

Laurie Barge

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Education:

Ph.D., 2009, Geological Sciences, University of Southern California, Los Angeles, CA
B.S., 2004, Astronomy and Astrophysics (Minor in Physics), Villanova University, Villanova, PA

Professional Experience:

6/2010-present Caltech Postdoctoral Scholar, Jet Propulsion Laboratory
2006-2009 NASA Harriett G. Jenkins Pre-doctoral Fellow, University of Southern California
2004-2006 College Merit Fellow, Dept. of Earth Sciences, University of Southern California
5/2008-7/2008 Petrophysics Intern, Marathon Oil Company, Houston, TX
11/2004-8/2006 Graduate Research Assistant, Jet Propulsion Laboratory
6/2004-8/2004 NASA Academy Intern, Goddard Space Flight Center
8/2002-5/2004 Research Assistant, Dept. of Astronomy and Astrophysics, Villanova University

Grants / Awards / Fellowships:

2010, 2007 American Astronomical Society International Travel Grant
2009 Women in Science and Engineering (WiSE) Travel Grant
2006-2009 NASA Harriet G. Jenkins Pre-doctoral Fellow
2008 Women in Science and Engineering (WiSE) Merit Fellowship
2007-2009 USA Funds Access to Education Scholarship
2008 USC Dean Joan M. Schaefer Research Award
2008 Phi Kappa Phi Love of Learning Award
2007 NASA Astrobiology Institute (NAI) Lewis and Clark Field Scholar
2007 USC Dean Joan M. Schaefer Merit Scholarship / Research Award
2007, 2006 USC Dept. of Earth Sciences Outstanding Teaching Assistant Award
2007, 2005, 2004 USC Dept. of Earth Sciences Student Travel Grant
2006 Mars Exploration Program Student Travel Grant
2004 Keck Fellowship, University of Southern California
2004 College Merit Fellowship, USC College of Letters and Sciences
2000-2004 National Merit Scholarship, Villanova University
2003-2004 Blue White Scholarship, Villanova University
2002 Delaware Space Grant Consortium Summer Research Scholar

Activities:

- Member of the NASA Astrobiology Institute Focus Group: "Thermodynamics, Disequilibrium, and Evolution". (Attended the first workshop at the Centro de Astrobiologia, Madrid, Spain.)
- Invited speaker for panel on "Women in Planetary Sciences" at the YSS Undergraduate Planetary Science Research Conference at LPSC, March 2011.
- Served as a referee for the *Journal of Physical Chemistry*.
- Co-organizer of the Research Focus Group at the 2009 Astrobiology Graduate Conference, Seattle, WA. (Funded by the NAI Conference and Workshop Fund.)

Professional Memberships:

- American Geophysical Union (AGU)
- American Mineralogical Society

- American Chemical Society (ACS)
- Astrobiology Society

Other Schools and Programs Attended:

- 2010 NSF "On the Cutting Edge" Workshop: *Preparing for an Academic Career in the Geosciences*, Stanford University, July 29-August 1 2010.
- 2009 NASA-Nordic Astrobiology Summer School: *"Water, Ice and the Origin of Life in the Universe"* Reykjavik, Iceland, 6/29 - 7/14 2009
- 2006 International Summer School in Astrobiology: *"Origins: From the Big Bang to Life."* 10-14 July 2006, Santander, Spain
- 2006 LAPLACE Astrobiology Winter School: *"Habitable Planets Around Sun-like Stars: Common or Rare?"*. 4-9 Jan 2006, University of Arizona, Tucson, AZ.
- 2005 Short Course on *"Molecular Geomicrobiology"*, 3-4 Dec 2005, University of California at Berkeley, Berkeley, CA, USA.
- 2005 NAI Astrobiology Winter School on *"Water on Earth and in Space"*, 10-21 Jan 2005, University of Hawaii, Honolulu, HI and Hilo, HI
- 2004 NASA Academy at Goddard Space Flight Center, 6 June – 13 August 2004, Greenbelt, MD (Funded by the Delaware Space Grant Consortium.)

Teaching/Mentoring Experience:

- 5/2011-8/2011 **Co-Mentor, JPL Research Assistantship Program**
- Mentored an undergraduate intern at JPL; supervised the student daily in lab.
- 8/2006-12/2007 **Teaching Assistant, University of Southern California - Department of Earth Sciences**
- Taught lab sections for *GEOL 125 – Earth History* (a general earth science course) and *GEOL 240 – Earthquakes* (an introductory geophysics course).
- 7/2006 **Assistant Science Instructor, Education Unlimited**
- Taught an intensive 10-day astronomy course for 7th-9th grade girls at the Sally Ride Science Camp at UCLA.
- 2001-2004 **Teaching Assistant, Villanova University - Department of Astronomy and Astrophysics**
- Teaching Assistant for *AST 1073 – Stellar Lab* and *AST 1075 – Planets Lab*. Assisted with understanding of coursework, and graded all assignments.

Publications:

J. Petruska and **L. M. Barge** (2011) Bilaterally Symmetric Facial Morphology Simulated by Diffusion-Controlled Chemical Precipitation. In preparation.

Chan, M.A., Potter, S.L., Bowen, B.B., Petersen, E.U., Parry, W. T., Bowman, J.R., **Barge, L.M.**, and Seiler, W., 2011, in press, Characteristics of terrestrial ferric oxide concretions and implications for Mars, in Grotzinger, J. and Milliken, R., *Sedimentary geology of Mars: SEPM Special Publication*.

L. M. Barge, D. E. Hammond, M. A. Chan, S. Potter, J. Petruska, K. H. Nealon (2011) Precipitation Patterns Formed by Self-Organizing Processes in Porous Media. *Geofluids*, 11: 124-133.

L. M. Barge, K. Nealon, J. Petruska (2010) Organic Influences on Inorganic Patterns of Diffusion-Controlled Precipitation in Gels. *Chemical Physics Letters*, Vol. 493, Issues 4-6, pp. 340-345.

L. M. Barge. (2009) Self-organized mineral precipitates: Laboratory and Field Studies. Ph.D.

Thesis, University of Southern California.

Published Abstracts:

L. M. Barge, M. J. Russell, I. Kanik. (2011) Precipitation Patterns of Iron Minerals in a Chemical Gradient: A Laboratory Analog to Hydrothermal Environments on the Early Earth. *LPSC XLII*, Abs #1099.

L. M. Barge (2009) Ability of Biochemicals to Induce Pattern Formation in Inorganic Precipitates. *Astrobiology*, Vol. 9, No. 5, AGC09-p08.

L. M. Barge and J. Petruska. (2009) Experimental Tests of Micro-concretion Nucleation in Porous Media. *LPSC XL*, Abs #1910.

L. M. Barge, J. Petruska, M. A. Chan, S. Potter, K. Neelson. (2008) Formation of Spherical Precipitates in Diffusion-Controlled Systems - A Possible Laboratory Analogue for the Martian Hematite Concretions. *LPSC XXXIX*, Abs. #1414.

L. M. Barge and J. Petruska. (2007) Iron Precipitation Patterns in Gels: Implications for the Formation of Hematite Concretions at Meridiani Planum, Mars. *LPSC XXXVIII*, Abs. #1676.

L. M. Barge, J. Petruska, S. Potter, M. A. Chan, J. Cho, K. Neelson (2007) Mineral precipitation in porous media: Laboratory diffusion experiments as analogues for concretion formation on Earth and Mars. *Eos Trans. AGU*, Abstract P21A-0224B.

L. M. Barge and T. J. Parker. (2006) Landing Site Map Compilation and Hazard Assessment for Phoenix. *LPSC XXXVII* Abs. #2341.

L. M. Barge and K. Neelson (2005). Photosynthesis via Mineral Fluorescence in Harsh UV Radiation Environments, *Eos Trans. AGU*, 86(52), Abstract P51D-0953.

F. P. Maloney, E. F. Guinan, **L. M. Barge**, R. A. Mardling (2003) Revisiting the Anomalous Apical Motion of the Eccentric Eclipsing Binary DI Herculis. *BAAS* 35, no. 5, p.1224.

Barge, L. M., Ribas, I., Maloney, F. P.; DeWarf, L. E.; Fitzpatrick, E. L.; Guinan, E. F. (2003) The LMC Eclipsing Binary HV2241: Fundamental Properties and Evolution. *BAAS* 35, no. 3, p. 708.

Oral Presentations:

L. M. Barge (2011) Pyrophosphate Generation in A Proton Gradient. Oral presentation at the NASA Astrobiology Institute Focus Group ("Thermodynamics, Disequilibrium, and Evolution"), Centro de Astrobiologia, Madrid.

L. M. Barge (2011) Driving Pyrophosphate Synthesis by an Ambient Proton-Motive Force? Part of double seminar ("Life Emerges Through Entropy Trapping"), Jet Propulsion Laboratory, 2/3/2011.

L. M. Barge, J. Petruska, S. Potter, M. A. Chan, J. Cho, K. Neelson (2008) Mineral Precipitation in Porous Media: Laboratory Diffusion Experiments as Analogues for Concretion Formation in Utah and on Mars. Keynote presentation at the 2008 Australian Earth Sciences Convention, Perth, Western Australia, 7/2008.

L. M. Barge, J. Petruska, K. Neelson (2007) Experimental Observations of Diffusion-Driven Mineral Precipitation: Implications for Concretion Formation on Earth and Mars. Presentation given at the 2nd International Workshop on Exploring Mars and its Terrestrial Analogues, Trento, Italy.

L. M. Barge (2006) Precipitation Patterns in Gels: Mechanisms of Formation, and Applications to the Study of Biosignatures. Presentation at the Centro de Astrobiologia (CISC/INTA), Instituto Nacional de Technica Aeroespacial, Madrid, Spain.

L. M. Barge and P. Mahaffy. (2004) Carbon Isotope Ratios on Mars. NASA Academy Individual Research Project. Presentation at NASA Goddard Space Flight Center, 8/2004.