Dr. David H. Grinspoon
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EDUCATION

Doctor of Philosophy in Planetary Sciences
University of Arizona; Tucson, Arizona
Minor in Physical Chemistry
Dissertation: Large Impact Events and Atmospheric Evolution on the Terrestrial Planets
Date Received: May 1989

Bachelor of Sciences
Brown University; Providence, Rhode Island
Major in Planetary Science
Honors Thesis: Tectonic Ridges on Venus: A Problem in Comparative Planetology
Date received: June 1982

Bachelor of Arts
Brown University; Providence, Rhode Island
Major in Philosophy of Science
Honors Thesis: Philosophy of Planetary Science
Date received: June 1982

Research Summary:

My research interests, stated broadly, are in surface-atmospheric interactions on terrestrial planets, with a special focus on atmospheric evolution and habitability. I have served as PI on grants from the NASA Planetary Geology and Geophysics, Planetary Atmospheres, Exobiology, and Venus Express Participating Scientist Programs. I am Co-I on the Chemistry of Titan Lead Team of the NASA Astrobiology Institute. I am Interdisciplinary Scientist on the European Space Agency's Venus Express mission (funded by NASA). I am Co-I on the RAD instrument on the Mars Science Laboratory. I have published papers in Icarus, Journal of Geophysical Research, Planetary and Space Science, Nature, Science, and several other journals. I have also been a science Co-I on several large mission proposals to the NASA New Frontiers and Discovery programs. I have given numerous keynote and plenary addresses at international conferences.

Outreach Summary:

I am lead scientist for outreach of the Titan Astrobiology Lead Team (based at JPL). I have written and performed several original planetarium shows. I have lectured widely, written two award winning popular books on planetary science and astrobiology, and participated in numerous popular science television and radio productions. I write the monthly "Cosmic Relief" column for Sky &Telescope Magazine, where I am a contributing editor. In 2006 I was awarded

the Carl Sagan Medal for Outstanding Communication of Planetary Science by the Division for Planetary Sciences of the American Astronomical Society. I brought a "Science on a Sphere" display system to the Denver Museum of Nature & Science (through an informal science center grant from NASA), and I am actively involved in producing new content for this system in the area of comparative planetology and climate change. Here at the Museum I am also involved in teacher trainings, exhibit development and a wide variety of public programming. I have organized symposia and public discussions on a wide range of contemporary scientific issues, including a widely attended four-part, year-long series of panel discussions on "Ethics of Space Exploration". Recently I have been involved in bringing NASA science to middle-school students on the Navajo Nation, through the multi-year "NASA and the Navajo Nation Space Camp" series.

Service Summary:

In addition to serving on numerous Museum committees, search committees, task forces and so forth, I have been active in national service to the planetary science and astrobiology communities. This has involved serving on several national advisory committees, such as NASA's Solar System Exploration Subcommittee, and the Inner Planets Panel of the recent NRC Decadal Survey, for which I also was science champion of a large mission study, the Venus Climate Mission, which was included in the final report as a possible flagship mission in the coming decade. I am also chair of a NASA focus group on Comparative Planetary Climatology. I have served on numerous NASA review panels, served a term as associate editor of the Journal of Geophysical Research, and served as Book Review Editor for Astrobiology Journal. I have convened and chaired numerous sessions for the American Geophysical Union and other meetings. I am currently a convener of an upcoming Lunar and Planetary Institute Conference on Comparative Planetology.

APPOINTMENTS

2006	Curator of Astrobiology, Denver Museum of Nature & Science
2000	Associate Professor Adjunct, Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder
2006-	Research Associate, Center for Space Exploration Policy Research
2001-2005	Principal Scientist, Southwest Research Institute, Boulder
1999 -2001	Visiting Scientist, Southwest Research Institute, Boulder
1991-1999	Senior Research Associate, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder
1991-1999	Assistant Professor, Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder
1989-1991	National Research Council Post-Doctoral Associate, Theoretical Studies Division, NASA/Ames Research Center; Moffett Field, California
1983-1989	Research Assistant, Lunar and Planetary Laboratory, University of Arizona
1979	Research Assistant, Voyager Imaging Team, JPL

AWARDS and HONORS

2011 Named one of "**100 Colorado Creatives**" by Westword newspaper.

2007 Named "**Alpha Geek**" by *WIRED* Magazine.

2006 **Carl Sagan Medal for Public Communication of Planetary Science**, American Astronomical Society

2004 **PEN Center USA Literary Award for Research Nonfiction** for Lonely Planets: The Natural Philosophy of Alien Life.

2000 Named **Outstanding Visiting Scientist** for "extraordinary volunteer work" by the Visiting Scientist Program of Metropolitan State College of Denver

1998 **Finalist** for 1997 *Los Angeles Times Book Prize* for Venus Revealed

1997 **Astrobiology Stellar Site Award** for Venus Revealed Web Site

1997 **Space Views Space Site Award** for Venus Revealed Web Site

1996 Named "**Outstanding Teacher**" by Mortar Board, a Senior Honor Society at the University of Colorado

1996 **Nominated** for **Boulder Faculty Excellence in Teaching Award**

1992 **Finalist** for the **Teaching Recognition Award** by the Student Organization for Alumni Relations at the University of Colorado

1992 University of Colorado **Junior Faculty Development Award**

1989 **Gerard P. Kuiper Memorial Award** given by the Department of Planetary Sciences, University of Arizona, for outstanding graduate student research and scholastic achievements

PROFESSIONAL ACTIVITIES AND SOCIETIES

2011 Guest editor, special issue of *Planetary and Space Science on Comparative Planetary Climatology*

2011 Member, *NASA Mars Science Laboratory Participating Scientist Program Review Panel*

2010 Science Champion, Venus Climate Mission study for *NRC Planetary Decadal Survey*

2009-2010 Member, Inner Planets Panel, *National Research Council Decadal Survey on Planetary Exploration*

2008- Co-Investigator, *NASA Astrobiology Institute*

2008 Chair, Comparative Planetary Climate Focus Group, *Venus Exploration Analysis Group, NASA*

2008-2009 Member and Atmospheres Subgroup Lead, *Venus Flagship Mission Science and Technology Definition Team, NASA*

2008 Convener of Union Session on *Comparative Climate Evolution*, Fall meeting, *American Geophysical Union*

2007 Member, NASA Ad hoc committee on Science Communication, convened by the *NASA Associate Administrator for Science*

2007 Convener: Workshop on Environmental Ethics and Space Exploration Policy, 4/11 - 4/13, *NASA Ames Research Center*, Mountain View, CA

2007 Convener, *Venus Express Science Workshop*, 3/18-24, La Thuile, Italy, Convener for two sessions on Atmospheric Structure and Evolution,

2007 Interdisciplinary Scientist, Venus Express, *European Space Agency*

2005 Member, *Venus Express Participating Scientist Review Panel, NASA*

2005 Member, *Venus Exploration Program Analysis Group, NASA*

2005 Committee on the Origin and Evolution of Life, *National Research Council*

2004- Lead Scientist for Astrobiology, Radiation Assesment Detector Experiment, on the *Mars Science Laboratory* (currently *en route* to Mars)

2001 - Senior Editor and Book Review Editor, *Astrobiology*

1998-2002 Member of the *Solar System Exploration Subcommittee, NASA*

1998-2003 Member of the *Campaign Science Working Group for Terrestrial Planets, NASA*

1995 Special Session Convener, Spring meeting of the *American Geophysical Union*

1993-1998 Associate Editor, *Journal of Geophysical Research: Planets*

1992-1993 Member, *NASA Venus Data Analysis Program Review Panel*

1993, 1996 Member, *NASA Planetary Atmospheres Program Review Pane*l

2000, 2004, 2008: Member, *NASA Exobiology Program Review Panel*

1994 Proposal Reviewer for *NASA Planetary Geology and Geophysics* and *NASA Origins* programs

1991 -1993 Program Committee, *Division for Planetary Sciences of the American Astronomical Society*
American Astronomical Society (Division of Planetary Science)

American Geophysical Union
American Physical Society
American Institute of Physics
International Astronomical Union
Colorado Alliance for Science
Science Discovery Advisory Committee for the Boulder *Daily Camera* Newspaper

TEACHING EXPERIENCE

Courses taught: Introductory Astronomy; Astrobiology; Planetary Atmospheres, The Planet Venus, Accelerated Introductory Astronomy, Planetary Geology, Graduate Seminars in Planetary Science, Life in the Universe.

- Have taught all levels, from Kindergarten through graduate school.
- Have taught over 2000 undergraduate and graduate students.

Thesis Committee

- Eight Ph.D. students at the University of Colorado
- One Ph.D. student at M.I.T.

TALKS

Invited Papers at Conferences

Grinspoon, D.H. and C. Sagan (1988). *The effect of asteroid and comet impacts on the early terrestrial environment.* Abstract for invited talk at the twenty-seventh COSPAR meeting. July 18-29, 1988, Espoo, Finland

Grinspoon, D.H. and J.S. Lewis (1988). *Evolution of water and deuterium on Venus.* Abstract for invited talk at the spring, 1988 American Geophysical Union meeting, EOS.

Grinspoon, D.H. (1993). *Resurfacing history and water on Venus*. Talk at the Spring 1993 meeting of the American Geophysical Union.

Grinspoon, D.H. (1994). *Comets and the climate history of Venus*. Abstracts of the workshop on Small Bodies in the Solar System and their Interactions with the Planets. Mariehamn, August, 1994.

Grinspoon, D.H. (1995). *Atmospheric Composition and Outgassing on Venus*. Abstract for invited talk at spring 1995 meeting of American Geophysical Union, EOS: **76**, S190.

Grinspoon, D.H. (1995). *Can "Venus System Science" provide environmental lessons for Earth?* Invited talk at the meeting of the Geological Society of America, New Orleans, November, 1995.

Grinspoon, D.H. (1998). *Geologic and Atmospheric Evolution on Venus.* Invited talk at the meeting of Division for Planetary Sciences of the American Astronomical Society. Madison, WI, October 1998.

Grinspoon, D.H. (1999). *Atmospheric Evolution on the Terrestrial Planets.* Invited talk at the spring 1999 meeting of the American Geophysical Union. Boston. May, 1999.

Grinspoon, D.H. (2002). *Climate Evolution on Venus: The Most Earthlike Planet.* Invited talk at the meeting of the Geological Society of America, Denver, November, 2002.

Grinspoon, D.H. (2004). *Sympathy for the Devil: The Case for Life on Venus.* Invited talk at the 3rd Astrobiology Conference, NASA/Ames Research Center, April 2004.

Grinspoon, D.H. (2005). *The History of Water on Venus.* Invited talk at the Workshop on Water in the Inner Solar System, 15th Annual Goldschmidt Conference on Geochemistry and Mineralogy, Moscow, Idaho.

Grinspoon, D.H. (2005). *The Astrobiological Aspects of Titan: A New Vision from Cassini-Huygens.* Invited keynote lecture at the 15th Annual Goldschmidt Conference on Geochemistry and Mineralogy, Moscow, Idaho.

Grinspoon, D.H. (2005). *The Complex Relationship between Planets and Life.* Invited talk at the 17th Annual U.S. Frontiers of Science Symposium. Irvine, CA, October, 2005.

Grinspoon, D.H. (2006.) *Venus and Astrobiology.* Invited talk at the AGU Chapman Conference on "Exploring Venus as a Terrestrial Planet". Key Largo, FL. February 13-17, 2006.

Grinspoon, D.H. (2006). *The Evolution of Mars, Venus and Titan: Lessons for the Limits of Habitability.* Pale Blue Dot III Workshop, Adler Planetarium, Chicago, IL, September 17-20, 2006.

Grinspoon, D.H. (2006). *The Pleasures and Perils of Popularization*. Carl Sagan Medal Lecture at the Conference of the Division of Planetary Sciences of the American Astronomical Society, Pasadena, CA. October 12, 2006.

Grinspoon, D.H. and Bullock M.A. (2006). *The Human Exploration of Venus*. Talk at the meeting of NASA's Venus Exploration Activities Group, Pasadena, CA, May, 2006.

Grinspoon, D.H. (2007) *Coupled Climate/Surface/Interior Evolution of Venus.* Invited talk at the 24th assembly of the International Union of Geology and Geophysics, Perugia, Italy, July 2007.

Grinspoon, D.H. (2007). *Isotopic Clues to Atmospheric and Water Loss.* Invited talk at Venus Express Science Workshop, March 18-24, 2007, La Thuile, Italy.

Grinspoon, D.H. (2007). *Extraterrestrial Spirituality*. Invited talk at Workshop on Environmental Ethics and Space Exploration Policy, NASA Ames Research Center, Mountain View, CA. April 11–13, 2007

Grinspoon, D.H. (2007). *Cloud Microphysics*, IAFF, Rome, Italy. July 10, 2007

Grinspoon, D.H. (2007). *Where are the Aliens?*, The Googleplex, Mountain View, CA. August 5, 2007

Grinspoon, D.H. (2008). *Evolution of water on Venus*, Invited talk at Venus Express Science Workshop, LaThuile, Italy, March 3-9, 2008

Grinspoon, D.H., (2008). *Coupled Climate, Surface and Interior Evolution of Venus*, Iinvited talk at the the COSPAR (Committee on Space Research of the International Council for Science) Scientific Assembly in Montreal, Canada. July 13-20, 2008

Grinspoon, D.H. (2008). *Surface/Atmosphere/Interior Evolution of Venus*, Invited talk at the Fall meeting of the American Geophysical Union in San Francisco, CA. December 17, 2008

Grinspoon, D.H. (2009). *The History of Venus,* Invited keynote address for Venus Geochemistry Workshop, Lunar and Planetary Institute, Houston, TX. February 26-27, 2009

Grinspoon, D.H. (2009), *The Divergent Evolution of Venus, Earth and Mars*, Invited Keynote Talk at the International Conference on Comparative Planetology: Venus-Earth-Mars, Noordwijk, The Netherlands. May 15, 2009

Grinspoon, D.H. (2009). *New Results on Evolution of Venus*, Invited talk at IAMAS, MOCA-09, Montreal, Canada. July 21, 2009

Grinspoon, D.H. (2009). *History of Science Since Galileo*, Invited keynote lecture at the 2009 meeting of the Astronomical Society of the Pacific, September 13, 2009

Grinspoon, D. H. (2010). *Coupled Surface-Atmosphere Evolution of Venus*, Invited talk at the 2010 International Venus Workshop, Madison, WI. June 20-26, 2010

Grinspoon, D.H. (2010). *Science vs. Anti-Science in the Climate and Evolution Debates*, Invited plenary presentation at the 2010 meeting of the Astronomical Society of the Pacific, Boulder, CO. August 2, 2010

Grinspoon, D.H. (2010). *The Atmosphere of Venus*, Invited talk at ExoClimes 2010: Exploring the Diversity of Planetary Atmospheres, University of Exeter, England. September 7, 2010

Grinspoon, D.H. (2010). *Evolution of Water on Venus*, Invited talk at Venus Express Science Conference, Aussois, France. June 24, 2010

Grinspoon, D.H. (2011). *Origin and Distribution of Life in the Universe,* Invited keynote address for the Astrobiology Graduate Student Conference, Montana State University, Bozeman. June 14, 2011

Contributed Papers at Conferences

Garvin, J.B., D.H. Grinspoon, J.W. Head, P. Helfenstein, P.Lucey, P.J. Mouginis-Mark and E.A. Robinson (1980). Rock morphology and size distributions at the Viking landing sites and comparison with Venus. *Lunar and Planetary Science*, **11**: 317-319. (Lunar and Planetary Science Conference)

Hilton, D.A., C.C. Cunningham, R.E. Eplee, Jr., D.H. Grinspoon, A. Hildebrand, T.D. Jones, S. Pope, N.M. Schneider, M.V. Sykes, and D.M. Hunten (1984). Design and construction of the "Mars Ball" prototype exploration vehicle. *Bull. Am. Astron. Soc*., **16**: 707. (AAS/DPS Meeting)

Grinspoon, D.H., and J.S. Lewis (1984). Deuterium fractionation in the pre-solar nebula: The role of surface catalysis. *Bull. Am. Astron. Soc.*, **1**:701.(AAS/DPS Meeting)

Hilton, D.A., R.E. Eplee, Jr., D.H. Grinspoon, A. Hildebrand, T.D. Jones, R. Marcialis, M. Marley, S. Pope, N.M. Schneider, A. Tyler, and D.M. Hunten (1985). Construction of the "Mars Ball" prototype exploration vehicle. *Bull. Am. Astron. Soc.,* **1**:697. (AAS/DPS Meeting)

Grinspoon, D.H., and J.S. Lewis (1986). Accretion of cometary volatiles on Venus. *Bull. Am. Astron. Soc.*, **1**:824. (AAS/DPS Meeting)

Hilton, D.A., R.E. Eplee, Jr., D.H. Grinspoon, D.M Janes, T.D. Jones, E. McFarlane, M. Marley, S. Pope, B. Rizk, N.M. Schneider, A. Tyler, and D.M. Hunten (1986). Construction of the "Mars Ball" roving vehicle. *Bull. Am. Astron. Soc.*, **1**:810. (AAS/DPS Meeting)

Grinspoon. D.H. and J.S. Lewis (1987). Cometary water on Venus. Abstracts of the Meeting on Origin and Evolution of Planetary and Satellite Atmospheres, Tucson, Arizona, March 1987.

Grinspoon, D.H. and C. Sagan (1987). Impact dust and climate on the primordial Earth. Abstracts of the Workshop on Long Term Stability of the Earth System, Pennsylvania State University, July-August, 1987.

Grinspoon, D.H. and C. Sagan (1987). Was the early Earth shrouded in impact-generated dust? *Bull. Am. Astron. Soc.*, **1**:872. (AAS/DPS Meeting)

Grinspoon, D.H. and W.K. Hartmann (1988). Intense early bombardment and its effects on primordial Earth. Abstracts of the Conference on the Origin of the Earth, Berkeley, CA, December 1988, LPI Contribution No. 681.

Zahnle, K.J. and D.H. Grinspoon (1989). Amino acids from an evaporating comet? *Bull. Am. Astron. Soc.*, **21**, 923. (AAS/DPS Meeting)

Grinspoon, D.H. and J.S. Lewis (1989). A proposed explanation of the mysterious Venusian water profile. *Bull. Am. Astron. Soc*., **2**:924. (AAS/DPS Meeting)

Grinspoon, D. and W.K. Hartmann (1990). Quantitative modelling of the early intense bombardment. Abstracts of the International Workshop on Meteorite Impact on the Early Earth. Perth, Australia, September 1990. LPI Contribution No. 746.

Grinspoon, D. and K. Zahnle (1990). Comet dust at the K/T boundary: Implications for the young Earth. Abstracts of the International Workshop on Meteorite Impact on the Early Earth. Perth, Australia, September 1990. LPI Contribution No. 746.

Grinspoon, D.H., J.B. Pollack, B. Dalton, J.F. Bell, D. Crisp, and R. Wattson (1990). Analysis of high resolution IR spectra of the Venus nightside. *Bull. Am. Astron. Soc.*, **2**:1052. (AAS/DPS Meeting)

Carlson, R.W., K.H. Baines, P.R. Weissman, W.D. Smythe, T. Encrenaz, P. Drossart, E. Lellouch, F.W. Taylor, J.B. Pollack and D.H. Grinspoon (1990). Near infrared imaging and spectroscopy of the deep atmosphere of Venus. *EOS*, **7**:1430. (Winter AGU Meeting)

Carlson, R.W., K.H. Baines, L.W. Kemp, T. Encrenaz, P. Drossart, E. Lellouch, F.W. Taylor, A.D. Collard, S.B. Calcutt, J.B. Pollack and D.H. Grinspoon (1991). Galileo near infrared

mapping spectroscopy of Venus' composition and cloud physics. *Bull. Am. Astron. Soc.*, **2**:1204. (AAS/DPS Meeting)

Bezard, B., C. deBergh, J.P. Maillard, D. Crisp, J. Pollack and D.H. Grinspoon (1991). High-Resolution Spectroscopy of Venus' night side in the 2.3, 1.7 and 1.1-1.3 mm windows. *Bull. Am. Astron. Soc.* **2**:1192. (AAS/DPS Meeting)

Pollack,, J.B., J.B. Dalton, D. Grinspoon, R. Wattson, R. Freedman, D. Crisp, D. Allen, B. Bezard and C. deBergh (1991). Simulations of the near infrared spectra of Venus' nightside with high temperature databases. *Bull. Am. Astron. Soc.*, **2**:1193. (AAS/DPS Meeting)

Zahnle, K. and D.H. Grinspoon (1991). Comet dust as a source of amino acids. Abstracts of Conference on Comets and the Origin and Evolution of Life, University of Wisconsin, October 1991, p. 40.

Lewis, J.S. and D.H. Grinspoon (1991). Cometary and asteroidal bombardment of Earth: Monte Carlo simulation, Abstracts of Conference on Comets and the Origin and Evolution of Life, University of Wisconsin, October 1991, p. 20.

Bullock, M.A., D.H. Grinspoon and J.W. Head (1992). Modelling the volcanic resurfacing of Venus. Abstracts of the 23rd Lunar and Planetary Science Conference. Houston, TX, March 1992

Bullock, M.A., D.H. Grinspoon and J.W. Head (1992). Monte Carlo modelling of resurfacing on Venus. Abstract and poster presented at the Brown University-Vernadsky Institute Workshop Microsymposium 15: "The Venus Crust: Mechanisms of formation and evolution".

Grinspoon, D.H. (1992) Venusian Hydrology: Steady-state reconsidered. Papers presented to the International Colloquium on Venus, Pasadena, CA. LPI Contribution #789. p. 36

Grinspoon, D.H., J.B. Pollack, R.W. Carlson, K.H. Baines, T. Encrenaz and F.W. Taylor (1992). Probing Venus' cloud structure with Galileo NIMS. *Bull. Am. Astron. Soc.*, **24**:995. (AAS/DPS Meeting)

Dalton, J.B., J.B. Pollack, D.H. Grinspoon, R.B. Wattson, D. Crisp and D.A. Allen (1992). Water abundance in the deep Venus atmosphere as constrained by near-infrared spectroscopic observations. *Bull. Am. Astron. Soc.*, **24**:995. (AAS/DPS Meeting)

Pollack, J.B., J.B. Dalton, D.H. Grinspoon, R.B. Wattson, R. Freedman, D. Crisp, D.A. Allen, B. Bezard and C. DeBergh (1992). Near-infrared light from Venus' nightside: A spectroscopic analysis. *Bull. Am. Astron. Soc.*, **24**:996. (AAS/DPS Meeting)

Encrenaz, T., P. Drossart, B. Bezard, E. Lellouch, M. Roos, F. Taylor, A. Collard, J. Pollack, D. Grinspoon, R. Carlson, K. Baines and L. Kamp (1992), The H_2O abundance in the lower atmosphere of Venus from NIMS-Galileo. *Bull. Am. Astron. Soc.*, **24**:1042. (AAS/DPS Meeting)

Bullock, M.A., D.H. Grinspoon and J.W. Head (1992). Monte Carlo Modeling of the resurfacing of Venus. Papers presented to the International Colloquium on Venus, Pasadena, CA. LPI Contribution #789, Pasadena, CA. p. 14.

Bullock, M.A., D.H. Grinspoon, and J.W. Head, Monte Carlo Modeling of Resurfacing of Venus, in Brown University-Vernadsky Institute Workshop Microsymposium 15, 1992.

Bullock, M.A., D.H. Grinspoon and J.W. Head (1993). Venus resurfacing rates: constraints provided by 3-D Monte Carlo simulations. Abstracts of the 24th Lunar and Planetary Science Conference. Houston, TX. March 1993. p. 213-214

Grinspoon, D.H. (1993). Evolutionary implications of a steady-state water abundance on Venus. Abstracts of the 24th Lunar and Planetary Science Conference. Houston, TX. March 1993. p.579-580.

Dalton, J.B., J.B. Pollack, D.H. Grinspoon, B. Bezard and C. de Bergh. (1993). Chlorine abundances in the deep Venus atmosphere as constrained by Near-Infrared spectroscopic observations. *Bull. Am. Astron*. Soc., **25**:1093-1094. (AAS/DPS Meeting)

D.H. Grinspoon, M.A. Bullock, and J.W. Head (1993). Resurfacing history of Venus and implications for atmospheric evolution. *Bull. Am. Astron. Soc.*, **25**:1094. (AAS/DPS Meeting)

M.A. Bullock, D.H. Grinspoon and J.B. Pollack (1993). Perturbations to the Venus greenhouse effect due to mineral equilibrium buffering. *Bull. Am. Astron. Soc*., **25**:1094. (AAS/DPS Meeting)

Bullock, M.A., D.H. Grinspoon, and J.W. Head (1993). Venus Resurfacing Rates: Constraints Provided by 3-D Monte Carlo Simulations, in *EOS,* **74:**189. (AGU)

Bullock, M.A., D.H. Grinspoon, and J.W. Head (1994). The Time Dependence of Resurfacing on Venus: Constraints Provided by the Impact Cratering Record, in *EOS*, **75**: 215,. (AGU)

Grinspoon, D.H., M.A. Bullock, J.B. Pollack, and J.W. Head (1994). The Climate History of Venus, in *EOS*, **75**: 214, (AGU)

Bullock, M.A., D.H. Grinspoon, and J.B. Pollack (1994). Venus Climate Stability and Volcanic Resurfacing Rates, in Abstracts of the 25th Lunar and Planetary Science Conference. Houston, TX. March 1994.

Bullock, M.A., and D.H. Grinspoon (1995). Atmospheric Water Variability and the Venus Greenhouse Effect, in *Bull. Am. Astron. Soc*. **27**. (AAS/DPS Meeting)

Bullock, M.A., and D.H. Grinspoon (1995). Climatic Consequences of Episodic Outgassing on Venus, in *EOS*, **76:** S190. (AGU)

Grinspoon, D.H., and M.A. Bullock (1995). Implications of Resurfacing for the History of Atmospheric Water on Venus, in *Bull. Am. Astron. Soc*., **27**. (AAS/DPS Meeting)

Grinspoon, D.H. (1995) The Water budget of Venus. Venus II conference, Tucson AZ, January 1995.

Bullock, M.A., and D.H Grinspoon (1997). Cloud-Climate Interactions on Venus: Abstracts of the 28th Lunar and Planetary Science Conference. Houston, TX. March 1997.

Grinspoon, D.H. (1997). Deuterium in the inner solar system. Abstract for talk at Fall, 1997 AGU meeting in San Francisco, CA.

Bullock, M.A., and D.H. Grinspoon (1998). Climate Change on Venus, *Bull. Am. Astron. Soc*., **30**. 1998.

Bullock, M.A., and D.H. Grinspoon (1998). Geological Forcing of Surface Temperatures on Venus, 28th Lunar and Planetary Science Conference. Houston, TX. Abstract 1542, March, 1998.

Solomon, S.C., M.A. Bullock, and D.H. Grinspoon (1998). Climate Change as a Regulator of Global Tectonics on Venus, 28th Lunar and Planetary Science Conference. Houston, TX. Abstract 1624, March 1998.

Solomon, S.C., M.A. Bullock, and D.H. Grinspoon (1998). Climate Change as a Regulator of Gobal Tectonics on Venus, AGU Meeting, *EOS,* **79**. 1998.

Solomon, S., M.A. Bullock and D.H. Grinspoon (1998). Geophysical consequences of climate change on Venus. Abstract submitted to the 29th Lunar and Planetary Science Conference. Houston, TX. March 1998.

Bullock, M.A., and D.H. Grinspoon (1999). The Abundance of Sulfur in Venus Magmas, *Bull. Am. Astron. Soc*., **31**. 1999.

Grinspoon, D.H., and M.A. Bullock (1999). Evolution of Atmospheres on Terrestrial Planets, AGU Spring Meeting, 1999.

Grinspoon, D.H. (1999) Cometary Water on Mars. (AAS/DPS meeting)

Phillips, R.J., M.A. Bullock, D.H. Grinspoon, B.M. Hyneck, O. Aharonson, R.M.E. Williams, and S.A. Hauck. (2000). Did Tharsis Influence Climate and Fluvial Activity on Mars?, Fall AGU Meeting, 2000.

Bullock, M.A., R.J. Phillips, and D.H. Grinspoon. (2000). Climatic Effects of the Formation of Tharsis on Mars, *Bull. Am. Astron. Soc*. **32**:1092.

Grinspoon, D.H., and M.A. Bullock. (2000). Impact Induced Climate Change on Venus: The role of Large Comets, *Bull. Am. Astron. Soc*.,. **32**:1119-1120.

Phillips, R.J., M.T. Zuber, W.B. Banerdt, M.A. Bullock, D.H. Grinspoon, O. Aharonson, S.A. Hauck, B.M. Hyneck, and R.M.E. Williams. (2000). Tharsis Influence on Global Shape, Fluvial Activity, and Climate. Keystone Mars Workshop, 2000.

Grinspoon, D.H., and M.A. Bullock. (2000). Global Change on Venus: Evolution of an Extreme Environment, Spring AGU Meeting, 2000.

Bullock, M.A., S.C. Solomon, and D.H. Grinspoon. (2000). Relationships Among Volcanic Eruptions, Climate Change, and Tectonics on Venus: The Effects of Medium-Sized Eruptions, 31st Lunar and Planetary Science Conference. Abstract 2051, March 2000.

Dombard, A.J., S.C. Solomon, M.A. Bullock, R.J. Phillips, and D.H. Grinspoon. (2000). The Formation of Wrinkle Ridges on Venus via Climate Change: A Thermomechanical Finite Element Analysis, 31st Lunar and Planetary Science Conference. Abstract 1197. Houston, TX. March 2000.

B. Dalton, D.H. Grinspoon, C. de Bergh, B. Bezard and J.B. Pollack (2000) Chlorine abundance in the deep Venus atmosphere as constrained by near-infrared spectroscopic observations. *Bull. Am. Astron. Soc*. **32** (AAS/DPS meeting)

Grinspoon, D.H. (2000). Is the Truth Out There?: SETI and the Science Wars. Contributed talk at the University of Colorado Astrobiology Workshop, February 5, 2000

Bullock, M.A., D.H. Grinspoon and R.J. Phillips (2001). Volcanically Induced Climate Change on Mars and Venus. European Geophysical Society Meeting, Nice, France, March 28,2001.

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Colloquia and Seminars

Impact Generated Dust and Early Earth Climate, Dept. of Astronomy, Cornell University, Fall 1988.

Large Impacts and Atmospheric Evolution, Lunar and Planetary Laboratory, University of Arizona, Fall 1989.

Water on Venus, Department of Astrophysical, Planetary and Atmospheric Sciences, University of Colorado, April 1990.

Clues to the Solar System's Origins, Lecture at a workshop for science teachers on Teaching in the Planetary Sciences for NASA/Division For Planetary Sciences, NASA/Ames Research Center, November 1991.

Evolution of the Surface and Atmosphere of Venus, Department of Astrophysical, Planetary and Atmospheric Sciences, University of Colorado, Spring 1993.

Gaia Shmai: What does the Earth Really Want? Laboratory for Atmospheric and Space Physics, University of Colorado, Spring 1993.

Evolution of the Surface and Atmosphere of Venus, Lowell Observatory, Spring 1993.

Evolution of the Surface and Atmosphere of Venus, A series of four colloquia given at NASA/ Ames Research Center throughout 1992 and 1993.

Comparative Planetology of Venus and Earth, Lecture at a workshop for science teachers on Teaching in the Planetary Sciences for NASA/ Division For Planetary Sciences, Boulder, CO. October, 1993.

Evolution of the Surface of Venus, Dept. of Geology, University of Colorado, Spring 1994.

Deuterium in the Inner Solar System, Department of Astrophysical, and Planetary Sciences, University of Colorado, Fall, 1997

Origin of Water on Mars, Southwest Research Institute, Boulder, Spring 2000.

Climate Change on Venus: Evolution of an Extreme Environment, Astrobiology Colloquium at the University of Washington, Seattle, Summer 2000.

Venus: Long Lost Sister or Evil Twin?, Southwest Research Institute, San Antonio. January, 2001

The importance of Venus in biocentric planetary exploration. NASA Astrobiology Institute Meeting, Tempe, AZ. March, 2003

Sympathy for the Devil: The Case for Life on Venus, Bates College Physics Department, February 2004.

The Search for Life Beyond Mars. Brandeis University joint colloquium, Departments of Physics and Biology, January 2005.

The Search for Life Beyond Mars. University of Washington, Seattle, Program in Astrobiology, February, 2005.

The Geological History of Venus, Department of Geology Colloquium, University of Wisconsin, Madison, March, 2005

The Search for Life Beyond Mars, Department of Physics, University of Western Ontario, London, Ontario, March, 2005.

Astrobiology and the Exploration of Venus, Curator's Lunchtime Lecture, Denver Museum of Nature & Science. January 25, 2006.

Searching for Life, Searching for Minds: Astrobiology and the Problem of Design in Nature. Talk at the University of Arizona as part of the "Astrobiology and the Sacred" lecture series. April 26, 2006.

Life in Extremely Acidic Environments, Arizona State University, February 15, 2007

Astrobiology and Venus Exploration, Seminar at LASP, CU Boulder, April 25, 2007

Speculations on Advanced Alien Cultures, Sternberg Institute for Radio Astronomy, Moscow Russia, November 5, 2007

New Ideas in Venus Exploration, Van Allen Lecture Series, NASA HQ, Washington, DC., November 24, 2007

Plans for Future United States Venus Missions, International Space Science Institute, Bern Switzerland, May 18, 2009

What is Life and How Should We Search for It Elsewhere?, Ricketson Auditorium, Denver Museum of Nature & Science, June 15, 2011

Life on Titan: Have we need of This Hypothesis?, Univ. of Washington-Seattle, May 17, 2011

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Grinspoon, D. 2011. August 11, Astrobiology website-Podcast: "Living Dangerously" (http://www.astrobio.net/hottopic_solarsystem_earth.php)

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Books Authored

D. H. Grinspoon (1997) **Venus Revealed: A New Look Below the Clouds of Our Mysterious Twin Planet.** (Addison-Wesley)

M. Ya. Marov and D.H. Grinspoon (1998) **The Planet Venus**. Yale University Press.

D.H. Grinspoon (2003) **Lonely Planets: The Natural Philosophy of Alien Life.** Ecco/HarperCollins

PUBLIC LECTURES:

Tucson Public Schools.

San Francisco Public Schools.

Denver Public Schools.

Commerce City (Colorado) Public Schools.

Boulder Public Schools.

Our Modern Understanding of the Solar System. Denver Museum of Natural History, May, 1997.

Earth's Twin Planet Venus. Planetfest, Pasadena Civic Center, July, 1997.

Life on Venus? Planetfest, Pasadena Civic Center, July, 1997.

What Venus can teach us about Earth. National Space Society, Boston Mass, July 1997.

Earth's Twin Planet Venus. Fiske Planetarium, December 1997.

The Year in Astronomy. Denver Museum of Natural History, February 1998.

Planets Like Earth. Pacific Science Center, Seattle, February 1998.

Earth's Twin Planet Venus. Fiske Planetarium, April 1998.

Venus Revealed. Hayden Planetarium, American Museum of Natural History, New York (part of their "Distinguished Author Lecture Series") October 1998.

Earth's Twin Planet Venus. Fiske Planetarium, April 1999.

Aliens Evolving: Changing Images of Extraterrestrials in Fiction and Science. Fiske Planetarium, April 2000

Select Public Lectures in 2003:

Denver Museum of Nature and Science

Denver Astronomical Society

Hayden Planetarium, New York City

Adler Planetarium, Chicago

Chabot Space and Science Center, Oakland, CA

Morrison Planetarium, San Francisco

Smithsonian Institution, Washington, DC.

Pacific Science Center, Seattle WA

Select Public Lectures in 2004:

Chabot Space and Science Center, Oakland, CA

Bates College, Lewiston, ME

Pacific Science Center, Seattle, WA

Harvard University

The Ethics of Space Exploration . Unitarian Universalist Forum, Lafayette, CO

Denver Chapter of the Mars Society

Annual Meeting of the American Astronomical Society, Denver, CO

Where are the Extraterrestrials . Chautauqua Forum Series, Boulder, CO

Public Forum on Ethics of Space Exploration, San Francisco, CA

Select Public Lectures in 2005:

Boston Museum of Science, Lowell First Friday Lecture Series. January 7, 2005

Organized and spoke at several public events for the Huygens probe landing on Titan. Hayden Planetarium, New York City. January 14 & 15, 2005

Pacific Science Center, Seattle, WA

Adler Planetarium, Chicago, IL

Morrison Planetarium, San Francisco (Benjamin Dean Lecture Series)

Denver Museum of Nature and Science

East Bay Astronomical Society, Oakland, CA

The Space Place, Madison, WI

Café Scientifique, Denver, CO

Annual Lecture in Planetary Sciences, University of Western Ontario, London Ontario.

Featured Speaker for Astonomy Weekend. Carnegie Science Center, Pittsburgh April 2 & 3, 2005

Select Public Lectures in 2006:

Astrobiology and Venus Exploration, DMNS

Venus Exploration talk for volunteers, DMNS

Searching for Life, Searching for Minds, University of Arizona

Climate Change and Hollywood (panel discussion) Boulder Museum of Contemporary Art.

Panel discussion on "Cosmic Catastrophes" with Ira Flatow, Adler Planetarium, Chicago

Climate Catastrophes in the Solar System, DMNS

What About Bodies on Other Worlds? Aliens in Science Fiction. Talk co-sponsored by Denver Film Society with film critic Howie Movshovitz. 150 Attendees

Invasion of the Body Snatchers. Discussion, Starz Film Center, Denver

What Happened to Pluto? Astronomy Day Lecture

Astrobiology and the Exploration of Venus, Curator's Lunchtime Lecture, Denver Museum of Nature & Science. January 25, 2006.

Searching for Life, Searching for Minds: Astrobiology and the Problem of Design in Nature. Talk at the University of Arizona, as part of the **Astrobiology and the Sacred l**ecture series. April 26, 2006.

Select Public Lectures in 2007:

My Trip to Venus (By Way of Europe), Denver Museum of Nature & Science

3 Years on Mars – 3rd Anniversary of Spirit and Opportunity Landings, Ricketson Auditorium, Denver Museum of Nature & Science

Talking About Climate Change, VIP Room, Denver Museum of Nature & Science

Climate Catastrophes in the Solar System, ESTEC Netherlands

Origins of Planets and Life, Ricketson Auditorium, Denver Museum of Nature & Science

Environmental Ethics and Space Exploration, IMAX Theater, Denver Museum of Nature and Science

Comparing Worlds, Climate Catastrophes in the Solar System, Carl Sagan Medal Public Lecture, Silicon Valley Lecture Series, Foothill College, Los Altos CA. (500 Attendees)

Missions to Venus, Space Day Lecture at Galaxy Stage, Denver Museum of Nature and Science

60 minutes in Space, Planetarium, Denver Museum of Nature and Science, May 30, 2007

A New Space Race? Chinese and American Plan for War and Peace in Orbit and Beyond, IMAX Theater, Denver Museum of Nature and Science

Reflections on Other Planets, Climate Change & the Natural Philosophy of Alien Life. Renaissance Weekend, Monterey CA, September 2, 2007

Climate Catastrophes in the Solar System, Fiske Planetarium, Boulder CO, September 28, 2007

New Developments in the Search for Extraterrestrial Intelligence, Boulder Future Salon, November 16, 2007

Select Public Lectures in 2008:

The Evolution of Climate Life and so-called Intelligence, Denver Museum of Nature & Science, July 30, 2008.

Climate Catastrophes in Solar System, Cornell Astronomy Society, October 10, 2008

Extraterrestrial Life: the Hype and the Hope, Metro State College, Denver, October 23, 2008

Select Public Lectures in 2009:

Darwinian Evolution Beyond the Earth: Change We Can Believe In? Denver Museum of Nature & Science,February 19, 2009

Natural Disasters on Other Planets ? Denver Museum of Nature & Science, March 18, 2009

Astrobiology of Titan, Denver Museum of Nature & Science, August 18, 2009

Evolution of Planetary Exploration, Mountain View Performing Arts Center, September 24, 2009

Origin and Path of Life in the Universe, Denver Museum of Nature & Science, October 1, 2009

UFO Conspiracies/Scientific Views, Curious Theater Group talk, Denver Colorado, October 23, 2009

Titan and Astrobiology, Univ. of Colorado-Boulder, Astrobiology Club, Decemver 2, 2009

Natural Disasters in Science and in Film, Denver Museum of Nature & Science, IMAX theater

Life Out There, Planetarium presentation, November 3, 2009

Select Public Lectures in 2010:

Who Are we? Where are We Going? Are We Alone? Astrobiology in Culture, at NASA symposium celebrating 50 years of Exobiology, October 14, 2010.

Climate change and planetary evolution, European Space Research and Technology Centre, Noordwijk, The Netherlands, November 10, 2010

Is there art on other planets? Colorado Springs Fine Arts Center, January 30, 2010

Life Out There, Planetarium presentation, February 18, 2010

Astrobiology Update, Jewish Community Day School, Boston, MA, March 7, 2010

Astrobiology: Current research in space exploration and life on other worlds. Lockheed Martin Space Systems Company, CO, April 12, 2010

Impacts, Planetary Climates & Venus, Co-presenter with Bill Nye "The Science Guy" (Executive Director, Planetary Society) and Jan Smit, VU University of Amsterdam, Lecture Hall of Monona Terrace Convention Center, Madison, WI. August 31, 2010

Winds on Titan, Gates Planetarium, Denver, CO, August 25, 2010

Select Public Lectures in 2011:

Astrobiology, Denver Professional Womens Society, January 24, 2011

Is There Art on Other Planets? The Clay Center for Arts and Sciences, Charleston, WV, April 19, 2011

What Is Life and How Do We Look for It Elsewhere, "Café Scientifique," Brooklyns, Denver, CO, January 26, 2011

What is Life and How Should We Be Searching for It Elsewhere? Dartmouth College, Hanover, NH, May 26, 2011

Is There Art on Other Planets?, Public Library, Jackson Hole, WY, July 30, 2010

*Life Out There,*Planetarium presentation, Gates Planetarium, Denver, July 8 & 9, 2011

Host presentation of film, *2001 – a Space Odyssey*, Science Fiction Film Series, Denver Film Society. July 27, 2011

ADDITIONAL PUBLIC OUTREACH AND COMMUNITY SERVICE

Contributing Blogger to the "Pale Blue Blog"

Podcast series "Dr. G's Astrobiology Connection" on online Astrobiology Magazine

Guest Curator and Principal Investigator of an exhibit of planetary imagery at the Denver Museum of Natural History, Fall 1997.

Public debate on "The Drake Equation Revisited" sponsored by the NASA Exobiology Research Program, held at NASA/Ames Research Center, September, 2003, with Dr. David Grinspoon debating Dr. Peter Ward, moderated by Dr. Frank Drake. Transcript available at http://www.astrobio.net/news/article610.html

Public debate: "Should we Terraform Mars?" sponsored by the NASA Astrobiology Insitute, held at NASA/Ames Research Center, April, 2004. Transcript at http://www.astrobio.net/news/article1020.html

NASA Astrobiology Magazine "Great Debates" series, "Rare Earth Debate", five part series. Transcript available at http://www.astrobio.net/news/article236.html

Popular science guest commentator on National Public Radio, Wisconsin Public Radio, Colorado Public Radio, and approximately two dozen other broadcast outlets.

Ongoing twice weekly "Grinspoon Astrobiology Report" on nationally syndicated ABC Radio.

Contributor to the Comparative Planetology Web Site of the Jet Propulsion Laboratory.

Consultant and interviewee for The Discovery Channel show "Extraterrestrial Life".

Script Consultant and interviewee for television series "Life Beyond Earth" by science writer Timothy Ferris.

Consultant and interviewee for BBC television series "The Planets"

Interview subject for National Geographic Television special "Naked Science"

Science commentator for national FOX TV News

Science commentator for CNN

Development of new planetarium shows at Fiske Planetarium for in-class use.

Advisor and Contributor to the Solar System Collaboratory Web-Site, a collaboration between four Colorado schools to create an online resource to augment introductory astronomy courses.

Invited guest on on-line astronomy chat sessions on Omni On-line and Prodigy Astronomy Forum.

Lectured for middle school teachers at a "Jason Project" workshop at the Denver Museum of Natural History. (December, 1997)

Attended African American Education Summit, Denver CO, March, 1996.

Participation in the Visiting Scientist Program of the Colorado Alliance for Science, lecturing in the Denver Public Schools.

Lecturer at workshops for science teachers on Teaching in the Planetary Sciences for NASA/ Division for Planetary Sciences.

Visiting teacher at Sojourner House for Youth Advocates, Inc., (a home for at-risk youth) San Francisco, CA. (1990)