Dr. Amanda L. Nahm
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Education

University of Nevada, Reno, Nevada — May 2010
Ph.D., Geology, Advisor: Dr. Richard Schultz
Dissertation: *Geomechanical and tectonic investigations into the geologic history of Mars at local, regional, and global scales*

University of Colorado, Boulder, Colorado — May 2006
B.A., Geology, Astronomy (minor), Advisors: Dr. Robert Pappalardo and Dr. Alan Lester

Professional Experience

Postdoctoral Fellow, Center for Lunar Science and Exploration, NASA Lunar Science Institute, USRA–Lunar and Planetary Institute, (June 2010–present).
Teaching Assistant, GEOL 103: General Geology Laboratory, UNR (2010).
Instructor, GEOL 100: Earthquakes, Volcanoes, and Natural Disasters, UNR (2009).
Invited Visiting Researcher, Université de Nantes, Laboratoire de Planetologie et Géodynamique, Nantes, France, May–July 2009, Faulting in the Thaumasia Highlands, Mars.
Graduate Research Assistant, University of Nevada, Reno (2006–2010).
Planetary Geology and Geophysics Undergraduate Research Program (PGGURP) Intern, Brown University, Providence, Rhode Island, June–August 2005, Mid-Amazonian Glaciation of the Martian Dichotomy Boundary.

Research

My work uses a combination of techniques such as photogeologic image analysis, analysis of topography combined with mechanical modeling, and techniques developed in field geology and engineering fracture mechanics to solve key problems in the broad field of planetary tectonics. I am particularly interested in the tectonic and deformation histories of the terrestrial bodies, mainly Mars, Mercury, and the Moon. Some of my recent research includes:

- Structural mapping of the Schrödinger Basin, the Moon
- Forward mechanical modeling of lunar normal faults
- Structural and photogeologic analyses of the Orientale Basin on the Moon
- Structural mapping and determination of the deformation sequence of the Thaumasia Highlands, Mars

- Formation of the Pantheon Fossae radial graben structure, Caloris Basin, Mercury
- Analysis of surface faults to calculate the magnitude of global contraction on Mars
- Depth of faulting for wrinkle ridges (blind thrust fault anticlines) on the Moon and their relationship to lobate scarps (surface-breaking thrust faults)
- Rock mass classification and physical properties of the Burns Formation, Mars
- Global redistribution of sulfates from the Burns Formation, Mars
- Amazonian (recent) glaciation of the dichotomy boundary on Mars

Teaching Experience

I have taught GEOL 103 to ~30 students, GEOL 100 to ~100 students, and have contributed to two other classes as described below. The dual, 400/600-level course number indicates both advanced undergraduates and graduate students can enroll. Course prefixes: GE: Geological Engineering, GEOL: Geology.

1. General Geology Laboratory (GEOL 103): Introductory level laboratory geared toward science/geology majors; however, no geology majors were enrolled in either of the lab sections taught. Responsible for preparing laboratory exercises, with topics such as rock and mineral identifications, structural geology, and two field labs (topics: flooding, faulted sedimentary rocks). Required text: *Laboratory Manual in Physical Geology*, 8th edition (2008), R. M. Busch (editor).
2. Earthquakes, Volcanoes, and Natural Disasters (GEOL 100): Introductory level class for non-science majors. Responsible for preparing and giving lectures, choosing the textbook, and writing homeworks and tests. Required text: *Physical Geology*: *Earth Revealed*, 8th edition (2009), D. Carlson and C. Plummer.
3. Geology for Engineers (GE 250): Introductory class on geologic principles and processes relevant to geological, mining, and civil engineers. Taught 10% of the class.
4. Introduction to Geomechanics (GE 484/684): Upper division class on deformation of rocks and outcrops. Taught 10% of the class.

Honors and Awards

Runner-up, best Ph.D. candidate speaker in the Department of Geological Sciences and Engineering Student Colloquium, chosen by students and faculty (2010).

Mackay School of Earth Sciences and Engineering Outstanding Ph.D. Student in Geosciences, Awarded to a graduating Ph.D. student on the basis of GPA and service to the Department of Geological Sciences and Engineering at the University of Nevada, Reno (2010).

Lunar and Planetary Institute (LPI) Career Development Award to attend the 2010 Lunar and Planetary Science Conference (LPSC) (2010).

Viola Vestal Coulter Graduate Scholarship, Awarded to outstanding graduate students in the Mackay School of Earth Science and Engineering at the University of Nevada (2009).

College of Science poster competition, Awarded first place for poster in the graduate student poster competition at the University of Nevada (2008).

Outstanding Senior Award, Awarded to outstanding graduating seniors in the Department of Geological Sciences at the University of Colorado (2006).

Outstanding Senior, Association of Women Geoscientists (AWG) Rocky Mountain Region, Awarded to outstanding graduating female seniors (2006).

NASA Planetary Geology and Geophysics Undergraduate Research Program (PGGURP) Intern, Awarded after competitive international search; NASA provided a stipend and funds for travel and housing. I worked with Dr. Jim Head at Brown University on Mid-Amazonian glaciation of the dichotomy boundary, Mars (2005).

T. Keith Marks Scholarship, Scholarship is given to those that show academic excellence and have made strong contributions to the University of Colorado Department of Geological Sciences (2005).

Dean's List, Achieved term GPA above 3.75 at the University of Colorado (2004).

Professional Service

Judge, Geological Society of America Planetary Geology Division Stephen E. Dwornik award for outstanding graduate and undergraduate student presentations, Lunar and Planetary Science Conference (2011)

Panel Member, NASA's Mars Data Analysis Program grant review panel (2011)

Adjunct Panel Member, NASA's Planetary Geology and Geophysics grant review panel (2010)

Invited Co-Convener, "Fault and Fracture Studies in the Solar System," Geological Society of America annual meeting, Portland, Oregon; Simon Kattenhorn co-convener (2009)

Reviewer, *Geophysical Research Letters* (2007, 2011), *Icarus* (2009)

External reviewer, grant proposals for NASA's Planetary Geology and Geophysics Program (2009, 2010)

Membership in Professional and Academic Societies

European Geophysical Union (EGU)
Geological Society of America (GSA)
Association for Women Geoscientists (AWG)
Golden Key International Honor Society
American Geophysical Union (AGU)

Invited Presentations

Wrinkle Ridges on Mars: Absence of Décollement Tectonics, European Geosciences Union annual meeting, Vienna, Austria, May 3, 2010, presented by R. A. Schultz.

First Mapping Results of the Thaumasia Highlands, Université de Nantes, Nantes, France, July 2, 2009.

Structural Mapping of the Thaumasia Highlands and Analysis of Surface Faults to Obtain the Magnitude of Global Contraction on Mars, German Aerospace Center (DLR), Berlin, Germany, June 25, 2009.

Deformation on Mars at Local and Regional Scales, invited seminar given at NASA Goddard Space Flight Center, November 13, 2008.

Peer-Reviewed Publications

Nahm, A. L., and Schultz, R. A. (2011), Magnitude of global contraction on Mars from analysis of surface faults: Implications for Martian thermal history, *Icarus*, 211, 389–400, doi:10.1016/j.icarus.2010.11.003.

Klimczak, C., Schultz, R. A., and **Nahm**, **A. L.** (2010), Evaluation of the origin hypotheses of Pantheon Fossae, central Caloris basin, Mercury, *Icarus*, 209, 262–270, doi: 10.1016/j.icarus.2010.04.014.

Nahm, A. L., and Schultz, R. A. (2010), Evaluation of the orogenic belt hypothesis for the formation of the Thaumasia Highlands, Mars, *Journal of Geophysical Research*, 115, E04008, doi:10.1029/2009JE003327.

Nahm, A. L., and Schultz, R. A. (2007), Outcrop-scale physical properties of Burns Formation at Meridiani Planum, Mars, *Geophysical Research Letters*, 34, L20203, doi:10.1029/2007GL031005.

Head, J. W., **Nahm, A. L.**, Marchant, D. R., Neukum, G., and the HRSC Team (2006), Modification of the dichotomy boundary on Mars by Amazonian mid-latitude regional glaciation. *Geophysical Research Letters,* 33, L08S03, doi: 10.1029/2005GL024360.

Other Publications

Kring, D. A., O. Abramov, M. G. Galenas, K. H. Joy, G. Y. Kramer, C. N. Mercer, **A. L. Nahm**, T. Niihara, T. Öhman, J. F. Rapp, A. J. Shaner, S. Simmons, M. B. Weller, and O. L. White (2011), Lunar Analogue Training at Meteor Crater, Arizona & the San Francisco Volcanic Field, AZ (Field trip guide), O. Abramov (editor), 113 p., Lunar and Planetary Institute contribution 1618, Houston, TX.

Articles in Preparation

Kramer, G. Y., **A. L. Nahm**, and D. A. Kring, Integrated Spectral and Geomorphological Analysis of the Schrödinger Basin.

Nahm, A. L. and D. A. Kring, Evidence for normal faulting of the outer rings of Orientale Basin, the Moon: Implications for basin formation.

Schultz, R. A., **Nahm**, **A. L.**, and L. G. J. Montési , Wrinkle ridges on Mars: Absence of décollement tectonics.

Nahm, A. L., R. A. Schultz, and D. A. Kring, Forward mechanical modeling of the Rupes Recta normal fault in eastern Mare Nubium, the Moon: Implications for the geologic history of Nubium Basin.

Abstracts and Presentations

2011

Nahm, A. L., Schultz, R. A., and Kring, D. A. Forward mechanical modeling of the Rupes Recta normal fault in eastern Mare Nubium, the Moon, European Geosciences Union annual meeting, Vienna, Austria, April 3–8, Geophysical Research Abstracts, Vol. 13, EGU2011-8785.

Nahm, A. L. and Kring, D. A. Evidence of normal faulting of the outer rings of Orientale Basin: Preliminary modeling results, Abstract #1172, Lunar and Planetary Science Conference 42, The Woodlands, TX, March 7–11.

2010

Schultz, R. A., **Nahm**, **A. L.**, and Montési, L. G. J. Wrinkle ridges on Mars: Absence of décollement tectonics, European Geosciences Union annual meeting, Vienna, Austria, May 2–7, Geophysical Research Abstracts, Vol. 12, EGU2010-0.

Nahm, A. L. and Schultz, R. A. A test of global contraction models for Mars using observations, Abstract #2086, Lunar and Planetary Science Conference 41, The Woodlands, TX, March 1–5.

2009

Nahm, A. L., Mangold, N., Ansan, V., and Schultz, R. A. Structural mapping and lithospheric flexure in the formation of the Thaumasia Highlands, Mars, Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 412, Portland, OR, October 18–21.

Nahm, A. L. and Schultz, R. A. Evaluation of the orogenic belt hypothesis for the formation of the Thaumasia Highlands, Mars, Abstract #1069, Lunar and Planetary Science Conference 40, The Woodlands, TX, March 23–27.

Schultz, R. A. and **Nahm, A. L**. Transient and long-term displacement-length scaling of planetary faults, Abstract #1075, Lunar and Planetary Science Conference 40, The Woodlands, TX, March 23–27.

Klimczak, C., **Nahm, A. L.**, and Schultz, R. A. Evaluation of the origin hypotheses of Pantheon Fossae, Mercury, Abstract # 1251, Lunar and Planetary Science Conference 40, The Woodlands, TX, March 23–27.

2008

Nahm, A. L. and Schultz, R. A. Evaluation of the orogenic belt hypothesis for the formation of Thaumasia, Mars, Abstract # P33B-1459, American Geophysical Union Annual Meeting, San Francisco, CA, December 15–19.

Nahm, A. L. and Schultz, R. A. Stress calculations for thrust faults in the southern Thaumasia Region, Mars, Abstract # 1111, Lunar and Planetary Science Conference 39, League City, TX, March 10–14.

2007

Nahm, A. L. and Schultz, R. A. Was there a period of global contraction on Mars?, Abstract # P13D-1552, American Geophysical Union Annual Meeting, San Francisco, CA, December 10–14.

Nahm, A. L. and Schultz, R. A. Outcrop-scale properties of sedimentary rocks on Mars, Abstract # 218-6, Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 590, Denver, CO, October 28–31.

Okubo, C. H., Schultz, R. A., and **Nahm, A. L**. Strength and deformability of light-toned layered deposits observed by MER Opportunity: Eagle to Erebus Craters. Abstract # 3040, 7th International Conference on Mars, Pasadena, CA, July 9–13.

Nahm, A. L., Schultz, R. A., and Thompson, S. D. Outcrop-scale properties of the Burns Formation at Meridiani Planum, Mars. Abstract # 1976, Lunar and Planetary Science Conference 38, League City, TX, March 12–16.

McCollom, T., Hynek, B. M., and **Nahm, A. L**. Could erosion of Meridiani Planum represent a significant contributor to global sulfate-rich Martian soils?, Abstract # 2151, Lunar and Planetary Science Conference 38, League City, TX, March 12–16.

2006

Nahm, A. L., Head, J. W., and Marchant, D. R. Lobate debris aprons surrounding mesa clusters north of Ismeniae Fossae, Mars: Characteristics and transition to lineated valley fill. Abstract # 1186, Lunar and Planetary Science Conference 37, League City, Texas, March 13–17.

2005

Head, J. W. III, Marchant, D. R., **Nahm, A.**, Agnew, M., and Dickson, J. Lineated valley fill at the dichotomy boundary on Mars: Evidence for regional mid-latitude glaciation. Abstract # 94125, GSA Abstracts with Programs Vol. 37, No. 7, p. 91.

Head, J. W., **Nahm, A. L.**, Marchant, D. R., Neukum, G., and the Mars Express HRSC Team. Modification of the dichotomy boundary on Mars by Amazonian mid-latitude regional glaciation, Vernadsky-Brown Microsymposium 42, October 10–12, Moscow, Russia, abstract ms020 [CD-ROM].

Additional Experience

Education, Public Outreach, and Mentoring Experience

- Judge, Center for Lunar Exploration (Lunar and Planetary Institute) high school research projects, April 2011
- Meeting mentor for an undergraduate first-time conference participant, Lunar and Planetary Science Conference, The Woodlands, TX, March 2011.
- Clear Creek Independent School District science fair judge, Houston, TX, February 2011.
- Lecture to members of the Society of Hispanic Professional Engineers, "An introduction to the solar system," at the Lunar and Planetary Institute, Houston, TX, December 2010.

- Workshop presenter, Sally Ride Festival, Rice University, Houston, TX, November 2010.
- Invited contributor, Moon Zoo blog, www.MoonZoo.org, July 2010, April 2011.
- Family Space Days, Lunar and Planetary Institute, Houston, TX, June 2010 – present.
- University of Nevada, Reno, NV, Mentor, ASCENT (All Students College Educated in Nevada Today) program, August 2008 – May 2010.
- Intel International Science and Engineering Fair judge, Reno, NV, May 2009.
- Roche Colorado/Boulder Valley Regional Science Fair judge, University of Colorado, Boulder, CO, March 2005 and 2006.

Tutoring Experience

- A to Z Tutoring, Reno, NV, August 2007 – August 2009
- University of Colorado, Boulder, CO, August 2004 – May 2006

Work Experience

- *Student Contractor*, U.S. Geological Survey, Denver, CO, May – August 2006
- *Laboratory Assistant*, University of Colorado, Boulder, CO, Cooperative Institute for Research in Environmental Sciences (CIRES), October 2004 – May 2006
- University of Colorado, Boulder, CO, Department of Geological Sciences Mentorship, June 2004
- *Intern*, Sun Chemical, Inc., Carlstadt, NJ, Analytical Chemistry Laboratory, May – August 2003

Miscellaneous

- Global contraction work featured in an article for the BBC Sky at Night magazine, Issue 71, April 2011.
- Featured in a national science book for grades 1–8 discussing real scientists and their professions, to be published by Houghton Mifflin Harcourt in 2012.