

JOEL AARON HUROWITZ

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Academic Experience:

2006-2007	Caltech Postdoctoral Scholar at the Jet Propulsion Laboratory
2006	Ph.D., Geosciences – Stony Brook University
2001	M.S., Earth & Space Sciences – State University of New York at Stony Brook
1996	B.S., Geology – State University of New York at Albany

Positions Held:

2010-Present	Deputy Project Scientist, Moonrise New Frontiers Mission Proposal Team
2009-Present	Principal Investigator, JPL-Keck Institute for Space Studies Strategic Research & Technology Development Program: <i>New Directions in Robotic Exploration of Mars</i>
2009-Present	Associate in Geology – Division of Geological and Planetary Sciences, Caltech
2007-Present	Director's Fellow – Jet Propulsion Laboratory
2007-Present	Project Science Specialist, Mars Exploration Rover Mission – Jet Propulsion Laboratory
2006-2009	Visitor in Geology – Division of Geological and Planetary Sciences, Caltech
2004-2007	Scientific Collaborator – Mars Exploration Rover Mission, Jet Propulsion Laboratory
1999-2006	Research Assistant – Stony Brook University
1998-1999	Teaching Assistant – Stony Brook University
1996-1998	Hydrogeologist – Leggette, Brashears & Graham, Inc.

Invited Talks:

<i>Invited Speaker:</i>	Department of Geoscience Colloquium, UNLV, 2010
<i>Invited speaker:</i>	Chair's Council of the Division of Geological and Planetary Sciences, Caltech, 2009
<i>Keynote speaker:</i>	Surface Geochemistry and Processes on Mars, Goldschmidt Conference, 2008
<i>Invited speaker:</i>	Kriegel Lecture in Planetary Sciences, Caltech, 2008
<i>Invited speaker:</i>	Planetary Science and Life Detection Colloquium, Jet Propulsion Laboratory, 2007
<i>Invited speaker:</i>	Department of Geosciences Colloquium, Stony Brook University, 2007

Professional Activities:

Ongoing	Reviewer: <i>GCA, Icarus, JGR-Planets, JGR- Biogeosci., Geol. Mag., GRL</i>
Ongoing	NASA Proposal Review Panelist and External Reviewer
2009	Organizing Committee Member, LPI "Workshop on the New Mars Chemistry"
2008-2009	Moonrise New Frontiers Mission Technical Baseline Review Committee, JPL
2007	Session Co-Convenor: American Geophysical Union Fall Meeting
2001-2006	Emission Spectrometer Laboratory Manager
2004	NASA-JPL Planetary Sciences Summer School
2001	Session Chair, American Geophysical Union Fall Meeting
2001	Geochemist's Workbench Training Seminar
1999-2001	Thermal Ionization Mass Spectrometer Laboratory Manager
1994-1996	Intern, New York State Geological Survey

Awards Received:

2005	NASA Group Achievement Award for the MER Second Extended Mission Team
2004	NASA Group Achievement Award for the MER First Extended Mission Team
2004	Stephen E. Dwornik Planetary Geoscience Student Paper Award (honorable mention, poster)

2003	NASA Sponsored Student, 6 th International Mars Conference
1999	Stony Brook University, Department of Geosciences Excellence in Teaching Award

Educational Activities:

2010	Lecturer, Optical Petrology Lab (Ge115c), Div. of Geological and Planetary Sciences, Caltech
2005-2006	Undergraduate Research Mentor, Stony Brook University
2006	Invited Lecturer, Stony Brook Honors College, Stony Brook University
2005-2006	Visiting Science Instructor, Arrowhead Elementary School, East Setauket, NY
2004	Invited Lecturer, Johns Hopkins University Center for Talented Youth
1998-1999	Lecturer, Introductory Physical Geology Lab, Stony Brook University

Press Coverage:

- Press Release for Advanced Online Publication, *Nature Geoscience*, April 4th, 2010
- Feature Article, *Space.com*: “Study suggests source of acid waters that shaped Mars” April 14th, 2010, by Andrea Thompson.
- Feature Article, *Planetary Science Research Discoveries*: “Oxidants from pulverized minerals” June 19th, 2007, by Linda M.V. Martel.
- Feature Article, *New Scientist*: “Martian dust may be hazardous to your health” March 19th, 2007, by Jeff Hecht.

Research Interests:

- Sedimentary geochemistry
- Experimental and theoretical aqueous geochemistry
- Radiogenic isotope and trace element geochemistry
- Planetary geology, planetary exploration
- Mineral surface reactivity and toxicity

Professional Associations: Geochemical Society, American Geophysical Union

PUBLICATIONS (IN PREP):

1. **Hurowitz, J.A.**, Wyatt, M.B., Taylor, G.J., McLennan, S.M., Milliken, R.E. (in prep), A global perspective on Martian chemical weathering.

PUBLICATIONS (2010):

2. **Hurowitz, J.A.**, Fischer, W.W., Tosca, N.J., Milliken, R.E. (2010) Origin of acidic surface waters and the evolution of atmospheric chemistry on early Mars, *Nature Geoscience*, DOI: 10.1038/NGEO831

PUBLICATIONS (2009):

3. Farrand, W.H., Glotch, T.D., Rice, J.W., **Hurowitz, J.A.**, Swayze, G. (2009) Discovery of jarosite-bearing sediments within the Mawrth Vallis region of Mars: Implications for the geologic history of the region, *Icarus*, 204, 478-488.
4. Milliken, R.E., Fischer, W.W., **Hurowitz, J.A.** (2009), Missing salts on early Mars, *Geophysical Research Letters*, 36, L11202, doi:10.1029/2009GL038558.
5. **Hurowitz, J.A.**, Tosca, N.J., Dyer, M.D. (2009), Acid production by $\text{FeSO}_4 \cdot n\text{H}_2\text{O}$ dissolution and implications for terrestrial and martian aquatic systems, *American Mineralogist*, 94, 409-414.
6. Schmidt, M.E., Farrand, W.H., Johnson, J.R., Schröder, C., **Hurowitz, J.A.**, McCoy, T.J., Ruff, S.W., Arvidson, R.E., DesMarais, D.J., Lewis, K.W., Ming, S.W., Squyres, S.W., deSouza Jr., P.A. (2009), Spectral, mineralogical, and geochemical variations across Home Plate, Gusev Crater, Mars indicate high and low temperature alteration, *Earth & Planetary Science Letters*, 281, 258-266.

PUBLICATIONS (2008):

7. Farrand, W.H., Bell III, J.F., Johnson, J.R., Arvidson, R.E., Crumpler, L., **Hurowitz, J.A.**, Schröder, C. (2008), Rock spectral classes observed by the Spirit rover's Pancam on the Gusev Crater Plains and in the Columbia Hills, *Journal of Geophysical Research*, 113, E12S38, doi:10.1029/2008JE003237.
8. Arvidson, R.E., Ruff, S.W., Morris, R.V., Ming, D.W., Crumpler, L.S., Yen A.S., Squyres, S.W., Sullivan, R.J., Bell III, J.F., Cabrol, N.A., Clark, B.C., Farrand, W.H., Gellert, R., Greenberger, R., Grant, J.A., Guinness, E.A., Herkenhoff, K.E., **Hurowitz, J.A.**, Johnson, J.R., Klingelhofer, G., Lewis, K.W., Li, R., McCoy, T.J., Moersch, J., McSween, H.Y., Murchie, S.L., Schmidt, M., Schroder, C., Wang, A., Wiseman, S., Madsen, M.B., Goetz, W., McLennan, S.M. (2008) Spirit Mars rover mission to the Columbia Hills, Gusev Crater: Mission overview and selected results from the Cumberland Ridge to Home Plate, *Journal of Geophysical Research*, 113, E12S33, doi:10.1029/2008JE003183, 2008.
9. Yen, A.S., Morris, R.V., Clark, B.C., Gellert, R., Knudson, A.T., Squyres, S.W., Mittlefehldt, D., Ming, D.W., Arvidson, R.E., McCoy, T., Schmidt, M., **Hurowitz, J.A.**, Li, R., Johnson, J.R. (2008), Hydrothermal processes at Gusev Crater: An evaluation of Paso Robles Class soils, *Journal of Geophysical Research*, 113, E06S10, doi:10.1029/2007JE002978, 2008.

PUBLICATIONS (2007):

10. **Hurowitz, J.A.** and McLennan, S.M. (2007) A ~3.5Ga record of water-limited, acidic weathering conditions on Mars, *Earth and Planetary Science Letters*, 260, 432-443.
11. **Hurowitz, J.A.**, McLennan, S.M., Schoonen, M.A.A., Tosca, N.J., (2007), Production of hydrogen peroxide in martian and lunar soils, *Earth and Planetary Science Letters*, 255, 41-52.

PUBLICATIONS (2006):

12. **Hurowitz, J.A.**, McLennan, S.M., McSween, H.Y., Jr., DeSouza, P.A., Jr., Klingelhöfer, G. (2006) Mixing relationships and the effects of secondary alteration in the Wishstone and Watchtower classes of Husband Hill, Gusev Crater, Mars, *Journal of Geophysical Research*, 111, E12S14, doi:10.1029/2006JE002795.
13. **Hurowitz, J.A.**, McLennan, S.M., Tosca, N.J., Arvidson, R.E., Michalski, J.R., Ming, D.W., Schroeder, C., Squyres, S.W. (2006) In-situ and experimental evidence for acidic weathering on Mars, *Journal of Geophysical Research*, 111, E02S19, doi:10.1029/2005JE002515.
14. Squyres, S.W., Arvidson, R.E., Clark, B.C., Bell III, J.F., Crumpler, L.S., Farrand, W.H., Gorevan, S., Herkenhoff, K.E., **Hurowitz, J.A.**, McSween, H.Y., Ming, D.W., Morris, R.V., Ruff, S.W., Wang, A., Yen, A. (2006) The rocks of the Columbia Hills, *Journal of Geophysical Research*, 111, , No. E2, E02S16, doi:10.1029/2005JE002562.

15. Wang, A., Haskin, L.A., Squyres, S.W., Arvidson, R.E., Jolliff, B.L., Crumpler, L., Gellert, R., Schroeder, C., Herkenhoff, K., **Hurowitz, J.A.**, Tosca, N.J., Farrand, W., Anderson, R.C. (2006) Sulfate deposition in subsurface regolith exposed in trenches at the plains traversed by the Spirit rover in Gusev Crater, Mars. *Journal of Geophysical Research*, 111, No. E2, E02S16, doi:10.1029/2005JE002513.
16. Wang, A., Korotev, R.L., Jolliff, B.L., Haskin, L.A., Crumpler, L., Farrand, W., Herkenhoff, K.E., de Souza, P., Kusack, A.G., **Hurowitz, J.A.**, Tosca, N.J. (2006) Evidence for phyllosilicate in Wooly Patch, an altered rock encountered at West Spur, Columbia Hills by Spirit Rover. *Journal of Geophysical Research*, 111, No. E2, E02S16, doi:10.1029/2005JE002516.
17. Arvidson, R.E., Squyres, S.W., Anderson, R.C., Bell, J.F. III, Brückner, J., Cabrol, N.A., Calvin, W.M., Carr, M., Christensen, P.R., Clark, B.C., Crumpler, L.S., Des Marais, D.J., d'Uston, C., Economou, T., Farmer, J.D., Farrand, W.H., Folkner, W.M., Golombek, M., Gorevan, S., Grant, J., Greeley, R., Grotzinger, J., Guinness, E., Hahn, B.C., Haskin, L.A., Herkenhoff, K.E., **Hurowitz, J.A.**, Hviid, S., Johnson, J.R., Klingelhöfer, G., Knoll, A., Landis, G., Leff, C., Lemmon, M., Li, R., Madsen, M., Malin, M.C., McLennan, S.M., McSween, H.Y., Ming, D., Moersch, J., Morris, R.V., Parker, T.J., Rice, J., Richter, L., Rieder, R., Rodionov, D., Schröder, C., Sims, M., Smith, M., Smith, P., Soderblom, L.A., Sullivan, R., Thompson, S., Tosca, N.J., Wang, A., Wänke, H., Ward, J., Wdowiak, T., Wolff, M., Yen, A.S. (2006) Overview of the Spirit Mars Exploration Rover Mission to Gusev Crater: Landing Site to the Methuselah Outcrop in the Columbia Hills, *Journal of Geophysical Research*, 111, E02S01, doi:10.1029/2005JE002499.

PUBLICATIONS (2005):

18. **Hurowitz, J.A.**, McLennan, S.M., Lindsley, D.H., Schoonen, M.A.A. (2005) Experimental epithermal alteration of synthetic Los Angeles meteorite: Implications for the origin of Martian soils and identification of hydrothermal sites on Mars, *JGR-Planets*, 110, E07002, doi:10.1029/2004JE002391, 2005.
19. **Hurowitz, J.A.** and McLennan, S.M. (2005) Geochemistry of Cambro-Ordovician sedimentary rocks of the northeastern USA: Changes in sediment sources at the onset of Taconian orogenesis, *Journal of Geology*, 113, 571-587.
20. Tosca, N.J., McLennan, S.M., Clark, B.C., Grotzinger, J.P., **Hurowitz, J.A.**, Knoll, A.H., Schröder, C., Squyres, S.W. (2005) Geochemical modeling of evaporation processes on Mars: Insight from the sedimentary record at Meridiani Planum, *Earth and Planetary Science Letters*, 240 (1), 122-148.
21. McLennan, S.M., Bell III, J.F., Calvin, W.M., Christensen, P.R., Clark, B.C., deSouza, P.A., Farmer, J.D., Farrand, W.H., Fike, D., Gellert, R., Ghosh, A., Glotch, T.D., Grotzinger, J.P., Hahn, B.C., Herkenhoff, K.E., **Hurowitz, J.A.**, Johnson, J.R., Jolliff, B.L., Klingelhofer, G., Knoll, A.H., Learner, Z.A., Malin, M.C., McSween, H.Y., Pocock, J., Ruff, S.W., Soderblom, L.A., Squyres, S.W., Tosca, N.J., Watters, W., Wyatt, M.B., Yen, A., (2005) Provenance and diagenesis of the Burns Formation, Meridiani Planum, Mars, *Earth and Planetary Science Letters*, 240 (1), 95-121.
22. Crumpler, L.S., Squyres, S.W., Arvidson, R.E., Bell, J.F. III, Blaney, D., Cabrol, N.A., Christensen, P.R., DesMarais, D.J., Farmer, J.D., Fergason, R., Golombek, M.P., Grant, F.D., Grant, J.A., Greeley, R., Hahn, B.C., Herkenhoff, K.E., **Hurowitz, J.A.**, Knudson, A.T., Landis, G.A., Li, R., Maki, J., McSween, H.Y., Ming, D.W., Moersch, J.E., Payne, M.C., Rice, J.W., Richter, L., Ruff, S.W., Sims, M., Thompson, S.D., Tosca, N.J., Wang, W., Whelley, P., Wright, S.P., Wyatt, M.B. (2005) MER Geologic Traverse Science by the Spirit Rover in the Plains of Gusev Crater, Mars, *Geology*, 33(10), 809-812 .
23. Yen, A.S., Gellert, R., Schröder, C., Morris, R.V., Bell III, J.F., Knudson, A.T., Clark, B.C., Ming, D.W., Crisp, J.A., Arvidson, R.E., Blaney, D.L., Brückner, J., Christensen, P.R., DesMarais, D.J., deSouza Jr., P.A., Economou, T.E., Ghosh, A., Hahn, B.C., Herkenhoff, K.E., Haskin, L.A., **Hurowitz, J.A.**, Jolliff, B.L., Johnson, J.R., Klingelhöfer, G., Madsen, M.B., McLennan, S.M., McSween, H.Y., Richter, L., Rieder, R., Rodionov, D., Soderblom, L.A., Squyres, S.W., Tosca, N.J., Wang, A., Wyatt, M.B., Zipfel, J. (2005) An integrated view of the chemistry and mineralogy of martian soils, *Nature*, 436, doi:10.1038/nature03637.
24. Haskin, L.A., Wang, A., Jolliff, B.L., McSween, H.Y., Clark, B.C., Des Marais, D.J., McLennan, S.M., Tosca, N.J., **Hurowitz, J.A.**, Farmer, J.D., Yen, A.S., Squyres, S.W., Arvidson, R.E., Klingelhöfer, G., Schröder, C., de Souza Jr., P.A., Ming, D.W., Gellert, R., Zipfel, J., Brückner, J., Bell III, J.F., Herkenhoff, K.E., Christensen, P.R., Ruff, S.W., Blaney, D.L., Gorevan, S., Cabrol, N.A., Crumpler, L.S., Grant, J.A., Soderblom, L.A., (2005) Water alteration of rocks and soils on Mars at the Spirit rover site in Gusev Crater, *Nature*, 436, doi:10.1038/nature03640.

PUBLICATIONS (2004):

25. Bock, B., **Hurowitz, J.A.**, McLennan, S.M., Hanson, G.N. (2004) Scale and timing of rare earth element redistribution in the Taconian foreland of New England, *Sedimentology*, 51(4), 885-897.

BOOK CHAPTERS:

1. McLennan, S.M., Bock, B., Hemming, S.R., **Hurowitz, J.A.**, Lev, S.M., McDaniel, D.K. (2003) The roles of provenance and sedimentary processes in the geochemistry of sedimentary rocks. *Geochemistry of Sediments and Sedimentary Rocks: Evolutionary Considerations to Mineral Deposit-Forming Environments*. Lentz, D.R., Ed. St.John's: Geological Association of Canada, 192 pp.

WHITE PAPERS:

1. MEPAG ND-SAG (2008). Science Priorities for Mars Sample Return, Unpublished white paper, 70 p, posted March 2008 by the Mars Exploration Program Analysis Group (MEPAG) at <http://mepag.jpl.nasa.gov/reports/index.html>. Contributor to MEPAG Goal II analysis.

ABSTRACTS (2010):

1. **Hurowitz, J.A.**, Fischer, W.W., Milliken, R.E., Tosca, N.J. (2010) Fe-Redox, aridification and acidic surface waters on early Mars, *Goldschmidt 2010*, Knoxville, TN.
2. **Hurowitz, J.A.**, Fischer, W.W., Milliken, R.E., Tosca, N.J. (2010) Redox chemistry and the origin of acidity on the ancient surface of Mars, In *1st International Conference on Mars Sedimentology and Stratigraphy*, Abstract #6054, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2009):

3. **Hurowitz, J.A.**, Fischer, W.W., Milliken, R.E., Tosca, N.J. (2009) Redox on early Mars and the origin of surface acidity, *American Geophysical Union Fall Meeting*, San Francisco, CA.
4. **Hurowitz, J.A.** (2009), Clay mineral formation and evolution in an experimental basalt weathering profile, In *40th Lunar and Planetary Science Conference*, Abstract #2083, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2008):

5. **Hurowitz, J.A.** (2008), A ~3.5By record of water-limited, acidic weathering on Mars, *Goldschmidt 2008*, Vancouver, B.C.

ABSTRACTS (2007):

6. **Hurowitz, J.A.** and Yen, A.S. (2007), Laboratory measurements of oxygen gas release from basaltic minerals exposed to ultraviolet radiation: Implications for the Viking Gas Exchange experiments, *American Geophysical Union Fall Meeting*, San Francisco, CA.
7. Yen, A.S., Ming, D.W., Morris, R.V., Clark, B.C., Gellert, R., **Hurowitz, J.A.** (2007), Silica deposits within Gusev Crater: Clear evidence for Martian water, *American Geophysical Union Fall Meeting*, San Francisco, CA.
8. Taylor, G.J., Stopar, J.D., **Hurowitz, J.A.**, McLennan, S.M., Boynton, W.V., Wyatt, M.B., Baloga, S.M. (2007), A view of Martian weathering from microns to hundreds of kilometers, *Goldschmidt 2007*, Cologne, Germany.
9. **Hurowitz, J.A.**, Taylor, G.J., Wyatt, M.B., McLennan, S.M., Yen, A.S., Boynton, W.V. (2007) A global view of Martian weathering based on lander, GRS, and MGS-TES data, In *7th International Conference on Mars*.
10. Yen, A.S., Clark, B.C., Gellert, R., Morris, R.V., **Hurowitz, J.A.** (2007) Zinc as an indicator of alteration at the Martian surface, In *7th International Conference on Mars*.
11. Farrand, W.H., Rice, J., Glotch, T.G., **Hurowitz, J.A.** (2007) Hyperspectral, multi-spectral, and textural analyses of the Mawrth Vallis layered terrain, In *7th International Conference on Mars*.
12. **Hurowitz, J.A.**, Yen, A.S., Kim, S. (2007) Experimental constraints on oxygen gas release and mobility of adsorbed superoxide in Martian soils, In *Lunar and Planetary Science XXXVIII*, Abstract #2041, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2006):

13. **Hurowitz, J.A.**, McLennan, S.M., Yen, A.S. (2006) A comparison of chemical weathering styles on Earth and Mars, *American Geophysical Union Fall Meeting*, San Francisco, CA.
14. Yen, A.S., Clark, B.C., **Hurowitz, J.A.** (2006) Decomposition of organic compounds at the Martian surface, *American Geophysical Union Fall Meeting*, San Francisco, CA.
15. McLennan, S.M., Grotzinger, J.P., **Hurowitz, J.A.**, Tosca, N.J. (2006) Sulfate geochemistry and the sedimentary rock record of Mars, *Workshop on Martian Sulfates as Recorders of Atmospheric-Fluid-Rock Interactions*, Lunar and Planetary Institute, Houston.
16. Lewis, J., **Hurowitz, J.A.**, McLennan, S.M. (2006) Aqueous alteration of Clovis Class Mars rocks from Gusev Crater, *Undergraduate Research and Creative Activity Conference*, Stony Brook, NY.
17. **Hurowitz, J.A.**, McLennan, S.M., and the Athena Science Team (2006) Geochemical mixing relationships between bedrock lithologies on Husband Hill, Gusev Crater, Mars In *Lunar and Planetary Science XXXVII*, Abstract #1621, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2005):

18. **Hurowitz, J.A.**, McLennan, S.M., and the Athena Science Team (2005) Weathering of rocks and soils on Mars, *Geological Society of America, Annual Meeting*, Salt Lake City, UT.

19. **Hurowitz, J.A.**, Tosca, N.J., McLennan, S.M., and the Athena Science Team (2005) Experimental basalt alteration at low-pH: Implications for weathering relationships on Mars, In *Lunar and Planetary Science XXXVI*, Abstract #2025, Lunar and Planetary Institute, Houston (CD-ROM).
20. **Hurowitz, J.A.**, Tosca, N.J., McLennan, S.M., and Schoonen, M.A.A. (2005) Mechanically produced radical species at silicate surfaces and the oxidant in Martian soils, In *Lunar and Planetary Science XXXVI*, Abstract #1991, Lunar and Planetary Institute, Houston (CD-ROM).
21. Korotev, R.L., Wang, A., Jolliff, B.L., Crumpler, L., Farrand, W.H., Herkenhoff, K.E., de Souza, P., Kusack, A.G., **Hurowitz, J.A.**, Tosca, N.J. (2005) Phyllosilicates in Wooly Patch outcrop investigated by Spirit Rover at West Spur, Gusev Crater. *Geological Society of America, Annual Meeting*, Salt Lake City, UT.
22. McLennan, S.M., **Hurowitz, J.A.**, Tosca, N.J. (2005) Surficial processes on a basaltic planet. *18th Kongsbergseminar, The patterns of wet planets*.
23. McLennan, S.M., Bell III, J.F., Calvin, W.M., Christensen, P.R., Clark, B.C., deSouza, P.A., Farrand, W.H., Fike, D., Gellert, R., Ghosh, A., Glotch, T.D., Grotzinger, J.P., Hahn, B.C., Herkenhoff, K.E., **Hurowitz, J.A.**, Johnson, J.R., Johnson, S.S., Jolliff, B.L., Klingelhöfer, G., Knoll, A.H., Learner, Z.A., Malin, M.C., McSween, H.Y., Pocock, J., Ruff, S.W., Squyres, S.W., Tosca, N.J., Watters, W., Wyatt, M.B., Yen, A., and the Athena Science Team (2005) Provenance and diagenesis of impure evaporitic sedimentary rocks on Meridiani Planum, Mars, In *Lunar and Planetary Science XXXVI*, Abstract #1884, Lunar and Planetary Institute, Houston (CD-ROM).
24. Tosca, N.J., McLennan, S.M., Clark, B.C., Grotzinger, J.P., **Hurowitz, J.A.**, Knoll, A.H., Schröder, C., Squyres, S.W., and the Athena Science Team (2005) Geochemical modeling of evaporites on Mars: Insight from Meridiani Planum, In *Lunar and Planetary Science XXXVI*, Abstract #1724, Lunar and Planetary Institute, Houston (CD-ROM).
25. Wang, A., Haskin, L.A., Squyres, S.S., Arvidson, R.E., Crumpler, L.S., Gellert, R., **Hurowitz, J.A.**, Schroder, C., Tosca, N.J., Herkenhoff, K.E., Jolliff, B.J., and the Athena Science Team (2005) Sulfate deposition in regolith exposed in trenches on the plains between Spirit landing site and Columbia Hills in Gusev Crater, Mars, In *Lunar and Planetary Science XXXVI*, Abstract #2236, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2004):

26. **Hurowitz, J.A.**, Tosca, N.J., McLennan, S.M., Lindsley, D.H., Schoonen, M.A.A. (2004) A reappraisal of adsorbed superoxide ion as the cause behind the reactivity of the Martian soils, In *Lunar and Planetary Science XXXV*, Abstract #1699, Lunar and Planetary Institute, Houston (CD-ROM).
27. Schoonen, M.A.A., Strongin, D.R., Cohn, C.A., Smirnov, A., Laffers, R., **Hurowitz, J.A.**, Michel, F.M., Mueller, S., Wimmer, E., Leifer, N.D., Grey, C.P., (2004) Reactivity of defects on mineral surfaces: A multidisciplinary approach, *Proceedings from the 228th National Meeting of the American Chemical Society*, Philadelphia, PA.
28. Arlaukas, S.M., **Hurowitz, J.A.**, Tosca, N.J., McLennan, S.M. (2004) Iron-oxide weathering in sulfuric acid: Implications for Mars, In *Lunar and Planetary Science XXXV*, Abstract #1868, Lunar and Planetary Institute, Houston (CD-ROM).
29. Tosca, N.J., **Hurowitz, J.A.**, Meltzer, L., McLennan, S.M., Schoonen, M.A.A. (2004) Olivine weathering on Mars: Getting back to basics, In *Lunar and Planetary Science XXXV*, Abstract #1043, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (2003):

30. **Hurowitz, J.A.**, McLennan, S.M., Lindsley, D.H., Schoonen, M.A.A. (2003) The hydrothermal soil formation mechanism: relevant conditions and implications of experimental results, *6th International Mars Conference*, Pasadena, CA.
31. **Hurowitz, J.A.**, McLennan, S.M., Lindsley, D.H., Schoonen, M.A.A. (2003) Hydrothermal alteration of the Martian crust: an experimental approach, In *Lunar and Planetary Science XXXIV*, Abstract #1781, Lunar and Planetary Institute, Houston (CD-ROM).

ABSTRACTS (1997-2002):

32. N. J. Tosca, **J. A. Hurowitz**, S. M. McLennan, D. H. Lindsley, M. A. A. Schoonen (2002) Surficial processes on Mars: An experimental approach, In *Lunar and Planetary Science XXXIII*, Abstract #1354, Lunar and Planetary Institute, Houston (CD-ROM).

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34. **Hurowitz, J.A.** and McLennan, S.M. (2000) Neodymium isotopic evolution of the eastern margin of Laurentia: Rifting to the Taconian orogeny, *Geological Society of America, 35th Annual Meeting, Northeastern Section*, New Brunswick, NJ.
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