

HEIDI B. HAMMEL

Space Science Institute
Connecticut Office • 72 Sarah Bishop Road
Ridgefield, CT 06877

Phone: (203) 438-3506 • Email: hbh@alum.mit.edu

COLOR CODING: GREEN =2007 & late 2006, BLUE = 2006, INDIGO = 2005

EDUCATION

1988 Ph. D. University of Hawaii, Physics and Astronomy

CURRENT PROFESSIONAL POSITION

Space Science Institute, Boulder, CO

Co-Director, Research Branch (2003 - present)

Senior Research Scientist (August 1999 - present)

RECENT HONORS, AWARDS

2006 Hammel's Hubble Space Telescope Comet Crash observations cited as the Number 1 program in "Hubble's Top 10," a feature article in *Scientific American* **295**, 42-49

2002 Carl Sagan Medal (American Astronomical Society, Division for Planetary Sciences)

2002 Profiled as one of Discover Magazine's 50 Most Important Women in Science (<http://discovermagazine.com/2002/nov/feat50/>)

2000 Elected a Fellow of the American Association for the Advancement of Science

RECENT PROFESSIONAL ACTIVITIES

The Planetary Society, Board of Directors (2005-present)

AURA Board of Directors (2003-present)

AAAS Section D (Astronomy)

Member-at-large (2002 - present)

American Astronomical Society (AAS), Division for Planetary Science (DPS)

AAS George Van Biesbroeck Prize Committee (2006 - present)

DPS Prize Subcommittee (2005 - 2007)

DPS Web Site Developer, Administrator; see <http://www.aas.org/~dps> (1995 - 2007)

Advisory Activities

AAAC/NSF Exoplanet Task Force (2006 - present)

NASA Astrophysics Subcommittee (2006 - present)

NASA Solar System Exploration Strategic Roadmap Committee- "SRM12", Ex Officio, Education Liaison (2005-2006)

NASA Education Strategic Roadmap Committee – "SRM3" (2005-2006)

NASA Space Science Advisory Committee - SScAC (2002-2005)

NASA IRTF-Keck Management Operations Working Group (2001 - 2003)

PROFESSIONAL ACTIVITIES continued

Science Investigations

Team Member, Science Working Group, AURA/NOAO Giant Segmented Mirror Telescope development project (2007 - present)

Interdisciplinary Scientist, James Webb Space Telescope (2002 - present); also JWST (formerly NGST) Interim Science Working Group (2001 - 2002)

Team Member and Chair of Giant Planets Sub-panel, NASA Science and Technology Definition Team, Terrestrial Planet Finder – Coronagraph Mission (2005 - 2006)

Other Activities and Science Investigations

Organizing Committees for Scientific Meetings, both Science (SOC) and Local (LOC)

SOC, Planetary Atmospheres, Baltimore, MD, November 2007

LOC, Astrophysics in the Next Decade: JWST and Concurrent Facilities, Tucson, AZ, September 2007

SOC, Workshop On Science Associated With The Lunar Exploration Architecture, Tempe, AZ, November 2006

SOC, An International TPF/Darwin Workshop: Star Planet Interactions and implications for Habitability, Pasadena, CA, November 2006

SOC & LOC, "Uranus at Equinox" Workshop, Pasadena, CA, May 2006

National Academy of Science Space Studies Board Committee Memberships

Committee on Priorities for Space Science Enabled by Nuclear Power and Propulsion (2004-2005)

EDUCATIONAL, MENTORING, AND PUBLIC OUTREACH ACTIVITIES

Co-author with Noreen Grice on "Touch the Solar System," Braille book prototype development (2007 - present)

Panelist, "Inspiring Girls in Science: Engineering Your Future", The Donofrio Technology Series, Ridgefield Public Library, Ridgefield, CT (March 2007)

Science Coordinator, "Giant Worlds: A Voyage to the Outer Solar System" Museum Exhibit, Space Science Institute, Boulder, CO (2005 - present)

John J. McCarthy Observatory, Board of Directors, New Milford, CT (2005-present)

Science Fair Judge, East Ridge Middle School, Ridgefield, CT (January 2007; January 2006)

Participant, "Women Making Science: Problems, Progress, Power," a symposium sponsored by the NSF, The Feminist Press, and The Graduate Center at the City University of New York, New York, NY (December 2006)

Panelist, "Career Alternatives" discussion, sponsored by the Committee on the Status of Women in Astronomy, Division for Planetary Sciences Meeting, Pasadena, CA (October 2006)

Astronomy commentator, The Danbury News-Times, Danbury, CT (2001-present)

August 2007, Uranus Rings

October 2006, Physics Nobel Prize winner John Mather

August 2006, new definition of planet and Mars urban myth

EDUCATIONAL, MENTORING, AND PUBLIC OUTREACH ACTIVITIES (continued)

Visiting Scholar, Bismarck State College: visit included talks with high-school students, middle-school students, and women engineering students from across the college, in addition to live TV and radio interviews, a public lecture, workshops for teachers, and a special presentation for children. Bismarck, North Dakota (September 2006)

Visits to School and Scout Troops, Career Days, and Similar Activities

August 2007, Waimea Middle School, all Seventh and Eighth Grade classes, Waimea, HI

June 2007, Sarah Noble Intermediate School, all Sixth Grade classes, New Milford, CT

March 2007, Newton-Ransom Elementary School, all Fourth Grade classes, Clarks Summit, PA

June 2006, Ridgebury Elementary School, all Third Grade classes, Ridgefield, CT

May 2006, Sarah Noble Intermediate School, all Sixth Grade classes, New Milford, CT

May 2006, Girl Scout Brownie Troop 264, Ridgefield, CT

November 2005, St. Mary's School, Ridgefield, CT

November 2005, East Ridge Middle School, Ridgefield, CT

May 2005, Girl Scout Brownie Troop 264, Ridgefield, CT

February 2005, Children's Corner Kindergarten classes, Ridgefield, CT

Keynote Speaker, Ridgefield Chamber of Commerce Seminar: "Road to Self-Discovery and Empowerment - Women's Forum," West Redding, CT (May 2006)

Distinguished Visiting Professor, New Mexico State University, NSF ADVANCE Program: visit included talks with astronomy graduate students, middle-school students, pre-service teachers, and women faculty and students from across the university, in addition to newsprint and radio interviews, a public lecture, and a science colloquium. Las Cruces, New Mexico (April 2006)

Speaker, D'Onofrio Technology Series, "Inspiring Girls in Science: Local Women Talk Tech," Ridgefield Public Library, Ridgefield, CT (March 2005)

See also: "Presentations - Other Invited Talks or Presentations for Non-Scientific Audiences"

PAPERS IN PREPARATION

- [59] Hammel, H. B., M. L. Sitko, G. S. Orton, T. Geballe, D. K. Lynch, R. W. Russell, T. Hewagama, and L. Bernstein. Spatially-resolved mid-infrared ethane spectroscopy on Neptune. To be submitted to *Astrophysical Journal* (2007).
- [58] Hammel, H. B., I. de Pater, K. A. Rages, L. A. Sromovsky, P. M. Fry and M. R. Showalter. Discrete Dark Features on Uranus. To be submitted to *Icarus* (2007).

PAPERS SUBMITTED TO REFEREED JOURNALS

- [57] Sitko, M. L., W. J. Carpenter, R. L. Kimes, J. L. Wilde, D. K. Lynch, R. W. Russell, R. J. Rudy, S. M. Mazuk, C. C. Venturini, R. C. Puetter, C. A. Grady, E. F. Polomski, J. P. Wisniewski, S. M. Brafford, H. B. Hammel, and R.B. Perry. Variability of disk emission in pre-Main Sequence and related stars. I. HD 31648 and HD 163296 - isolated Herbig Ae stars driving Herbig-Haro flows. To be submitted to the *Astronomical Journal* (2007).
- [56] Fitzsimmons, A., A. M. Zalucha, J. Elliot, J. Thomas-Osip, H. B. Hammel, T. R. Marsh, V. S. Dhillon, F.W. Taylor, and P. G. J. Irwin. The 2003 Nov 14 occultation by Titan of TYC-1343-1865-1. I. High-cadence multi-colour occultation lightcurves. Submitted to *Astron. & Astrophys.* (2007).
- [55] Goldman, B., M. C. Cushing, M. S. Marley, É. Artigau, K. S. Baliyan, V. J. S. Béjar, J. A. Caballero, N. Chanover, M. Connelley, R. Doyon, T. Forveille, S. Ganesh, C. R. Gelino, H. B. Hammel, J. Holtzman, S. Joshi, U. C. Joshi, S. K. Leggett, M. C. Liu, E. L. Martín, V. Mohan, D. Nadeau, R. Sagar, and D. Stephens. CLOUDS search for variability in brown dwarf atmospheres. I: Infrared spectroscopic time series of L/T transition brown dwarfs. Submitted to *Astron. & Astrophys.* (2007).

PAPERS IN PRESS AT REFEREED JOURNALS

- [54] Zalucha, A. M., A. Fitzsimmons, J. Elliot, J. Thomas-Osip, H. B. Hammel, T. R. Marsh, V. S. Dhillon, F.W. Taylor, and P. G. J. Irwin. The 2003 Nov 14 occultation by Titan of TYC-1343-1865-1. II. Analysis of light curves. Submitted to *Icarus* (2007).
- [53] Sromovsky, L. A., P. M. Fry, H. B. Hammel, I. de Pater, K. A. Rages, and M. R. Showalter. Dynamics, evolution, and structure of Uranus' brightest cloud feature. *Icarus*, in press (2007).
- [52] de Pater, I., H. B. Hammel, M. R. Showalter, and M. A. van Dam. The Dark Side of the Rings of Uranus. *Science*, in press (2007).

PAPERS PUBLISHED IN REFEREED JOURNALS

- [51] Lynch, D. K., R. W. Russell, H. B. Hammel, and M. L. Sitko. Mid-infrared spectroscopy of Phobo and Deimos. *Astron. Journal* **134**, 1459-1463 (2007).

PAPERS PUBLISHED IN REFEREED JOURNALS (continued)

- [50] Hammel, H. B., M. L. Sitko, G. S. Orton, T. Geballe, D. K. Lynch, R. W. Russell, and I. de Pater. Distribution of ethane and methane emission on Neptune. *Astron. Journal* **134**, 637-641 (2007).
- [49] Hammel, H. B., and G. W. Lockwood. Suggestive correlations between the brightness of Neptune, solar variability, and Earth's temperature. *Geophysical Research Letters* **43**, L08203, doi:10.1029/2006GL028764 (2007).
- [48] Hammel, H. B., and G. W. Lockwood. Long-term atmospheric variability on Uranus and Neptune. *Icarus* **186**, 291-301 (2007).
- [47] Gardner, J. P., J. C. Mather, M. Clampin, R. Doyon, M.A. Greenhouse, H. B. Hammel, J. B. Hutchings, P. Jakobsen, S. Lilly, K. Long, J. I. Lunine, M. J. McCaughrean, M. Mountain, J. Nella, G. H. Rieke, M. J. Rieke, H.-W. Rix, E. P. Smith, G. Sonneborn, M. Stiavelli, H. S. Stockman, R. A. Windhorst, and G. S. Wright. The James Webb Space Telescope. *Space Science Review* **123**, 485-606 (2006).
- [46] Hammel, H. B., M. L. Sitko, D. K. Lynch, R. W. Russell, T. Hewagama, and L. Bernstein. Mid-infrared ethane emission on Neptune and Uranus. *Ap. J.* **644**, 1326-1333 (2006).
- [45] de Pater, I., H. B. Hammel, S. G. Gibbard, and M. R. Showalter. New dust belts of Uranus: One ring, two ring, red ring, blue ring. *Science* **312**, 92-94 (2006).
- [44] de Pater, I., S. Gibbard, and H. B. Hammel. Evolution of the dusty rings of Uranus. *Icarus* **180**, 186-200 (2006).
- [43] Hammel, H. B., I. de Pater, S. Gibbard, G. W. Lockwood, and K. Rages. Uranus in 2003: Zonal winds, banded structure, and discrete features. *Icarus* **175**, 534-545 (2005).
- [42] Hammel, H. B., I. de Pater, S. G. Gibbard, G. W. Lockwood, and K. Rages. New cloud activity on Uranus in 2004: First detection of a southern feature at 2.2 microns. *Icarus* **175**, 284-288 (2005).
- [41] de Pater, I., S. Gibbard, E. Chiang, H. B. Hammel, B. Macintosh, F. Marchis, S. Martin, H. G. Roe, and M. Showalter. The dynamic neptunian ring arcs: gradual disappearance of Liberté and a resonant jump of Courage. *Icarus* **174**, 263-272 (2005).
- [40] Gibbard, S. G., I. de Pater, I., and H. B. Hammel. Near-infrared adaptive optics imaging of the satellites and individual rings of Uranus. *Icarus* **174**, 253-262 (2005).

BOOK CHAPTERS

- [8] Hammel, H. B. The Ice Giant Systems of Uranus and Neptune. In *Solar System Update* (Eds. Phillippe Blondel and John Mason), Springer-Verlag, Berlin and Heidelberg, Germany, in press (2007).
- [7] Hammel, H. B. Uranus through the Eyes of Hubble. In *Hubble 2005: Science Year in Review*, Space telescope Science Institute, Baltimore, MD (2006).

OTHER PUBLICATIONS

- [13] Lisse, C. M., M.V. Sykes, D. Trilling, J. Emery, Y. Fernandez, H. B. Hammel, B. Bhattacharya, E. Ryan, and J. Stansberry. "Planetary Science Goals for the Spitzer Warm Era - A White Paper." <http://ssc.spitzer.caltech.edu/mtgs/warm/wp.html> (2007).
- [12] Hammel, H. B. and the JWST Science Working Group. "James Webb Space Telescope: The Next Great Observatory." *Space Telescope Science Institute Newsletter* **23**, 21-22 (2006).
- [11] The Terrestrial Planet Finder Coronagraph Science and Technology Development Team Report. Editors: Marie Levine, Stuart Shaklan, and James Kasting. JPL Document D-34923 (June 2006).
- [10] Sykes, M. V., and H. B. Hammel. "OpEd: NASA Space Science Continues To Be at Risk." http://www.space.com/spacenews/archive06/SykesOpEd_032706.html (2006).

ABSTRACTS

- [85] Hammel, H. B. Mid-IR Observations of the Outer Planets. *Bull. Amer. Astron. Soc.* **38**, 1223-1224 (2007).
- [84] Hammel, H. B., M. L. Sitko, G. S. Orton, T. Geballe, D. K. Lynch, R. W. Russell, and I. de Pater. Distribution of Ethane and Methane Emission on Neptune. *Bull. Amer. Astron. Soc.* **38**, 936 (2007).
- [83] Lynch, D. K., R. J. Rudy, R. W. Russell, S. Masuk, Venturini, C. C., M. L. Sitko, H. B. Hammel, R. C. Puetter and R. B. Perry. The 0.5-13 μm Spectrum of V4332 Sagittarii in 2006. *Bull. Amer. Astron. Soc.* **38**, 907 (2007).
- [82] Rages, K. A., H. B. Hammel, and I. de Pater. Neptune from Keck: Tracking down the scatterers. *Bull. Amer. Astron. Soc.* **38**, 555 (2006).
- [81] Martin, S. I. de Pater, J. Kloosterman, S. Gibbard, and H. B. Hammel. Multi wavelength imaging of Neptune at high spatial resolution. *Bull. Amer. Astron. Soc.* **38**, 502 (2006).
- [80] Norwood, J., N. Chanover, and H. Hammel. Constraints on the distribution of methane in Uranus' atmosphere. *Bull. Amer. Astron. Soc.* **38**, 502 (2006).
- [79] Hammel, H. B., and G. W. Lockwood. Long-term atmospheric variability on Uranus and Neptune. *Bull. Amer. Astron. Soc.* **38**, 502 (2006).
- [78] Zalucha, A., J. Elliot, A. Fitzsimmons, V. Dhillon, T. Marsh, H. B. Hammel, P. Irwin, J. Thomas-Osip, and F. Taylor. High Altitude, Wavelength-dependent Extinction in Titan's Atmosphere from the 2003 Nov. 14 Occultation. *Bull. Amer. Astron. Soc.* **37**, 723 (2005).
- [77] Hammel, H. B., M. Sitko, D. Lynch, R. Russell, T. Hewagama, and L. Bernstein. Mid-Infrared Ethane Emission on Neptune and Uranus. *Bull. Amer. Astron. Soc.* **37**, 662-663 (2005).

Invited Colloquia, Seminars, and Talks for Scientific AudiencesUranus and Neptune

April 2007, Invited Colloquium, Williams College, Williamstown, MA.

April 2006, Invited Colloquium, New Mexico State University, Las Cruces, NM.

February 2006, Invited Colloquium, Wesleyan University, Middletown, CT.

March 2005, Invited Colloquium, Massachusetts Institute of Technology, Department of Earth, Atmospheric, and Planetary Sciences, Cambridge, MA.

Invited Academic Lectures for Undergraduate and Graduate Students

April 2007, "Telescopes in Space." Williams College, Williamstown, MA [undergraduates]

April 2007, "Exploration of the Giant Planets." Fordham University, Bronx, NY [undergraduates]

November 2006, "Exploration of the Giant Planets." Fordham University, Bronx, NY [undergraduates]

Other Invited Talks or Presentations for Non-Scientific AudiencesIs Pluto a Planet?

August 2007, "Is Pluto a Planet?" Mauna Kea Visitor Center, Mauna Kea, HI [general public]

November 2006, "Is Pluto a Planet?" Ridgefield Public Library, Ridgefield, CT [general public]

Various Topics

October 2006, "The New Outer Solar System," New Pond Farm Education Center, Redding, CT [general public]

May 2006, "Exploring a New World," Joint presentation with James Cameron and Bill Nye, Sponsored by The Planetary Society in cooperation with the U.S. House of Representatives Science Committee, Washington, DC [members of the US House of Representatives and affiliated staff]

March 2006, "Uranus and Neptune: Understanding the Ice Giants," Invited Speaker, "Astronomy for All" Mediterranean Solar Eclipse Cruise [astronomy enthusiasts]

May 2006, "Exploring the Giant Planets," Invited Speaker, Wilton Lunch Bunch, Westport, CT [retired men]

Planets Around Other Stars

June 2006, Invited Speaker, Ridgefield Men's Club, Ridgefield, CT [retired men]

April 2006, Invited Speaker, New Mexico State University [general public]

March 2006, Invited Speaker, "Astronomy for All" Mediterranean Solar Eclipse Cruise [astronomy enthusiasts]

Press Conferences

April 2006, National Academy of Science, Panel member for the announcement of the paperback edition of the book Series, "Women's Adventures in Science," Washington, DC.

April 2005, NASA Astronomy Update: "Spitzer Space Telescope Discovers Light from Extrasolar Planets," NASA Television, NASA Headquarters, Washington, DC. (Participated in pre-conference planning and pre-conference interviews, but missed actual press conference due to last-minute rescheduling caused by an embargo violation.)

Biography and Print Interviews

August 2007, "Astronomer Dispels Myths about Being a Scientist," article by Erin Miller, 15 August 2007, West Hawaii Today, story (Big Island, HI).

March 2007, "From Abington to Jupiter," article by Melissa Kelly, 27 March 2007, The Abington Journal, story and photo (Clarks Summit, PA).

April 2006, biography trade edition published; library edition published 2005: "Beyond Jupiter: The Story of Planetary Astronomer Heidi Hammel," written by Alfred Bortz, in the National Academies Press series "*Women's Adventures in Science*" (<http://www.nap.edu/was/>). Associated kids' website sponsored by the National Academy of Science (http://www.iwaswondering.org/heidi_homepage.html). ISBN 0-531-16775-5.

July 2006, "Star Power: Heidi Hammel Unlocks Planetary Secrets," article by Lesley Cotton, Ridgefield Magazine, Vol. 4, p. 58-60.

April 2006, "The Big Picture: Astronomer Heidi Hammel takes a down-to-earth approach to her job," article by Lois Street, Connecticut Magazine. Vol. 69, pp 96-99.

Podcasts, Radio, and Television Interviews

August 2006, Film interview for National Geographic production about weather in the Solar System, Mauna Kea Observatory, HI.

July 2006, Podcast, Planetary Radio, "Turning the Spotlight to Uranus and Neptune with Heidi Hammel", <http://www.planetary.org/radio/show/00000192/>

December 2005, Podcast, Planetary Radio, "Uranus and Neptune Take Center Stage With Heidi Hammel", <http://www.planetary.org/radio/show/00000139/>