

Curriculum Vitae

Janice L. Bishop, Ph.D.

The SETI Institute

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Education:

- Ph.D. in Chemistry (and Planetary Science), Brown University, 1994.
- M.S. in Applied Earth Science (Remote Sensing), Stanford University, 1988.
- B.S. in Chemistry, Stanford University, 1988.

Professional Positions:

- Principal Investigator for the SETI Institute at NASA-Ames Research Center, March 1999 - present.
- Research Associate, NRC Fellow at NASA-Ames Research Center, March 1997 - February 1999.
- Postdoctoral Research Scientist, DLR-Berlin, September 1994 - February 1997.

Recent Professional Activities:

- Mars surface composition and surface processes: Analysis of visible to thermal infrared laboratory data of Mars analog materials (and minerals found in them) for comparison with spacecraft data of the Martian surface. Emphasis on martian meteorites, volcanic alteration products (Hawaii, Iceland and elsewhere), hydrothermal regions, acidic aqueous sites, and sediments from cold desert environments.
- CRISM Science Team: Pre-orbit - providing spectral input to the selection of channel wavelengths for detection of a maximum variety of possible minerals, contributing to development of spectral analysis tools, and providing inputs to the spectral database. In orbit - focus will be on identification of alteration minerals.
- Relationships between early photosynthetic organisms and mineralogy: Performing lab and field experiments to explore the ability of iron oxide-bearing species to facilitate growth of photosynthetic organisms by providing solar UV protection.
- Laboratory alteration experiments to explore the effects of chemical alteration on basalt and altered basalt Mars analog materials.

Mission and Community Activities:

Planetary Mission Participation:

- Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) on 2005 Mars Reconnaissance Orbiter (MRO): lead for the spectral identification tasks related to hydrated minerals and surface alteration, 2001 - present.
- Center for Mars Exploration (CMEX): participate in projects and meetings on Mars Landing Site development and furthering information technology capability for Martian Missions, 1998 - present.
- Pathfinder Mineralogy SOWG: worked on spectral analyses of Martian rocks and soils using IMP spectra and laboratory spectra, 1997 - 1999.

Janice L. Bishop, Ph.D.

Community Service Activities:

Editor, *Icarus*, November, 2003 - December, 2004.

Review Panel Member: NASA programs 1999 - present.

External Reviewer: multiple NASA programs; scientific articles for *Science*, *Nature*, *Clays Clay Minerals*, *Journal of Geophysical Research*, *Meteoritics and Planetary Science*, *Geophysical Res. Letters*, *Planetary and Space Science*, *Geology*, *Clay Mineralogy* and others.

Mars Human Precursor Science Steering Group Member: July - September, 2004.

Educational Outreach Activities:

Outstanding Women Scientists Series Lecture: "*The Surface of Mars: What We Know and How We're Learning More*", Indiana University, October, 2004.

Member, Board of Trustees, *Summer Science Program, Inc. (SSPI)*, an educational program in math and astronomy for accelerated high school students (www.summerscience.org), September, 2002 - present.

Science Advisor, *Universal Times*; newsletter for students and alumni of the Summer Science Program in Astronomy for high school students, October, 1999 - 2002.

Graduation Address, *Summer Science Program*, Thacher School, Ojai, CA, August, 1999.

Science reviewer, McGraw-Hill, evaluated / edited science textbooks for grades 1-6, July, 1999.

Assistant, *Science on Saturday Lecture Series* for grade school children, sponsored by LLNL and Sigma Xi, Livermore, CA, Saturday mornings February - April, 1998; lecturer at "Expanding Your Horizons" conference on math and science for teen-age girls, 1985.

Scientific Societies/Committees:

Membership in Professional Organizations: Sigma Xi, 1990 - present; Planetary Society, 1991 - present. Clay Minerals Society, 1991 - present; Meteoritical Society, 1991 - present; Mineralogical Society of America, 1997 - present; Geologic Society of America, 1997 - present; American Geophysical Union, 1998; Eur. Geophys. Soc., 1995; Amer. Chem. Soc., 1990 - 1994.

Selected Peer-Reviewed Publications:

Bishop J. L., Murad E., Lane M. D., and Mancinelli R. L. (2004) Multiple Techniques for Mineral Identification on Mars: A Study of Hydrothermal Rocks as Potential Analogues for Astrobiology Sites on Mars. *Icarus*, **169** (2), 311-323.

Bishop J. L. and Murad E. (2004) Characterization of minerals and biogeochemical markers on Mars: A Raman and IR spectroscopy study of montmorillonite. *J. Raman Spectr.*, **35**, 480-486.

Bishop, J. L., Anglen B. L., Pratt L. M., Edwards H. G. M., Des Marais D. J. & Doran P. T. (2003) A Spectroscopy and Isotope Study of Sediments from the Antarctic Dry Valleys as Analogs for Potential Paleolakes on Mars. *International Journal of Astrobiology*, **2**(4), 273-287.

Bishop J. L., Murchie S. L., Pieters C. M., Zent A. P. (2002) A Model for Formation of Dust, Soil and Rock Coatings on Mars: Physical and Chemical Processes on the Martian Surface. *J. Geophys. Res.* **107**(E11), 5097, doi:10.1029/2001JE001581.

Bishop J. L., Madejova J., Komadel P., and Froeschl H. (2002) The Influence of Structural Fe, Al and Mg on the Infrared OH Bands in Spectra of Dioctahedral Smectites. *Clay Miner.* **37**, 607-616.

Bishop J. L., Schiffman P., Southard R. (2002) Geochemical and mineralogical analyses of palagonitic tuffs and altered rinds of pillow lavas on Iceland and applications to Mars. In *Volcano-Ice Interactions on Earth and Mars*, eds. J.L. Smellie and M.G. Chapman (Geological Society, Special Pub. No. 202) London, 371-392.

Janice L. Bishop, Ph.D.

- Bishop J. L. and Murad E. (2002) Spectroscopic and Geochemical Analyses of Ferrihydrite from Hydrothermal Springs in Iceland and Applications to Mars. In *Volcano-Ice Interactions on Earth and Mars*, eds. J. L. Smellie and M. G. Chapman (Geological Society, Special Pub. No. 202) London, 357-370.
- Bishop J. L., Banin A., Mancinelli R. L., Klovstad M. L. (2002) Detection of soluble and fixed NH_4^+ in clay minerals by DTA and IR reflectance spectroscopy: A potential tool for planetary surface exploration, *Planetary Space Science* **50**, 11-19.
- Bishop J. L., Froeschl H., Lougear A., Newton J., Körner W., Koeberl C., Doran P. and Trautwein A. X. (2001) Mineralogical and geochemical analyses of Antarctic sediments: A reflectance and Mössbauer spectroscopy study with applications for remote sensing on Mars. *Geochim. Cosmochim. Acta*, **65**, 2875-2897.
- Bishop J. L., Murad E., Madejova J., Komadel P., Wagner U. and Scheinost A. (1999) Visible, Mössbauer and infrared spectroscopy of dioctahedral smectites: Structural analyses of the Fe-bearing smectites Sampor, SWy-1 and SWa-1. *11th International Clay Conference*, June, 1997, Ottawa, 413-419.
- Bishop J. L., Fröschl H. and Mancinelli R. L. (1998c) Alteration processes in volcanic soils and identification of exobiologically important weathering products on Mars using remote sensing. *J. Geophys. Res.* **103**, 31,457-31,476.
- Bishop J. L., Pieters C. M., Hiroi T. and Mustard J. F. (1998a) Spectroscopic analysis of martian meteorite ALH 84001 powder and applications for spectral identification of minerals and other soil components on Mars. *Meteorit. Planet. Sci.* **33**, 699-708.

Selected List of Published Contributions to Academic Conferences:

- Bishop J. L., Schiffman P., Drief A., and Southard R. J. (2004) Cemented volcanic soils, martian spectra and implications for the martian climate. Lunar Planet. Sci. XXXV., Lunar Planet. Inst., Houston, CD-ROM #1796 (abstr.).
- Bishop J. L., Schiffman P., Southard R. J., Drief A., Verosub K. L., and Smith D. J. (2004) Classifying terrestrial volcanic alteration processes and defining alteration processes they represent on Mars. Lunar Planet. Sci. XXXV., Lunar Planet. Inst., Houston, CD-ROM #1780 (abstr.).
- Pieters C. M., Dyar M. D., Hiroi T., Bishop J., Sunshine J., and Klima R. (2004) Pigeonite masquerading as olivine at Mars: First results from Mars spectroscopy consortium. Lunar Planet. Sci. XXXV., Lunar Planet. Inst., Houston.
- Bishop J. L., Parente M., and Hamilton V. E. (2003) Identifying Minerals on Mars Through VNIR and Mid-IR Spectral Deconvolution based on the Martian Meteorites. *Eos Trans. AGU* **84 (46)**, Abstr.# P21B-0045.
- Bishop J. L., Drief A. and Dyar M. D. (2003) Physical Alteration of Martian Dust Grains, its Influence on Detection of Clays and Identification of Aqueous Processes on Mars. In *Sixth Int'l Conf. on Mars*, Pasadena, CA, CD-ROM abs. #3008.
- Bishop J. L. (2003) Identification of secondary minerals on Mars: Importance for water, chemical alteration, and life. Eur. Geophys. Soc. Meeting, Nice, France, CD-ROM abs. #08115.
- Bishop J. L., Schiffman P., Murad E. and Southard R. (2001) Iceland as a Model for Chemical Alteration on Mars. In *Lunar and Planet. Sci. XXXII*, CD-ROM #1435 (abstr.).
- Bishop J. L. and Rothschild L. J. (2002) Iron Oxide May Have Filtered UV for Early Photosynthetic Microbes, Astrobiology Science Conference, NASA Ames Research Center, Moffett Field, CA, p.141.