teams, interfacing with the public, and conducting my own research projects. The first project is a focused study of the dependence of incidence angle in identifying craters, crater diameters, and albedo features. Future applications will include using craters for stratigraphy and understanding secondary crater populations. Moon Mappers will branch into studying craters on Mercury for which I will also be the Science Lead.

CU Boulder - January 2007 - present

LASP / APS Department

*Doctoral Dissertation Advisor:* Brian Hynek, Ph.D. <hynek@lasp.colorado.edu>

*Dissertation Title:* "Planetary Surface Properties, Cratering Physics, and the Volcanic History of Mars from a New Global Martian Crater Database"

**Research Description:** Crater studies on Mars

My graduate work focused on generating a complete catalog of Mars' craters to 1.0 km diameter, though the catalog contains more smaller craters to ensure statistical completeness. Out of this came a reassessment of basic Martian crater properties focusing on gravity-controlled terrain-dependent morphologies. Applications from it that I have published on focus on secondary craters. Applications I am currently investigating are dating the largest craters on the planet, understanding how lobate ejecta blankets form, and erosion processes across Mars. I am also involved in the latest Mars global geologic mapping projects out of USGS and in using craters for stratigraphic and age-dating purposes.

**FORMAL TEACHING EXPERIENCE:**

2011 - Completed CU-Boulder's Graduate Teacher Program certification.

2010 - Completed NASA's Center for Astronomy Education Workshop.

CU Boulder - Summer 2010

APS Department

Instructor of Record for ASTR 1110 - Introductory Astronomy, the Solar System, for Non-Majors, Non-Lab

CU Boulder - Fall 2005, Spring 2006, Spring 2007

APS Department

Lab TA/Instructor (2005, 2006) and Lecture TA (2007) for ASTR 1010 - Introductory Astronomy, the Solar System, for Non-Majors, with Lab

## PEER-REVIEWED PUBLICATIONS:

- In Prep. **Robbins, S.J.**; Antonenko, I.; Gay, P.; Ostrach, L.R.; Chapman, C.R.; M. Kirchoff. *CosmoQuest Moon Mappers, Crowd-Source Point Data Reduction, and Lighting Effects on Crater Counts*. in prep.
- In Prep. **Robbins, S.J.**; Dohm, J., and B.M. Hynek. *A Youthful Mars*. in prep. for *Science*.
- In Prep. **Robbins, S.J.**; Hynek, B.M.; Lillis, R.; and W. Bottke. *The Large Crater Impact History of Mars and Implications for the Late Heavy Bombardment and Dynamo*. in prep. for *Icarus*.
- In Prep. Kring, D.A. *et al.* *Structural Shearing of Overturned Impact Ejecta at Meteor Crater, Arizona, and Implications for the Trajectory of the Impacting Iron Asteroid*. in prep. for *Meteoritics and Planetary Sciences*.
- Submitted Herrick, R.R.; Shenk, P.M.; and **S.J. Robbins**. *Surveys of Elliptical Crater Populations on the Saturnian Satellites, Mercury, and Mars*. Submitted to *Icarus*.
- In Review **Robbins, S.J.**; and B.M. Hynek. *A New Global Database of Mars Impact Craters  $\geq 1$  km: 2. Global and Regional Properties and Their Implications to Gravity Scaling*. In review with *Journal of Geophysical Research – Planets*. doi: 10.1029/2011JE003967.
- In Review **Robbins, S.J.**; and B.M. Hynek. *A New Global Database of Mars Impact Craters  $\geq 1$  km: 1. Database Creation, Properties, and Parameters*. In review with *Journal of Geophysical Research – Planets*. doi: 10.1029/2011JE003966.
- 2011 Hynek, B.M.; **Robbins, S.J.**; Šmárek, O.; and S. Zhong. *Geological Evidence for a Migrating Tharsis Plume*. *Earth & Planetary Science Letters*, **310**, pp. 327-333. doi: 10.1016/j.epsl.2011.08.020.
- 2011 Collins, G.S.; Davidson, T.; Elbeshausen, D.; **Robbins, S.J.**; and B.M. Hynek. *The Size-Frequency Distribution of Elliptical Impact Craters*. *Earth & Planetary Science Letters*, **310:1-2**, pp. 1-8. doi: 10.1016/j.epsl.2011.07.023.
- 2011 **Robbins, S.J.**; and B.M. Hynek. (2011). *Secondary Crater Fields from 24 Large Primary Craters on Mars: Insights into Nearby Secondary Crater Production*. *Journal of Geophysical Research - Planets*, **116**, E10003. doi: 10.1029/2011JE003820.
- 2011 Joy, K., and **30 coauthors**. (2011). *Moon Zoo: Citizen Science in Lunar Exploration*. *Astronomy & Geophysics*, **52:2**, pp. 2.10-2.12, doi: 10.1111/j.1468-4004.2011.52210.x.
- 2011 **Robbins, S.J.**; and B.M. Hynek. (2011). *Distant Secondary Craters from Lyot Crater, Mars, and Implications for Ages of Planetary Bodies*. *Geophysical Research Letters*, **38**, L05201. doi: 10.1029/2010GL046450.
- 2011 **Robbins, S.J.**; Di Achille, G; and B.M. Hynek. (2011). *The Volcanic History of Mars: High-Resolution Crater-Based Studies of the Calderas of Twenty Volcanoes*. *Icarus*, **211**, pp. 1179-1203. doi: 10.1016/j.icarus.2010.11.012.
- 2010 **Robbins, S.J.**; Stewart, G.R.; Lewis, M.C.; Colwell, J.E.; and M. Sremčević. (2010). *Estimating the Masses of Saturn's A and B Rings from High-Optical Depth N-Body Simulations and Stellar Occultations*. *Icarus*, **206**, pp. 431-445. doi: 10.1016/j.icarus.2009.09.012.
- 2006 **Robbins, S.J.**; Henney, C. J.; and J. W. Harvey. (2006). *Solar Wind Forecasting with Coronal Holes*. *Solar Physics*, **233**, No. 2. doi: 10.1007/511207-006-0064-y.
- 2003 **Robbins, S.J.**; Meyer, B. S.; and G. C. Jordan, IV. (2003). *Modeling Nucleosynthesis: Web-Based Tools*. *IAPPP*, **94**, pp. 22-29.

**SELECTED CONTRIBUTED ABSTRACTS and CONFERENCE PROCEEDINGS:**

- 2012/03 LPSC **Robbins, S.J.**; Antonenko, I.; Gay, P.L.; Lehan, C.; and J. Moore. (2012). *Cataloging the Moon with the CosmoQuest Moon Mappers Citizen Science Project*. **43**, #2856.
- 2012/03 LPSC **Robbins, S.J.**; and B.M. Hynek. (2012). *Impact History of Large Boulders at Mars: Implications for the Late-Heavy Bombardment and Isochron Uncertainties*. **43**, #1649.
- 2012/03 LPSC Dohm, J.M.; **Robbins, S.J.**; and B.M. Hynek. (2012). *Recent Geological and Hydrological Activity in Amazonis and Elysium Basins and the Link, Marte Vallis (AME): Prime Target for Future Reconnaissance*. **43**, #1948.
- 2012/03 LPSC Anderson, R.C.; Dohm, J.M.; **Robbins, S.J.**; Hynek, B.M.; and J. Andrews-Hanna. (2012). *Terra Sirenum: Window into Pre-Tharsis and Tharsis Phases of Mars Evolution*. **43**, #2803.
- 2012/03 LPSC Tanaka, K.L.; Rodriguez, J.A.P.; Fortezzo, C.M.; Platz, T.; Michael, G.; and **S.J. Robbins**. (2012). *Geologic History of Valles Marineris, Mars, Revisited*. **43**, #2821.
- 2012/03 LPSC Tanaka, K.L.; Dohm, J.M.; Fortezzo, C.M.; Irwin, III, R.P.; Kolb, E.J.; Skinner, Jr., J.A.; Hare, T.M.; Platz, T.; and **S.J. Robbins**. (2012). *The Geology of Mars: What the New Global Map Shows*. **43**, #2702.
- 2012/02 ESSB **Robbins, S.J.**, and B.M. Hynek. (2012). *Revising the Earliest Recorded Impact History of Mars and Implications for the Late Heavy Bombardment*. **2**, #4039.
- 2011/10 DPS Gay, P.L.; Brown, S.; Huang, D.; Daus, C.; Lehan, C.; and **S.J. Robbins**. (2011). *Moon Zoo: Making the Public Part of a Crater Survey Algorithm*. **6**, #EPSC-DPS2011-1612.
- 2011/09 PCC **Robbins, S.J.**; Chapman, C.R.; and P.L. Gay. (2011). *Moon Zoo: Lessons Learned from the First Year of Citizen Scientists Identifying Lunar Craters*. **2**, #1105.
- 2011/09 PCC **Robbins, S.J.**; and B.M. Hynek. (2011). *It's Done! A New Martian Global Crater Database to 1.0 km*. **2**, #1104.
- 2011/03 LPSC **Robbins, S.J.**; and B.M. Hynek. (2011). *Distant Secondary Craters from Lyot Crater, Mars, and Implications for Ages of Planetary Bodies*. **42**, #1330.
- 2011/03 LPSC Hynek, B.M.; **Robbins, S.J.**; Smarek, O.; and S. Zhong. (2011). *Geological Evidence for a Migrating Tharsis Plume on Early Mars*. **42**, #1603.
- 2011/03 LPSC Tanaka, K.L.; Fortezzo, C.M.; Dohm, J.M.; Irwin, III, R.P.; Skinner, Jr., J.A.; Hare, T.M.; Platz, T.; and **S.J. Robbins**. (2011). *Completing the New Global Geologic Map of Mars*. **42**, #2265.
- 2011/03 LPSC Kring, D., and **25 coauthors**. (2011). *Asymmetrical Distribution of Impact Ejected Lithologies at Barringer Meteorite Crater (AKA Meteor Crater)*. **42**, #1740.
- 2011/03 LPSC Kring, D., and **25 coauthors**. (2011). *Fold Hinge in Overturned Coconino Sandstone and its Structural Displacement During the Formation of Barringer Meteorite Crater (AKA Meteor Crater)*. **42**, #1740.
- 2010/10 PCC **Robbins, S.J.**; Di Achille, G.; and B.M. Hynek. (2010). *Dating the Most Recent Episodes of Volcanic Activity from Mars' Main Volcanic Calderas*. **1**, #1010.
- 2010/03 LPSC **Robbins, S.J.**; and B.M. Hynek. (2010). *Progress Towards a New Global Catalog of Martian Craters and Layered Ejecta Properties, Complete to 1.5 km*. **41**, #2257.
- 2010/03 LPSC **Robbins, S.J.**; Di Achille, G.; and B.M. Hynek. (2010). *Dating the Most Recent Episodes of Volcanic Activity from Mars' Main Volcanic Calderae*. **41**, #2252.
- 2009/09 MCC **Robbins, S.J.**; and B.M. Hynek. (2009). *Progress Towards a New Global Catalog of Martian Craters and Layered Ejecta Properties, Complete to 1.5 km*. 12<sup>th</sup> Mars Crater Conference, #1207.
- 2009/03 LPSC **Robbins, S.J.**; and B.M. Hynek. (2009). *Towards a New Catalog of Lobed Martian Craters Compared with a New Global Crater Database, Complete to 1.5 km*. **40**, #2460.
- 2008/10 DPS **Robbins, S.J.**; Stewart, G.R.; Colwell, J.E.; and M.C. Lewis. (2008). *Self-Gravity Wakes in Saturnian Rings: Effects of Varying Location, Particle Density and Introducing a Particle Size Distribution*. pp. 424, **40:21.05**.
- 2008/09 MCC **Robbins, S.J.**; and B.M. Hynek. (2008). *MOLA Data May Introduce Significant Artifacts in Crater Diameters*. 11<sup>th</sup> Mars Crater Conference, #1107.
- 2008/03 LPSC **Robbins, S.J.**; and B.M. Hynek. (2008) *Testing Formation Theories of NW Arabia Terra, Mars: New Clues from Old Craters*. **39**, #2417.

- 2007/10 DPS     **Robbins, S.J.;** Stewart, G.R.; Colwell, J.E.; and M.C. Lewis. (2007). *Simulations of Clumping Effects in High-Optical Depth Rings*. 38, pp. 420.
- 2007/10 MCC     **Robbins, S.J.;** and B.M. Hynek. (2007). *A New Automated Method of Determining Depth, Diameter, and Volume of Known Craters*. 10<sup>th</sup> Mars Crater Conference, #1006.

**FIELD EXPERIENCE:**

- Fall 2010             Selected for the first Meteor Crater Field Camp for a week-long detailed study of regions of the Barringer "Meteor Crater" outside of Flagstaff, AZ.
- Fall 2005, 2007       Participant in the annual planetary analogues geology field trip offered to CU-Boulder graduate students. 2005 went to southern Colorado, northern Arizona and northern New Mexico to explore canyons, sand dunes, craters, and other features. 2007 went to Hawai'i's big island to study volcanic analogues and geologic mapping.

**GRANTS and FELLOWSHIPS:**

- June 2011             Awarded the first NASA Baruch Blumberg Citizen Science Post-doctoral Fellowship.
- March 2011-'12       Maryland Space Grant award for work on the citizen science project "Moon Zoo."
- Jun. 2010 - '13       Hynek, B.M.; **S.J. Robbins;** Barlow, N., and Tanaka, K. *A Global Mars Crater Database to 1.5-km-Diameter*. NASA grant awarded under the 2010 ROSES. Funded my last year of graduate school and half of two years of a postdoc to complete Mars crater database and analysis. I wrote the majority of this 3-year proposal.
- Sep. 2007 - '10       Hynek, B.M.; and **S.J. Robbins.** *Understanding Lobate Craters on Mars: Keys to Subsurface Water*. NASA grant awarded under the 2007 NESSF program in planetary science. I wrote this 3-year fellowship in its entirety.

**PROFESSIONAL AFFILIATIONS:**

- 2007 - present       Planetary Crater Consortium (formerly Mars Crater Consortium)
- 2004 - present       American Astronomical Society (Junior Member 2004-2011)

**REFERENCES (phone numbers available upon request):**

- Brian Hynek             Associate Professor, Laboratory for Atmospheric and Space Science  
University of Colorado, Boulder  
1234 Innovation Drive  
Boulder, CO 80309  
brian.hynek@lasp.colorado.edu
- Clark Chapman         Senior Research Scientist, Southwest Research Institute, Boulder  
1050 Walnut St.  
Suite 300  
Boulder, CO 80302  
cchapman@boulder.swri.edu
- Nadine Barlow           Associate Professor, Dept. of Physics and Astronomy  
NAU Box 6010  
Northern Arizona University  
Flagstaff, AZ 86011-6010  
nadine.barlow@nau.edu

## SELECTED EDUCATIONAL WORK AND PUBLIC OUTREACH:

### Internet-Based

- 2008 - present Write "Exposing PseudoAstronomy" blog that examines popular pseudo-science beliefs relating to astronomy <<http://pseudoastro.wordpress.com>>. In 2011, started eponymous podcast (see below).
- 2005 Website "Journey Through the Galaxy" listed in Exploring Earth and Space Systems by Kent Franklin (© 2005) as site to help grades 9-12 students pass proficiency in the Minnesota Earth and Space Systems standards
- 1997 - present Created, manage, and maintain website "Journey Through the Galaxy" which is an educational astronomy site for the edification of the general public; presently available at <<http://jtg.sjrdesign.net>>

### Community - Mass Media

- 2011 Interviewed by the Center for Inquiry's "Point of Inquiry" podcast about 2012 doomsday ideas.
- 2011 - present Write, host, and produce "Exposing PseudoAstronomy" podcast that examines popular pseudo-science beliefs relating to astronomy, geology, and physics <<http://podcast.sjrdesign.net>>.
- 2010 - present Participating scientist in the National Academy of Science's "Science & Entertainment Exchange" that links media with scientists as advisors.
- November 2010 Gave a 4-hr live interview for the national *Radio Amerika Now* radio show about the 2012 Apocalypse phenomenon and the methodology of "real" science.
- June 2009, '10 Gave a 1-hr live interview for the local *Rational Alchemy* radio show and podcast about the Apollo Moon Hoax (2009) and 2012 Apocalypse phenomenon (2010).
- 2009 - present Regular guest and "Staff Astronomer" of *The Conspiracy Skeptic* podcast.
- June 2009 Was also interviewed by 3 national news outlets for the moon hoax topic.

### Public Lectures

- 2007, 2008, 2011 Presented talk, "The Apollo Moon Hoax: Why We Did NOT Not Go to the Moon," at various venues, including on-campus planetarium and the world's first "Skepticamp" conference.
- 2010 Presented talk, "Doomsday 2012: Death by the Mayans, Pole Shifts, or Galactic Alignments?" at various venues.
- 2009 Presented talk, "Is the Universe 10,000 Years Old?" at various venues.
- 2008 Public lecture about Pluto's Planetary Status debate at the CU-Boulder's Fiske Planetarium.

### Community - General and Grade Schools

- Spring, 2009-'12 Science Fair judge for the regional Science Fair, including Head Judge in Earth & Space Sciences category in 2011-2012.
- 2008-'10 School Years Participating scientist with Project ASTRO-GEO which paired a scientist with a grade school teacher for classroom visits to help connect students with professionals in the field throughout the academic year.
- April of 2006-'11 Ran the 16" and 18" Sommers-Bausch Observatory telescopes as part of the Astronomy Day activities at CU-Boulder.
- June 22 & 26, 2004 Assisted with the National Solar Observatory's TLRIBSE program – a brief internship for grade school teachers to allow them to experience cutting-edge astronomical research
- June & July 2004 Assisted with Kitt Peak Nightly Observing Program (KPNO NOP) – a nightly public outreach program for members of the general public

### Mentoring

- 2011-'12 School Year Co-supervision of undergraduate with work on Mars craters to study erosion.
- 2006-'07 School Year Mentored high school student on open cluster photometry to derive relative ages as part of the Boulder Valley School District's "Science Research Seminar." Student won 3<sup>rd</sup> place in the regional science fair in subject.

Departmental

2009-2011

Operated, maintained, and rebuilt the APS department's website.

Fall 2006, '07, '08, '09

Taught an APS-specific Graduate Teacher Program seminar on using the department's CCD camera at the campus observatory.