Victoria E. Hamilton, Ph. D.

Section Manager
Southwest Research Institute
1050 Walnut St., Suite 300
Boulder, CO 80302
Office: (720) 240-0115; Fax: (303) 546-9687
E-mail: hamilton@boulder.swri.edu
http://www.boulder.swri.edu/~hamilton/

Summary

Hamilton has extensive experience with laboratory spectroscopy and Mars data analysis, was an affiliate of the MGS TES science team, and is a Participating Scientist on the Mars Odyssey and Mars Science Laboratory missions. She is a science team Co-Investigator and Deputy Instrument Scientist on the OSIRIS-REx asteroid sample return mission. She has published on laboratory mineral and meteorite spectroscopy, numerical modeling of infrared spectra, Martian surface composition, Martian atmospheric aerosol composition, & surface thermophysical properties. Hamilton built, operates, and manages a NASA-supported spectroscopy laboratory equipped with three spectrometers for measuring visible, near infrared, and thermal infrared properties of rocks, minerals, and meteorites in reflectance and emission.

Education

Ph.D., Geology, Arizona State University, Tempe, AZ, 1998.

B.A., Cum Laude, with Departmental Honors, Geology, Occidental College, Los Angeles, CA, 1993.

Employment

Section Manager, Planetary Physics. Southwest Research Institute (March 2012 – present)

Principal Scientist. Southwest Research Institute (May 2008 – March 2012)

Associate Researcher (tenured 2007). Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Manoa (August 2007 – April 2008)

Assistant Researcher. Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Manoa (August 2002 – July 2007)

Faculty Research Associate. Department of Geological Sciences, Arizona State University (January 2001 – August 2002)

Visiting Assistant Professor. Department of Geological Sciences, Arizona State University (2000; summer 2001)

Postdoctoral Research Associate. Department of Geological Sciences, Arizona State University (1998 – 2000)

Graduate Research Associate. Department of Geological Sciences, Arizona State University (1993 – 1998)

Member of Technical Staff. Jet Propulsion Laboratory, Pasadena, CA (1993 – 1996)

Advising & Teaching Experience

Ph.D. committee member & GA support, Romy D. S. Hanna, 2012-present.
Ph.D. degree awarded to Mikki M. Osterloo, 2010 (co-advisor).
Ph.D. degree awarded to Meryl L. McDowell, 2009 (advisor).
Ph.D. degree awarded to William C. Koeppen, 2008 (advisor).
Master's degree awarded to Romy D. Schneider, 2006 (advisor).

GG 710 – Univ. Hawai'i – Selected Topics in Geology & Geophysics (seminar).
GG 670C – Univ. Hawai'i – Geology of Planets – Mars.
GG 671B – Univ. Hawai'i – Remote Sensing – Planets. Co-taught with Prof. Paul Lucey.
GEO 101 – Arizona State University – taught 3 semesters, enrollment each semester ~220.

Honors and Awards

NASA Group Achievement Award, MSL Science Office Development and Operations Team, 2013.

Asteroid 7237 Vickyhamilton (1988 VH), 2007.

Young Alumni Seal Award, Occidental College, 2003 (Inaugural Recipient).

NASA Group Achievement Award, 2001 Mars Odyssey Thermal Emission Imaging System Team, 2005.

NASA Group Achievement Award, Mars Global Surveyor Thermal Emission Spectrometer Team, 2000.

National Physical Science Consortium (NPSC) Graduate Fellowship for Women and Minorities in the Sciences, sponsoring employer/stipend support: Jet Propulsion Laboratory, 1993 to 1998.

Honorable Mention, Oral Presentation, Geological Society of America Stephen E. Dwornik Planetary Geosciences Student Paper Award, 1996.

NASA Planetary Geology and Geophysics Undergraduate Research Internship (PGGUR), Jet Propulsion Laboratory, 1992.

Professional Service & Organizations

Chair, NASA Mars Exploration Program Assessment Group Goals Committee (MEPAG Executive Committee member) (2012-present).
Member, Precursor Strategy Analysis Group (P-SAG), co-sponsored by MEPAG and SBAG (2012).
Chair, NASA MEPAG Supporting Research and Technology Science Analysis Group (SRT SAG) (2011-2012).
Reviewer, Report of the National Research Council Planetary Science Decadal Survey (2010).
Member, Editorial Board, *Minerals.*
Member, MEPAG Goals Committee (2007-2011).
Member, NRC Committee on Cost Growth in NASA Earth and Space Science Missions (2009-2010).
Planetary Science Subcommittee, NASA Advisory Council (2006 – 2009).
Lunar and Planetary Institute Science Council, Universities Space Research Association (2006 – 2009).
MEPAG Mid-range Rover Science Analysis Group (MRR SAG), 2009.
Mars Architecture Review Committee, Committee for Planetary Exploration, National Research Council (2006).
Associate Editor, *Journal of Geophysical Research – Planets*, July 2003 – 2006.
Host Researcher, "JASON Expedition: Mysteries of Earth and Mars", JASON Foundation for Education, 2004 – 2006.
Panel Chair, NASA Mars Fundamental Research Program, 2008.
Panel Chair, NASA Mars Data Analysis Program, 2006, 2007.
Group Chief, NASA Astrobiology Technology and Instrument Development Program, 2005.
Group Chief, NASA Mars Data Analysis Program Review Panel, 2001, 2003, 2004.
Group Chief, NASA Mars Fundamental Research Program Review Panel, 2003.
Panel Member, NASA Planetary Instrument Design and Development Program, 2001, 2002.
Judge, Dwornik Student Paper Contest, Lunar and Planetary Science Conference, 2001.
Panel Member, NASA Mars Data Analysis Program Review Panel, 1998 to 2000.
Member, American Geophysical Union (1995 to present).
Member, Geological Society of America (intermittent).
Member, Meteoritical Society (1997-1998, 2001-present).

Publications

Refereed Research Articles

Hamilton, V. E., A. R. Vasavada, E. Sebastián, M. de la Torre Juárez, M. Ramos, C. Armiens, R. E. Arvidson, I. Carrasco, P. R. Christensen, M. A. De Pablo, W. Goetz, J. Gómez-Elvira, M. T. Lemmon, M. B. Madsen, F. J. Martín-Torres, J. Martínez-Frías, A. Molina, M. C. Palucis, S. C.

R. Rafkin, M. I. Richardson, R. A. Yingst, and M.-P. Zorzano, Observations and preliminary science results from the first 100 sols of MSL Rover Environmental Monitoring Station ground temperature sensor measurements at Gale Crater, *J. Geophys. Res.*, doi: 101002/2013JE004520, in press.

Yingst, R. A., L. C. Kah, M. Palucis, R. M. E. Williams, J. Garvin, J. C. Bridges, N. Bridges, R. G. Deen, J. Farmer, O. Gasnault, W. Goetz, **V. E. Hamilton**, V. Hipkin, J. K. Jensen, P. L. King, A. Koefoed, S. P. Le Mouélic, M. B. Madsen, N. Mangold, J. Martinez-Frias, S. Maurice, E. M. McCartney, H. Newsom, O. Pariser, V. H. Sautter, R. C. Wiens, Characteristics of pebble- and cobble-sized clasts along the Curiosity rover traverse from Bradbury Landing to Rocknest, *J. Geophys. Res., 118*, doi:0.1002/2013JE004435, 2361-2380, 2013.

Osterloo, M. M., **Hamilton, V. E.**, and F. S. Anderson, A laboratory study of the effects of roughness on the thermal infrared spectra of rock surfaces, *Icarus, 220*, 404-426, 2012.

Hamilton, V. E., and S. W. Ruff, Distribution and characteristics of Adirondack-class basalt as observed by Mini-TES in Gusev crater, Mars and possible volcanic sources, *Icarus, 218*, 917-949, 2012.

Osterloo, M. M., Anderson, F. S., **Hamilton, V. E.,** and Hynek, B. M., The geologic context of proposed chloride-bearing terrains on Mars, *J. Geophys. Res.*, *115*, E10012, doi: 10.1029/2010JE003613, 2010.

Madden, A. S., **Hamilton, V. E.**, Elwood Madden, M. E., Larson, P. R., Miller, M. A., Low-temperature mechanism for formation of coarse crystalline hematite through nanoparticle aggregation, *Earth Planet. Sci. Lett., 298*, 377-384, 2010.

Minitti, M. E. and **V. E. Hamilton**, A search for basaltic-to-intermediate glasses on Mars: Assessing Martian crustal mineralogy, *Icarus*, *21*0, 135-149, 2010.

Hamilton, V. E., Thermal infrared (vibrational) spectroscopy of Mg-Fe olivines: A review and applications to determining the composition of planetary surfaces (Invited Review), *Chemie der Erde, 70*, doi:10.1016/j.chemer.2009.12.005, 2010.

Newsom, H. E., N. L. Lanza, A. M. Ollila, S. M. Wiseman, T. L. Roush, G. A. Marzo, L. L. Tornabene, C. H. Okubo, M. M. Osterloo, **V. E. Hamilton**, and L. S. Crumpler, Inverted channel deposits on the floor or Miyamoto crater, Mars, *Icarus*, *205*, 64-72, doi:10.1026/j.icarus. 2009.1003.1030, 2010.

McDowell, M. L., and **V. E. Hamilton**, Seeking phyllosilicates in thermal infrared data: A laboratory and Martian data case study, *J. Geophys. Res.*, doi:10.1029/2008JE003317, 2009.

Hamilton, V. E., R. V. Morris, J. E. Gruener, and S. A. Mertzman, Visible, near infrared, and middle infrared spectroscopy of altered basaltic tephras: Spectral signatures of phyllosilicates, sulfates, and other aqueous alteration products with application to the mineralogy of the Columbia Hills of Gusev crater, Mars, *J. Geophys. Res*., *113*, E12S43, doi:

10.1029/2007JE003049, 2008.

Edwards, C. S., P. R. Christensen, and **V. E. Hamilton**, Evidence for extensive olivine-rich basalt bedrock outcrops in Ganges and Eos Chasma, Mars, *J. Geophys. Res.*, *113,* E11003, doi: 10.1029/2008JE003091, 2008.

Tornabene, L., J. Moersch, H. Y. McSween Jr., **V. Hamilton**, J. Piatek, and P. Christensen (2008), Surface and crater-exposed lithologic units of the Isidis Basin as mapped by co-analysis of THEMIS and TES derived data products, *J. Geophys. Res., 113*, E10001, doi: 10.1029/2007JE002988, 2008.

Stockstill-Cahill, K. R., F. S. Anderson, and **V. E. Hamilton**, A study of low albedo deposits within Amazonis Planitia craters: Evidence for locally-derived ultramafic to mafic materials, *J. Geophys. Res., 113*, doi:10.1029/2007JE003036, 2008.

Koeppen, W. C. and **V. E. Hamilton**, The global distribution, composition, and abundance of olivine on the surface of Mars from thermal infrared data, *J. Geophys. Res.*, *113*, E05001, doi:10.1029JE002984, 2008.

Osterloo, M.M., **V. E. Hamilton**, J.L. Bandfield, T.D. Glotch, A.M. Baldridge, P.R. Christensen, L.L. Tornabene, and F.S. Anderson, Chloride-bearing materials in the southern highlands of Mars, *Science, 319*, 1651-1654, 2008.

McDowell, M.L. and **V.E . Hamilton**, Geologic characteristics of relatively high thermal inertia intracrater deposits in southwestern Margaritifer Terra, Mars, *J. Geophys. Res., 112*, E12001, doi:10.1029JE002925, 2007.

Stopar, J.D., G.J. Taylor, **V.E. Hamilton**, and L. Browning, Kinetic model of olivine dissolution and extent of aqueous alteration on Mars, *Geochim. Cosmochim. Acta, 70,* 6136-6152, doi: 10.1016/j.gca.2006.1007.1039, 2006.

Schneider, R. D., and **V. E. Hamilton**, Geology and composition of a Martian intracrater deposit in Amazonis Planitia, Mars, *J. Geophys. Res.*, *111*, doi:10.1029/2005JE002611, 2006.

McSween, H.Y., and 41 others (incl. V.E. Hamilton), Characterization and petrologic interpretation of olivine-rich basalts at Gusev Crater, Mars, *J. Geophys. Res., 111,* E02S10, doi:10.1029/2005JE002477, 2006.

Hamilton, V.E., H.Y. McSween, Jr., and B. Hapke, Mineralogy of Martian atmospheric dust inferred from infrared spectra of aerosols, *J. Geophys. Res.*,*110*, E12006, doi: 10.1029/2005JE002501, 2005.

Christensen, P. R., H. Y. McSween Jr., J. L. Bandfield, S. W. Ruff, A. D. Rogers, **V. E. Hamilton**, N. Gorelick, M. B. Wyatt, B. M. Jakosky, H. H. Kieffer, M. C. Malin, and J. E. Moersch, Evidence for igneous diversity and magmatic evolution on Mars from infrared spectral observations, *Nature, 436,* 504-509, 2005.

Koeppen, W.C., and **V.E. Hamilton**, Discrimination of glass and phyllosilicate minerals in thermal infrared data, *J. Geophys. Res.*, *110*, doi:10.1029/2005JE002474, 2005.

Hamilton, V.E., and P.R. Christensen, Evidence for extensive olivine-rich bedrock on Mars, *Geology, 33*, 433-436, doi:410.1130/G21258.21251, 2005.

Christensen, P.R., M.B. Wyatt, T.D. Glotch, A.D. Rogers, S. Anwar, R.E. Arvidson, J.L. Bandfield, D.L. Blaney, C. Budney, W.M. Calvin, A. Fallacaro, R.L. Fergason, N. Gorelick, T. Graff, **V.E. Hamilton**, A.G. Hayes, J.R. Johnson, A.T. Knudson, H.Y. McSween Jr., G.L. Mehall, L.K. Mehall, J.E. Moersch, R.V. Morris, M.D. Smith, S.W. Squyres, S.W. Ruff, and M.J. Wolff, Mineralogy at Meridani Planum from the Mini-TES experiment on the Opportunity Rover, *Science*, *306* (5702), 1733-1739, 2004.

Bandfield, J.L., **V.E. Hamilton**, P.R. Christensen, and H.Y. McSween Jr., Identification of quartzofeldspathic materials on Mars, *J. Geophys. Res.*, *109* (E10), doi:10.1029/2004JE002290, 2004.

Christensen, P.R., S.W. Ruff, R.L. Fergason, A.T. Knudson, S. Anwar, R.E. Arvidson, J.L. Bandfield, D.L. Blaney, C. Budney, W.M. Calvin, T.D. Glotch, M.P. Golombek, N. Gorelick, T.G. Graff, **V.E. Hamilton**, A. Hayes, J.R. Johnson, H.Y. McSween Jr., G.L. Mehall, L.K. Mehall, J.E. Moersch, R.V. Morris, A.D. Rogers, M.D. Smith, S.W. Squyres, M.J. Wolff, and M.B. Wyatt, Initial results from the Mini-TES experiment in Gusev crater from the Spirit rover, *Science*, *305* (5685), 837-842, 2004.

Milam, K., H. Y. McSween Jr., **V. E. Hamilton**, J. E. Moersch, and P. R. Christensen, Accuracy of plagioclase compositions from laboratory and Mars spacecraft thermal emission spectra, *JGR, 109,* xxxx, doi: 10.1029/2003JE002097, 2004 (in press).

Hamilton, V. E., Thermal infrared emission spectroscopy of titanium-enriched pyroxenes, *JGR, 108,* 5095, doi: 10.1029/2003JE002052, 2003.

Hamilton, V. E. and M. E. Minitti, Are oxidized shergottite-like basalts an alternative to "andesite" on Mars?, *Geophys. Res. Lett., 30,* 1915, doi: 10.1029/2003GL017839, 2003.

Hamilton, V. E., P. R. Christensen, H. Y. McSween, Jr., and J. L. Bandfield, Searching for the source regions of Martian meteorites using MGS TES: Integrating Martian meteorites into the global distribution of volcanic materials on Mars, *Meteor. Planet. Sci., 38,* 871-886, 2003.

Christensen, P. R., and 19 others (including **V. E. Hamilton**), Morphology and composition of the surface of Mars: Mars Odyssey THEMIS results, *Science, 300,* 2056-2061, 2003.

Hamilton, V. E., P. R. Christensen, and J. L. Bandfield, Volcanism or aqueous alteration on Mars?, *Nature, 421,* 711-712, doi:10.1038/421711b, 2003.

Hamilton, V. E., M. B. Wyatt, H. Y. McSween, Jr., and P. R. Christensen, Analysis of terrestrial and Martian volcanic compositions using thermal emission spectroscopy: II. Application to Martian surface spectra from MGS TES, *J. Geophys. Res.*, *106*, 14,733-14,746, 2001.

Wyatt, M. B., **V. E. Hamilton**, H. Y. McSween, Jr., P. R. Christensen, L. A. Taylor, Analysis of terrestrial and Martian volcanic compositions using thermal emission spectroscopy: I. Determination of mineralogy, chemistry, and classification strategies, *J. Geophys. Res.*, *106*, 14,711-14,732, 2001.

Christensen, P. R., J. L. Bandfield, **V. E. Hamilton**, S. W. Ruff, H. H. Kieffer, T. N. Titus, M. C. Malin, R. V. Morris, M. D. Lane, R. L. Clark, B. M. Jakosky, M. T. Mellon, J. C. Pearl, B. J. Conrath, M. D. Smith, R. T. Clancy, R. O. Kuzmin, T. Roush, G. L. Mehall, N. Gorelick, K. Bender, K. Murray, S. Dason, E. Greene, S. Silverman, and M. Greenfield, The Mars Global Surveyor Thermal Emission Spectrometer experiment: Investigation description and surface science results, *J. Geophys. Res.*, 106, 23,823-23,871, 2001.

Hamilton, V. E., Thermal infrared emission spectroscopy of the pyroxene mineral series, *J. Geophys. Res.*, **105**, 9701-9716, 2000.

Hamilton, V. E., and P. R. Christensen, Determining the modal mineralogy of mafic and ultramafic igneous rocks using thermal emission spectroscopy, *J. Geophys. Res.*, **105**, 9717-9733, 2000.

Bandfield, J. L., **V. E. Hamilton**, and P. R. Christensen, A global view of Martian surface compositions from MGS-TES, *Science*, **287**, 1626-1630, 2000.

Christensen, P. R., J. L. Bandfield, M. D. Smith, **V. E. Hamilton**, and R. N. Clark, Identification of a basaltic component on the Martian surface from Thermal Emission Spectrometer data, *J. Geophys. Res.*, **105**, 9609-9621, 2000.

Christensen, P. R., J. L. Bandfield, R. N. Clark, K. S. Edgett, **V. E. Hamilton**, T. Hoefen, H. H. Kieffer, R. O. Kuzmin, M. D. Lane, M. C. Malin, R. V. Morris, J. C. Pearl, R. Pearson, T. L. Roush, S. W. Ruff, and M. D. Smith, Detection of crystalline hematite mineralization on Mars by the Thermal Emission Spectrometer: Evidence for near-surface water, *J. Geophys. Res*., **105**, 9623-9642, 2000.

Christensen, P. R., J. L. Bandfield, **V. E. Hamilton**, D. A. Howard, M. D. Lane, J. L. Piatek, S. W. Ruff, and W. L. Stefanov, A thermal emission spectral library of rock-forming minerals, *J. Geophys. Res.*, **105**, 9735-9739, 2000.

Allen, C., Albert, F., Combie, J., Jolliff, B., Kuebler, K., Wang, A., **Hamilton, V.**, Lindstrom, D., Morris, R., Mittlefehldt, D., Morris, P., Murray, R., Nyquist, L., Simpson, P., and Symes, S., Effects of sterilizing doses of gamma radiation on Mars analog rocks and minerals, *J. Geophys. Res.,* **104**, 27,043-27,066, 1999.

Hamilton, V. E., P. R. Christensen, and H. Y. McSween Jr., Discrimination of Martian meteorite lithologies and mineralogies using vibrational spectroscopy, *J. Geophys. Res.,***102**, 25,593-25,603, 1997.

Edgett, K. E., B. J. Butler, J. R. Zimbleman, and **V. E. Hamilton**, Geologic context of the Mars radar "Stealth" region in southwestern Tharsis, *J. Geophys. Res.,* **102**, 21,545-21,568, 1997.

Hamilton, V. E., and E. R. Stofan, The geomorphology and evolution of Hecate Chasma, Venus, *Icarus*, **121**, 171-194, 1996.

Book Chapters

Bell III, J. F., Glotch, T. D., **V. E. Hamilton**, T. McConnochie, T. McCord, A. McEwen, P. R. Christensen, and R. E. Arvidson, Visible to near-IR multispectral orbtial observations of Mars, in *The Martian Surface: Composition, Mineralogy, and Physical Properties*, J. Bell, ed., 636 pp., Cambridge University Press, Cambridge, 2008.

Christensen, P. R., J. L. Bandfield, R. L. Fergason, **V. E. Hamilton**, and A. D. Rogers, The compositional diversity and physical properties mapped from the Mars Odyssey Thermal Emission Imaging System, in *The Martian Surface: Composition, Mineralogy, and Physical Properties*, J. Bell, ed., 636 pp., Cambridge University Press, Cambridge, 2008.

Christensen, P. R., J. L. Bandfield, A. D. Rogers, T. D. Glotch, **V. E. Hamilton**, S. W. Ruff, and M. B. Wyatt, Global mineralogy mapped from the Mars Global Surveyor Thermal Emission Spectrometer, in *The Martian Surface: Composition, Mineralogy, and Physical Properties*, J. Bell, ed., 636 pp., Cambridge University Press, Cambridge, 2008.

Stofan, E. R., **V. E. Hamilton**, D. L. Janes and S. E. Smrekar, Coronae on Venus: Morphology and Origin, in *Venus II*, S. W. Bougher, D. M. Hunten, and R. J. Phillips, eds., 1362 pp., University of Arizona Press, Tucson, 1997.

Book Review

Hamilton, V. E., A blue view of the red planet, *Science*, *307*, 1564, 2005.