

Curriculum Vitae

John Fraser Mustard

Professor of Geological Sciences

Education

- B.Sc. Geological Sciences (Honors), May 1983, University of British Columbia, Vancouver, B.C. CANADA
M.Sc. Geological Sciences, May 1986, Brown University, Providence RI.
Ph.D. Geological Sciences, May 1990, Brown University, Providence RI.

Professional Appointments

- 7/2007-present Professor of Geological Sciences and Professor of Environmental Studies, Brown University
7/2000-6/2007 Associate Professor of Geological Sciences and Associate Professor of Environmental Studies, Brown University
7/1998-6/2000 Steven Robert Assistant Professor, Assistant Professor of Geological Sciences, Brown University
7/1996-6/1998 Assistant Professor, Department of Geological Sciences, Brown University
7/1991-6/1996 Assistant Professor for Research, Department of Geological Sciences, Brown University
1/1990-6/1991 Post-doctoral research associate in the Department of Geological Sciences at Brown University

Completed Research and Scholarship

Edited Book

Gutman G., C. Justice, D. Skole, R. Rindfuss, J. Mustard, W. Turner, T. Janetos, and E. Moran (eds) *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* Kluwer Netherlands (2004).

Book Chapters

- Mustard, J. F., R. Defries, T. Fisher and E. Moran, Land Use and Land Cover Change Pathways and Impacts. Chapter 26 in Gutman G. et al (eds) *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* Kluwer Netherlands (2004).
- Mustard, J. F. and T. Fisher, Land Use and Land Cover Change and Hydrology. Chapter 15 in Gutman G. et al (eds) *Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface* Kluwer Netherlands (2004).
- Mustard, J. F., and J. M. Sunshine, Spectral Analysis for Earth Science: Investigations Using Remote Sensing Data, in *Remote Sensing for the Earth Sciences, Manual of Remote Sensing 3rd Ed. Vol. 3*, (Andrew Rencz, Editor), J. Wiley and Sons Inc., New York, Chapter 5, pg. 251-307, 1999.
- Pieters, C. M., J. F. Mustard, J. M. Sunshine, Quantitative mineral analyses of planetary surfaces using reflectance spectroscopy, in *Mineral Spectroscopy: A tribute to Roger G. Burns*, (M. D. Dyar, C. McCammon, and M. W. Schaefer, eds.), The Geochemical Society, Houston TX, pp. 307-326, 1996.

Refereed Publications (85)

Submitted and in review:

Murchie, S. L., J. Mustard, R. Arvidson, F. Seelos, S. Pelkey, L. Roach, B.L. Ehlmann, R. Milliken, J.-P. Bibring, K. Seelos, J.A. McGovern, T. Martin, D. Humm, R. Green, P. Cavender, C. Hash, E. Malaret, P. Bedini, K. Beisser, J. Bishop, A. Brown, S. Byrne, T. Choo, R.T. Clancy, R. Clark, D. Des Marais, R. Espiritu, K. Fishbaugh, J. Grant, C. Harvel, J. Hayes, K. Heffernan, K.E. Herkenhoff, N. Izenberg, A. Knudson, Y. Langevin, A. McEwen, P. McGuire, R. Morris, F. Poulet, M. Robinson, P. Russell, T. Roush, M. Smith, W.-J. Shyong, K. Strohbahn, G. Swayze, H. Taylor, T. Titus, S. Wiseman, and M. Wolff, Mineralogic Evidence from CRISM for Past Martian Environmental Variability, (in revision) *Nature* 2008.

Publications in peer-reviewed journals:

2008

- Bishop, J. L., E. A. Noe Dobrea, N. K. McKeown, M. Parente, B. L. Ehlmann, J. R. Michalski, R. R. Milliken, F. Poulet, G. A. Swayze, J. F. Mustard, S. L. Murchie, and J-P. Bibring, Phyllosilicate diversity and past aqueous activity revealed at Mawrth Vallis, Phyllosilicate diversity and past aqueous activity revealed at Mawrth Vallis, Mars. *Science* 321, DOI: 10.1126/science.1159699, pp. 830-833, 2008
- Bradley, B. and J. F. Mustard, Comparison of phenology trends by land cover class: a case study in the Great Basin, USA, *Global Change Biology*, 14, 334-346, doi :10.1111/j.1365-2486.2007.01479.x 2008.
- Ehlmann, B. L., J.F. Mustard, C.I. Fassett, S.C. Schon, J.W. Head III, D.J. Des Marais, J.A. Grant, S.L. Murchie and the CRISM team, Clay mineralogy and organic preservation potential of lacustrine sediments from a Martian delta environment, Jezero crater, Nili Fossae, Mars, *Nature Geosci.* doi: 10.1038/ngeo207, 2008
- Galford, G. L., A. Gendrin, J. F. Mustard and J. Mellillo, C. C. Cerri and C. E. Cerri, Wavelet analysis of MODIS time series to detect expansion and intensification of mechanized agriculture, *Remote Sensing of Environment*, 112, 576–587, 2008
- McGuire, P.C., M.J. Wolff, M.D. Smith, R.E. Arvidson, S.L. Murchie, R.T. Clancy, T.L. Roush, S.C. Cull, K.A. Lichtenberg, S.M. Wiseman, R.O. Green, T.Z. Martin, R.E. Milliken, P.J. Cavender, D.C. Humm, F.P. Seelos, K.D. Seelos, H.W. Taylor, B.L. Ehlmann, J.F. Mustard, S.M. Pelkey, T.N. Titus, C.D. Hash, E.R. Malaret, and the CRISM Team, MRO/CRISM Retrieval of Surface Lambert Albedos for Multispectral Mapping of Mars with DISORT-based Radiative Transfer Modeling: Phase 1 -- Using Historical Climatology for Temperatures, Aerosol Optical Depths, and Atmospheric Pressures, (in press) *IEEE Trans. Geo. Remote Sens.*, 2008.
- Milliken, R. E., G. Swayze, R. Arvidson, J. Bishop, R. Clark, B. Ehlmann, J. Grotzinger, R. Morris, S. Murchie, J. Mustard, C. Weitz, and the CRISM Science Team, Spectral Evidence for Sedimentary Silica on Mars, (in press) *Geology* (2008)
- Mustard, J. F., S. L. Murchie, S. M. Pelkey, B. L. Ehlmann, R. E. Milliken, J. A. Grant, J-P. Bibring, F. Poulet, J. Bishop, E. Noe Dobrea, L. Roach, F. Seelos, R. E. Arvidson, S. Wiseman, R. Green, C. Hash, D. Humm, E. Malaret, J. A. McGovern, K. Seelos, T. Clancy, R. Clark, D. Des Marais, N. Izenberg, A. Knudson, Y. Langevin, T. Martin P. McGuire, R. Morris, M. Robinson, T. Roush, M. Smith, G Swayze, H. Taylor, T. Titus, and M. Wolff, Hydrated Silicate Minerals on Mars Observed by the Mars Reconnaissance Orbiter CRISM Instrument, *Nature* 454, 305-309 doi:10.1038/nature07097, 2008.
- Wray, J. J., B. L. Ehlmann, S. W. Squyres, J. F. Mustard, and R. L. Kirk, Compositional stratigraphy of clay-bearing layered deposits at Mawrth Vallis, Mars, *Geophys. Res. Lett.*, 35, L12202, doi:10.1029/2008GL034385, 2008.

- Baratoux D., P. Pinet, A. Gendrin, L. Kanner, J. Mustard, Y. Daydou, J. Vaucher, J.-P. Bibring, Mineralogical structure of the subsurface of Syrtis Major from OMEGA observations of lobate ejecta blankets, 112, E08S05, doi:10.1029/2007JE002890. *J. Geophys. Res.*, 2007
- Bibring, J.-P., R. E. Arvidson, A. Gendrin, B. Gondet, Y. Langevin, S. Le Mouélic, N. Mangold, R. V. Morris, J. F. Mustard, F. Poulet, C. Quantin, C. Sotin, Coupled Ferric Oxides and Sulfates on the Martian Surface, *Science* 317, 1206 DOI: 10.1126/science.1144174, 2007.
- Bradley, B.A., R. Jacob, J. Hermance, and J. Mustard, A curve-fitting procedure to derive inter-annual phenologies from time series of noisy satellite NDVI data, *Remote Sensing of Environment*, 106, 137-145, 2007.
- Cloutis, E. A., M. A. Craig, J. F. Mustard, R. V. Kruzelecky, W. R. Jamroz, A. Scott, D. L. Bish, F. Poulet, J.-P. Bibring, and P. L. King, Stability of hydrated minerals on Mars, *Geophysical Research Letters*, v. 34, L20202, doi: 10.1029/2007GL031267, 2007
- Combe, J-Ph., S. Le Mouélic, C. Sotin, A. Gendrin, J. F. Mustard, L. Le Deit, P. Launeau, J.-P. Bibring, B. Gondet, Y. Langevin, P. Pinet, and the OMEGA Science team. Analysis of OMEGA / Mars Express data hyperspectral data using a Multiple-Endmember Linear Spectral Unmixing Model (MELSUM): Methodology and first results, *Planetary and Space Science*, 56 951–975 2008.
- Fisher, J. I. and J. F. Mustard, Cross-scalar satellite phenology from ground, Landsat, and MODIS data, *Remote Sensing of Environment*, v. 109, doi: 10.1016/j.rse.2007.01.004, 262-273, 2007.
- Fisher, J. I., A. R. Richardson and J. F. Mustard, Phenology model from surface meteorology does not capture satellite-based greenup estimations, *Global Change Biology*, vol. 13, 707-721, doi: 10.1111/j.1365-2486.2006.01311.x, 2007
- Hermance, J. F., R. W. Jacob, B. A. Bradley and J. F. Mustard, Extracting Phenological Signals from Multi-Year AVHRR NDVI Time Series: Framework for Applying High-Order Annual Splines with Roughness Damping, *IEEE Trans. Geosci. Remote Sens.*, vol. 45, 3264-3276, doi: 10.1109/TGRS.2007.903044, 2007.
- Jouglet D., Poulet F., Milliken R. E., Mustard J. F. , Bibring J.-P., Langevin Y., Gondet B, and the OMEGA team, Hydration state of the Martian surface as seen by Mars Express OMEGA I -Analysis of 3 micron hydration feature, doi:10.1029/2006JE002846, *J. Geophys. Res.* 2007.
- Kanner, L. C., J. F. Mustard, A. Gendrin Assessing the limits of the Modified Gaussian Model for remote spectroscopic studies of pyroxenes on extraterrestrial surfaces, *Icarus*, vol. 187, 442-456, 2007.
- Mangold, N., F. Poulet, J. F. Mustard, J.-P. Bibring, Y. Langevin, B. Gondet, V. Ansan, Ph. Masson, J. W. Head, C. Fassett, G. Neukum Mineralogy of Nili Fossae region with OMEGA/Mex data: 2. Aqueous alteration of the crust, *J. Geophys. Res.* 112, E08S04, doi 10.1029/2006JE002835, 2007.
- Milliken, R. E., J. F. Mustard, Estimating the Water Content of Hydrated Minerals Using Reflectance Spectroscopy II: Effects of Particle Size, *Icarus*, vol. 189, 574-588, 2007.
- Milliken, R. E., J. F. Mustard, Estimating the Water Content of Hydrated Minerals Using Reflectance Spectroscopy I: Effects of Darkening Agents and Low-Albedo Materials, *Icarus*, vol. 189, 550-573, 2007.
- Milliken, R. E., J. F. Mustard, F. Poulet, D. Jouglet, J.-P. Bibring, B. Gondet, Y. Langevin, Hydration state of the Martian surface as seen by Mars Express OMEGA II – H₂O content of the surface, *J. Geophys. Res.*, Vol. 112, E08S07, doi:10.1029/2006JE002853, 2007.
- Mustard, J. F., F. Poulet, J. W. Head, N. Mangold, J.-P. Bibring, S. M. Pelkey, C. Fassett, Y. Langevin, G. Neukum, Mineralogy of the Nili Fossae region with OMEGA/Mex data: 1) Ancient Impact Melt in the Isidis Basin and Implications for the Transition from the Noachian to Hesperian, , *J. Geophys. Res.*, Vol. 112, E08S03, doi:10.1029/2006JE002834, 2007.

Pelkey, S. M., J. F. Mustard, S. L. Murchie, R.T. Clancy, M. Wolff, M. Smith, R. E. Milliken, J.-P. Bibring, A. Gendrin, F. Poulet, Y. Langevin, B. Gondet, CRISM Multispectral Summary Products: Parameterizing Mineral Diversity on Mars from Reflectance, *J. Geophys. Res.*, 112, E08S14, doi:10.1029/2006JE002831, 2007.

2006

Poulet, F., C Gomez, J.-P. Bibring, Y. Langevin, B. Gondet, P. Pinet, G. Belluci, J. Mustard, Martian surface mineralogy from Observatoire pour la Minéralogie, l'Eau, les Glaces et l'Activité on board the Mars Express spacecraft (OMEGA/MEx): Global mineral maps, *J. Geophys. Res.*, Vol. 112, No. E8, E08S02, doi 10.1029/2006JE002840, 2007

Bibring, J.-P., Y. Langevin, J. F. Mustard, F. Poulet, R. Arvidson, A. Gendrin, B. Gondet, N. Mangold, and the OMEGA Team, The Mars History defined from the OMEGA/MEx spectra and inferred mineralogy, *Science*, v312, 400-404, 10.1126/science.1122659 2006.

Bradley, B. A. and J. F. Mustard, Characterizing the Landscape Dynamics of an Invasive Plant and Risk of Invasion Using Remote Sensing. *Ecological Applications*, 16(3), 1132–1147, 2006

Bradley, B. A., R. A. Houghton, J. F. Mustard, and S. P. Hamburg, Invasive grass reduces carbon stocks in shrublands of the Western U.S., 12, 1815–1822, doi: 10.1111/j.1365-2486.2006.01232.x *Global Change Biology*, 2006.

Cloutis, E. A., F.C. Hawthorne, S. A. Mertzman, K. Krenn, M. A. Craig, D. Marcino, M. Methot, J. Strong, J. F. Mustard, D. L. Blaney, J. F. Bell III, and F. Vilas, Detection and discrimination of sulfate minerals using reflectance spectroscopy, *Icarus*, 184, 121-157, 2006.

Elmore, A. J., J. F. Mustard and S. P. Hamburg, Agricultural Legacies in the Great Basin alter vegetation response to precipitation and vegetation composition, *Ecosystems*, vol. 9, 1231-1241, doi: 10.1007/210021-005-0069-7, 2006.

Elmore, A. J., S. J. Manning, J. F. Mustard and J. M. Craine, Desert phreatophytic vegetation response to changes in groundwater depth, *J. Applied Ecology*, vol. 43, 770-779, doi: 10.1111/j.1365-2664.2006.01197.x 2006.

Fisher, J., J. F. Mustard, and M. Vadeboncoeur, High resolution phenologies from Landsat data, *Remote Sensing of Environment* 100, 265-279, 2006.

Head, J. W. and J. F. Mustard, Breccia Dikes in Impact Craters on Mars: Erosion and Exposure on the Floor of a 75-km Diameter Crater at the Dichotomy Boundary, *Meteoritics and Planetary Science*, 41, 1675-1690, 2006.

Roach, L., J. F. Mustard, A. Gendrin, D. Fernández-Remolar, R. Amils, L. Amaral Zettler Finding Mineralogically Interesting Targets for Exploration from Spatially Coarse Visible and Near IR Spectra, *Earth Planet. Sci. Let.* 252 (2006) 201–214, 2006.

2005

Bibring, J.-P., Y. Langevin, A. Gendrin, B. Gondet, F. Poulet, M. Berthé, A. Soufflot, R. Arvidson, N. Mangold, J. Mustard, B. Schmitt and the OMEGA Science Team, Mars surface diversity as reveal by the OMEGA/Mex observations, *Science* v307, 1576-1581, 10.1126/science.1108806.1144174 2005.

Bradley, B. A. and J. F. Mustard, Identifying Land Cover Variability Distinct from Land Cover Change: Cheatgrass in the Great Basin, *Remote Sensing of Environment* 94, 204-213, 2005.

Gendrin, A., N. Mangold, J.-P. Bibring, Y. Langevin, B. Gondet, G., F. Poulet, G. Bonello, C. Quantin, J. Mustard, R. Arvidson, and S. LeMouelic, Sulfates in Martian layered terrains: The OMEGA/Mars Express view, *Science* v. 307, 1587-1591, 2005.

Li, L. and J. F. Mustard, Lateral mixing on the Moon: Remote sensing observations and modeling, *J. Geophys. Res.* 110, E11002, doi: 10.1029/2004JE002295, 2005.

- Milliken, R. E. and J. F. Mustard, Quantifying absolute water content of minerals using near-infrared reflectance spectroscopy, *J. Geophys. Res.* 110, E12001, doi: 10.1029/2005JE002534, 2005.
- Mustard, J. F., F. Poulet, A. Gendrin, N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, G. Bellucci, F. Altieri, and the OMEGA Science Team, Olivine and pyroxene diversity in the crust of Mars, *Science* v307, 1594-1597, 10.1126/science.1109098 2005.
- Mustard J. F. and C. Cooper, Joint analysis of ISM and TES data: The utility of multiple wavelength regimes for Martian surface studies, *J. Geophys. Res.* 110, E05012, DOI 10.1029/2004JE002355, 2005.
- Poulet, F., J-P. Bibring, J. F. Mustard, A. Gendrin, N. Mangold, Y. Langevin, R. E. Arvidson, B. Gondet, G. Gomez and the OMEGA Science Team, Phyllosilicates on Mars and Implications for the Early Mars History, *Nature*, (doi:10.1038/nature04274), vol. 438, 623-627, 2005.

2004

- Bibring, J.P., Y. Langevin, F. Poulet, A. Gendrin, B. Gondet, M. Berthe, A. Soufflot, P. Drossaert, M. Combes, G. Bellucci, V. Moroz, N. Mangold, B. Schmitt, and The OMEGA Science Team, Perennial water ice identified in the south polar cap of Mars, *Nature* (doi:10.1038/nature02461), 428, 627 - 630, 2004.
- Fisher, J., and J.F. Mustard, High spatial resolution sea surface climatology from Landsat thermal infrared data, *Remote Sensing of Environment*, 90 (3), 293-307, 2004.
- Schultz, P.H., and J.F. Mustard, Impact melts and glasses on Mars, *Journal of Geophysical Research*, 09(E01001), doi: 10.1029/2002JE002025, 2004.

2003

- Elmore, A. J., J. F. Mustard, and S. J. Manning, Regional patterns of plant community response to changes in water: Owens Valley, California, *Ecological Applications*, 13(2), 443-460, 2003.
- Elmore, A. J. and J. F. Mustard, Precision and Accuracy of EO-1 Advanced Land Imager (ALI) Data for Semiarid Vegetation Studies, *IEEE Trans. Geosci. Rem. Sens.* 41 (6), 1311-1320, 2003.
- Head, J. W., J. F. Mustard, M. A. Kreslavsky, R. E. Milliken and D. R. Marchant, Recent Ice Ages on Mars 426, pp. 797-802, *Nature*, 2003.
- Li, L. and J. F. Mustard, Highland contamination in lunar mare soils: Improved mapping with multiple end-member spectral mixture analysis (MESMA), *J. Geophys. Res.* Vol. 108, No. E6, 5053 10.1029/2002JE001917, 2003
- Milliken, R. E., J. F. Mustard, D. L. Goldsby, Viscous Flow Features on the Surface of Mars: Observations from High-Resolution Images, *J. Geophys. Res.* Vol. 108, No. E6, 5057 10.1029/2002JE002005, 2003.

2002

- Cooper, C. and J. F. Mustard, Spectroscopy of loose and cemented sulfate-bearing soils: Implications for duricrust on Mars, *Icarus*, 158, 42-55, 2002.
- Keshava, N. and J. F. Mustard, Spectral Unmixing, *IEEE Signal Processing*, vol. 19, No. 1, pp. 44-57, 2002.
- Laskar, J., B. Levrard, and J. Mustard, Orbital forcing of the Martian polar layered deposits, *Nature* v. 419, 375-377, 2002.
- Minitti, M. E., J. F. Mustard, M. J. Rutherford, The effects of glass content and oxidation on the spectra of SNC-like basalts: Applications to Mars remote sensing, *J. Geophys. Res.* 107 (55) 10.1029/2001JE001518 2002.

Tokar, R. L., W. C. Feldman, T. H. Prettyman, K. R. Moore, R.C. Elphic, D.J. Lawrence, M.A. Kreslavsky, J.W. Head III, J. F. Mustard, and W. V. Boynton, Ice concentration and distribution near the South Pole of Mars: Synthesis of Odyssey and Global Surveyor analyses, *Geophys. Res. Lett.* *V. 29*, doi:10.1029/2002/GL015691, 2002.

2001

Mustard, J. F., C. D. Cooper and M. K. Rifkin, Evidence for recent climate change on Mars from the identification of youthful near-surface ground ice, *Nature* vol. 412, 411-414, 2001.

Mustard, J. F., M. Staid, and W. Fripp, A semi-analytical approach to the calibration of AVIRIS data to reflectance over water: Application to a temperate estuary, *Remote Sensing of Environment* *75*, 335-349, 2001

2000

Chabrilat, S., P. C. Pinet, G. Ceuleneer, P. E. Johnson, and J. F. Mustard, Ronda peridotite massif: Methodology for its geological mapping and lithological discrimination from airborne hyperspectral data, *International Journal of Remote Sensing*, *21*, 2363-2388, 2000. Elmore, A. J., J. F. Mustard, S. Manning, and D. Lobell, Quantifying Vegetation Change in Semi-arid Environments: Precision and Accuracy of Spectral Mixture Analysis and the Normalized Difference Vegetation Index. *Remote Sensing of Environment* *73*, 86-102, 2000.

Li, L. and J. F. Mustard, Compositional gradients across mare-highland contacts: The importance and geological implications of lateral mixing, *J. Geophys. Res.-Planets* *105*, 20431-20450, 2000.

Murchie, S. L., L. Kirkland, S. Erard, J. F. Mustard, and M. Robinson, NIR spectral variations on Mars from ISM imaging spectrometer data: Evidence for lithologic variations of the surface layer, *Icarus*, *147*, 444-471, 2000.

1999

Cooper, C. and J. F. Mustard, Fine particle reflectance spectra of palagonite and smectite from visible to mid-infrared wavelengths: Effects on spectral contrast *Icarus*, *142*, 557-570, 1999.

Mustard, J. F., M. Carney, and A. Sen, The use of satellite data to quantify thermal effluent impacts, *Estuarine, Coastal, and Shelf Science*, *49*, 509-524, 1999.

1998

Bishop, J. L., J. F. Mustard, C. M. Pieters, and T. Hiroi, Spectroscopic analysis of Martian meteorite Allan Hills 84001 powder and applications for the spectral identification of minerals and other soil components on Mars, *Meteorit. Planet. Sci.*, *33*,(4), 699-707, 1998.

Mustard, J. F., L. Li, and G. He, Nonlinear spectral mixture modeling of lunar multispectral data: Implications for lateral transport, *J. Geophys. Res.-Planets*, *103*, 19,419-19,425, 1998.

1997

Mustard, J. F. and J. E. Hays, Effects of hyperfine particles (<25 μm) on reflectance spectra from 0.3 to 25 μm , *Icarus*, *125*, 145-163, 1997.

Mustard, J. F., S. L. Murchie, S. Erard, and J. M. Sunshine, In Situ Compositions of Martian Volcanics: Implications for the Mantle, *J. Geophys. Res.-Planets*, *102*, 25605-25615, 1997.

Mustard, J. F., A. Sen, C. Swanson, D. Mendelsohn, and C. Deacutis, Integration of remotely sensed data and hydrodynamic modeling into a GIS to assess the impacts of thermal effluent in an estuary, in *Proc. 4th International Conference on Remote Sensing for Marine and Coastal Environments*, II-34-II-43, 1997.

Tompkins, S., J. F. Mustard, C. M. Pieters, and D. W. Forsyth, Optimization of endmembers for spectral mixture analysis, *Remote Sensing of Environment*, *59*, 472-489, 1997.

1996

Mustard, J.F. and J. W. Head, Buried stratigraphic relationships along the southwestern shores of Oceanus Procellarum: Implications for early lunar volcanism, *J. Geophys. Res.* 101, 18,913-18,925, 1996.

1995

Antonenko, I, J. W. Head, J. F. Mustard, and B. R. Hawke, Criteria for detection of lunar cryptomare, *Earth, Moon, and Planets*, 69, 141-172, 1995.

Mustard, J. F., and J. M. Sunshine, Seeing through the dust on Mars: Links between the SNC meteorites and heterogeneity on the surface of the Red Planet, *Science*, 267, 1623-1626, 1995.

1994

Erard, S., J. F. Mustard, S. L. Murchie, J-P. Bibring, P. Cerroni, and A. Coradini, Martian aerosols: Near-infrared spectral properties and effects on the observation of the surface, *Icarus*, 111, 317-337, 1994.

Mustard, J. F., Scientific visualization in earth and planetary science: It looks good but will it publish, New Scholarship, New Serials: *Proc. NASIG Workshop*, The Serials Librarian, 24, 3-8, 1994.

Mustard, J. F., and J. F. Bell III, New composite spectra of Mars from 0.4 to 3.14 μm , *Geophys. Res. Letters*, 21, 353-356, 1994.

Mustard, J. F., Lithologic mapping of gabbro and peridotite sills in the Cape Smith fold and thrust belt with Thematic Mapper and airborne radar data, *Canadian Journal of Remote Sensing*, 20, 222-232, 1994.

Tompkins, S., C. M. Pieters, J. F. Mustard, P. Pinet, and S. D. Chevrel, Distribution of materials excavated by the lunar crater Bullialdus and implication of the geologic history of the Nubium region, *Icarus* 110, 261-274, 1994.

1993

Geissler, P. E., R. B. Singer, G. Komatsu, S. Murchie, and J. Mustard, An unusual spectral unit in West Candor Chasma: Evidence for aqueous or hydrothermal alteration in the Martian canyons, *Icarus*, 106, 380-391, 1993

Head, J. W., S. Murchie, J. F. Mustard, C. M. Pieters, G. Neukum, A. McEwen, R. Greeley, and M. J. S. Belton, Lunar impact basins: New data for the western limb and farside (Orientale and South Pole-Aitken Basins) from the first Galileo flyby, *J. Geophys. Res.* 98, 17149-17182, 1993.

Murchie, S. L., J. F. Mustard, and S. Erard, Spatial variations in the spectral properties of bright regions in Mars, *Icarus* 105, 454-468, 1993.

Mustard, J.F., S. Erard, J-P. Bibring, J.W. Head, Y. Langevin, C. M. Pieters, Surface composition of Syrtis Major-Isidis Basin from imaging spectrometer observations: Implications for volcanism and surface processes, *J. Geophys. Res.* 98, 3387-3400, 1993.

Mustard, J. F., Relationship of soil, grass, and bedrock over the Kaweah serpentinite melange through spectral mixture analysis of AVIRIS data, *Remote Sensing of Environment*, 44, 293-308, 1993

1992

Mustard, J. F., Chemical composition of actinolite from reflectance spectra, *American Mineralogist* 77, 345-358, 1992.

1991

Erard, S., J-P. Bibring, J. F. Mustard, O. Forni, J. W. Head, S. Hurtrez, Y. Langevin, C. M. Pieters, J. Rosenqvist, C. Sotin, Spatial variations in composition of the Valles Marineris and Isidis Planitia regions derived from ISM data, *Proc. 21st Lunar Planet. Sci. Conf.*, 437-455, 1991.

1989

Mustard, J. F., and C. M. Pieters, Photometric phase functions of common geologic minerals and applications to quantitative analysis of mineral mixture reflectance spectra, *J. Geophys. Res.* 94, 13,619- 13634, 1989.

1988

Pieters, C. M. and J. F. Mustard, Exploration of crustal/mantle material for the Earth and Moon using reflectance spectroscopy, *Remote Sensing of the Environment* 24, 151-178, 1988

1987

Mustard, J. F., and C. M. Pieters, Quantitative abundance estimates from bidirectional reflectance measurements, *Proc. 17th Lunar Planet. Sci. Conf., J. Geophys. Res.*, 92, E617-E626, 1987.

Mustard, J. F., and C. M. Pieters, Abundance and distribution of serpentinized ultramafic microbreccia in Moses Rock dike: Quantitative application of mapping spectrometer data, *J. Geophys. Res.* 92, 10,376-10,390, 1987.

Book Review

Mustard, J. F., All About Mars, review of the book *Mars*, edited by H. H. Kieffer, B. M. Jakosky, C. W. Snyder, and M. S. Matthews, *Science*, vol. 260, 1174-1175, 1993.

Articles

Mustard, J. F., A Wet and Altered Mars, *Nature* 417, 234-235, doi:10.1038/417234a, 2002.

Reports (Not including Final Reports for Funded Projects)

New Frontiers in the Solar System: An Integrated Strategy, Decadal Survey Committee, Space Studies Board, National Research Council, National Academies Press, Washington D.C., 2003.

Assessment of Mars Science and Mission Priorities, Committee on Lunar and Planetary Evolution, Space Studies Board, National Research Council, National Academy Press, Washington D.C., 112 pp. 2002.

Quarantine and Certification of Martian Samples, Committee on Lunar and Planetary Evolution, Space Studies Board, National Research Council, National Academy Press, Washington D.C., 132 pp. 2001.

Miller, J., M. Bauer, J. Cihlar, R. Davis, N. Goel, Y. Kerr, J. Mustard, and J. Price, Review of the EOS-AM 1 Land Data Products for ASTER, MISR, and MODIS, NASA Report, 80 pp., 1996.

Kirkland, L., J. F. Mustard, J. McAfee, B. Hapke, and M. Ramsey, Mars Infrared Spectroscopy: From Theory and the Laboratory to Field Observations, *EOS Trans AGU*, 83, (47), Fall Meeting Supplement, Abstract P62B-11, 2002.

Abstracts and Short Papers

(Past 6 Years) (First Authorship denotes presentation)

2008

Bishop, J. L., McKeown, N. K., Noe Dobreá, E. Z., Ehlmann, B. L., Michalski, J. R., Milliken, R. E., Poulet, F., Mustard, J. F., Swayze, G. A., Murchie, S. L., Bibring, J.-P. and the CRISM Team. Phyllosilicate diversity observed by CRISM in Mawrth Vallis: identification of nontronite, montmorillonite, kaolinite and hydrated silica. *Lunar and Planetary Science Conference XXXIX, Abstract 2124, 2008.*

- Bishop, J. L., Parente, M., Weitz, C. M., Noe Dobrea, E. Z., Calvin, W. M., Milliken, R. E., Roach, L. A., Murchie, S. L., McKeown, N. K., Mustard, J. F., and the CRISM Team. Characterization of light-toned sulfate and hydrated silica layers at juventae chasma using CRISM, OMEGA, HIRISE and context images. *Lunar and Planetary Science Conference XXXIX, Abstract 2334, 2008.*
- Ehlmann, B. L., Mustard, J. F., Kumar, P. S. Integrated Spectra of Impact products from lonar crater: the effects of weathering and implications from mars. *Lunar and Planetary Science Conference XXXIX, Abstract 2437, 2008.*
- Ehlmann, B.L., Mustard, J.F., Bishop, J.L., Swayze, G.A., Roach, L.H., Clark, R.N., Milliken, R.E., Poulet, F., Murchie, S.L. and the MRO CRISM Team. Distinct provinces of aqueous alteration in the western isidis region identified with MRO-CRISM. *Lunar and Planetary Science Conference XXXIX, Abstract 2326, 2008.*
- Johnsson, A., Delbratt, , Mustard, J. F., Milliken, R. E., Reiss, D, Hiesinger, H., Olvmo, M. Small scale polygonal patterns along southeren water ice margin on Mars. *Lunar and Planetary Science Conference XXXIX, Abstract 1753, 2008.*
- Lichtenberg, K. A., Arvidson, R. E., Murchie, S., Roach, L. H., Andrews-Hanna, J., Noe Dobrea, E., and Mustard, J. F. Structural and geological relations between igneous rocks and their alteration products in Xanthe Terra, Mars. *Lunar and Planetary Science Conference XXXIX, Abstract 1390, 2008.*
- Malaret, E., Hash, C., Murchie, S., Seelos, F., McGuire, P., Arvidson, R., Wolff, M., Smith, M., Mustard, J.F., Pelkey, S., Martin, T., McGovern, A., Choo, T., Humm, D., Shyong, W.-J., and the CRISM Team. Construction of the CRISM global multispectral map of mars. *Lunar and Planetary Science Conference XXXIX, Abstract 2081, 2008.*
- McKeown, N. K., Bishop, J. L., Noe Dobrea, E. Z., Ehlmann, B. L., Michalski, J. R., Mustard, J. F., Murchie, S. L., Silver, E., Bibring, J.-P., and the CRISM Team. The distribution of Phyllosilicates in mawrth vallis as seen by CRISM. *Lunar and Planetary Science Conference XXXIX, Abstract 1400, 2008.*
- Mest, S.C., Crown, D.A, Bleamaster III, L.F., and Mustard. J.F. Morphology, Morphometry and distribution of craters in NW Hellas, Mars. *Lunar and Planetary Science Conference XXXIX, Abstract 1704, 2008.*
- Milliken, R. E., Swayze, G., Arvidson, R., Bishop, J., Clark, R., Ehlmann, B., Grotzinger, J., Morris, R., Murchie, S., Mustard, J., Weitz, C., and the CRISM Science Team. Spectral evidence for sedimentary silica on mars. *Lunar and Planetary Science Conference XXXIX, Abstract 2025, 2008.*
- Mustard, J. F., Murchie, S. L., Ehlmann, B. L., Milliken, R. E., Bibring, J-P., Poulet, F., Bishop, J., Roach, L., Seelos, F. and the CRISM Science Team. Regional geology and stratigraphy of the NILI Fossae-Syrtis-Isidis region: new insights from CRISM and MRO data. *Lunar and Planetary Science Conference XXXIX, Abstract 1701, 2008.*
- Noe Dobrea, E. Z., Bishop, J.L., McKeown, N.K., Swayze, G., Michalski, J.R., Poulet, F., Bibring, J.-P., Mustard J.F., Ehlmann, B.L., Arvidson, R., Morris, R.V., Murchie, S., McEwen, A.S., Malaret, E., Hash, C., and the CRISM Team. Clay bearing units in the region around Mawrth Vallis: stratigraphy, extent and possible alteration fronts. *Lunar and Planetary Science Conference XXXIX, Abstract 1077, 2008.*
- Parmentier, E.M., Mustard, J.F., Ehlmann, B.L., and Roach, L.H. Deep hydrothermal circulation and implications for the early crustal compositional and thermal evolution of mars. *Lunar and Planetary Science Conference XXXIX, Abstract 1544, 2008.*
- Poulet, F., Platevoet, B., Bar- dintzeff, J.-M., Mangold, N., Bibring, J.-P., Mustard, J.F., Langevin, Y., Vincendon, M., Aleon, A., Gondet B., and Pinet, P. Modal composition of Martian low albedo regions from OMEGA reflectance spectra: implications for upper crustal petrology. *Lunar and Planetary Science Conference XXXIX, Abstract 1760, 2008.*
- Roach, L.H., Mustard, J.F., Murchie, S.L., Aharonson, O., Lowenstein, T., Weitz, M., Arvidson, R.E., Bishop, J.L., Lewis, K., Lichtenberg, K., Seelos, F., and the CRISM Science Team. Sulfate mineral stratigraphy in Valles Marineris interior layered deposits. *Lunar and Planetary Science Conference XXXIX, Abstract 1891, 2008.*

Roach, L.H., Mustard J.F., Murchie, S.L., Bibring, J-P., Arvidson, R.E., Bishop, J.L., Milliken, R.E., Seelos, F. and the CRISM Science team. Constraints on the rate of sulfate phase changes in Valles Marineris interior layered deposits. *Lunar and Planetary Science Conference XXXIX, Abstract 1823, 2008.*

Skok, J. R., Mustard, J. F., Murchie, S. L., Roach, L. H., Ehlmann, B.L., and Thollet. P. Compositionally distinct ejecta blankets in syrtis major: implications for environmental change. *Lunar and Planetary Science Conference XXXIX, Abstract 1790, 2008.*

2007

Baratoux, D., Pinet, P.C., Gendrin, A., Kanner L., Mustard J., Daydou, Y., Vaucher, J., and Bibring, J.-P., The alteration of the mineralogical composition of ejecta at Syrtis Major. *European Space Agency European Mars Science and Exploration Conference*, Abstract 1119663, 2007.

Baratoux, D., P. Pinet, A. Gendrine, L. Kanner, J. Mustard, Y. Daydou, J.-P, Bibring, Impact craters mineralogy from OMEGA data: implications on alteration history, ejecta emplacement, and subsurface composition, *Seventh International Conference on Mars*, 2007.

Bibring, J. P., D. Loizeau, S. M. Pelkey, S. Murchie, J. F. Mustard, J. Bishop, B. L. Ehlmann, B. Gondet, N. Mangold, F. Poulet, L. H. Roach, F. Seelos, T. Omega, and the CRISM science team, Coupled OMEGA-CRISM Observations of Marwth Vallis, *Lunar and Planetary Science Conference XXXVIII*, Abstract 2160, 2007.

Bishop, J. L., Noe Dobrea, E., McKeown, N., Mustard, J. F., Ehlmann, B. L., Milliken, R. E., Murchie, S. Bibring, L., J., Poulet, F., Malaret, E., Hash, C. Layering of Al- and Fe/Mg-phyllosilicates in Western Mawrth Vallis, Mars, and Implications for Aqueous Processes During the Noachian Period. *Eos Trans. AGU, 88(52), Fall Meet. Suppl.*, Abstract P13D-1559, 2007.

Bishop, J. L., E. Noe Dobrea, S. L. Murchie, C. M. Weitz, W. M. Calvin, L. A. Roach, S. M. Pelkey. A. J. Brown, J. F. Mustard, J.-P. Bibring, and the MRO CRISM Team. Sulfates and mafic minerals in Juventae Chasma as seen by CRISM in coordination with OMEGA, HIRISE and context images. *Seventh International Conference on Mars*, Abstract 3350, 2007.

Bishop, J. L. S. L. Murchie, L. L. Tornabene, S. M. Pelkey, V. C. Gulick, B. L. Ehlmann, J. F. Mustard, A. J. Brown, and the MRO CRISM Team. Characterization of phyllosilicates in Libya Montes and the southern Isidis Basin, *Seventh International Conference on Mars*, 2007.

Crown, D. A., Bleamaster, L. F., Mest, S. C., Mustard, J. F. Geology of the NW Rim of the Hellas Basin. *Eos Trans. AGU, 88(52), Fall Meet. Suppl.*, Abstract P41A-0189, 2007.

Ehlmann, B. L., Mustard, J. F., Swayze, G. A., Griffes, J. L., Bishop, J. L., Milliken, R. E., Clark, R. N., Bibring, J. P., Poulet, F., Murchie, S. L., Seelos, F. P. Humm, D. Mineralogic Diversity and Geomorphology of CRISM-detected Phyllosilicate Bearing Materials in Nili Fossae, Mars: Implications for Aqueous Alteration. *Eos Trans. AGU, 88(52), Fall Meet. Suppl.*, Abstract P12A-04, 2007.

Ehlmann, B. L., Mustard J. F., J. L. Bishop, G. A. Swayze, S. M. Pelkey, R. N. Clark, R. E. Milliken, F. Poulet, W. M. Calvin, S. L. Murchie, L. H. Roach, J. L. Griffes, and the MRO CRISM team. New secondary minerals detected by MRO CRISM and their geologic settings: kaolinite, chlorite, illite/muscovite, and the possibility of serpentine or carbonate in Nili Fossae, *Seventh International Conference on Mars*, Abstract 3270, 2007.

Ehlmann, B. L., J. F. Mustard, S. M. Pelkey, L. H. Roach, F. Poulet, J. P. Bibring, S. L. Murchie, and the CRISM science team, New phyllosilicate mineral signatures from west of Nili Fossae, Mars through combined OMEGA-CRISM analysis, *Lunar and Planetary Science Conference XXXVIII*, Abstract 2078, 2007.

Fassett, C. I., Ehlmann, B. L., Head, J. W., Mustard, J. F., Schon, S. C., Murchie, S. L. Sedimentary Fan Deposits in Jezero Crater Lake, in the Nili Fossae Region, Mars: Meter- scale Layering and Phyllosilicate-Bearing Sediments. *Eos Trans. AGU, 88(52), Fall Meet. Suppl.*, Abstract P13D-1562, 2007.

Galford, G. L., Mustard, J., Melillo, J., Kicklighter, D., Cerri, C. E., Cerri, C. C. Rapid Land-Use Changes for Large-Scale Industrialized Agriculture and Associated Estimates of Greenhouse Gas Emissions in the Brazilian Amazon. *Eos Trans. AGU, 88(52), Fall Meet. Suppl.*, Abstract B43A-0895, 2007.

- Galford, G.L., J.F. Mustard, J.M. Melillo, C.C. Cerri, C.E.P. Cerri, D. Kicklighter, B. Felzer, Biogeochemical consequences of land-use transitions along Brazil's agricultural frontier. Invited poster, *NASA Land Cover and Land Use Change Science Team Meeting*, College Park, Maryland, 2007.
- Knudson, A. T., L. H. Roach, R. E. Arvidson, P. R. Christensen, S. L. Murchie, and J. F. Mustard, The geologic context of hematite in Valles Marineris: comparison of CRISM data to results from TES, THEMIS and OMEGA, *Lunar and Planetary Science Conference XXXVIII*, Abstract 2333, 2007.
- Knudson, A. T., R. E. Arvidson, P. R. Christensen, S. L. Murchie, J. F. Mustard, L. H. Roach, C. M. Weitz, S. M. Wiseman, and the CRISM science team, Aqueous geology in Valles Marineris: new insights in the relationship of hematite and sulfates from CRISM and HiRISE, *Seventh International Conference on Mars*, 2007.
- Mangold, N., F. Poulet, J. F. Mustard, J.-P. Bibring, Y. Langevin, B. Gondet, V. Anasan, P. Masson, H. Hoffmann, G. Neukum, and the OMEGA science team and the HRSC team, The clay-rich region of Nili Fossae as observed with Mars express data, *Seventh International Conference on Mars*, 2007.
- McGuire, P. C., Wolff, M. J., Smith, M. D., Arvidson, R. E., Murchie, S. L., Clancy, R. T., Roush, T. L., Cull, S. C., Lichtenberg, K. A., Wiseman, S. M., Green, R. N., Martin, T. Z., Cavender, P. J., Humm, D. C., Seelos, F. P., Seelos, K. D., Taylor, H. W., Ehlmann, B. L. Mustard, J. F., Pelkey, S. M., Titus, T. N., Hash, C. D., Malaret, E. R. CRISM Retrieval of Surface Lambert Albedos for Multispectral Mapping of Mars with DISORT- based Radiative Transfer Modeling: Phase 1 -- Using Historical Climatology for Temperatures, Aerosol Optical Depths, and Atmospheric Pressures. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P23A-1088, 2007.
- McKeown, N. K., AU: Bishop, J. L., Noe Dobrea, E., Ehlmann, B. L., Mustard, J. F., Murchie, S. L., Bibring, J., Poulet, F., Silver, E., Malaret, E., Hash, C., CRISM team. Phyllosilicate identification in Mawrth Vallis: an analysis of CRISM multispectral data and targeted images FRT4ECA and HRS307A. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P13D-1558, 2007.
- Michalski, J., Noe, E., Mustard, J., AU: Bibring, J. TI: A Thermal Infrared View of Altered Noachian Martian Crust. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P11E-06, 2007.
- Milliken, R. E., Swayze, G., Murchie, S., Bishop, J., Clark, R., Ehlmann, B., Grotzinger, J., Mustard, J., Weitz, C., TI: Spectral Evidence for Aqueous Alteration of the Plains Surrounding Valles Marineris, Mars. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P12A-02, 2007.
- Murchie, S., Roach, L., Milliken, R., Seelos, F., Wiseman, S., Humm, D., Mustard, J., Bibring, J., CRISM Team. Spectral Mapping of Interior Layered Deposits of Western Candor Chasma by CRISM. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P21C-04, 2007.
- Murchie, S., Milliken, R., Roach, L., Bibring, J.-P., Mustard, J., Pelkey, S., Seelos, F., Bishop, J. Grotzinger, J. and the CRISM science team, CRISM mapping of layered Material in western Candor Chasma, *Seventh International Conference on Mars*, 2007.
- Murchie, S., Bibring, J. P., Bishop, J., Humm, D., Milliken, R., Mustard, J., Pelkey, S., Roach, L., Seelos, F., Seelos, K. and the CRISM science team, First CRISM observations of layered material in western Candor Chasma, *Lunar and Planetary Science Conference XXXVIII*, Abstract 1476, 2007.
- Mustard, J. F., Murchie, S. L., Pelkey, S. M., Ehlmann, B. L., Milliken, R. E., Grant, J. A., Bibring, J.-P., Poulet, F., Bishop, J., Arvidson, R. E., Roach, L., Seelos, F., Humm, D., Langevin, Y., and Gondet, B., New Insights into Hydrated Silicate Minerals Observed on Mars by OMEGACRISM. *European Space Agency European Mars Science and Exploration Conference*, Abstract 1120981, 2007.
- Mustard, J. F., Thollot, P., Murchie, S. L., Ehlmann, B. L., Roach, L. A., Seelos, F. Poulet, F., Bibring, J.-P., Baratoux, D., Pinet, P., Langevin, Y., Gondet, B., OMEGA-CRISM Characterization of Magic of Crustal Composition in the Syrtis Major Region. *European Space Agency European Mars Science and Exploration Conference*, Abstract 1124670, 2007.
- Mustard, J. F., Bibring, J. Composition, Stratigraphy, and Structure of the Phyllosian/Noachian Crust and Implications for Early Mars I. *Eos Trans. AGU*, 88 (52), *Fall Meet. Suppl.*, Abstract P11E, 2007.
- Mustard, J. F., Murchie, S. L., Pelkey, S. M., Ehlmann, B. L., Milliken, R. E., Grant, J. A., Bibring, J., Poulet, F., Bishop, J. L., Roach, L. E., Seelos, F., Arvidson, R. E., Swayze, G., Clark, R., Wiseman, S., Humm, D. Occurrence and Stratigraphy of Phyllosilicate and Hydrated Silicate Minerals on Mars from OMEGA and CRISM. *Eos Trans. AGU*, 88(52), *Fall Meet. Suppl.*, Abstract P11E-03, 2007.

- Mustard, J. F., P. Thollot, S. L. Murchie, S. M. Pelkey, B. L. Ehlmann, L. A. Roach, F. Seelos, F. Poulet, J.-P. Bibring, and the CRISM science team, OMEGA-CRISM characterization of mafic crustal composition: pyroxene, *Seventh International Conference on Mars*, 2007.
- Mustard, J. F., S. L. Murchie, S. M. Pelkey, B. L. Ehlmann, R. E. Milliken, J. A. Grant, J.-P. Bibring, F. Poulet, J. Bishop, L. Roach, F. Seelos, D. Humm, and the CRISM science team, Overview of hydrated silicate minerals observed on Mars by CRISM, *Seventh International Conference on Mars*, Abstract 3240, 2007.
- Mustard, J. F., S. L. Murchie, B. L. Ehlmann, S. M. Pelkey, L. A. Roach, F. Seelos, F. Poulet, J. P. Bibring, N. Mangold, J. A. Grant, R. E. Milliken, and the CRISM science team, CRISM-OMEGA observations of phyllosilicate-olivine stratigraphy in Nili Fossae, Mars. *Lunar and Planetary Science Conference XXXVIII*, Abstract 2071, 2007.
- Mustard, J. F., Pelkey, S. M., Titus, T. N., Hash, C. D., Malaret, E. R. CRISM Retrieval of Surface Lambert Albedos for Multispectral Mapping of Mars with DISORT- based Radiative Transfer Modeling: Phase 1 -- Using Historical Climatology for Temperatures, Aerosol Optical Depths, and Atmospheric Pressures, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract P23A-1088, 2007.
- Noe Dobrea, E. Z., Bishop, J. L., McKeown, N., Mustard, J. F., Ehlmann, B. L., Murchie, S. L., Bibring, J., Poulet, F., Malaret, E., Hash, C. The extent of phyllosilicates in the northern highlands around Mawrth Vallis: CRISM observations of Western Arabia Terra. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract P13D-1560, 2007.
- Parmentier, E. M., Mustard, J. F., Ehlmann, B. L., Roach, L. H. Deep Hydrothermal Circulation and Implications for the Early Crustal Compositional and Thermal Evolution of Mars. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract P11E-04 INVITED, 2007.
- Pelkey, S. M., J. F. Mustard, S. Murchie, F. Poulet, J. P. Bibring, J. Bishop, N. Izenberg, F. Seelos, B. L. Ehlmann, L. H. Roach, R. E. Milliken, and the CRISM science team, CRISM Observations of Hydrated Craters Deposits in Terra Tyrrhena, Mars, *Lunar and Planetary Science Conference XXXVIII*, Abstract 1994, 2007.
- Pieters, C. M., J. Boardman, B. Buratti, R. Clark, R. Green, J. W. Head, S. Lundeen, E. Malaret, T. B. McCord, J. F. Mustard, C. Runyon, M. Staid, J. Sunshine, L. Taylor, S. Tompkins, and P. Varanasi, M3 on Chandrayaan-1: Strategy for Mineral Assessment of the Moon, *Lunar and Planetary Science Conference XXXVIII*, Abstract 1295, 2007.
- Pinet, P., C., Heuripeau, F., Clenet, H., Chevrel, S., Daydou, Y., Baratoux, D., Rosemberg, C., Bibring, J.P., Poulet, F., Gondet, B., Mustard, J., LeMoužlic, S., Bellucci G., and the OMEGA team, Mafic Mineralogy variation across Syrtis Major Shield and Surroundings as inferred from Visible-Near-Infrared Spectroscopy by OMEGA/MARS EXPRESS, *European Space Agency European Mars Science and Exploration Conference*, Abstract 1118536, 2007.
- Pinet, P. C., F. Heuripeau, H. Clenet, S. Chevrel, Y. Daydou, D. Baratoux, C. Rosemberg, J.-P. Bibring, F. Poulet, B. Gondet, J. Mustard, S. LeMouélic, G. Bellucci, and the OMEGA science team, Mafic mineralogy variations across Syrtis major shield and surroundings as inferred from visible-near-inferred spectroscopy by OMEGA/Mars express, *Seventh International Conference on Mars*, 2007.
- Poulet, F., J.-P. Bibring, B. Gondet, Y. Langevin, J. F. Mustard, N. Mangold, V. Chevrier, A. Gendrine, Discovery, mapping and mineralogy of phyllosilicates on Mars by MEx-OMEGA: a reappraisal, *Seventh International Conference on Mars*, 2007.
- Poulet, F., Bibring, J.-P., Langevin, Y., Gondet, B., Mangold, N., Loizeau, D., Chevrier V., Mustard, J., Identification, Mapping and Mineralogy of Phyllosilicates on Mars as seen by MEx-OMEGA, *European Space Agency European Mars Science and Exploration Conference*, Abstract 1117363, 2007.
- Roach, L. H., Mustard, J. F., Murchie, S. L., Bishop, J. L., Arvidson, R. E., Morris, R. V., Milliken, R. E., Lichtenberg, K. A. Multi-sulfate and Iron Oxide Assemblages Within the Valles Marineris Interior Layered Deposits. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract P21C-05, 2007.
- Roach, L.H., J.F. Mustard, S.L. Murchie, J.L. Bishop, C.M. Weitz, A.T. Knudson, J.-P. Bibring, S.M. Pelkey, B.L. Ehlmann, and the CRISM science team, Magnesium and iron sulfate variety and distribution in East Candor and Capri Chasma, Valles Marineris, *Seventh International Conference on Mars*, 2007.

- Roach, L. H., J. F. Mustard, S. Murchie, Y. Langevin, J. P. Bibring, J. Bishop, N. Bridges, A. Brown, S. Byrne, B. L. Ehlmann, K. Herkenhoff, P. C. McGuire, R. E. Milliken, S. Pelkey, F. Poulet, F. P. Seelos, K. Seelos, and The CRISM science team, CRISM Spectral Signatures of the North Polar Gypsum Dunes, *Lunar and Planetary Science Conference XXXVIII*, Abstract 1970, 2007.
- Roach, L. H., J. F. Mustard, S. Murchie, C. M. Weitz, B. L. Ehlmann, S. Pelkey, F. P. Seelos, K. Seelos, J. P. Bibring, and The CRISM science team, Sulfate identification in east candor, Valles Marineris with CRISM visible-infrared spectra, *Lunar and Planetary Science Conference XXXVIII*, Abstract 2106, 2007.
- Searls, M., M. Mellon, S. Martinez-Alonso, and the HiRISE Team, Mid-latitude dissected mantle terrain as viewed from HiRISE, *Seventh International Conference on Mars*, 2007.
- Seelos, F., K. Seelos, S. Murchie, J. Mustard, J. Giffes, and the CRISM science team, MRO CRISM observations of the MSL candidate landing sites, *Seventh International Conference on Mars*, 2007.
- Swayze, G. A. R. E. Milliken, R. N. Clark, J. L. Bishop, B. L. Ehlmann, S. M. Pelkey, J. F. Mustard, S. L. Murchie, A. J. Brown and the MRO CRISM Team, Spectral evidence for hydrated volcanic and/or impact glass on Mars with MRO CRISM, *Seventh International Conference on Mars*, 2007.
- Wray, J. J. S. W. Squyres, B. L. Ehlmann, J. F. Mustard, and the HiRISE Team. Meter-scale morphology and stratigraphy of phyllosilicate-rich outcrops in Mawrth Vallis, *Seventh International Conference on Mars*, 2007.

2006

-
- Baratoux, D., A. Gendrin, P. Pinet, J. Mustard, L. Kanner, F. Heuripeau, H. Clenet, Y. Daydou, J. Vaucher, S. Chevrel, J. P. Bibring, and T. Omega Co-Investigator, Toward a 3-D view of the mineralogy of Syrtis Major through impact cratering from OMEGA data, *Lunar and Planetary Science Conference XXXVII*, Abstract 1376, 2006.
- Bibring, J. P., Y. Langevin, F. Poulet, B. Gondet, A. Gendrin, J. Mustard, N. Mangold, R. E. Arvidson, and The CRISM science team, The Mars history derived from the mineralogical data of OMEGA/MEx acquired during the first Martian year of operations, *Lunar and Planetary Science Conference XXXVII*, Abstract 2276, 2006.
- Chemtob, S. M., R. E. Arvidson, D. C. Fernandez-Remolar, R. Amils, R. V. Morris, D. W. Ming, O. Prieto-Ballesteros, J. F. Mustard, L. Hutchison, T. C. Stein, C. E. Donovan, G. M. Fairchild, L. R. Friedlander, N. M. Karas, M. N. Klasen, M. P. Mendenhall, E. M. Robinson, S. E. Steinhardt, and L. R. Weber, Identification of hydrated sulfates collected in the northern Rio Tinto valley by reflectance and raman spectroscopy, *Lunar and Planetary Science Conference XXXVII*, Abstract 1941, 2006.
- Combe, J. P., S. Le Mouélic, C. Sotin, A. Gendrin, L. Le Deit, J. F. Mustard, J. P. Bibring, B. Gondet, Y. Langevin, and The CRISM science team, Analysis of OMEGA/mars express hyperspectral data using a linear unmixing model: methods and preliminary results, *Lunar and Planetary Science Conference XXXVII*, Abstract 2010, 2006.
- Fernandez-Remolar, D. C., O. Prieto-Ballesteros, S. M. Chemtob, R. V. Morris, D. Ming, A. H. Knoll, L. Hutchison, J. F. Mustard, R. Amils, and R. E. Arvidson, Geochemical processes driving the Rio Tinto acidic sedimentation: insights into sedimentary sequences on early Mars, *Lunar and Planetary Science Conference XXXVII*, Abstract 1809, 2006.
- Fisher, J. I., A. D. Richardson, J. F. Mustard, Phenology model from weather station meteorology does not predict satellite-based onset, *Eos Trans. AGU*, 87(52), *Fall Meet. Suppl.*, Abstracts, 31, 1061, 2006.
- Galford, G.L., J.F. Mustard, J.M. Melillo, A. Gendrin, C.C. Cerri, C.E.P. Cerri, Growing agricultural frontiers: spread and intensification of mechanized agriculture in the Brazilian Amazon. *Eos Trans. AGU*, 87(52), *Fall Meet. Suppl.*, Abstract B31C-1123, 2006.
- Gendrin, A., J. P. Bibring, J. Mustard, L. Kanner, N. Mangold, B. Gondet, Y. Langevin, F. Poulet, D. Baratoux, C. Sotin, and S. Le Mouelic, Strong pyroxene absorption bands on mars identified by OMEGA: geological counterpart, *Lunar and Planetary Science Conference XXXVII*, Abstract 1858, 2006.
- Gomez, C., F. Poulet, J. P. Bibring, Y. Langevin, B. Gondet, S. M. Pelkey, J. F. Mustard, G. Bellucci, and The CRISM science team, Global mineral maps on Mars, *Lunar and Planetary Science Conference XXXVII*, Abstract 1405, 2006.

- Hermance, J. F., R. W., Jacob, B. A. Bradley, J. F. Mustard, Dynamically characterizing a variety of phenological responses of semi-arid areas to hydrological inputs using multi-year AVHRR NDVI time series and HYDRO1k-type terrain parameters, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 31, 1080, 2006.
- Hutchison, L. E., J. F. Mustard, D. Fernandez-Remolar, and R. Amils, Quantifying mineralogic diversity from remotely sensed VNIR spectra to identify mineralogic hotspots, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 23, 0074, 2006.
- Jacob, R., B. A. Bradley, J. Hermance, J. F. Mustard, I: Phenology-based land cover classification and assessment of land cover trends: a case study in the western U.S., *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 33, 05, 2006.
- Jouglet, D., F. Poulet, J. P. Bibring, Y. Langevin, B. Gondet, R. E. Milliken, and J. F. Mustard, Analysis of Mars surface hydration through the MEx/OMEGA observation of the 3 μm absorption band, *paper presented at European Planetary Science Congress*, 2006.
- Jouglet, D., F. Poulet, R. Milliken, J. Mustard, J. Bibring, Y. Langevin, and B. Gondet, Mars surface hydration seen by MEx/OMEGA through the 3 μm feature, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 23, 0089, 2006.
- Jouglet, D., F. Poulet, J. F. Mustard, R. E. Milliken, J. P. Bibring, Y. Langevin, and B. Gondet, Observation of 3 μm hydration feature on Mars from OMEGA-MEx data, *Lunar and Planetary Science Conference XXXVII*, Abstract 1741, 2006.
- Kanner, L. C., J. F. Mustard, A. Gendrin, and J. P. Bibring, Joint OMEGA-THEMIS investigation of TES type II deposits and local terrain, Nili Patera, Syrtis Major, Mars *Lunar and Planetary Science Conference XXXVII*, Abstract 1648, 2006.
- Le Mouélic, S., J. P. Combe, C. Sotin, L. Le Deit, A. Gendrin, J. Mustard, J. P. Bibring, Y. Langevin, B. Gondet, and P. Pinet, Analysis of OMEGA/Mars Express hyperspectral images with a linear unmixing model, *paper presented at European Planetary Science Congress*, 2006.
- Le Mouélic, S., C. Sotin, J. P. Combe, L. Ledet, A. Gendrin, J. Mustard, J. P. Bibring, Y. Langevin, B. Gondet, and P. Pinet, Composition of the dust on Mars derived from OMEGA hyperspectral images, *Lunar and Planetary Science Conference XXXVII*, Abstract 1409, 2006.
- Mangold, N., F. Poulet, J. F. Mustard, J. P. Bibring, Y. Langevin, B. Gondet, V. Ansan, P. Masson, H. Hoffman, G. Neukum, H. C.-I. Team, and I. T. Omega Co, Correlation between phyllosilicates, olivine and landforms in Nili Fossae region, Mars, *Lunar and Planetary Science Conference XXXVII*, Abstract 1791, 2006.
- McGuire, P. C., R. E. Arvidson, S. L. Murchie, M. J. Wolff, M. D. Smith, T. Z. Martin, R. E. Milliken, J. F. Mustard, S. M. Pelkey, K. A. Lichtenberg, P. J. Cavender, D. C. Humm, T. N. Titus, and E. R. Malaret, First retrieval of surface Lambert Albedos from Mars reconnaissance orbiter CRISM data, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 23, 0058, 2006.
- McGuire, P. C., M. J. Wolff, R. E. Arvidson, M. D. Smith, R. T. Clancy, S. L. Murchie, J. F. Mustard, S. M. Pelkey, and T. Z. Martin, Retrieval of surface Lambert Albedos from the Mars reconnaissance orbiter CRISM data, *Lunar and Planetary Science Conference XXXVII*, Abstract 1529, 2006.
- Milliken, R. E., and J. F. Mustard, Estimating absolute H₂O content of low-Albedo materials using reflectance spectroscopy, *Lunar and Planetary Science Conference XXXVII*, Abstract 1954, 2006.
- Milliken, R. E., J. F. Mustard, F. Poulet, J. P. Bibring, Y. Langevin, B. Gondet, and S. Pelkey, The H₂O content of the martian surface as seen by Mars express OMEGA, *Lunar and Planetary Science Conference XXXVII*, Abstract 1987, 2006.
- Milliken, R. E., F. Poulet, J. F. Mustard, D. Jouglet, J. Bibring, Y. Langevin, B. Gondet, and S. Pelkey, The hydration state of the Martian surface as seen by Mars Express OMEGA, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 21, 07, 2006.

- Murchie, S., R. Arvidson, P. Bedini, K. Beisser, J. Bibring, J. Bishop, A. Brown, J. Boldt, P. Cavender, T. Choo, R. T. Clancy, E. H. Darlington, D. Des Marais, R. Espiritu, D. Fort, R. Green, E. Guinness, J. Hayes, C. Hash, K. Heffernan, D. Humm, J. Hutcheson, N. Izenberg, J. Lees, E. Malaret, T. Martin, J. A. McGovern, P. McGuire, R. Morris, J. Mustard, S. Pelkey, M. Robinson, T. Roush, F. Seelos, K. Seelos, S. Slavney, M. Smith, W. J. Shyong, K. Strohbahn, H. Taylor, M. Wirzburger, and M. Wolff, First CRISM observations of Mars, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 33, 04, 2006.
- Murchie, S., R. Arvidson, P. Bedini, J.-P. Bibring, J. Bishop, P. Caven-de1, T. Choo, R. T. Clancy, D. Des Marais, R. Espiritu, R. Green, E. Guinness, J. Hayes, C. Hash, K. Heffernan, D. Humm, J. Hutcheson, N. Izenberg, E. Malare, T. Martin, J. A. McGovern, P. McGui2, R. Morris, J. Mustard, S. Pelkey, M. Robinson, T. Roush, F. Seelos, S. Slavney, M. Smith, W.-J. Shyong, K. Strohbahn, H. Taylor, M. Wirzburger, and M. Wolff, Looking forward to CRISM, *LPI Contributions*, Abstract 7022, 2006.
- Mustard, J. F., Multi-instrument sulfate detection and mineral stability on Mars, *LPI Contributions*, Abstract 7055, 2006.
- Mustard, J. F., J. Bibring, Y. Langevin, F. Poulet, D. Jouglet, B. Gondet, R. E. Milliken, G. Gellucci, R. Arvidson, and N. Mangold, Mars mineralogy from OMEGA visible-near infrared measurements, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 21, 01, 2006.
- Mustard, J. F., F. Poulet, J. W. Head, N. Mangold, J. P. Bibring, C. Fassett, Y. Langevin, and G. Neukum, Ancient crust, aqueous alteration, and impact melt preserved in the Isidis Basin, Mars, *Lunar and Planetary Science Conference XXXVII*, Abstract 1683, 2006.
- Nicholis, M., R. E. Milliken, J. F. Mustard, and M. Rutherford, VIS-NIR Spectral properties of olivine in a basaltic glass: implications for olivine-rich terrains on Mars, *Lunar and Planetary Science Conference XXXVII*, Abstract 2378, 2006.
- Pieters, C., J. Boardman, B. J. Buratti, R. N. Clark, R. Green, J. W. Head, III, T. B. McCord, J. Mustard, C. Runyon, M. Staid, J. Sunshine, L. Taylor, and S. Tompkins, Global Mineralogy of the Moon: a cornerstone to science and exploration, *Lunar and Planetary Science Conference XXXVII*, Abstract 1630, 2006.
- Poulet, F., J. P. Bibring, Y. Langevin, B. Gondet, J. Mustard, A. Gendrin, N. Mangold, D. Loizeau, R. E. Arvidson, and V. Chevrier, The distribution of phyllosilicates on Mars from the OMEGA-MEx imaging spectrometer, *Lunar and Planetary Science Conference XXXVII*, Abstract 1698, 2006.
- Poulet, F., C. Gomez, J. Bibring, Y. Langevin, B. Gondet, and J. Mustard, Martian surface mineralogy from OMEGA/MEx: global mineral maps, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 21, 03, 2006.
- Poulet, F., J. Mustard, R. E. Arvidson, J. P. Bibring, Y. Langevin, B. Gondet, R. Milliken, and S. Pelkey, Mineralogy of the PHOENIX landing sites from the OMEGA-MEX imaging spectrometer, *Lunar and Planetary Science Conference XXXVII*, Abstract 1706, 2006.
- Wyatt, M. B., and J. F. Mustard, Constraints on mineral-phase abundances and compositions in the low-albedo northern plains of Mars using MGS-TES, OMEGA, and laboratory spectral data, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstracts, 21, 04, 2006.

2005

- Arvidson, R., A. Gendrin, J.-P. Bibring, F. Poulet, Y. Langevin, M. Wolff, J. F. Mustard, R. Morris, Mars express OMEGA observations over Meridiani Planum, *First Mars Express Science Conference*, 2005.
- Bishop, J. L., J. P. Bibring, M. D. Dyar, A. Gendrin, M. D. Lane, J. F. Mustard, M. Parente, and F. Poulet, Searching for Aqueous Activity on Mars through Analyses of OMEGA Spectra, *paper presented at Bulletin of the American Astronomical Society*, 2005.
- Bradley, B. J. F. Mustard, R. Jacob, J. Hermance, Using a curve-fitting methodology on remotely sensed time series to detect subtle patterns of land surface phenology, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract B43B-0273, 2005.
- Bradley, B.A., J.F. Mustard, and L.C. Schneider, Assessing Spatial Changes and Drivers of Biological Invasions Using Remote Sensing: The Case of Cheatgrass in Northern Nevada, *American Association of Geographers Annual Meeting*, April, 2005.

- Combe, J.-P., C. Sotin, S. Le Mouélic, P. Launeau, J. F. Mustard, A. Gendrin, J-P. Bibring, B. Gondet, Y. Langevin, The Omega Science Team, Methodology of hyperspectral reflectance data analysis for mineralogical mapping of planetary surfaces : application to OMEGA/mars-express images, *OMEGA Lunar and Planetary Science Conference XXXVI*, Abstract 1633, 2005.
- Fisher, J. I., J. F. Mustard, M. Vadeboncour, Green leaf phenology at Landsat resolution: scaling from the plot to satellite, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract B41E-05, 2005.
- Gendrin, A. J.-P. Bibring, J. F. Mustard, L. Kanner, B. Gondet, Y. Langevin, The OMEGA Team, Pyroxenes on Mars as seen by OMEGA/Mars Express; areas of high concentrations and global distribution, an update, *EGU General Assembly*, 2005.
- Gendrin, A., J-P. Bibring, J. F. Mustard, N. Mangold, C. Quantin, B. Gondet, Y. Langevin, F. Poulet, C. Sotin, S. Le Mouélic, J-P. Combe, L. Hutchison, The Omega Team, Identification of predominant ferric signatures in association to the martian sulfate deposits, *Lunar and Planetary Science Conference XXXVI*, Abstract 1378, 2005.
- Gendrin, A., N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, F. Poulet, G. Bonnelo, C. Quantin, J. F. Mustard, R. E. Arvidson, S. Le Mouélic, The Omega Team, Sulfates on Mars layered terrains: OMEGA high resolution campaign confirms low resolutions identifications, *Lunar and Planetary Science Conference XXXVI*, Abstract 1363, 2005.
- Gendrin, A., N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, F. Poulet, C. Quantin, G. Bonnelo, J. F. Mustard, R. E. Arvidson, S. Le Mouélic, The Omega team, Identification and mapping of sulfates by OMEGA/Mars express, *First Mars Express Science Conference*, 2005.
- Gendrin, A., N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, F. Poulet, G. Bonnelo, C. Quantin, J. F. Mustard, R. Arvidson, The OMEGA Team, Sulfate deposits seen at high resolution by OMEGA/Mars Express, *EGU General Assembly*, 2005.
- Gendrine, A., J. P. Bibring, F. Poulet, J. Mustard, L. Kanner, B. Gondet, and Y. Langevin, The distribution of mafic minerals on Mars as inferred by the OMEGA/Mars Express dataset, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P13C-06, 2005.
- Hermance, J. F., R. W. Jacob, B. A. Bradley, J. F. Mustard, a user's version view of a robustified, bayesian weighted least-squares recursive algorithm for interpolating AVHRR-NDVI data: applications to an animated visualization of the phenology of a semi-arid study area, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract B43B-0275, 2005.
- Hutchison, L., J.F. Mustard, A. Gendrin, J-P. Bibring, Y. Langevin, B. Gondet, N. Mangold, and the OMEGA Science Team. Mafic Polyhydrated Sulfates and Kieserite in Capri Chasma. *Lunar and Planetary Science Conference XXXVI*, Abstract 1404, 2005.
- Hutchison, L. J.F. Mustard, A. Gendrin, L.A. Amaral-Zettler, R. Amils, D. Fernandez-Remolar. In-Situ Spectroscopic Characterization of Acidic Sulfate Deposits of Rio Tinto, a Mars analog. NAI, abstract, 2005.
- Hutchison, L., J.F. Mustard, A. Gendrin, L.A. Amaral Zettler, D. Fernandez-Remolar. "Implications of scaling visible and near IR spectroscopic data on detection of mineralogy: A case study in Rio Tinto, Spain." GSA annual meeting, Salt Lake City, 2005
- Kanner, L.C., J.F. Mustard, J-P. Bibring, A. Gendrin, Y. Langevin, B. Gondet, S. Pelkey, and the OMEGA Science Team, Analysis of Martian Pyroxene Compositions in Syrtis Major: Full MGM Application to OMEGA *Lunar and Planetary Science Conference XXXVI*, Abstract 1730, 2005.
- LeMouelic, S., C. Sotin, J-Ph Combe, J-Ph, Y. Quesnel, B. Langlais, J. F. Mustard, J.-P. Bibring, Y. Langevin, A. Gendrin, B. Gondet, The OMEGA Team, Mineralogy of the magnetic anomaly site South of Sytis derived from OMEGA/MarsExpress hyperspectral data, *EGU General Assembly*, 2005.
- Mangold, N., A. Gendrin, C. Quantin, F. Poulet, J.-P. Bibring, B. Gondet, J. F. Mustard, A new view of the geology of valles marineris interior deposits with OMEGA spectral data, *First Mars Express Science Conference*, 2005.
- Milliken, R. E., J. F. Mustard, F. Poulet, J. Bibring, and Y. Langevin, Estimating the absolute water content of Arabia Terra using Mars express OMEGA data, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P14A-02, 2005.

- Milliken, R. E. and J. F. Mustard, A laboratory-based model for estimating absolute H₂O content of minerals using VIS-NIR spectroscopy, *Lunar and Planetary Science Conference XXXVI*, Abstract, 1368, 2005.
- Milliken, R. E., J. F. Mustard, J-P Bibring, Y. Langevin, B. Gondet, S. Pelkey, and the Mars Express OMEGA team, Mapping the water content of the martian surface using Mars Express OMEGA data, *Lunar and Planetary Science Conference XXXVI*, Abstract, 1370, 2005.
- Mustard, J.F., A. Gendrin, F. Poulet, J.-P. Bibring, Y. Langevin, S. Erard, S. Pelkey, R. Milliken, L. Kanner, OMEGA analysis of mafic and hydrated minerals associated with the syrtis major region of Mars, *First Mars Express Science Conference*, 2005.
- Mustard, J.F., F. Poulet, A. Gendrin, N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, G. Belluci, F. Altieri, and the OMEGA Science Team, Compositional diversity of the martian crust from OMEGA observations, *Lunar and Planetary Science Conference XXXVI*, Abstract, 1316, 2005.
- Mustard, J. F., F. Poulet, A. Gendrin, J. W. III Head, N. Mangold, J.-P. Bibring, Y. Langevin, B. Gondet, C. Sotin, S. Le Mouélic, P. C. Pinet, The Omega Science Team, Crustal formation, volcanism, and alteration in the Syrtis major region revealed by OMEGA data, *Lunar and Planetary Science Conference XXXVI*, Abstract, 1341, 2005.
- Mustard, J. F., F. Poulet, J. W. Head, N. Mangold, and J. P. Bibring, Ancient crust, hydrolytic weathering, and impact melt preserved in the Isidis Basin, Mars, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P14A-01, 2005.
- Pelkey, S. M., J. F. Mustard, J. Bibring, R. Milliken, Y. Langevin, B. Gondet, A. Gendrin, F. Poulet, and S. Murchie (2005), Strengths and limitations of spectral parameters for mapping surface composition on Mars, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P21B-0154, 2005.
- Pelkey, S. M., J. F. Mustard, J.-P. Bibring, R. Milliken, Y. Langevin, B. Gondet, A. Gendrin, F. Poulet, S. Erard, S. Murchie, R. Arvidson, the OMEGA Science Team, the CRISM Team. Global spectral and compositional diversity of Mars: a test of CRISM global mapping with Mars Express OMEGA data. *Lunar and Planetary Science Conference XXXVI*, Abstract, 1458, 2005.
- Pelkey, S. M., A. Gendrin, J. F. Mustard, N. Mangold, J-P. Bibring, Y. Langevin, B. Gondet, and the OMEGA Science Team. An integrated study of OMEGA-identified mineral deposits in eastern Hebes Chasma, Mars. *Lunar and Planetary Science Conference XXXVI*, Abstract, 1891, 2005.
- Pollock, H. R., R. E. Haring, B. Sutin, J. F. Mustard, J. Boardman, Wide Field Imaging Spectrometer (WFIS) -- Instrument Design and first field tests, *Lunar and Planetary Science Conference XXXVI*, Abstract 2310, 2005.
- Poulet, F., J.-P. Bibring, J. F. Mustard, A. Gendrin, Y. Langevin, B. Gondet, N. Mangold, Hydrated minerals on Mars as seen by MEx-OMEGA, *EGU General Assembly*, 2005.
- Poulet, F., J. F. Mustard, Y. Langevin, J-P. Bibring, A. Gendrin, B. Gondet, C. Gomez, Variation of the 3 micron absorption feature on Mars, *First Mars Express Science Conference*, 2005.
- Poulet, F., N. Mangold, J. F. Mustard, J-P. Bibring, A. Gendrin, Y. Langevin, B. Gondet, Ph Masson, J. W. III Head, G. Neukum, the OMEGA Science Team; The HRSC team, spectral and morphologic properties of Nili Fossae, *Lunar and Planetary Science Conference XXXVI*, Abstract 1819, 2005.
- Poulet, F., N. Mangold, J. Bibring, D. Loizeau, J. F. Mustard, J. W. Head, A. Gendrin, V. Ansan, C. Gomez, P. Masson, Neukum, and G. Omega-Hrsc Co-I Teams, Evidence for phyllosilicates in the early Mars crust at Nili Fossae and Mawrth Valles using OMEGA and HRSC data, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract P21B-0144, 2005.
- Poulet, F., J. P. Bibring, A. Gendrin, N. Mangold, J. Mustard, Y. Langevin, B. Gondet, D. Loizeau, C. Gomez, V. Chevrier, G. Neukum, O. Team, and H. Team, Phyllosilicates as revealed by OMEGA and its implication for the early Martian environment, *paper presented at Bulletin of the American Astronomical Society*, 2005.
- Sotin, C., S. Le Mouélic, J-P. Combe, Y. Quesnel, B. Langlais, J. F. Mustard, A. Ladai, J-P. Bibring, Y. Langevin, A. Gendrin, S. Erard, B. Gondet. The Omega Science Team, Mineralogy of the magnetic anomaly site South of Syrtis derived from OMEGA/Mars express hyperspectral data, *Lunar and Planetary Science Conference XXXVI*, Abstract 1696, 2005.

2004

- Bradley, B., R. Jacob, J. Hermance, J. Mustard, Distinguishing inter-annual phenological variability from long-term change in the Great Basin using a new method of time-series modeling, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl, 2004.
- Fisher, J.I., J.F. Mustard, P. Sanou, Trajectories of vegetation change under controlled land-use in Sudanian West Africa, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl, 2004.
- Gendrin, A., and J.F. Mustard, Sulfate-Cemented Soils Detected in tTES Data Through the application of an Automatic Band Detection Algorithm, *Lunar and Planetary Science Conference XXXV*, Abstract 1205, 2004.
- Gendrin, A., F. Poulet, N. Charvin, Y. Langevin, and J.F. Mustard, Combining a non linear unmixing model and the tetracorder algorithm application to the ISM dataset, *Lunar and Planetary Science Conference XXXV*, Abstract 1207, 2004.
- Head III, J.W., and J.F. Mustard, Geological evidence for climate change on Mars, *Lunar and Planetary Science Conference XXXV*, Abstract 1889, 2004.
- Jacob, R.W., B. Bradley, J.F. Hermance, J. Mustard, A robust, bayesian approach to the analysis of vegetative phenology using satellite vegetative indices in the presence of outliers, noisy data and data gaps, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl, 2004.
- Milliken, R.E., and J.F. Mustard, Determining water content of geologic materials using reflectance spectroscopy, *Lunar and Planetary Science Conference XXXV*, Abstract 1620, 2004.
- Mustard, J.F., A simple approach to estimating surface emissivity with THEMIS, *Lunar and Planetary science Conference XXXV*, Abstract 1552, 2004.
- Mustard, J.F., J-P. Bibring, S. Pelkey, R.E. Milliken, Y. Langevin, B. Gondet, A. Gendrin, F. Poulet, S. Erard, S.L. Murchie, R.E. Arvidson, Global spectral and compositional diversity of mars: a test of CRISM global mapping with mars express OMEGA data, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl, 2004.

2003

- Bonello, G., J. P. Bibring, R. V. Morris, and J. F. Mustard, OMEGA Observations of Mars Analogue Rocks, *Lunar and Planetary Science Conference XXXIV*, CD-ROM, Abstract #1664, 2003.
- Bradley, B.A., J.F. Mustard, and J. Albert, "How Big is the Problem? Constraints on the Extent of Cheatgrass Invasion in the Great Basin, US", *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.
- Bradley, B., J. Mustard, and J. Albert, "Using ArcGIS to Verify Remotely Sensed Extents of Invasive Species", NEArc Conference, 2003
- Bradley, B.A., J.F. Mustard, and R. Tausch, "Regional Mapping of Cheatgrass (*Bromus tectorum*) in the Great Basin, US", ESA Annual Meeting, 2003
- Bradley, B., and J. F. Mustard, Invasive species in the Great Basin, US: Identifying regional anomalous vegetation response and local land use drivers using AVHRR and Landsat TM, *AGU Chapman Conference (Ecosystem Interactions with Land Use Change)*, June 2003.
- Fisher, J. I. and J. F. Mustard, Constructing a climatology of Narragansett Bay surface temperature with satellite thermal imagery. *The Rhode Island Natural History Survey Conference*, RI, March 7, 2003.
- Fisher, J. I., and J. F. Mustard, Constructing a high resolution sea surface climatology of Southern New England using satellite thermal imagery. *New England Estuarine Research Society/Southern New England Chapter of the American Fisheries Society Joint Meeting*, Fairhaven, MA, Talk, May 10, 2003.
- Fisher, J.I., and J.F. Mustard, High spatial resolution sea surface climatology from Landsat thermal infrared data. *Ecological Society of America Conference*. Savannah, GA. August, 7, 2003.
- Head, J.W., J.F. Mustard, M.A. Kreslavsky, R.E. Milliken, Geological Evidence for Recent Ice Ages on Mars, *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.
- Milliken, R. E. and J. F. Mustard, Erosional morphologies and characteristics of latitude-dependent surface mantles on Mars, *Sixth International Conference on Mars*, Abstract #3240, Pasadena, 2003.
- Milliken, R. E. and J. F. Mustard, Observations and Modeling of the Absorbed Water in Montmorillonite with Reflectance Spectroscopy, *Lunar and Planetary Science Conference XXXIV*, CD-ROM, Abstract #1345, 2003.

- Milliken, R. E. and J. F. Mustard, Quantifying changes in water content of montmorillonite using reflectance spectroscopy, *Clay Minerals Society 40th Meeting*, Athens, Ga., 2003.
- Mustard, J. F., First Look at the Thermophysical Properties of the Dissected Mantle, *Lunar and Planetary Science Conference XXXIV*, CD-ROM, Abstract #2005, 2003.
- Mustard, J.F., Geomorphic Indicators of ground Ice on Mars and Evidence for Climate Change, *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.
- Mustard, J.F., Mars Surface Composition Through Pan-spectral Analysis: Mafic Mineralogy, Alteration, And Hydration, *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.
- Mustard, J. F., M. A. Kreslavsky, J. W. I. Head, and R. E. Milliken, Correlating Meter-Scale Morphology and Kilometer-Scale Topography: Evidence for a Degraded Mid-Latitude Surface Layer on Mars, *Lunar and Planetary Science Conference XXXIV*, CD-ROM, Abstract #1289, 2003.
- Mustard, J. F., J. W. Head, M. A. Kreslavsky, R. E. Milliken, and D. R. Marchant, Geological evidence for recent martian ice ages, *Sixth International Conference on Mars*, Abstract #3250, Pasadena, 2003.
- Tokar, R.L., M.A. Kreslavsky, J.F. Mustard, W.C. Feldman, J.W. Head, K.R. Moore, T.H. Prettyman, The North and South Polar Water Ice Margins on Mars, *Eos Trans. AGU*, 84 (46), Fall Meet. Suppl., Abstract xxxxx-xx, 2003.

Theses

- Mustard, J. F., The geology of the Mount Brew area, Lillooet, British Columbia, unpublished B.Sc. Thesis, University of British Columbia, Vancouver, B.C. Canada, pp. 33, 1983.
- Mustard, J. F., Methods of quantitative analysis of reflectance spectra and application to imaging spectrometer data, Ph.D. Thesis, Brown University, Providence RI, USA, pp. 231 1990.

Invited Lectures

- *Composition of the Martian Surface*, Spectroscopy from Space, The Spectroscopy Society of Pittsburgh, 10/27/90
- *Considerations of Non-linear Mixing Analysis*, Sub-pixel Analysis Workshop, 20th Applied Imagery Pattern Recognition (AIPR) Workshop, SPIE, Washington D.C., 10/15/91
- Invited Attendee and Panel Member, National Academy of Sciences' Fourth Annual Symposium on Frontiers of Science, Beckman Center, Irvine CA 11/5-11/7 1992
- *Composition of the Martian Crust: Clues from ISM Imaging Spectrometer Data*, Lunar and Planetary Institute, Houston TX, 6/10/93.
- *Scientific Visualization in Earth and Planetary Science: It looks good but will it publish*, North American Serial Interest Group, Brown University, 6/11/93.
- *Lithologic Mapping in the Cape Smith Fold and Thrust Belt with TM and Airborne Radar Data*, Institute for Space and Terrestrial Studies, York University, Toronto, Ont, 9/15/93
- Invited Attendee, National Academy of Sciences' Third Annual Symposium on Frontiers of Science, Beckman Center, Irvine CA 11/4-11/6 1993.
- *Understanding Processes on Mars: Rocks to Dust*, Massachusetts Institute of Technology, May 3, 1995.
- *Planetary Contributions to Environmental Remote Sensing*, GSA Annual Meeting, Nov. 1995.
- *New Insights into Crustal Heterogeneity and Chemical Alteration on Mars*, Geologic Survey of Canada, 2/21/96.
- *Quantitative Methods for Determining Surface Composition with Application to Geologic Mapping and Global Change*, Canadian Center for Remote Sensing, 2/20/96.
- *The Dynamics of Thermal Effluent from the Brayton Point Power Plant*, Mt. Hope Bay Research Forum, Mass. Coastal Zone Management, Executive Office of Environmental Affairs, 6/24/97
- *Seasonal and Tidal Dynamics of Thermal Effluent in the Mt. Hope Bay Estuary*, Environmental Protection Agency, Atlantic Ecology Division, Narragansett RI, 8/97

- *Application of Remotely Sensed Data to Environmental Problems in Narragansett Bay*, Dept. Ecology and Evolutionary Biology, Brown University, 9/97.
- *The Composition of the Martian Crust and Implications for the Mantle*, Department of Geological Sciences, RPI, New York, November, 1997.
- *Impact of Brayton Point thermal effluent on the Mt. Hope Bay estuary*, Environmental Protection Agency, Boston MA, December, 1998.
- *Impact of Brayton Point thermal effluent on the Mt. Hope Bay estuary*, Rhode Island Department of Environmental Management, December, 1998.
- *Quantifying Thermal Impacts of Effluent with Remotely Sensed Data*, Environmental Protection Agency, Research Division, Lexington MA, January, 1999.
- *Mineralogy and Mixing on Mars and the Moon*, invited talk for AGU Fall Meeting special session “Spectroscopy of Solar System Objects: A Session Celebrating the Contribution of John Adams,” December, 1998.
- *Remote Sensing of the Narragansett Bay Waters: Progress and Promise*, invited talk to the symposium “Integrating science in the decision making process: Managing estuarine habitats in Narragansett Bay, Northeast Regional GSA Meeting, March, 1999
- *Hyperspectral Remote Sensing of Estuarine Waters*, University of Rhode Island, Graduate School of Oceanography Biological Oceanography colloquium, April, 1999.
- *Water Quality Information from Remotely Sensed Data*, invited speaker for the 1999 Environmental Expo special session on advances in hydrodynamic analyses, May, 1999.
- *Review of the ISM Instrument and Results*, Spectroscopy of the Martian Surface, What Next?, Lunar and Planetary Institute, Houston, June, 1999.
- *Recent Results from the Mars Missions*, Geology Department Colloquium, University of Vermont, 2/2000.
- *Impact of Water Use on Semi-Arid Ecosystems, Owens Valley CA.*, Geology Department Noon Seminar, University of Vermont, 2/2000.
- *Land Use and Land Cover Change in Semi-Arid Ecosystems*, Geography Department, Boston University, 9/2000.
- *Remote Sensing for Monitoring Estuarine Dynamics*, EMAP Symposium 2001, 4/2001.
- *Recent climate change on Mars*, University of Nantes, November, 2001
- *Remote sensing of water optical properties*, University of Nantes, October, 2001
- *The composition of the martian surface from infrared remote sensing*, University of Nantes, October 2001.
- *Ground ice and the evidence for climate change on Mars*, CNRS Toulouse, November, 2001
- *Cemented sulfates and ground ice on Mars: Evidence for recent climate change*, Institute d’Astrophysique Spatial, University of Paris, November 2001
- *New Observations of Narragansett Bay with Remote Sensing*, University of Rhode Island, April, 2002.
- *Remotely Sensed Environmental Parameters of Mt. Hope Bay, Narragansett Bay, and the New England Coastal Ocean* School of Marine Science and Technology, University of Massachusetts , Dartmouth, September 11, 2002
- *Recent Near Surface Ground Ice and Periodic Climate Change on Mars*, Woods Hole Oceanographic Institution, November 1, 2002
- *Beyond Red: The Composition of the Martian Surface*, Invited, presentation to the Fall AGU meeting special session in honor of Tom McCord, 2002.
- *Water, Fish, and Electricity, a Hot Topic in Mt. Hope Bay*, Massachusetts Institute of Technology, January, 2003.
- *Periodic Climate Change on Mars*, California Institute of Technology, March, 2003
- *The Temperature of Mt. Hope Bay*, New England Estuarine Research Society Meeting, May 2003.
- *Mars Exploration* Astro Assembly, Rhode Island, October 2003.
- *Ice Ages on Mars*, MIT EAPS Department, October 2003

- *Geomorphic Indicators of ground Ice on Mars and Evidence for Climate Change*, 2003 AGU, Fall Meeting.
- *Mars Surface Composition Through Pan-spectral Analysis: Mafic Mineralogy, Alteration, And Hydration*, 2003 AGU, Fall Meeting.
- *Mars Composition Diversity from the OMEGA Experiment*, Geological Society of America Annual Meeting, Denver, November 2004
- *Climate Change on Mars*, Rhode Island College Sigma Xi Inauguration Dinner, May, 2005
- *Multi-Instrument Sulfate Detection and Mineral Stability on Mars, Martian Sulfates as Recorders of Atmospheric-Fluid-Rock Interactions*, Houston TX (2006)
- *Mineralogic Evolution of Mars*, Penn State Department of Geological Sciences Colloquium, 2006
- *Blue, White and Red Mars: The mineralogic evolution of the Mars*, Brown University Colloquium, 2007
- *Hydrated Silicate Mineralogy of Mars from the CRISM Investigation*, Institute d'Astrophysique Spatial, University de Paris-Sud, Paris, France June 2008

Service

University:

Under the Elms (Development Office) Speaker, 1991, 1994, 1995
 Brown Summer Science Adventure, workshop on remote sensing, 1993.
 Brown Parents Council participant
 MacMillan Hall Dedication, seminar and video, 1998
 Member of the Environmental Science Committee
 Parents Leadership Weekend, Speaker and Workshop, Water in the Environment, March 2000
 Freshman Advising, 2000-2001, 2003-2004, 2004-2005, 2005-2006
 Co-developed the Environmental Change Initiative
 Speaker, Parents Weekend, October 2003
 Alumni Office, Meeting of the Minds:
 Dallas, May 2004
 Tuscon, November, 2004
 Washington DC, April 2005
 Development Office, Denver gathering, November 2004.
 Spoke at the President's Leadership Council Dinner, February 2004
 Presentation to Corporation Members, February 2004
 A Day on College Hill Presentation to Parents, April 2005
 Brown University Staff Development Day Presentation, June 2005
 Brown- Marine Biological Laboratory Oversight Committee 2004-present
 Brown University Environmental Change Advisory Board, 2004-present
 Chair of Search, Director, Center for Environmental Studies 2007-2008.

Department:

Departmental Computer Committee, 1993-1995, 1997-1999
 Department Undergraduate Field Trip, Organized and Lead, 1992; Assisted 1994, 1995
 Chair, Planetary Geoscience Group Computer Committee
 Search Committee, Geochemistry of Environmental Change, 1998
 Undergraduate Program, Geology concentration advisor, 1997-2001
 Chair's Advisory Committee, 2000-2001, 2005-2008
 Search Committee, Physics and Chemistry of Magma Processes, 2000-2001
 Department Curricular Committee 2002-2003
 Department Colloquium Committee 2003-2004
 Search Committee, Director, CES and Environmental Change Initiative, 2003-2004

Search Committee, ESH Faculty position, 2004-2005.
Search Committee, Planetary Faculty position, 2006.
Search Committee, ECI Faculty Position, 2005-2006.
Search Committee, ECI Faculty Position, 2007-2008.

Professional Community:

Associate Editor, Proceedings of Lunar and Planetary Science, Volume 21, 1990
Associate Editor, Proceedings of Lunar and Planetary Science, Volume 22, 1991
Associate Editor, Journal of Geophysical Research-Planets, 1/96-12/98
Planetary Astronomy Mars Watch Review Panel, 1992
Organized and Convened AGU Special Session "Why Mars is Red", for Fall AGU 1994.
Member of NASA's Lunar and Planetary Geoscience Review Panel 1993-1995
(Remote Sensing Group Chief, 1994-1995)
Member, Management and Operations Working Group for the NASA Planetary Geology and Geophysics Program (S. Solomon, Chair), 1994-1996.
Executive Secretary, NASA's Terrestrial Planets Science Working Group (TePSWG), 1994-1996.
Member of the Mars Surveyor '98 Instrument Selection Panel, for NASA's division of Solar System Exploration, Oct. 1995.
Member of EOS-AM1 panel to evaluate the algorithms and scientific yield from the Earth Observing System, May 1996
Invited Participant, EPA-NASA Workshop on Water Monitoring, Remote Sensing, and Advanced Technologies, Dec. 1996
Chair of Optics Panel, NASA Planetary Instrument Definition and Development Program Panel Review, fall, 1996 and 1997.
Member, NASA Science Definition Team for Mars Surveyor 2001 Orbiter, 1996-1997.
Member of Earth System Science Pathfinder Step 1 review panel, 1998.
Member of Review Panel for NASA's Land Use Land Cover Change program, 2000.
Member, NASA Science Definition Team for Mars'05 Mars Reconnaissance Orbiter, 2000-2001
Elected Secretary for the Planetary Sciences Section of AGU and member of the AGU Fall Program Planning Committee, 2000-2002.
Presentations on Liberal Arts Undergraduate Science Curricula to the Aga Khan University Planning Committee, 2001-2002
Member of the Space Studies Board Committee on Planetary and Lunar Exploration (COMPLEX), 9/98-01/02
Member, Space Studies Board, Solar System Exploration Survey Committee for the study "A New Strategy for Solar System Exploration", 5/01-7/02
NASA Mars Exploration Program, Pathways Steering Group, member, 02/01-06/01
Organized and Convened Workshop, Infrared Spectroscopy of Mars: From Theory and the Laboratory to Field Observations, LPI, Houston, 2002
Member, NASA Science Concept Definition Team for Project Prometheus, 2003-2004
Member NASA Astrobiology Field Laboratory Science Definition Team, 2003-2004
Invited Participant: Applications of NASA's Land Cover/Land-Use Change (LCLUC) science results to NASA's national priority areas, 2003
Invited Participant: Implementation planning process for the Land-Use/Land-Cover Change (LULCC) research element of the U.S. Climate Change Science Program strategic plan, 2003
Organized and Convened AGU Special Session Evidence for Recent Climate Change on Mars, December 2003
Development of Interdisciplinary Undergraduate Science Curriculum, Aga Khan University, Karachi Pakistan, June 2004.
Member, NASA Space Science Advisory Committee (SScAC), 2002-2005
Co-organized the 41st Brown-Vernadsky Microsymposium, Geological Evidence for Recent Climate Change on Mars, Houston, March, 2005

Co-organized the special session OMEGA@Mars for the 36th Lunar and Planetary Science Conference, Houston, March, 2005
Mars Science Laboratory 2009 Landing Site Steering Committee, 2006-2009.
Co-organized the 45st Brown-Vernadsky Microsymposium, Geological Evidence for Recent Climate Change on Mars, Houston, March, 2007
Chair of the Mars Exploration Program Assessment Group (MEPAG), 2007-2009
Co-organized the special session The Noachian Mars for the Fall Meeting of the American Geophysical Union, 2007
Co-organized the 47st Brown-Vernadsky Microsymposium, Geological Evidence for Recent Climate Change on Mars, Houston, March, 2008
Co-organized the special session The Noachian Mars for the Fall Meeting of the American Geophysical Union, 2008

Spacecraft Involvement

- CRISM on Mars Reconnaissance Orbiter, Deputy PI, 2001-2009
- OMEGA on Mars Express, Co-Investigator, 2002-2008
- Moon Mineralogy Mapper (M3) on Chandrayan, Co-Investigator 2006-2009
- Earth Observer 1, Science Team Member, 2000-2002

Academic Honors, Awards, etc

- 5 awards for academic excellence at University of British Columbia (1979-1983)
- NSERC post-graduate scholarship (1986-1988)
- Named the Stephen Robert Assistant Professor by the Brown Corporation, 1/7/1998.

Memberships

- Sigma Xi (1992)
- American Geophysical Union
- American Society for Photogrammetry and Remote Sensing
- American Association for the Advancement of Science

Teaching

Courses:

GE133 Global Environmental Remote Sensing. Lecture course with lab developed for undergraduate and graduate students with environmental science interests. Spring semester, 1996/1997/1998/1999/2001/2003/2004/2005/2006/2007 (Enrollment 20-25)
GE233 Advanced Remote Sensing and GIS, New lecture and lab course for advanced topics in remote sensing, Fall semester 1997/2002/2005/2007 (Enrollment 4-8)
GE195 (21) Geographical Information Systems, Lecture and lab course centered around geographical information systems, Fall semester 2000 (Enrollment 10), joint with Lynn Carlson
GE0016 (21) Global Environmental Change. Freshman Seminar, Fall Semester 2003/2004 2004/2005, 2006/2007. (Enrollment 20)

Independent Study:

Jasper Oshun, fall 2005/2006

Undergraduate Advising:

6 students/year for the past 3 years

Student Advising:

Graduate Students:

Master's

J. Hays, 1995.

A. Sen, MSc, Environmental Studies 1997, (Joint with S. Hamburg)

H. Chen, 2001

Ph.D.

S. Tompkins (joint with C. M. Pieters), Ph.D. 1996.

L. Lin, began 9/95, M.Sc. 1998 Ph.D. 2002

C. Cooper, began 9/96, M.Sc. 1998 Ph.D. 2004

A. Elmore, began 9/97, M.Sc. 1999 Ph.D. 2003

B. Bradley began 9/2001 M.Sc. 2003 Ph.D. 2006

J. Fisher began 9/2001 M.Sc. 2003 Ph.D. 2006

R. Milliken, began 9/2001 M.Sc. 2003 Ph.D. 2006

L. Roach began 9/2004 M.Sc. 2006

L. Kanner began 9/2004 M.Sc. 2006

G. Galford began 9/2004 M.Sc. 2006

B. Ehlmann began 9/2006 M.Sc. 2008

T. Garcia began 9/2006 M.Sc. 2008

J. Skok began 9/2007

Undergraduate Student Theses:

N. Taylor '94 Senior Honors thesis in Biology (Ecology), (D. Murray and S. Gaines)

E. Gonzales '94, Senior Honors thesis in geological sciences

A. Holdsworth '95, Summer research fellowship from National Institute for Global Environmental Change (NIGEC)

A. Ballantine '96, Senior thesis in geological sciences (UTRA Fellowship, 1995)

A. Trueba '96, Senior thesis in geological sciences (Joint with T. Herbert and D. Murray)

A. Sen, '96, Senior Thesis in Environmental Science (with S. Hamburg)

G. Proctor, Senior Thesis, Geological Sciences, '97 (Prell)

D. Wexler, Senior Thesis, Geological Sciences, '97 (joint with T. Herbert)

M. Carney, Senior Thesis Environmental Science, '97 (Hamburg, Prell)

E. Wolf, Senior Thesis, Geological Sciences, '98.5 (Prell)

V. Gokaldos, Senior Thesis, Environmental Science, '99 (UTRA 1998, Hamburg)

D. Lobell, Independent Study and Research, Applied Math '00

L. Firestone, Senior Thesis, Environmental Science, '00 (A. Foster)

G. Bulman, Senior Thesis, Geological Sciences, '00 (T. Herbert).

M. Rifkin, Senior Thesis, Geological Science, '01

C. Balazs, Senior Thesis, Environmental Science '01.

A. Bashkar, Geological Sciences, '08