

## MARIA BANKS

Smithsonian Institution, National Air and Space Museum, Center for Earth and Planetary Studies  
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### EDUCATION

University of Arizona, Ph.D., Geosciences, 2009

Planetary Sciences Minor

Queens College, Completed work towards B.S., Geological sciences, 2002-2005

University of Arizona, B.F.A., Music Performance, Magna cum laude, 1995

### RESEARCH AND EXPERIENCE

**Post-doctoral fellow, Smithsonian Institution, National Air and Space Museum, Washington, DC, 08/2009-to present**

- Analyze tectonic features on the Moon using imagery from the Lunar Reconnaissance Orbiter Camera (LROC) onboard the Lunar Reconnaissance Orbiter (LRO)

**Research Associate, University of Arizona, Tucson, AZ, 08/05 – 07/09**

- Member of the High Resolution Imaging Science Experiment (HiRISE) camera team.
- Worked with the MESSENGER Mission science team

**Field Assistant and Technology Specialist, University of Arizona, Tucson, AZ, 07/08-08/2008**

- Part of an 8-member field campaign in Alaska involving satellite imaging by ASTER (aboard the Terra spacecraft) and field researchers from the U.S. and Switzerland.

**Manager of Science Communications, University of Arizona, Tucson, AZ, 04/08 – 07/08**

- Member of the Phoenix Mars Mission.

**Independent Research Project Analyzing Lunar Crater Size Frequency Distributions, University of Arizona, Tucson, AZ, 08/05 – 12/06**

**Shell Oil Company, Research and Development Internship, Houston, TX, 06/06 – 08/06**

**NASA's Planetary Geology and Geophysics Undergraduate Research Program (PGGURP) Internship, NASA Ames Research Center, Moffett Field, CA, 06/04 – 08/04**

- Conducted quantitative analysis of the energy transfer between saltating particles and rock surfaces under earth and Martian atmospheric conditions using experiments run with the Martian Surface Wind Tunnel (MARSWIT) in the Arizona State University Aeolian Facility at NASA Ames Research Center.

**Laboratory Assistant, Queens College, Flushing, NY, 10/03 – 4/04**

- Prepared, washed, and sampled core sediments from the late Paleocene.

**Fieldwork and Research Project on Pleistocene Sea Level Changes in Bermuda, Queens College, Flushing, NY, 06/03 – 08/03**

- Designed an independent undergraduate research project with the goal of constraining glacial to interglacial eustatic (i.e. global sea level) changes using evidence of low and high sea levels (in relation to present sea level) from Pleistocene stratigraphy of Bermuda.

**The University of Arizona/NASA Space Grant Undergraduate Research Internship Program, Intern, University of Arizona, Tucson, AZ, 08/93 – 04/94**

- Analyzed radar images of Venus from the Magellan Mission to identify and measure impact craters and developed statistical tests to demonstrate a random distribution of impact craters with respect to elevation.

## PUBLICATIONS AND ABSTRACTS

Banks, M. E., Bryne, S., Galla, K. G. , Murray, B. C., McEwen, A. S., Bray, V. J., Fishbaugh, K. E., Dundas, C. M., Herkenhoff, K. E., Murray, B. C., and the HiRISE Team, 2009, Crater Population and Resurfacing of the Martian North Polar Layered Deposits, *submitted to Journal of Geophysical Research*.

Banks, M. E. 2009, Glacial processes and morphologies in the southern hemisphere of Mars, Ph.D. dissertation, University of Arizona, Tucson, AZ.

Banks, M. E., Lang, N. P., McEwen, A. S., Kargel, J. S., Baker, V. R., Strom, R. G., Grant, J. A., Pelletier, J. D., and the HiRISE Team, 2009, An Analysis of the Sinuous Ridges in the Southern Argyre Planitia, Mars using HiRISE and CTX Images and MOLA Data, *Journal of Geophysical Research*, 114, E09003, doi:10.1029/2008JE003244

Banks, M. E., Galla, K. G. Bryne, S., Murray, B. C., McEwen, A. S., and the HiRISE Team, 2009, Crater Population and Resurfacing of the Martian North Polar Cap, *Lunar and Planetary Science XXXX*, abstract # 2441.

Banks, M. E., McEwen, A. S., Kargel, J. S., Baker, V. R., Strom, R. G., Mellon, M. T., Pelletier, J. D., Gulick, V. C., Keszthelyi, L., Herkenhoff, K. E., Jaeger, W. L., and the HiRISE Team, 2008, High Resolution Imaging Science Experiment (HiRISE) observations of glacial and periglacial morphologies in the circum-Argyre Planitia highlands, *Journal of Geophysical Research*, 113, E12015, doi:10.1029/2007JE002994.

Banks, M.E., and Pelletier, J., 2008, Forward Modeling of Ice Topography on Mars to Infer Basal Shear Stress Conditions, *Journal of Geophysical Research*, 113, E01001, doi:10.1029/2007JE002895.

Banks, M. E., McEwen, A.S., Kargel, J.S., Baker, V.R., Strom, R.G., Gulick, V.C., Keszthelyi, L., Grant, J.A., Jaeger, W.L., Pelletier, J.D., and the HiRISE Team, 2008, HiRISE Observations of Glacial Morphologies in Argyre Planitia, Mars, *American Geophysical Union*, abstract #P41A-1353.

McEwen, A.S. et al., 2008, The high resolution imaging science experiment (HiRISE) during MRO's Primary Science Phase (PSP), *in press Icarus*.

Martínez-Alonso, S., Mellon, M. T., Banks, M. E., Keszthelyi, L. P., McEwen, A. S., and The HiRISE Team, 2008, Evidence of volcano-ice interaction in Acidalia Planitia, Mars, *submitted to Icarus*.

Bridges, N.T., Banks, M.E., Beyer, R.A., Chuang, F.C., Herkenhoff, K.E., Keszthelyi, L.P., Fishbaugh, K.E., McEwen, A.S., Michaels, T.I., Thomson, B.J., and Wray, J.J., 2008, Dust Aggregate Bedforms, Yardangs, and Indurated Surfaces as Seen By the HiRISE Camera, *submitted to Icarus*.

**PUBLICATIONS AND ABSTRACTS, continued**

Banks, M. E., Lang, N. P., Kargel, J. S., McEwen, A. S., Baker, V. R., Strom, R. G., Grant, J. A., Pelletier, J. D., and the HiRISE Team, 2008, An Analysis of the Sinuous Ridges in the Southern Argyre Planitia, Mars using HiRISE Images and MOLA Data, 2008, *Lunar and Planetary Science XXXIX*, abstract # 2480.

Strom, R. G., Banks, M. E., Chapman, C. R., Domingue, D. L., Hawkins III, S. E., Head, J. W., McClintock, W. E., Merline, S. L., Murchie, S. L., Prockter, L. M., Robinson, M. S., Watters, T. R., Blewett, D. T., Gillis-Davis, J. J., Solomon, S. C., and the Messenger Team, 2008, The Size Distribution of Impact Craters on Mercury: a Perspective After the First Messenger Flyby, *Lunar and Planetary Science XXXIX*, abstract # 1219.

McEwen, A., et al., 2007, A Closer Look at Water-Related Geologic Activity on Mars, *Science*, 317 (5845), 1706, doi:10.1126/science.1143987.

Lang, N. P. and Banks, M. E., 2007, Evidence for Ice-Related Processes in Southern Argyre Planitia, Mars, *The Geological Society of America*, paper # 131775.

Banks, M. E., Lang, N. P., Kargel, J. S., McEwen, A. S., Baker, V. R., Strom, R. G., Grant, J. A., and the HiRISE Team, 2007. Analysis of the Argyre Planitia (Mars) Sinuous Ridges Using Early MRO Images, *American Geophysical Union*, abstract #P31B-0438.

Banks, M., McEwen, A. S., Mellon, M. T., Kargel, J. S., Gulick, V. C., Jaeger, W. L., Keszthelyi, L., Herkenhoff, K. E., and the HiRISE Team, 2007. Glacial Morphologies in the Western Charitum Montes, Argyre Basin Rim, *Lunar and Planetary Science XXXVIII*, abstract # 2164.

Banks, M., and Pelletier, J., 2007, Forward Modeling of the Topography of Ice on Mars to Infer Basal Shear Stress Conditions, *Lunar and Planetary Science XXXVIII*, abstract # 2396.

Banks, M., and Pelletier, J., 2006, Forward Modeling of the Topography and Flow of Ice on Mars to Infer Basal Shear Stress Conditions. *American Geophysical Union*, abstract #P31A-0114.

Banks, M., Strom, R. G., and Kring, D. A., 2006, Evaluating the Duration of the Lunar Cataclysm. *GeoDaze*, University of Arizona, Geosciences Department.

Banks, M., Bridges, N. T., and Benzit, M. 2005, Measurements of the Coefficient of Restitution of Quartz Sand on Basalt: Implications for Abrasion Rates on Earth and Mars. *Lunar and Planetary Science XXXVI*, abstract #2116.

Banks, M., Emerson, S., Strom, R.G., and Schaber, G.G. 1994, The Hypsometric Distribution of Impact Craters On Venus. *Lunar and Planetary Science XXV*, p. 55-56.

**PROFESSIONAL MEMBERSHIPS**

- American Geophysical Union
- The Planetary Society
- American Federation of Musicians

**SELECTED HONORS AND AWARDS**

- University of Arizona Honors College and Golden Key National Honor Society
- University of Arizona and Eastman School of Music Merit Scholarships
- University of Arizona Research Assistant/Associate funding for four years graduate study
- University of Arizona, Creative Achievement Award