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EDUCATION

- 1997-2004 Ph. D. Planetary Sciences, University of Arizona, "Water ice and radiation in the Solar System." Advisor: R. H. Brown.
1992-1997 B. S. Astronomy and Earth Sciences, University of Southern California

EMPLOYMENT

- Principal Investigator, SETI Institute** 2007-Present
NASA Postdoctoral Program Fellow 2006-2007
Research Associate, National Research Council 2005-2006
M. P. Bernstein, S. A. Sandford, **NASA Ames Research Center**
Near-infrared spectroscopy of Solar System ice analogs and calculation of optical constants.
- Research Associate, University of Arizona** 2004-2005
R. H. Brown, Department of Planetary Science
Studies of Solar System ices.
W. V. Boynton, Department of Planetary Science
Education and outreach support for Mars Odyssey Gamma Ray Spectrometer.
- Graduate Student, University of Arizona** 1997-2004
R. H. Brown, Department of Planetary Sciences
Theoretical and experimental studies of solar system ices, including telescope observations of icy solar system bodies.
- Teaching Assistant, University of Arizona** 1998-1999
Intern, Planetary Geology and Geophysics Undergraduate Research Program 1996
J.W. Head, Brown University, Department of Planetary Science.
- Research Assistant, Mellon Undergraduate Research Program** 1994-1997
C.G. Sammis, D. Bowman, USC Department of Earth Science
E. J. Rhodes, USC Department of Physics and Astronomy
- Teaching Assistant, University of Southern California** 1995-1997

PUBLICATIONS AND CONFERENCE ABSTRACTS

- Mastrapa, R., M. P. Bernstein, et al. (2008). "Optical constants of amorphous and crystalline H₂O-ice in the near infrared from 1.1 to 2.6 μ m." *Icarus* **197**, DOI: 10.1016/j.icarus.2008.04.008, 307-320..
- Mastrapa, R. M., T. Cadarette, et al. (2007). "Surface Binding Energies Of N₂, CH₄, And H₂O-ice Systems." *AGU Fall Meeting Abstracts* **13**: 03.

- Mastrapa, R. M., S. Sandford, et al. (2007). Binding Energies Of N₂, CH₄, And H₂O-ice Systems. AAS/Division for Planetary Sciences Meeting Abstracts.
- Mastrapa, R. M. E., M. P. Bernstein, et al. (2007). "Near Infrared Spectra of Pure Ices and Mixtures Relevant to Icy Satellites." LPI Contributions **1357**: 82-83.
- Brown, R. H., R. N. Clark, et al. (2006). "Composition and Physical Properties of Enceladus' Surface from Cassini's Visual and Infrared Mapping Spectrometer." Science. 311: 1425-1428
- Mastrapa, R. M. E. and R. H. Brown (2006). "Ion Irradiation of Crystalline H₂O-ice: Effect on the 1.65 μ m feature." Icarus. 183: 207-214.
- Bernstein, M. P., R. Mastrapa, et al. (2006). "Near IR spectra and real and imaginary indices of refraction of ices of relevance to KBOs." AGU Fall Meeting Abstracts 13: 0185.
- Mastrapa, R. M., M. P. Bernstein, et al. (2006). "New Optical Constants for Amorphous and Crystalline H₂O-ice." AGU Fall Meeting Abstracts 13: 0187.
- Sandford, S. A., R. M. Mastrapa, et al. (2006). The Location of the CO₂ Fundamental in Clathrate Hydrates and its Application to Infrared Spectra of Icy Solar System Objects. AAS/Division for Planetary Sciences Meeting Abstracts.
- Cruikshank, D. P., R. E. Mason, et al. (2006). Ethane on Pluto and Triton. AAS/Division for Planetary Sciences Meeting Abstracts.
- Mastrapa, R. M., M. P. Bernstein, et al. (2006). New Optical Constants for Amorphous and Crystalline H₂O-ice. AAS/Division for Planetary Sciences Meeting Abstracts.
- Mastrapa, R. M. E., M. P. Bernstein, et al. (2005). "Near Infrared Spectra of Mixtures Relevant to Icy Satellites." AGU Fall Meeting Abstracts 11: 0109.
- Sandford, S. A., R. M. E. Mastrapa, et al. (2005). "Near Infrared spectra of ice mixtures relevant to Solar System ices." AAS/Division for Planetary Sciences Meeting Abstracts 37.
- Mastrapa, R. M. E., M. H. Moore, et al. (2005). "Proton Irradiation of Crystalline Water Ice: Timescales for Amorphization in the Kuiper Belt." AAS/Division for Planetary Sciences Meeting Abstracts 37.
- Mastrapa, R. M. E., J. P. Emery, et al. (2003). "Mapping the distribution of crystalline water ice on the surface of Europa using high-resolution near infrared spectroscopy." AAS/Division for Planetary Sciences Meeting Abstracts 35.
- Mastrapa, R. M. E. and R. H. Brown (2002). "Modeling Amorphization of Crystalline Water Ice on Europa, Ganymede, and Callisto." AGU Fall Meeting Abstracts 61: 0341.
- Grier, J. A., D. H. Atkinson, et al. (2002). Defining Long Term Goals and Setting Priorities for Education and Public Outreach. ASP Conf. Ser. 272: The Future of Solar System Exploration (2003-2013) -- First Decadal Study contributions.
- Grundy, W. M., H. F. Levison, et al. (2002). Probing The Solar System's Outermost Frontier: The Future of Kuiper Belt Studies. ASP Conf. Ser. 272: The Future of Solar System Exploration (2003-2013) -- First Decadal Study contributions.
- Mastrapa, R. M. E. and R. H. Brown (2002). "Modeling Amorphization of Crystalline Water Ice on Europa, Ganymede, and Callisto." Bulletin of the American Astronomical Society 34: 881.

- Mastrapa, R. M. E. and R. H. Brown (2002). Modeling Amorphization of Crystalline Water Ice on the Surfaces of Ganymede, Callisto, and Europa. Lunar and Planetary Institute Conference Abstracts.
- Mastrapa, R. M. E. and R. H. Brown (2001). Modeling the Effects of Ion Radiation on Crystalline Water Ice. Lunar and Planetary Institute Conference Abstracts.
- Grier, J. A., D. H. Atkinson, et al. (2001). "Defining Long Term Goals and Setting Priorities for Education and Outreach, 2003 to 2013 - Panel Report." *Bulletin of the American Astronomical Society* 33: 1053.
- Mastrapa, R. M. E. and R. H. B. Brown (2001). "Amorphization of crystalline water ice by ion radiation: Model results and implications for Kuiper Belt Objects." *Bulletin of the American Astronomical Society* 33: 1034.
- Mastrapa, R. M. E., H. Glanzberg, et al. (2001). "Survival of bacteria exposed to extreme acceleration: implications for panspermia." *Earth and Planetary Science Letters* 189: 1-2.
- Mastrapa, R. M. E., R. H. Brown, et al. (2000). Trapping of Volatiles in Amorphous Water Ice. Lunar and Planetary Institute Conference Abstracts.
- Mastrapa, R. M. E., H. Glanzberg, et al. (2000). Survival of *Bacillus Subtilis* Spores and *Deinococcus Radiodurans* Cells Exposed to the Extreme Acceleration and Shock Predicted During Planetary Ejection. Lunar and Planetary Institute Conference Abstracts.
- Mastrapa, R. M. E., R. H. Brown, et al. (1999). "Trapping of CH₄, CO, and CO₂ in Amorphous Water Ice." *AAS/Division for Planetary Sciences Meeting Abstracts* 31.
- Turtle, E. P., M. E. Minitti, et al. (1999). "AMBASSADOR: Asteroid Sample Return Mission to 7 Iris." *Acta Astronautica* 45(4-9): 415-422.
- Mastrapa, R. M. E. and H. J. Melosh (1998). Models of Formation for Asymmetric Coronae on Venus. Lunar and Planetary Institute Conference Abstracts.
- Mastrapa, R. (1997). Thermal evolution of Venus - A preliminary study based on tectonic feature spacing. Lunar and Planetary Institute Conference Abstracts.

HONORS

- 2006-2007 NASA Postdoctoral Program
- 2005-2006 National Research Council Research Associateship Program
- 2000 Second Place in Graduate Student Symposium, University of Arizona
- 1997 National Science Foundation Minority Fellowship
- 1997 LPSC Dworkin Award Student Poster Honorable Mention
- 1994 Mellon Minority Fellowship
- 1992 University of Southern California Trustee Scholar
- 1992 University of Southern California Resident Honors Program

EXPERIENCE

Laboratory - Extensive experience with ultra-high vacuum, cryogenic systems designed to simulate ices on solar system bodies. Conducted experiments at the Jet Propulsion Lab, Goddard Space Flight Center, and NASA Ames Research Center. JPL experiments involved volatile gas trapping in amorphous water ice using near IR and mass spectroscopy. GSFC experiments involved irradiating crystalline water ice with a

van de Graff generator and detecting changes with near IR spectroscopy. Constructed laboratory at the University of Arizona to measure optical constants with near IR spectroscopy. NASA Ames IR spectroscopy experiments include measurements of optical constants, characterization of chemical mixtures, and photolysis of crystalline H₂O-ice.

Observing - Three observing runs at W. M. Keck Observatory. PI program used the NIRC2 instrument to study the distribution of crystalline water ice on the surface of Europa with near IR spectroscopy. Assisted on two projects using NIRC to collect IR spectra of KBO's.

Software – Written code to calculate optical constants and create synthetic IR spectra. Experienced in Perl, Java, C, and C++ in unix, Mac OS X, and windows environments. Familiar with HTML, MySQL, Fortran, and IDL.

Education & Outreach – Teaching Assistant for 100 level classes for two years at USC. Taught a laboratory class for one semester at UA. Girl Scout volunteer. Gave presentations to individual troops and at Girl Scout Science Day. Provided web support and coordinated education events for Mars Odyssey GRS, including a presentation at the Tucson Children's Museum.

Leadership – Student representative to the faculty at USC and UA. LPLC Organizing Committee. Commission on the Status of Women at the University of Arizona, Executive Committee. Organized Astrochemistry Seminar Series at NASA Ames.

ACTIVITIES & MEMBERSHIPS

2008 May Attended Science of Solar System Ices Workshop

2007- Present SETI Safety Committee

2007 December Attended Satellite Formation Workshop

2007 September Attended Astrobiology Icy Worlds Workshop

2007 Served on one NASA Proposal Review Panel

2007 August Attended Satellite Workshop Boulder, CO

2007 May Attended OPAG Meeting in Boston, MA

2007 April Colloquium at JPL Pasadena, CA

2007 March Colloquium at Southwest Research Institute Boulder, CO

2006 Attended Europa Focus Group Meeting, NASA Ames

2006 Served on two NASA Proposal Review Panels

2005-2007 National Research Council Fellowship/NASA Postdoctoral Program

2002-Present Association for Women in Science

2000-2003 Commission on the Status of Women, University of Arizona

2000 Appeared in Cool Careers for Girls in Air and Space

1999-2000 Lunar and Planetary Lab Conference, Organizing Committee

1998-2000 Girl Scout Volunteer

1998-1999 WISE'M UP, Mentoring for Women in Science

1997-Present American Geophysical Union Member

1997-Present AAS Division of Planetary Science Affiliate Member

1994-1995 Society of Women in Science and Mathematics