

G. Scott Hubbard
3016 Sacramento Street
San Francisco, CA 94115
W: (650) 498-7077
scott.hubbard@stanford.edu

Professional Positions

- 2007-date** Adjunct Professor, Stanford University Engineering School, Department of Aeronautics and Astronautics. Hubbard's interests include the human and robotic exploration of space with an emphasis on new mission concepts and advanced technology. His current research group focus is on both human and robotic Solar System exploration, particularly the proposed Mars Sample Return Campaign and Humans Orbiting Mars initiative. Hubbard's award-winning book "*Exploring Mars: Chronicles from a Decade of Discovery*" recounts his work successfully restructuring NASA Mars Program. Prof. Hubbard is Director Emeritus of the Stanford Center of Excellence for Commercial Space Transportation, a research program for the FAA. Prof. Hubbard is also Founding Editor-in-Chief of a new peer-reviewed journal "*New Space*", devoted to the emerging entrepreneurial space industry and is Chair of the SpaceX Commercial Crew Safety Advisory Panel. Hubbard maintains an active speaking calendar and is regularly a plenary or keynote speaker in a wide variety of professional and public venues.
- 2006-2007** Visiting Scholar, Stanford University Electrical Engineering Department and Carl Sagan Chair for the Study of Life in the Universe, SETI Institute. Hubbard was responsible for providing strategic guidance to approximately 50 senior space scientists at the Carl Sagan Center within the SETI Institute and supervised several student projects at Stanford including Mars in situ instrumentation design and a business case analysis of emerging space businesses.
- 1987-2006** NASA Ames Research Center or NASA Headquarters
- 2002-2006** Director, NASA Ames Research Center

Hubbard exercised management responsibility for approximately 2,600 people, an annual operating budget in excess of \$700 million and a physical plant of 1700 acres with a capital value of more than \$2B. The research areas of this multidisciplinary laboratory included basic and applied aeronautics, information systems, space science, major airborne and space development projects and critical technologies such as spacecraft thermal protection. Funding for this research was derived from both NASA strategic assignments as well as peer reviewed competition. Hubbard substantially reorganized the center, streamlined operations and led a Center transformation to emphasize interdisciplinary science and technology research. Hubbard is known for his innovative approach to collaborations between government, academia and the private sector, exemplified by the award-winning NASA Research Park development and the only NASA University Affiliated Research Center. He was directly responsible for the Ames Project Columbia, one of the world's fastest super computers. The system was conceived, designed and brought on line in a record 120 days in partnership with Intel and SGI. In the fall of 2005 Hubbard announced an

agreement with Google that allows development of up to 1 million square feet of new research collaboration space and ensures an extensive research partnership between the 2 entities.

In 2003, from February to September he served full time as the sole NASA representative on the Columbia Accident Investigation Board (CAIB) at the request of NASA Administrator Sean O’Keefe. He directed impact testing that established the definitive physical cause of the loss of the Columbia.

2001-2002 Ames Deputy Director for Research

As Deputy Director for research, Hubbard was responsible for oversight of the extensive research portfolio at Ames in Information Sciences, Nanotechnology, Astrobiology and Aeronautics. He was responsible for overall strategic planning, competitive proposal development, hiring, and ensuring integration into NASA missions. He was instrumental in strategic collaborations such as the Ames/Jet Propulsion Laboratory Strategic Alliance.

2000-2001 NASA HQs – Mars Program Director

In March 2000, Hubbard was called to NASA Headquarters in Washington, DC, to serve as the first Mars program director following the loss of the Mars Polar Lander and Mars Climate Orbiter missions. In that capacity, he was responsible for successfully redefining all robotic Mars missions in response to the mission failures of 1999. The Mars Odyssey mission, launched during Hubbard’s tenure, is now successfully collecting data at the ‘red planet.’ The Mars Exploration Rovers (MER), which were selected as a direct result of the redefinition of the Mars program, have just completed a highly successful five years on the Martian surface, the Mars Reconnaissance Orbiter is now observing the planet and the Mars Phoenix Scout mission met all top level science objectives near the north pole of Mars.

1999-2000 Associate Director for Astrobiology and Space Programs

Hubbard provided Center-level oversight of research programs at Ames in Space, Life and Earth sciences, along with programs that comprise the new multidisciplinary study of life in the universe called ‘astrobiology. In addition, Hubbard was responsible for Center level review of flight programs such as Kepler, Life Science Missions and the Stratospheric Observatory for Infrared Astronomy (SOFIA).

1997-1999 Deputy Director, Space Directorate

During this period, Hubbard helped manage the 600 person Space Directorate which contained the Earth, Life and Space Sciences and related space flight projects. He also was a founder of both the discipline of astrobiology and NASA’s Astrobiology Institute, which as a “virtual institute” was one of the first of its kind. He served as the initial director of the NAI, and recruited his successor, Nobel Laureate Dr. Baruch Blumberg.

He was the also the NASA mission manager for the Lunar Prospector mission, which

launched on January 6, 1998, and discovered evidence of water ice at both the north and south poles of the Moon.

1996-1997 Associate Director, Space Directorate

Hubbard was credited as the originator of the highly successful Mars Pathfinder mission, and was the project manager for NASA Ames' portion of that mission, which landed on Mars in the summer of 1997.

1994-1996 Chief (acting), Space Projects Division

Hubbard oversaw the Center's major projects, including the Space Station Biological Research Project and the Stratospheric Observatory For Infrared Astronomy (SOFIA). He actively supported and incubated a project that eventually became Kepler, now a fully funded Discovery class mission.

1992-1994 Deputy Chief, Space Projects Division

Helped successfully advocate a new class of low cost space missions now known as the Discovery program. During this period Mr. Hubbard provided critical oversight for the Galileo Probe Project Office, the Pioneer series of missions and new project studies.

1992 Chief, Systems Engineering and Analysis Office, Centrifuge Facility Project Office (Space Station life science facility)

Carried out systems engineering for a complex set of Life Science hardware, experiments and software known as the Space Station Biological Research Project.

1990-1992 Chief, Space Instrumentation and Studies Branch

Management and oversight of a Branch responsible for matrix engineering, advanced studies and Infrared detector development.

1987-1990 Division Staff Scientist, Space Exploration Projects Office

Responsible for creation and advocacy of new projects through advanced studies. First defined the mission that became Mars Pathfinder in April, 1990.

Selected NASA Project/Program Management Assignments

2000-2001 First Mars Program Director, NASA Headquarters

1998-1999 Founding Director of the NASA Astrobiology Institute

1995-1999 NASA Manager, Lunar Prospector Mission

1993-1996 Ames Mars Pathfinder Project Manager

Positions Prior to NASA

1986-1987 Sr. Research Physicist, SRI International, Menlo Park, CA. Project leader for interdisciplinary research & development in the Geoscience and Engineering Center.

1980-1985 Director of Research and Development then General Manager, Canberra Semiconductor, Novato, CA.

Served as Manager and technical leader of a San Francisco Bay Area high-technology start-up company. Directed an ultra-pure semiconductor, crystal-growing laboratory. Developed unique technologies and facilities for crystal purification and detector fabrication.

1974-1980 Staff Scientist, Lawrence Berkeley Laboratory, Berkeley, CA.

Performed applied research and hardware development for radiation detector materials and devices. Developed ultrapure Ge crystals and Ge radiation detector technology; and the first all thin-window charged particle telescope. The ultra-pure germanium technology was utilized in the gamma-ray spectrometer now operating aboard Mars Odyssey.

1973-1974 Full time professional musician, Nashville, TN.

1970-1973 Research Engineer, Physics Department, Vanderbilt University, Nashville, TN.

Design, development and test of apparatus for research and demonstration

Consulting Experience

1978-1986 SRI International, Geoscience and Engineering Center, Menlo Park, CA.

1985-1987 Lawrence Berkeley National Lab, Nuclear Instrumentation Dept., Berkeley, CA.

2007-2016 Jet Propulsion Laboratory

2007-2013 Senior Consultant, Colbaugh and Heinsheimer Consulting, Inc.

2008-date UC Berkeley Haas School of Business Executive Education Lecturer

2009-2011 Sandia National Laboratory

2011-date B612 Foundation/Sentinel Mission

2013-2017 Dell Federal Systems (contractor to NASA HQs)

2012-date Chair, SpaceX Commercial Crew Safety Advisory Panel

2011-2018 Wyle Laboratories

2012-2017 Scitor Corporation

- 2014-2016 The Planetary Society
- 2015-2016 STX Entertainment: The Space Between Us
- 2018-date ASRC, Inuteq (contractor to NASA HQs)

Academic Background

- 1966-1970 B.A. degree in double major (honors curriculum): Physics-Astronomy, Vanderbilt University, Nashville, TN.
- 1975-1977 Graduate Studies in Solid-State and Semiconductor Physics, University of California, Berkeley, CA.
- 2006 Doctor of Science (hon.), Sc.D, Polytechnic University of Madrid
- 2007 Doctor of Arts, Honoris Causa, Cogswell Polytechnic College

Honors and Listings

- 2019 Honorary Fellow, American Institute of Aeronautics and Astronautics
- 2018 Vanderbilt Student Media Hall of Fame
- 2016 Henry Clay Distinguished Kentuckian Award
- 2016 NASA Exceptional Public Service Medal for NASA Advisory Council
- 2014 Elizabethtown High School Tradition of Excellence Alumni Award
- 2013 Kentucky Aviation Museum Hall of Fame
- 2013 Bronze Medal in Science; “Exploring Mars”, Independent Publishers Book Awards
- 2007 Challenger Learning Center Distinguished Achievement Award.
- 2006 Carl Sagan Memorial Award by the American Astronautical and Planetary Societies
- 2006 Presidential Meritorious Rank Senior Executive
- 2006 Doctor Honoris Causa Polytechnic University of Madrid
- 2005 NASA Exceptional Service Medal for Columbia Accident Board report
- 2004 Distinguished Service Medal (NASA’s Highest Award) for demonstrating the physical cause of the Columbia accident
- 2004 Engineering Science Award, International Academy of Astronautics
- 2004 Von Kármán medal for notable and distinguished technical performance in the field of Astronautics: American Institute of Aeronautics and Astronautics
- 2003 Elected Fellow, American Institute of Aeronautics and Astronautics
- 2003 “Laurels” from Aviation Week for Mars Exploration Rovers (Team award)
- 2002 NASA Outstanding Leadership Medal for Mars Odyssey
- 2002 Elected to the International Academy of Astronautics
- 2001 NASA Group Achievement Award for Decadal Planning Team NASA Exceptional Achievement Medal for Mars Program Restructuring
- 1999 NASA Outstanding Leadership Medal for Lunar Prospector Mission
- 1998 “Laurels” from Aviation Week for Lunar Prospector
- 1998 NASA Outstanding Leadership Medal for Mars Pathfinder Project
- 1997 “Laurels” from Aviation Week for Mars Pathfinder

- 1996 NASA Group Achievement Award for Science Institute Planning Team NASA Group Achievement Award for Galileo Probe Mission Team
- 1995 NASA Group Achievement Award for Ames Reorganization Team
- 1994 NASA Exceptional Achievement Medal for creation of Mars Environmental Survey (now Mars Pathfinder) mission.
- 1994 Jack Neilsen Award for best Director's Fund proposal
- 1992 Invited Speaker: JPL Workshop on Innovative Long Wave Infrared Detectors (4/92)
- 1991 Superior Presentation Award, IEEE Nuclear Science Society Annual Conference, Santa Fe N. M., Nov. 1991.
- 1990 NASA Group Achievement Award for Lunar and Mars Exploration Study
- 1982 Invited Speaker, Materials Research Society, Symposium on Nuclear Radiation Detector Materials, Boston MA.
- 1966-1970 Founder's Scholarship, Vanderbilt University.

Professional Societies

- Fellow California Council on Science and Technology (state appointment)
- Honorary Fellow (2019) Fellow (2003) American Institute of Aeronautics and Astronautics
- Academician/Full Member International Academy of Astronautics (elected membership)
- Member American Physical Society
- Member Nuclear Science Society (IEEE)

Committees, Panels and Boards (current and recent)

- Mars Exploration Program Analysis Group (MEPAG) Executive Committee
- NASA Advisory Council – at large member
- University of Colorado, Laboratory for Atmospheric and Space Physics (LASP) Advisory Committee
- NASA Advisory Council Science Committee
- The Planetary Society Board of Directors
- California Space Authority Board of Directors
- National Research Council/National Academies of Science Service
 - Committee to Review the Report of the NASA Planetary Protection Independent Review Board
 - Committee to Review the Planetary Protection Policy Development Process
 - Committee for the Review of NASA's Planetary Science Division's Restructured Research and Analysis Programs

Committee on the Mid-Term Assessment of Solar System Exploration

Peer Reviewer of the Review of the MEPAG Report on Mars Special Regions

Steering Committee Decadal Survey for Planetary Science

Committee on Astrobiology and Planetary Science (CAPS)

Science and Entertainment Exchange

Institute for Human-Machine Cognition Board of Science Advisors

Chair, California Blue Ribbon Task Force on Nanotechnology (2005)

Speaking Engagements/Public Lectures

Over the last 30 years Hubbard has become ever more in demand as a public lecturer, often averaging 50 presentations or more per year. He has appeared on most local, national and international media outlets including all major US networks (NBC, CBS, ABC, CNN) plus the BBC and cable outlets, and all major papers (New York Times, Washington Post, LA Times, Wall Street Journal, etc.) Hubbard has been a featured guest on Good Morning America, The Early Show and Today Show as well as local television news shows. In addition, Hubbard has been a key on-camera contributor to many documentaries produced by organizations such as National Geographic, the Discovery Channel and the History Channel. Recent distinguished lectures include the Wendell Holladay Physics Lecture, Vanderbilt University; Herman Schneider Foundation Lecture, University of Cincinnati; Beatty Memorial Lecture, McGill University; Von Karman Lecture, AIAA; Carl Sagan Memorial Lecture, American Astronautical Society and The Planetary Society.

Books:

Scott Hubbard, “**Exploring Mars: Chronicles from a Decade of Discovery**”,

University of Arizona Press, Feb 1, 2011,

<http://www.uapress.arizona.edu/Books/bid2340.htm>

Journal Editorships:

Prof. Hubbard is Founding Editor-in-Chief of a new peer-reviewed journal “*New Space*” devoted to the emerging entrepreneurial space industry. *New Space* is published by Mary Ann Liebert, Inc.

Students Co-Advised:

1. Ashley Chandler, PhD Completed 2012
2. Tim Szwarc, PhD completed 2013
3. Beth Jens, PhD completed 2016
4. Flora Mechentel, PhD completed 2019

Conference Papers and Refereed Publications

1. Douglas S. Hall and G. Scott Hubbard, "A UVB Photometric Study of HS Herculis," *Pub. of the Astronomical Soc. of the Pacific*, Vol. 83, **No. 494** (August 1971).
2. G. Scott Hubbard, "Inelastic Collisions Using Velcro," *The Physics Teacher*, Vol. 10, **No. 8** (November 1972).
3. G. Scott Hubbard, "Are Some of Those Stars Flat Up There?," *Science Digest*, Vol. 74, **No. 1** (July 1973).
4. G. Scott Hubbard, Eugene E. Haller and William L. Hansen, "Characterization of Polycrystalline Zone-Refined Ingots of High-Purity Germanium," *Nuclear Instruments and Methods*, **No.130** (1975).
5. E. E. Haller, W. L. Hansen, G. S. Hubbard, and F. S. Goulding, "Origin and Control of the Dominant Impurities in High-Purity Germanium," *IEEE Transactions on Nuclear Science*, **NS-23**, No. 1 (1976).
6. E. E. Haller, G. S. Hubbard, W. L. Hansen (LBL) and A. Seeger (Max Planck Institut fur Metallforschung), "The Divacancy-Hydrogen Complex in Dislocation Free, High-Purity Germanium," *Radiation Effects in Semiconductors*, Dubrovnik, Yugoslavia (September 6-9, 1976).
7. E. E. Haller, G. S. Hubbard, and W. L. Hansen, "Hydrogen-Multivalent Acceptor Complexes in High-Purity Germanium," *IEEE Transactions on Nuclear Science*, **NS-24**, No. 1 (1977).
8. G. S. Hubbard, E. E. Haller and W. L. Hansen, "Ion-implanted N-type Contact for High-Purity Germanium Radiation Detectors," *IEEE Transactions on Nuclear Science*, **NS-24**, No. 1 (1977).
9. G. S. Hubbard, E. E. Haller and W. L. Hansen, "Zone Refining High-Purity Germanium," *IEEE Transactions on Nuclear Science*, **NS-25**, No. 1 (1978).
10. E. E. Haller, and G. S. Hubbard, "Impurity Complex Formation in Ultrapure Germanium," *Izv. Acad. Nauk. SSSR, Phy. Ser.* **No. 42** (1978).
11. Jack T. Walton, G. Scott Hubbard, Eugene E. Haller, and Heinrich A. Sommer, "A Two-Dimensional Position Sensitive Si(Li) Detector," *IEEE Transactions on Nuclear Science*, **NS-26**, No. 1 (1979).
12. Eugene E. Haller, Pearl P. Li, G. Scott Hubbard, and W. L. Hansen, "Deep Level Transient Spectroscopy of High-Purity Diodes/Detectors," *IEEE Transactions on Nuclear Science*, **NS-26**, No. 1 (1979).
13. G. Scott Hubbard, Eugene E. Haller, and W. L. Hansen, "The Effect of Crystal Growth Direction on the Energy Resolution of High-Purity Germanium Detectors," *IEEE Transactions on Nuclear Science*, **NS-26**, No. 1 (1979).
14. G. Scott Hubbard, and Eugene E. Haller, "Germanium Charged Particle Telescopes with Ultra-Thin Contacts," *Nuclear Instruments and Methods*, **No.164** (1979).
15. G. Scott Hubbard, and Eugene E. Haller, "Electrical Properties of Dislocations in Ultrapure Germanium," *Journal of Electronic Materials*, **Vol. 9**, No. 1 (1980).

16. G. Scott Hubbard, and Eugene E. Haller, "The Influence of Material Parameters on Fast Neutron Damage of High-Purity Germanium Detectors," *IEEE Transactions on Nuclear Science*, **NS-27**, No. 1 (1980).
17. W. L. Hansen, E. E. Haller, and G. S. Hubbard, "Protective Surface Coatings on Semiconductor Nuclear Radiation Detectors," *IEEE Transactions on Nuclear Science*, **NS-27**, No. 1 (1980).
18. G. Scott Hubbard, "Materials Aspects of Germanium Radiation Detector Fabrication," **Nuclear Radiation Detector Materials**, North-Holland, New York (1983).
19. G. S. Hubbard, E. E. Haller and S. J. Pearton, "Novel Deep Donors in As-Grown Ultrapure Germanium," *Proc. of the 13th Int. Conf. on Defects in Semiconductors*, (August 1984).
20. G. S. Hubbard, E. E. Haller and S. J. Pearton, "The Effect of Novel Deep Donors on the Resolution of Reverse Electrode Germanium Radiation Detectors," *IEEE Transactions on Nuclear Science*, **NS-32**, No. 1 (1985).
21. G. Scott Hubbard and Alan R. Hargens, "Sustaining Humans in Space," *Mechanical Engineering*, September (1989).
22. Eugene E. Haller, J. Beeman, and W. L. Hansen, G. Scott Hubbard and R.E. McMurray, Jr., "Pyroelectric Detectors," *Proceedings of the Innovative Long Wavelength Infrared Detector Workshop*, JPL, Pasadena, CA, April 24-26, 1990.
23. D. L. Peterson and G. Scott Hubbard, "Scientific Issues and Potential Remote-Sensing Requirements for Plant Biochemical Content," *Journal of Imaging Science and Technology*, **Vol. 36**, Number 5, Sept./Oct. 1992.
24. P. F. Wercinski and G. S. Hubbard, "Sand and Dust Issues for the MESUR Mission," *Workshop on Sand and Dust on Mars*, Arizona State University February 4-5, 1991, NASA Conference Publication 10074 .
25. G. Scott Hubbard, "A Mars Environmental Survey Mission Concept," **Mars Exploration Past, Present and Future**, Progress in Astronautics and Aeronautics, Vol. 145, E. Brian Pritchard, ed. (1992), also presented at AIAA Conference, Williamsburg, VA, July 17-19, 1991,
26. G. Scott Hubbard, P. F. Wercinski, G. L. Sarver, R. P. Hanel, and R. Ramos "Mars Environmental Survey (MESUR): Science Objectives and Mission Description," *Workshop on The Martian Surface and Atmosphere Through Time* , Lunar and Planetary Institute, Boulder, Colorado, September 23-25, 1991
27. G. Scott Hubbard, P. F. Wercinski, G. L. Sarver, R. P. Hanel, and R. Ramos, "A Mars Environmental Survey (MESUR) - Feasibility of a Low Cost Global Approach," *Proceedings of the 42nd Congress of the International Astronautical Federation* , Montreal, Canada, October 5-11, 1991.
28. Roger D. Bourke, William C. Dias, Matthew P. Golombek, Donna L. Pivrotto, Francis M. Sturms, and G. Scott Hubbard, "Status of Robotic Mission Studies for the Space Exploration Initiative-1991," *Proceedings of the 42nd Congress of the International Astronautical Federation* , Montreal, Canada, October 5-11, 1991.
29. G. Scott Hubbard, R. E. McMurray, Jr., R. G. Keller, P. F. Wercinski, J. T. Walton, and K. Vierinen, "Results From A Si(Li) Gamma Ray Detector Stack for Future Mars Missions,"

- IEEE Transactions on Nuclear Science* , **NS-39**, 1992. (also Conference Proceedings of IEEE/NSS, Sante Fe N.M. Nov. 1991.)
30. G. Scott Hubbard, R.E. McMurray, Jr., R. Hanel, D. Dominguez, Eugene E. Haller, H. Baumann, and J. Beeman, "High D* Pyroelectric Detectors for Operation Near 100K," *Proceedings of the Innovative Long Wavelength Infrared Detector Workshop*, JPL, Pasadena, CA, April 7-9, 1992. (Invited)
 31. R. E. McMurray, Jr., G. Scott Hubbard, P. F. Wercinski, R. G. Keller, "MeV Gamma Ray Detection Algorithms for Stacked Silicon Detectors", *IEEE Transactions on Nuclear Science* , **NS-40**, pp. 882-889, August, 1993.
 32. G. Scott Hubbard, Robert E. McMurray, Jr., R. Hanel, D. Dominguez, F. P. J. Valero, H. Baumann, W. L. Hansen, and Eugene E. Haller, Pyroelectric Detector Development for the Radiation Measurement System, *Fourth Symposium on Global Change Studies*, Anaheim, CA, Jan. 1993.
 33. G. Scott Hubbard, ed., Report of the Planetary Flight Instrument Cost Workshop, NASA Ames Research Center, Moffett Field, CA, July 7-9, 1992.
 34. Roger D. Bourke, William C. Dias, Matthew P. Golombek, Donna L. Pivirotto, Francis M. Sturms, and G. Scott Hubbard, "Status of Robotic Mission Studies for the Space Exploration Initiative-1991," *Acta Astronautica* , **Vol. 29**, No. 9. pp.691-699, 1993.
 35. G. Scott Hubbard, R. E. McMurray, Jr., R. G. Keller, P. F. Wercinski, J. T. Walton, and Y. K. Wong, "Variable Temperature Performance of A Si(Li) Detector Stack," *IEEE Transactions on Nuclear Science* , **NS-41**, August, 1994.
 36. H. B. Cherry, E. E. Haller, R.P. Reade, J. W. Beeman, G. Scott Hubbard, R.E. McMurray, Jr., "Potassium Tantalate Niobate Thin Films for Spaceborne Pyroelectric Detectors," *8th International Symposium on Integrated Ferroelectrics*, **Vol. 15**, pp. 261-269, Tempe, Arizona, March 17-20, 1996.
 37. W. C. Feldman, A. B. Binder, G. S. Hubbard, R. E. McMurray, M. C. Miller, T. H. Prettyman, "The Lunar Prospector Gamma-Ray Spectrometer," *Lunar and Planetary Science Conference XXVII*, pp. 355- 356, March 18 – 22, 1996.
 38. G. Scott Hubbard, Alan B. Binder, Thomas A. Dougherty, Sylvia A. Cox, "The Lunar Prospector Discovery Mission: A New Approach to Planetary Science," *48th International Astronautical Congress*, IAF-97-Q.4.01, Turin, Italy, October 6–10, 1997.
 39. G. Scott Hubbard, Alan B. Binder, Thomas A. Dougherty, Sylvia A. Cox, "The Lunar Prospector Discovery Mission: A New Approach to Planetary Science," *Acta Astronautica*, **Vol 41**, No. 4-10, pp. 585-597, 1997.
 40. G. Scott Hubbard, Alan B. Binder, William Feldman, "The Lunar Discovery Mission: Mission and Measurement Description," *IEEE Transactions on Nuclear Science*, **Vol. 45**, No. 3, pp. 880-887, June, 1998.
 41. G. Scott Hubbard, William C. Feldman, Sylvia A. Cox, Marcie A. Smith, Lisa Chu-Thielbar, "Lunar Prospector: First Results and Lessons Learned," *IAF 49th International Astronautical Congress*, IAF-98-Q.4.01, Melbourne, Australia, September 28-October 2, 1998.

42. G. Scott Hubbard, "Lunar Prospector: Developing a Very Low Cost Planetary Mission," *1998 IEEE Aerospace Conference*, Vol. 2, pp. 505-515, Aspen, CO, March 21-28, 1998.
43. G. Scott Hubbard, Firouz M. Naderi, James B. Garvin, "Following the Water: the New Program for Mars Exploration," *52nd International Astronautical Congress*, IAF-01-Q.3.a.01, Toulouse, France, October 1-5, 2001; *Acta Astronautica* Vol. 51, No. 1-9, pp 337-350, 2002.
44. G. Scott Hubbard, William Feldman, Sylvia A. Cox, Marcie A. Smith, Lisa Chu-Thielbar, "Lunar Prospector: First Results and Lessons Learned," *Acta Astronautica*, Vol 50, No. 1, pp. 39-47, 2002.
45. G. Scott Hubbard, L. Caroff, R. Grymes, W. Likens, NASA's Astrobiology Institute: Initial Results of Multidisciplinary Research and Virtual Collaboration, *50th International Astronautical Congress*, IAF/IAA-99-G.2.01, October 4-8, Amsterdam, 1999.
46. G. Scott Hubbard, "The Exploration Of Mars; Historical Context & Current Results", AIAA Von Karman Lecture, January 2004
47. G. Scott Hubbard, "Humans and Robots: Hand in Grip", *55nd International Astronautical Congress*, IAF-01-Q.3.a.01, Vancouver, Canada, October 1-5, 2004. *Acta Astronautica*, Vol 57, pp. 649-660, 2005.
47. G. Scott Hubbard, L. Chu-Thielbar, "Astrobiology, The First Decade", *56nd International Astronautical Congress*, IAC-05-A3.2.B.08, Fukuoka, Japan, October 20, 2005.
48. G. Scott Hubbard, Gregory T. A. Kovacs, Lisa Chu-Thielbar, Detecting The Fingerprints Of Life, *57nd International Astronautical Congress*, IAC-06-D3.P.4, Valencia, Spain, October 5, 2006.
49. Space Entrepreneurs Finally May be Nearing Their Goals. G. Scott Hubbard, Aviation Week and Space Technology, November 20, 2006.
50. Coughlin, D. J., Alliy, M., Hubbard, G. Scott et al, Space: The Final Business Frontier, *AIAA Space 2006*, AIAA71988, San Jose CA, September 2006.
51. The Opportunity in Climate Change, Scott Hubbard and Charles Kennel, The Sacramento Bee, February 27th, 2007.
52. Examining the Vision for Space Exploration: Workshop Findings and Roadmap Analysis, G. Scott Hubbard, Louis Friedman and Kathryn Thornton, *59nd International Astronautical Congress*, IAC-08-B3.1.6, Glasgow, Scotland, September 29, 2008.
53. Beyond the Moon, James Bell, Louis Freidman, Scott Hubbard et al, The Planetary Society, October 2008.
54. Hubbard, G. Scott, Astrobiology: Its Origins and Development, *NASA 50th Anniversary Magazine*, pp156-163, 2008.
55. A Better Way to Go Where No One Has Gone Before, Scott Hubbard, op-ed, San Francisco Chronicle, Feb. 24, 2010.
56. Chandler, A. A., Cantwell, B. J., Hubbard G. S. & Karabeyoglu, A Two-Stage, Single Port Hybrid Propulsion System for a Mars Ascent Vehicle, *AIAA 2010-6635, 46th Joint Propulsion Conference*, Nashville, TN, July, 2010.

57. Chandler, A. A., Cantwell, B. J., Hubbard G. S. & Karabeyoglu, Feasibility of a Single Port Hybrid Propulsion System for a Mars Ascent Vehicle, *61st International Astronautical Congress*, Prague, CZ, September 30, 2010 and *Acta Astronautica, Volume 69, Issues 11-12, December 2011, Pages 1066-1072*, Ashley A. Chandler, Brian J. Cantwell, G. Scott Hubbard, Arif Karabeyoglu
58. Hubbard, G. Scott, The Historical Roots of Astrobiology (Invited), *Pardee Symposium, Geological Society of America Annual Meeting*, November 1, 2010.
59. Chandler, A.A., Cantwell, B.J., and Hubbard, G.S. Hybrid Propulsion for Solar System Exploration. *AIAA-2011-6103. 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, San Diego, California, July 31-August 3, 2011.
60. Chandler, A.A., Cantwell, B.J., Hubbard, G.S. and Zilliac, G. Visualization of the Liquid Layer Combustion of Paraffin Fuel, *62st International Astronautical Congress, Capetown, SA*, October 3-7, 2011.
61. Szwarc, T., Aggarwal, A, Hubbard, G.S., Cantwell, B.J., and Zacny, K. A Thermal Model for Analysis and Control of Drilling in Icy Formations on Mars, *62st International Astronautical Congress, Capetown, SA*, October 3-7, 2011 and *Planetary and Space Science*, **73** (2012) pp 214-220.
62. Zimmerman, J., Ow, A., and Hubbard, S., "Potential Opportunities for Secondary and Hosted Payloads on NASA Missions," *64th International Astronautical Congress*, Paper No. IAC-13-B4,5,7, Beijing, China, 2013.
63. Zimmerman, J., Ow, A., and Hubbard, G. S., "Secondary and Hosted Payloads in the 2013 National Space Transportation Policy: A NASA Case Study," *New Space*, Vol. 2, No. 1, March 2014, pp. 30-35.
64. Szwarc, T., Hubbard, G.S., Thermal mapping and trends of Mars analog materials in sample acquisition operations using experimentation and models, *Planetary and Space Science 99 (2014) 158–166*.
65. Jens, E., Cantwell, B., and Hubbard, S., "Hybrid Rocket Propulsion Systems for Outer Planet Exploration Missions" Under review for *Acta Astronautica* 2016.
66. Jens, E., Miller, V., Mechentel, F., Cantwell, B., and Hubbard, S., "A Visual Study of the Combustion of High Regression Rate and Classical Hybrid Rocket Fuels", 51st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Joint Propulsion Conferences, American Institute of Aeronautics and Astronautics, July 2015.
67. Jens, E., Cantwell, B., Hubbard, G. S., "Hybrid Rocket Propulsion Systems for Outer Planet Exploration Missions", 66th International Astronautical Congress, International Astronautical Federation, Jerusalem, Israel, October 2015.
68. Jens, E., Mechentel, F., Cantwell, B., Hubbard, S., and Chandler, A., "Combustion Visualization of Paraffin-Based Hybrid Rocket Fuel at Elevated Pressures," 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Joint Propulsion Conferences, American Institute of Aeronautics and Astronautics, July 2014.
69. Jens, E., Narsai, P., Cantwell, B., and Hubbard, S., "Schlieren Imaging of the Combustion of Classical and High Regression Rate Hybrid Rocket Fuels," 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Joint Propulsion Conferences, American Institute of Aeronautics and Astronautics, July 2014.

70. Jens, E., Miller, V., Mechentel, F., Cantwell, B., and Hubbard, S., “Visualisation of Combustion in a Turbulent Boundary Layer Over a Melting Fuel,” Australasian Fluid Mechanics Conference, Royal Melbourne Institute of Technology, Melbourne, Victoria, Australia, December 2014.
71. Jens, E., Cantwell, B., Hubbard, G. S., and Nakazono, B., “Hybrid CubeSat Propulsion System with Application to a Mars Aerocapture Demonstration Mission,” 65th International Astronautical Congress, International Astronautical Federation, Toronto, Canada, September 2014.
72. Experimental Visualization of Hybrid Combustion: Results at Elevated Pressures Elizabeth T. Jens*, Ashley C. Karp†, Victor A. Miller‡, G. Scott Hubbard§, and Brian J. Cantwell, Journal of Propulsion and Power, 2019

NOTE:

Author's Bibliography also includes an additional 12 technical reports and papers produced under contract with SRI International during the period 1980-1987.

Personal Interests

During undergraduate days at Vanderbilt University and continuing upon graduation Hubbard was lead guitar player in several bands and a studio musician in Nashville, Tennessee. While no longer a professional, he continues to play guitar in a jazz group and uses this skill with students and colleagues at training sessions and retreats.