

Paul Withers

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Citizenship: British (Green Card holder)

Education

- PhD, Planetary Science, University of Arizona 2003
- MS, Physics, Cambridge University, Great Britain 1998
- BA, Physics, Cambridge University, Great Britain 1998

Professional Experience

- Assistant Professor, Astronomy Department, Boston Univ. 2010-present
Analysis of atmosphere and ionospheric data from Venus, Earth and Mars, plus involvement with accelerometer and radio science spaceflight instruments
- Senior research associate, Boston Univ. Dr. Michael Mendillo 2007 – 2010
- Research associate, Boston Univ. Dr. Michael Mendillo 2003 – 2007
Analysis of ionospheric data from Venus, Earth and Mars, plus numerical modelling
- Graduate research assistant, Univ. of Arizona Dr. Stephen Bougher 1998 – 2003
Studies of tides in the martian upper atmosphere, plus an advisory role in mission operations for Mars Global Surveyor and Mars Odyssey aerobraking

Visiting and Short-Term Positions

- Visiting Research Fellow Open University, Great Britain 2004 – 2007
- Research consultant Dr. John Zarnecki (Open University) 2001(summer)
Developed techniques to analyze atmospheric structure data from entry probes, concentrating on the British Beagle 2 Mars lander.
- Research assistant Dr. Greg Neumann (NASA/Goddard) 2000(summer)
Worked with MOLA team to investigate the geology of the northern plains of Mars, supported by the competitive Goddard Summer Student Program.
- Research assistant Dr. Andrew Melatos (Caltech) 1997(summer)
Modeled pulsar outflows, supported by a competitive Caltech Summer Undergraduate Research Fellowship
- Website designer Dr. Nicholas Walton (ING) 1996(summer)
Worked at the Isaac Newton Group (ING) of Telescopes, La Palma, Spain

Fellowships, Honors, and Awards

- NASA Early Career Fellowship 2009
- CEDAR Postdoctoral Fellowship from NSF for upper atmospheric research 2003
- Kuiper Memorial Award from the University of Arizona for excellence in academic work and research in planetary science 2002
- Nominated for the Meteoritical Society/Geological Society of America's Best Student Paper in Planetary Sciences Award 2002
- Galileo Circle Graduate Scholarship from the University of Arizona 2001
- Highly Commended in annual British Young Science Writer Contest 2000
- Graduate Registration Fellowships from the University of Arizona 1999 – 2002

Invited Presentations (External)

- The unusual electrodynamics of Mars, European Planetary Science Congress, Rome, Italy 2010
- Results from the Phoenix Atmospheric Structure Experiment, 7th International Planetary Probe Workshop, Barcelona, Spain 2010
- The effects of solar flares on planetary ionospheres, AOGS meeting, Singapore 2009
- Exploring planetary ionospheres, Center for Atmospheric Research, University of Massachusetts - Lowell 2009
- Overview of my teaching and research, Department of Environmental, Earth and Atmospheric Sciences, University of Massachusetts - Lowell 2009
- Meteor layers in the martian and venusian ionospheres: Their connection to meteor showers, Europlanet N3 4th strategic workshop on meteor studies, Cologne 2008
- Plasma layers in the terrestrial, martian and venusian ionosphere: Their origins and physical characteristics, Europlanet N3 4th strategic workshop on meteor studies, Cologne 2008
- Variability of the ionosphere of Mars, 37th COSPAR meeting, Montreal 2008
- The Mars ionosphere: More than a Chapman layer, Armagh Observatory 2008
- The Mars ionosphere: More than a Chapman layer, University of Cologne 2007
- The top of the martian atmosphere, University College London 2007
- Determination of upper atmospheric properties on Mars and other bodies using satellite drag/aerobraking measurements, European Planetary Science Congress, Berlin 2006
- Huygens at Titan, MIT 2005
- Exploring Saturn with Cassini/Huygens, Tufts University 2004
- Oceans on Mars? Imperial College, London 2001

Invited Presentations (Internal)

- Mars: A foundation for exploring planetary atmospheres and ionospheres 2010
Boston University's Department of Astronomy
- A better way of modeling ionospheric electrodynamics, 2007
Boston University's Center for Space Physics
- The mean molecular mass of Titan's atmosphere, 2007
Boston University's Center for Space Physics
- Analysis of aerobraking accelerometer data from Mars, 2007
Boston University's Center for Space Physics
- Space physics at Mars, Boston University's Center for Space Physics 2006
- The effects of solar flares on the ionospheres of Earth and Mars, 2005
Boston University's Center for Space Physics
- How does the magnetic field of Mars affect the ionosphere? 2004
Boston University's Center for Space Physics
- The martian atmosphere, 2004
Professor Oliver's EC566 class at Boston University
- Tides in the martian upper atmosphere - and other topics, 2003
Boston University's Center for Space Physics
- The martian upper atmosphere, 2003
Professor Yelle's PTYS 544 class at the University of Arizona

Accepted Proposals

- "Thermospheric variability observed by past aerobraking missions and 2010
radio occultation experiments", NASA Mars Critical Data Products AO (\$193K) **PI Withers**
- "Developing a novel modeling approach for Mars' ionospheric 2010
electrodynamics", NASA Mars Fundamental Research Program (\$311K) PI Paty,
Collaborator Withers
- NASA Early Career Fellowship (\$100K in start-up funds) **PI Withers** 2009
- "Analysis of Phoenix entry data to support future Mars landers", 2009
Unsolicited proposal to NASA (\$77K) **PI Withers**
- "Venus Express Atmospheric Drag Experiment", Proposal to ESA, 2008
PI Mueller-Wodarg, **Co-I Withers**
- "Simulations of the effects of extreme solar flares on technological 2007
systems at Mars", NASA Living With a Star Targeted Research and Technology Program
(\$357K) **PI Withers**
- "Analysis of SPICAM stellar occultation data", NASA Mars Data 2007
Analysis Program (\$312K) **PI Withers**
- "Development of a Mars ionosphere model with time-dependent solar 2007
forcing for studies of solar flare effects", NASA Mars Fundamental Research Program
(\$264K) **PI Withers**

- “Application of Spirit and Opportunity atmospheric density/temperature profiles and TES temperature/pressure data to provide atmospheric density/temperature profiles for MSL EDL”, NASA Mars Critical Data Products AO (\$153K) **PI Withers** 2007
- “Mars ionospheric disturbances”, NASA Mars Data Analysis Program (\$287K) PI Michael Mendillo, **Co-I (and lead author) Withers** 2006
- “The Great Escape”, Step-1 Proposal for NASA's Mars Scout Program (~\$2M) PI Stern, **Co-I Withers** (one of two finalists) 2006
- “Analysis of Accelerometer data from aerobraking”, NASA Mars Odyssey Participating Scientist Program (\$52K) PI Mendillo, **Science PI (and lead author) Withers** 2005
- “The escape of oxygen from Mars”, NASA HST Cycle 13 Archival Research Program (\$66K) PI Wilson, **Co-I Withers** 2004
- “Studies of variability patterns and their causes in Mars' upper atmosphere”, NASA Mars Data Analysis Program (\$300K) PI Mendillo, **Co-I (and lead author) Withers** 2003
- “Comparative aeronomy: Photo-chemistry and neutral-plasma coupling at Earth and Mars”, NSF/CEDAR Postdoctoral Fellowship (\$120K) PI Mendillo, **Co-I (and lead author) Withers** 2003
- Geoplanets Summer School, Italy (~\$1K) 2002
- Graduate Scholarship, University of Arizona College of Science Galileo Circle (\$5K) 2001
- Goddard Summer Student Program (\$4K) 2000
- JPL Planetary Sciences Summer School (<\$1K) 1999
- Caltech Summer Undergraduate Research Fellowship (\$4K) 1997

Pending Funding Proposals

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- “Radio occultation studies at Mars”, NASA Early Career Fellowship Program (\$100K) **PI Withers** 2010

Planned Funding Proposals

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- “Entry science with 2016 ExoMars landing demonstrator”, ESA instrument AO (submission deadline on 1 March 2011) with subsequent NASA Participating Scientist opportunity (anticipated in late 2011), PI Ferri, **Co-I Withers**
 - “Atmospheric science with EDL and REMS instrumentation”, NASA Mars Science Laboratory Participating Scientist AO, **PI Withers**, submission deadline on 22 March 2011
 - “Radio occultations in the Jupiter system”, NASA Europa Orbiter and ESA Ganymede Orbiter (EJSM) instrument AO, collaboration involving Paetzold and **Withers**, anticipated in 2011

Selected Unsuccessful Funding Proposals

- “Atmospheric sounding through radio occultations”, NASA Trace Gas Orbiter instrument AO (~\$5M) PI Hinson, **Co-I Withers** 2010
- “The Great Escape”, Concept Study Report for NASA's Mars Scout Program (~\$450M) PI Burch, **Co-I Withers** 2008
- “Investigation of the martian upper atmosphere using MRO ACCEL data”, NASA Mars Reconnaissance Orbiter Participating Scientist Program (\$346K) **PI Withers** 2006
- “Atmospheric Structure Profiles”, NASA 2003 Mars Exploration Rovers Participating Scientist AO (\$300K) **PI Withers** 2002

Data Archiving Activities

- Coordinated delivery of Venus ionospheric data from Venera 15 and 16 to NASA Planetary Data System for review and archiving 2010
- Delivered atmospheric entry profiles (density, pressure, temperature) for Phoenix, and associated documentation, to NASA Planetary Data System for review and archiving 2010
- Advisor to Atmospheres node of the NASA Planetary Data System 2009-present
- Delivered atmospheric entry profiles (density, pressure, temperature) for Spirit and Opportunity, and associated documentation, to NASA Planetary Data System for review and archiving 2008
- Delivered Odyssey aerobraking data (measured accelerations, derived density profiles, fitted constant altitude densities), and associated documentation, to NASA Planetary Data System for review and archiving 2008

Service on Panels that Review Archival Datasets

- Participated in NASA Planetary Data System review of MGS radio science dataset (MORS_1102) 2007
- Participated in NASA Planetary Data System review of MRO aerobraking dataset (MROA_0001) 2007
- Participated in ESA Planetary Science Archive review of Rosetta radio science dataset 2007
- Participated in ESA Planetary Science Archive review of Huygens surface science package, descent trajectory working group, and housekeeping datasets 2005 - 2006
- Participated in NASA Planetary Data System review of Spirit entry dataset (MERIMU_1001) 2004
- Participated in NASA Planetary Data System review of Opportunity entry dataset (MERIMU_1001) 2004
- Participated in NASA Planetary Data System review of MGS aerobraking dataset (MGSA_0002) 2001

Service on Proposal Review Panels

- Group chief for NASA Mars Data Analysis Program 2011
- Review panel member for NASA Mars Data Analysis Program 2010
- Review panel member for NASA Planetary Mission Data Analysis Program 2009
- Review panel member for NASA Mars Fundamental Research Program 2009
- Review panel member for Senior Review of NASA Planetary Data System 2009
- Review panel member for NASA Planetary Instrument Definition and Development Program 2008
- Review panel member for NSF Astronomy and Astrophysics Research Grants Program 2007
- Review panel member for NASA Mars Fundamental Research Program 2006
- Review panel member for NSF Astronomy and Astrophysics Research Grants Program 2006
- Review panel member for NASA Mars Data Analysis Program 2005
- Review panel member for NASA Venus Express Participating Scientist Program 2005
- Review panel member for NASA Planetary Atmospheres Program 2005
- Review panel member for NASA Mars Data Analysis Program 2004

External Reviewer for Proposal Review Panels

- External reviewer for NASA Discovery Program (Step 1) 2011
- External reviewer for NASA Planetary Mission Data Analysis Program 2010
- External reviewer for NASA Mars Fundamental Research Program 2008
- External reviewer for NASA Moon and Mars Analogue Mission Activities Program 2008
- External reviewer for NASA Living With a Star Targeted Research and Technology Program 2007
- External reviewer for NASA Lunar Reconnaissance Orbiter Participating Scientist Program 2007
- External reviewer for NASA Mars Reconnaissance Orbiter Participating Scientist Program 2006
- External reviewer for NASA Mars Fundamental Research Program 2005

Reviewer of Articles Submitted to Scientific Journals

- Icarus, Journal of Atmospheric and Solar-Terrestrial Physics, Journal of Geophysical Research - Planets 2010

- Geophysical Research Letters (3), Journal of Geophysical Research - Planets 2009
- Geophysical Research Letters (2), Icarus 2008
- Icarus (2), Planetary and Space Science 2007
- Advances in Space Research, Geophysical Research Letters (4), Icarus, Journal of Spacecraft and Rockets, Mars, Planetary and Space Science 2006
- Annales Geophysicae, Icarus, Journal of Geophysical Research - Planets (2) 2005
- Journal of Geophysical Research - Space Physics, Journal of Spacecraft and Rockets 2004
- Journal of Geophysical Research - Planets, Planetary and Space Science 2003
- Icarus 2002
- Meteoritics and Planetary Science, Science 2001

Membership of Committees and Working Groups

- DPS Nominating Committee 2008-present
- Mars Exploration Program Analysis Group (MEPAG) Goals Committee member 2008-present
- Mars Exploration Program Analysis Group (MEPAG) Mars Human Precursor Science Steering Group - Atmospheric Focus Team member 2004-2005

Spacecraft Mission Involvement

- MAVEN Critical Data Products provider
- Venus Express Accelerometer Instrument (Co-I)
- Venus Express Radio Science Instrument (Co-I)
- Mars Express Radio Science Instrument (Co-I)
- Ranked in top 10% of ESA astronaut applicants in 2008, invited to next stage of screening, but unable to attend due to travel conflict
- Mars Science Laboratory “Atmospheric Council” for EDL Planning
- The Great Escape (TGE) Radio Science Instrument (Co-I, Phase A Study)
- The Great Escape (TGE) Accelerometer Instrument (Co-I, Phase A Study)
- Mars Odyssey Accelerometer Instrument (Participating Scientist)
- Huygens Atmospheric Structure Instrument (ACC sub-system Team Member)
- Huygens Surface Science Package (Team Member)
- Spirit Accelerometer (Member of MER Atmospheric Advisory Team)
- Opportunity Accelerometer (Member of MER Atmospheric Advisory Team)

- Beagle 2 Accelerometer (Member of Environmental Sensor Suite Team)
- Mars Odyssey Accelerometer (Student of a Member of ODY Atmospheric Advisory Group)
- Mars Climate Orbiter Accelerometer (Student of a Member of MCO Atmospheric Advisory Group)
- Mars Global Surveyor Accelerometer (Student of a Member of MGS Atmospheric Advisory Group)
- Mars Global Surveyor Laser Altimeter (Summer student with MOLA Team)

Professional Societies

- UK Planetary Forum, Member 2001-present
- American Geophysical Union's Planetary Sciences Section, Member 2000-present
- American Astronomical Society's Division for Planetary Science, Member 2000-present

Professional Collaborations

- IMCCE (France) - Jeremie Vaubaillon - Orbital dynamics of comets and meteoroids
- LATMOS (France) - Jean-Loup Bertaux, Franck Montmessin - Thermal structure and dynamics of planetary upper atmospheres
- University of Cologne (Germany) - Martin Paetzold, Kirsten Peter, Silvia Tellmann- Radio science instruments, planetary ionospheres, martian surface pressure, ionospheric effects of meteoroids
- Armagh Observatory (UK) - Tolis Christou - Origins and ionospheric effects of meteoroids
- Imperial College (UK) - Marina Galand, Ingo Mueller-Wodarg - Aerobraking accelerometer instruments, thermal structure and dynamics of planetary upper atmospheres, ionization processes
- Open University (UK) - , Andrew Ball (now at ESA), Brijen Hathi, Mark Leese, Stephen Lewis, Manish Patel, Martin Towner (now at Imperial College), John Zarnecki - Entry accelerometer instruments, planetary probes, atmospheric structure
- University of Leeds (UK) - John Plane - Effects of meteoroids on ionospheres
- Georgia Tech (USA) - Carol Paty - Ionospheric electrodynamics
- MIT (USA) - Kerri Cahoy - Radio science instruments, martian atmosphere and ionosphere
- NASA-GSFC (USA) - Phil Chamberlin - Ionospheric effects of variations in solar irradiance
- New Mexico State University (USA) - Reta Beebe, Lyle Huber, Jim Murphy - Data archiving, martian atmospheric dynamics
- Stanford University (USA) - David Hinson, Dick Simpson - Radio science instruments, data archiving, martian atmosphere and ionosphere
- University of California, Berkeley (USA) - Dave Brain, Matt Fillingim, Rob Lillis - Space environment of Mars, electrodynamics of Mars

- University of Colorado (USA) - Jeff Forbes - Atmospheric waves and tides
- University of Iowa (USA) - Firdevs Duru, David Morgan - Martian ionosphere
- University of Michigan (USA) - Steve Bougher - Thermal structure and dynamics of planetary upper atmospheres, aerobraking accelerometer instruments
- University of Washington (USA) - David Catling - Entry accelerometer instruments

I also play an active role in the Mars Upper Atmosphere Network , a collaborative group that developed out of the four Mars Express instruments that make measurements of the upper atmosphere, ionosphere and space environment of Mars. Other participants include Olivier Witasse (ESA), Niklas Edberg and Hermann Opgenoorth (University of Uppsala, Sweden), Edik Dubinin, Markus Fraenz and Erling Nielsen (Max Planck Institute for Solar System Research, Germany), Mark Lester (University of Leicester, UK), as well as some of those listed above.

Service to Scientific Community

- Organizer of community white paper (42 authors) on the ionosphere of Mars submitted to Planetary Science Decadal Survey 2009
- Convener of special session on “The atmosphere of Mars: New findings from modeling and observation” at Fall AGU meeting 2009
- Convener of special session on “Comparative meteor science - The effects of meteoroids in planetary atmospheres and ionospheres” at NSF/CEDAR meeting. 2009
- Judge for student poster awards, SPA section, Spring AGU meeting 2005
- Convener of special session on “The martian atmosphere in late 2003 to early 2004: Observations, predictions, and analyses” at Spring AGU meeting 2005
- Convener of special session on “Comparative aeronomy on Earth and Mars” at NSF/CEDAR meeting 2004
- Community Discussion Forum Moderator for Solar System Exploration Decadal Survey 2001

Media Activities

- Coverage of studies of meteor showers on Mars 2008
Featured in Astronomy Now, Science Daily, Space.com, AHN News
- Coverage of studies of meteor showers on Mars 2007
Featured in Sky and Telescope, University of Massachusetts - Lowell Sunrise Radio
- Coverage of studies of the effects of solar flares on Mars 2006
Featured in Boston University Today, MSNBC, New Scientist, Space.com, and USA Today
- Coverage of New Horizons launch 2006
Featured in Boston University Today
- Coverage of definition of a planet 2005
Featured in Boston University Today and Reuters

- Coverage of Genesis landing 2004
Featured in USA Today
- Coverage of Messenger launch 2004
Featured in Bloomberg News
- Coverage of landings of Spirit and Opportunity Mars Rovers 2004
Featured in Bostonia, Boston University Bridge, and USA Today
- Coverage of Mars Odyssey orbit insertion 2001
Featured in University of Arizona News and Spacedaily.com
- Coverage of studies of lunar crater Giordano Bruno 2001
Featured in Astronomy.com, BBC, Planetary Society News, Science, Sky and Telescope, NASA News, Spaceflightnow.com, University of Arizona News, and UPI
- Coverage of studies of martian northern plains 2001
Featured in Astronomy.com, Arizona Daily Star, CNN, Discover, Space.com, Spacedaily.com, Spaceflightnow.com, TechTV News, University of Arizona News, and Arizona Daily Wildcat
- Winner of NASA competition to name the Deep Space 2 microprobes 1999
Proposed names “Scott” and “Amundsen” selected from 17,000 entries. Featured in Journal of Aerospace and Defense Industry News, Arizona Daily Star, Planetary Society News, Space.com, Spacedaily.com, Spaceviews.com, and Arizona Daily Wildcat

Education/Public Outreach Activities

- Presentation to first grade students in Science Club for Girls, Boston 2010
- Science fair judge, O’Bryant School for Mathematics and Science, Boston 2009
- Science fair judge, O’Bryant School for Mathematics and Science, Boston 2008
- Radio interview with University of Massachusetts Lowell’s Sunrise Stargazer program on meteors at Mars 2007
- Science fair judge, O’Bryant School for Mathematics and Science, Boston 2006
- “Update on Spirit and Opportunity” at Boston Museum of Science 2004
- “Successes and failures of recent Mars exploration” at Tufts University 2004
- TV interview on “Nitebeat with Barry Nolan” about Spirit and Opportunity 2004
- Presentation at Open House to celebrate orbit insertion of Mars Odyssey, University of Arizona 2001
- Member of Education and Public Outreach Community Panel for Solar System Exploration Decadal Survey 2001
- “Lunar crater Giordano Bruno” at the University of Arizona’s Student Showcase 2000
- “Exploring Mars” at the University of Arizona’s Student Showcase, awarded prize for best poster by a graduate student in the physical sciences 1999

Geological Field Experience

- Organized short sections of University of Arizona's planetary geology fieldtrips each semester, planning field stops and leading discussions. Participated in nine geological fieldtrips around the southwestern US and nearby Mexico 1998 - 2002
- Participated in Cambridge University geological fieldtrip to Greece 1997

Service to Department

- Graduate Admissions Committee 2011
- Host of departmental seminar series 2010 spring
- Student Representative to the Dean's Board of Advisors, College of Science, University of Arizona 2002 - 2003

Teaching Experience

- Taught Astronomy 101 "The Solar System" at Boston University 2010 fall
- Collaboration with Boston University Educational Resource Center 2010
- Taught Astronomy 101 "The Solar System" at Boston University 2006 summer
- Participated in the University of Arizona's Scientist-Teacher Alliance, developed teaching plans and visited classrooms with middle school teachers 2002
- Attended three national workshops on graduate student teaching 2000 – 2002
- Teaching assistant for 100-level classes at University of Arizona 1999 - 2000

Students Mentored

- Katy Fallows, Boston University Astronomy PhD student 2011 - present
Investigating the morphology of the lower ionosphere of Mars
- Zachary Girazian, Boston University Astronomy PhD student 2010 - present
Investigating unusual features in the ionosphere of Mars
- Majd Matta, Boston University Astronomy PhD student 2007 - present
Modelling the effects of magnetic fields on the martian ionosphere, jointly mentored with Professor Mendillo
- Dane Sarcone, Boston University ECE undergraduate research assistant 2009
The effects of extreme solar flares on technological systems at Mars
- Jeffrey Russo, Boston University Astronomy undergraduate research assistant. Comparison of SPICAM and aerobraking measurements of the martian upper atmosphere 2008 - present
- Robert Pratt, Boston University Astronomy undergraduate research assistant. The effects of thermal tides on SPICAM measurements of the martian atmosphere 2008 - present
- Anthony Lollo, Boston University Astronomy undergraduate research assistant. Numerical simulations of the martian ionosphere, jointly mentored with Professor Mendillo 2008 - 2010
- Bob Lombardi, Boston University Astronomy undergraduate research assistant. Comparative modelling of planetary ionospheres, jointly mentored with Professor Mendillo 2006 - 2007

Staff Reseachers Mentored

- Anthony Lollo, Boston University. Numerical simulations of the martian ionosphere and empirical characterization of aerobraking environment at Mars 2010 - present

Peer Reviewed Publications

- **Withers** (2011) Attenuation of radio signals by the ionosphere of Mars: Theoretical development and application to MARSIS observations, *Radio Science*, doi:10.1029/2010RS004450, in press
- **Withers** and Catling (2010) Observations of atmospheric tides at the season and latitude of the Phoenix atmospheric entry, *Geophysical Research Letters*, 37, L24204, doi:10.1029/2010GL045382
- Lillis, Brain, England, **Withers**, Fillingim, and Safaenili (2010) Total electron content in the Mars ionosphere: Temporal studies and dependence on solar EUV flux, *Geophysical Research Letters*, 115, A11314, doi:10.1029/2010JA015698
- **Withers** (2010) Trajectory and atmospheric structure from entry probes: Demonstration of a real-time reconstruction technique using a simple direct-to-Earth radio link, *Planetary and Space Science*, 58, 2044-2049
- Opgenoorth, Dhillon, Rosenqvist, Lester, Edberg, Milan, **Withers** and Brain (2010) Dayside ionospheric conductivities at Mars, *Planetary and Space Science*, 58, 1139-1151
- **Withers** (2010) Prediction of uncertainties in atmospheric properties measured by radio occultation experiments, *Advances in Space Research*, 46, 58-73
- Hathi, Ball, Colombatti, Ferri, Leese, Towner, **Withers**, Fulchigioni and Zarnecki (2009) Huygens HASI servo accelerometer: A review and lessons learned, *Planetary and Space Science*, 57, 1321-1333
- **Withers** (2009) A review of observed variability in the dayside ionosphere of Mars, *Advances in Space Research*, 44, 277-307
- Paetzold, Tellmann, Haeusler, Bird, Tyler, Christou and **Withers** (2009) A sporadic layer in the Venus lower ionosphere of meteoric origin, *Geophysical Research Letters*, 36, L05203, doi:10.1029/2008GL035875
- **Withers**, Mendillo, Hinson, and Cahoy (2008) Physical characteristics and occurrence rates of meteoric plasma layers detected in the martian ionosphere by the Mars Global Surveyor Radio Science Experiment, *Journal of Geophysical Research*, 113, A12314, doi:10.1029/2008JA013636
- **Withers** (2008) Theoretical models of ionospheric electrodynamics and plasma transport, *Journal of Geophysical Research*, 113, A07301, doi:10.1029/2007JA012918
- Colombatti, **Withers**, Ferri, Aboudan, Ball, Bettanini, Gaborit, Harri, Hathi, Leese, Makinen, Stoppato, Towner, Zarnecki, Angrilli, and Fulchignoni (2008) Reconstruction of the trajectory of the Huygens probe using the Huygens Atmospheric Structure Instrument (HASI), *Planetary and Space Science*, 56, 586-600
- Christou, Vaubailon, and **Withers** (2008) The P/Halley stream: meteor showers on Earth, Venus, and Mars, *Earth, Moon, and Planets*, 102, 125-131
- Crosby, Bothmer, Facius, Griessmeier, Moussas, Panasyuk, Romanova, and **Withers** (2008) Interplanetary space weather and its planetary connection, *Space Weather*, 6, S01003, doi:10.1029/2007SW000361
- Christou, Vaubailon, and **Withers** (2007) The dust trail complex of comet 79P/du Toit-Hartley and meteor outbursts at Mars, *Astronomy and Astrophysics*, 471, 321-329

- **Withers** (2007) A technique to determine the mean molecular mass of a planetary atmosphere using pressure and temperature measurements made by an entry probe: Demonstration using Huygens data, *Planetary and Space Science*, 55, 1959-1963
- Montabone, Lewis, Read, and **Withers** (2006) Reconstructing the weather on Mars at the time of the MERs and Beagle 2 landings, *Geophysical Research Letters*, 33, L19202, doi:10.1029/2006GL026565
- **Withers** and Smith (2006) Atmospheric entry profiles from the Mars Exploration Rovers Spirit and Opportunity, *Icarus*, 185, 133-142, doi:10.1016/j.icarus.2006.06.013
- Mendillo, **Withers**, Hinson, Rishbeth, and Reinisch (2006) Effects of solar flares on the ionosphere of Mars, *Science*, 311, 1135-1138
- Bougher, Bell, Murphy, Lopez-Valverde, and **Withers** (2006) Polar warming in the Mars thermosphere: Seasonal variations owing to changing insolation and dust distributions, *Geophysical Research Letters*, 33, L02203, doi:10.1029/2005GL024059
- **Withers** (2006) Mars Global Surveyor and Mars Odyssey Accelerometer observations of the martian upper atmosphere during aerobraking, *Geophysical Research Letters*, 33, L02201, doi:10.1029/2005GL024447
- Fulchignoni and 42 colleagues, including **Withers** (2005) In situ measurements of the physical characteristics of Titan's environment, *Nature*, 438, 785-791, doi:10.1038/nature04314
- **Withers** and Mendillo (2005) Response of peak electron densities in the martian ionosphere to day-to-day changes in solar flux due to solar rotation, *Planetary and Space Science*, 53, 1401-1418, doi:10.1016/j.pss.2005.07.010
- **Withers**, Mendillo, Rishbeth, Hinson, and Arkani-Hamed (2005) Ionospheric characteristics above martian crustal magnetic anomalies, *Geophysical Research Letters*, 32, L16204, doi:10.1029/2005GL023483
- **Withers**, Bougher, and Keating (2003) The effects of topographically-controlled thermal tides in the martian upper atmosphere as seen by the MGS Accelerometer, *Icarus*, 164, 14-32
- **Withers**, Towner, Hathi, and Zarnecki (2003) Analysis of entry accelerometer data: A case study of Mars Pathfinder, *Planetary and Space Science*, 51, 541-561
- **Withers**, Lorenz, and Neumann (2002) Comparison of Viking Lander descent data and MOLA topography reveals kilometer-scale error in Mars atmosphere profiles, *Icarus*, 159, 259-261
- Nockolds and **Withers** (2002) Comment and reply on "Meteor storm evidence against the recent formation of lunar crater Giordano Bruno" by Paul Withers, *Meteoritics and Planetary Science*, 37, 465-466
- **Withers** and Neumann (2001) Enigmatic northern plains of Mars, *Nature*, 410, 651
- **Withers** (2001) Meteor storm evidence against the recent formation of lunar crater Giordano Bruno, *Meteoritics and Planetary Science*, 36, 525 – 529
- Lorenz, Lunine, **Withers**, and McKay (2001) Titan, Mars and Earth: Entropy production by latitudinal heat transport, *Geophysical Research Letters*, 28, 415 – 418

Manuscripts Under Review or In Preparation

- Mendillo, Lollo, **Withers**, Matta, Paetzold and Tellmann, Modeling Mars' ionosphere with constraints from same-day, multi-point observations, under review by Journal of Geophysical Research
- James, Clancy, Christensen, **Withers**, and Zurek, History of atmospheric observations, chapter in "The atmosphere and climate of Mars", eds. Forget, Haberle, Smith, Clancy and Zurek, Cambridge University Press, in preparation
- Bougher, Brain, Fox, Gonzalez-Galindo, Simon and **Withers**, The upper atmosphere and ionosphere, chapter in "The atmosphere and climate of Mars", eds. Forget, Haberle, Smith, Clancy and Zurek, Cambridge University Press, in preparation
- **Withers**, Pratt, Russo, Bertaux and Montmessin, Observations of thermal tides in the atmosphere of Mars by the SPICAM instrument, in preparation
- **Withers**, Russo, Pratt, Bertaux and Montmessin, Comparison of observations of the mesopause and lower thermosphere of Mars by the SPICAM instrument and aerobraking accelerometers to theoretical predictions, in preparation
- **Withers**, Empirical predictions of martian surface pressure in support of the landing of Mars Science Laboratory, in preparation

Other Publications

- **Withers** and Barnes (2010) Using satellites to probe extrasolar planet formation, Proceedings of IAU Symposium 276, in press
- Clarke, Schmidt, Baumgardner, Carveth, Matta, Mendillo, Moore, and **Withers** (2010) White paper on comparative planetary exosphere, white paper submitted to Heliophysics Decadal Survey
- **Withers** and Catling (2010) The Phoenix Atmospheric Structure Experiment (ASE): Data processing and scientific results, proceedings of the Seventh International Planetary Probe Workshop
- Atkinson and 55 colleagues, including **Withers** (2009) Entry probe missions to giant planets, white paper submitted to Planetary Science Decadal Survey
- Kursinski and 33 colleagues, including **Withers** (2009) Dual satellite Mars climate and chemistry mission concept, white paper submitted to Planetary Science Decadal Survey
- Mischna and 21 colleagues, including **Withers** (2009) Atmospheric science research priorities for Mars, white paper submitted to Planetary Science Decadal Survey
- Beebe and 39 colleagues, including **Withers** (2009) Data management, preservation and the future of the PDS, white paper submitted to Planetary Science Decadal Survey
- **Withers** and 42 colleagues (2009) The ionosphere of Mars and its importance for climate evolution, white paper submitted to Planetary Science Decadal Survey
- Johnson, Amend, Steele, Bougher, Rafkin, **Withers**, Plescia, Hamilton, Tripathi, and Heldmann (2008) Mars science goals, objectives, investigations, and priorities: 2008, Report from the NASA Mars Exploration Program Analysis Group (MEPAG)
- Mendillo and **Withers** (2008) Solar flare effects upon the ionospheres of Earth and Mars, in "Radio Sounding and Plasma Physics" (eds. Song, Foster, Mendillo, and Bilitza), American Institute of Physics Conference Proceedings, 974, 58-70

- **Withers** (2005) What is a planet?, *Eos*, 86(36), 326, doi:10.1029/2005EO360004
- Mendillo and **Withers** (2004) CEDAR workshop report on session CA1: Comparative aeronomy on Earth and Mars, *CEDAR Post*, 49 (Fall 2004), 4-5
- Farrell and 11 colleagues, including **Withers** (2004) Report from the Mars Human Precursor Science Steering Group Atmosphere Focus Team. Incorporated into: Beaty et al. (2005) An analysis of the precursor measurements of Mars needed to reduce the risk of the first human mission to Mars, MEPAG report posted online in June 2005
- **Withers** (2004) Should we believe atmospheric temperatures measured by entry accelerometers travelling at “slow” near-sonic speeds?, in *Proceedings of the Second International Planetary Probe Workshop*, NASA Ames Research Center, California, 23-27 August 2004, NASA/CP-2004-213456, p. 13-20
- **Withers**, Towner, Hathi, and Zarnecki (2004) Review of the trajectory and atmospheric structure reconstruction for Mars Pathfinder, in *Proceedings of the International Workshop Planetary Atmospheric Entry and Descent Trajectory Analysis and Science*, 6-9 October 2003, Lisbon, Portugal. Edited by A. Wilson, ESA SP-544, 163-174
- Grier and 28 colleagues, including **Withers** (2002) Defining long term goals and setting priorities for education and public outreach, in “The future of solar system exploration, 2003-2013” (ed. Sykes), *Astronomical Society of the Pacific Conference Series*, 272, 393-411
- **Withers** (2001) Atmospheric structure reconstruction using the Beagle 2 accelerometer, Technical report delivered to the Open University, Great Britain

Conference and Meeting Presentations

Martian Ionosphere

- **Withers** (2010) An exploratory survey of the attenuation of radio signals by the ionosphere of Mars, Fall AGU meeting, Abstract #SH43A-1807
- Lollo, Mendillo, **Withers**, Matta, Paetzold and Tellmann (2010) Modeling Mars' ionosphere with constraints from same-day observations by Mars Global Surveyor and Mars Express, Fall AGU meeting, Abstract #P52A-09
- Matta, **Withers**, Lollo and Mendillo (2010) 1.5 dimensional model of the martian ionosphere, Fall AGU meeting, Abstract #P53E-1557
- Jolitiz, Brain, Lillis, Fillingim, **Withers**, England and Safaeinili (2010) Total electron content in the Mars ionosphere: Temporal studies and dependence on solar inputs and crustal magnetic fields, Fall AGU meeting, Abstract #SM41B-1868
- Lollo, Mendillo, **Withers**, Matta, Paetzold and Tellmann (2010) Modeling Mars' ionosphere with constraints from same-day, multi-point observations, VEX/MEX radio science team meeting, Boston, MA, 1-2 November 2010
- Girazian and **Withers** (2010) Unusual features in the Mars ionosphere, VEX/MEX radio science team meeting, Boston, MA, 1-2 November 2010
- Opgenoorth, **Withers**, Witasse and the MUAN team (2010) Mars upper atmosphere network, DPS meeting, Abstract #30.10
- **Withers**, Lillis, Witasse, Opgenoorth and the MUAN team (2010) Mars upper atmosphere network, 5th Alfven conference, Sapporo, Japan, 4-8 October 2010, Abstract P-84
- **Withers**, Matta and Mendillo (2010) The unusual electrodynamics of Mars, European Planetary Science Congress, Rome, Italy, 20-24 September 2010, Abstract EPSC2010-68
- **Withers**, Witasse, Opgenoorth and the MUAN team (2010) Mars upper atmosphere network, European Planetary Science Congress, Rome, Italy, 20-24 September 2010, Abstract EPSC2010-289 (P96)
- Matta and **Withers** (2010) Recent results from Boston University, Workshop on coordinated upper atmospheric research at Mars, Rome, Italy, 16-17 September 2010
- **Withers** (2010) Predicting radio occultation uncertainties, VEX/MEX radio science team meeting, Sugarbowl, CA, 3-4 August 2010
- **Withers** (2010) Unusual martian ionospheric features, VEX/MEX radio science team meeting, Sugarbowl, CA, 3-4 August 2010
- **Withers**, Witasse and Opgenoorth (2010) Mars upper atmosphere network, 38th COSPAR meeting, Bremen, Germany, Abstract C32-0044-10
- **Withers** (2010) Attenuation of radio signals by the ionosphere of Mars: Theoretical development and exploratory survey, meeting of the Living With a Star Targeted Research and Technology Focus Team on "Extreme space weather events in the solar system", Los Angeles, CA, 7 July 2010
- Dhillon, Opgenoorth, Rosenqvist, Lester, Brain, **Withers**, Edberg and Milan (2010) Martian ionospheric conductivities in the magnetic pileup and crustal field regions, EGU meeting, Abstract EGU2010-11271

- Opgenoorth, Dhillon, Rosenqvist, Lester, Edberg, Milan, **Withers** and Brain (2010) Dayside ionospheric conductivities at Mars, EGU meeting, Abstract EGU2010-14232
- **Withers** (2010) The nightside ionosphere of Mars, VEX/MEX radio science team meeting, Bonn, Germany, 18-19 March 2010
- **Withers** and Matta (2010) Recent results from Boston University, Workshop on coordinated upper atmospheric research at Mars, Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany, 25-26 January 2010
- Dhillon, Rosenqvist, Opgenoorth, **Withers**, Brain and Lester (2009) Studies of martian ionospheric conductivities undertaken using Mars Global Surveyor and Mars Express data, Fall AGU meeting, Abstract #P23A-1242
- Opgenoorth, Rosenqvist, Dhillon, Lester, **Withers** and Brain (2009) Ionospheric conductivities at planets and planet-like bodies without internal magnetic field, Fall AGU meeting, Abstract #P11B-1225
- **Withers** (2009) Simulations of the effects of extreme solar flares on technological systems at Mars, meeting of the Living With a Star Targeted Research and Technology Focus Team on “Extreme space weather events in the solar system”, San Francisco, CA, 13 December 2009
- **Withers**, Lollo, Mendillo, Paetzold and Tellmann (2009) Comparisons and simulations of same-day observations of the ionosphere of Mars by radio occultation experiments on Mars Global Surveyor and Mars Express, DPS meeting, Abstract #54.08
- **Withers**, Espley, Lillis and Morgan (2009) The ionosphere of Mars: A community white paper for the planetary decadal survey, DPS meeting, Abstract #16.20
- Lollo, **Withers** and Mendillo (2009) Modeling Mars’ ionosphere with constraints from same-day, multi-point observations, VEX/MEX radio science team meeting, Port Townsend, WA, 27-28 August 2009
- **Withers** and Mendillo (2009) The effects of solar flares on planetary ionospheres, AOGS meeting, Abstract #PS14-A004, Singapore
- **Withers**, Espley, Lillis and Morgan (2009) The ionosphere of Mars and its importance for climate evolution, MEPAG meeting, Providence, RI, 29-30 July 2009.
- **Withers** (2009) Observations of metal ion layers across the solar system, NSF CEDAR Aeronomy Meeting, Sante Fe, NM, 28 June - 2 July 2009
- **Withers** (2009) Simulations of the effects of extreme solar flares on technological systems at Mars, meeting of the Living With a Star Targeted Research and Technology Focus Team on “Extreme space weather events in the solar system”, Melbourne, FL, 8 June 2009
- **Withers**, Christou, Mendillo, Paetzold, Peter, Tellmann and Vaubaillon (2009) Observations of the effects of meteors on the ionospheres of Venus, Earth and Mars, International Conference on Comparative Planetology: Venus-Earth-Mars, ESTEC, 11-15 May 2009
- Mendillo, Lombardi, Matta, Martinis, Moore and **Withers** (2009) Comparative aeronomy: Ionospheric production for terrestrial planets, International Conference on Comparative Planetology: Venus-Earth-Mars, ESTEC, 11-15 May 2009
- Chamberlin, Lu, Sternovsky, **Withers** and Woods (2009) Using the Flare Irradiance Spectral Model (FISM) to study the response of the Earth, Mars and Moon to solar flares, EGU meeting, Abstract EGU2009-5970

- **Withers** (2009) Estimating uncertainties in measurements of atmospheric properties by radio occultations, VEX/MEX radio science team meeting, Cologne, 16-17 April 2009
- **Withers** (2008) Simulations of the effects of extreme solar flares on technological systems at Mars, meeting of the Living With a Star Targeted Research and Technology Focus Team on “Extreme space weather events in the solar system”, San Francisco, CA, 14 December 2008
- **Withers** (2008) Mars ionospheric research at Boston University, VEX/MEX radio science team meeting, Brussels, 15-16 September 2008
- **Withers**, Paetzold and Christou (2008) Meteor layers in the martian and venusian ionospheres: Their connection to meteor showers, Europlanet N3 4th Strategic Workshop on Meteor Studies, Cologne, September 2008
- Paetzold and **Withers** (2008) Plasma layers in the terrestrial, martian and venusian ionosphere: Their origins and physical characteristics, Europlanet N3 4th Strategic Workshop on Meteor Studies, Cologne, September 2008
- Christou, Griffiths, McAuliffe, Koschny, Paetzold, Oberst, Trigo-Rodriguez, Vaubaillon, **Withers**, Chappelow and Patel (2008) A multi-instrument ExoMars study of meteoroid effects on the martian environment, European Planetary Science Congress, Abstract EPSC2008-A-00196
- Paetzold, Tellmann, Peter, Mendillo, **Withers**, Haeusler, Hinson, and Tyler (2008) The structure of the Mars ionosphere, European Planetary Science Congress, Abstract EPSC2008-A-00348
- Paetzold, Tellmann, Peter, Mendillo, **Withers**, Haeusler, Hinson, and Tyler (2008) The structure of the Mars ionosphere, 37th COSPAR meeting, Montreal, Abstract C32-0010-08
- **Withers** (2008) Variability of the ionosphere of Mars, 37th COSPAR meeting, Montreal, Abstract C32-0011-08
- Mendillo, Niehof, Garcia, Prested, McGregor, Viall, Moore, **Withers**, Martinis, and Stephan (2008) Can Equatorial Spread-F occur on other planets? 12th International Symposium on Equatorial Aeronomy, 18-24 May 2008, Crete, Greece
- Paetzold, Tellmann, Peter, Mendillo, **Withers**, Haeusler, Hinson, and Tyler (2008) The structure of the Mars ionosphere, EGU meeting, Abstract EGU2008-A-06804
- Christou, Vaubaillon and **Withers** (2008) Present and future observations of a meteor shower in the martian atmosphere, UK National Astronomy Meeting, Abstract P15/112
- **Withers**, Mendillo, Hinson, and Cahoy (2008) Morphology of meteoric plasma layers in the ionosphere of Mars as observed by the Mars Global Surveyor Radio Science Experiment, EGU meeting, Abstract EGU2008-A-02893
- Paetzold, **Withers**, Tellmann, Mendillo, Peter, Haeusler, Hinson, and Tyler (2007) The structure of the Mars ionosphere, Fall AGU meeting, Abstract #P32A-01
- **Withers** (2007) New theoretical tools for studying ionospheric electrodynamics, Fall AGU meeting, Abstract #SA51A-0237
- Paetzold, Tellmann, Peter, Haeusler, Hinson, Tyler, Mendillo, and **Withers** (2007) The structure of the ionosphere of Mars as observed by the Mars Express Radio Science Experiment, European Mars Science and Exploration Conference: Mars Express and ExoMars, November 12-16, 2007, ESA-ESTEC, Noordwijk, The Netherlands, Abstract #1120009

- Christou, Griffiths, McAuliffe, Koschny, Paetzold, Oberst, Trigo-Rodriguez, Vaubaillon, **Withers** and Chappelow (2007) A multi-instrument ExoMars study of meteoroid effects on the martian environment, European Mars Science and Exploration Conference: Mars Express and ExoMars, November 12-16, 2007, ESA-ESTEC, Noordwijk, The Netherlands, Abstract #1119183
- **Withers**, Mendillo, Paetzold, Tellmann, Christou, and Vaubaillon (2007) Comparison of ionospheric observations and dynamical predictions of meteor showers at Mars, DPS meeting, Abstract #59.08
- Christou, Vaubaillon, and **Withers** (2007) Annual and outburst meteor activity in the atmospheres of Venus and Mars, Meteoroids 2007, June 11-15, 2007, Barcelona, Spain
- Mendillo and **Withers** (2007) Simultaneous radio sounding of the ionospheres of Earth and Mars during a solar flare, Symposium in honor of Professor Bodo Reinisch's 70th birthday, University of Massachusetts - Lowell, 29 April 2007
- **Withers**, Wroten, Mendillo, and Chamberlin (2007) Simulations of the Mars ionosphere during a solar flare, Spring AGU, Abstract SA31B-05
- **Withers**, Wroten, Mendillo, Chamberlin, and Woods (2007) Modeling the effects of solar flares on the ionosphere of Mars, EGU meeting, Abstract EGU2007-A-05089
- **Withers**, Paetzold, Mendillo, Tellman, Haeusler, Hinson, and Tyler (2007) New observations of the topside ionosphere at Mars, EGU meeting, Abstract EGU2007-A-09435
- Paetzold, **Withers**, Tellman, Mendillo, Haeusler, Hinson, and Tyler (2007) Correlation between third layer formation in the Martian ionosphere and meteor streams at Mars, EGU meeting, Abstract EGU2007-A-09454
- **Withers**, Mendillo, and Hinson (2006) Space weather effects on the Mars ionosphere due to solar flares and meteors, European Planetary Science Congress, Berlin, 18-22 September
- **Withers** (2006) Comparative aeronomy at Earth and Mars (Final CEDAR Postdoc Report), NSF CEDAR Aeronomy Meeting, Sante Fe, NM, 19 June - 23 June
- Mendillo and **Withers** (2006) Effects of solar flares on Earth and Mars, Spring AGU meeting, Abstract U52A-02
- **Withers**, Mendillo, and Rishbeth (2006) Ionospheric disturbances at Mars: Implications for radio propagation, EGU meeting, Abstract EGU06-A-02444
- **Withers**, Mendillo, Wroten, Rishbeth, Hinson, and Reinisch (2005) Observations of the effects of solar flares on Earth and Mars, Fall AGU meeting, Abstract SA53B-1165
- **Withers**, Mendillo, Rishbeth, Hinson, and Arkani-Hamed (2005) Ionospheric characteristics above martian crustal magnetic anomalies, DPS meeting, Abstract #33.02
- Schoendorf, Siebert, Mendillo, **Withers**, and Wilson (2005) A new model of the solar wind interaction with the Mars ionosphere, Spring AGU meeting, Abstract #P21F-06
- **Withers** and Mendillo (2005) The response of an ionosphere to changes in the solar F10.7 flux: Comparison of Venus, Earth, and Mars, Spring AGU meeting, Abstract SA41A-03
- Schoendorf, Mendillo, **Withers**, and Wilson (2004) A new model of the solar wind interaction with Mars, DPS meeting, Abstract #37.03
- **Withers**, Mendillo, and Hinson (2004) The martian ionosphere in regions of crustal magnetic fields, DPS meeting, Abstract #26.09

- Mendillo and **Withers** (2004) Mars ionospheric studies using the MGS Radio Science Experiment, 35th COSPAR Scientific Assembly, Abstract #COSPAR04-A-02002
- Mendillo, **Withers**, and MIRI Team (2004) Approaches to a Mars international reference ionosphere, 35th COSPAR Scientific Assembly, Abstract #COSPAR04-A-02072
- **Withers** (2004) The influence of solar variability on the ionospheres of Earth and Mars (Interim CEDAR Postdoc Report), NSF CEDAR Aeronomy Meeting, Sante Fe, NM, 27 June - 2 July
- **Withers** (2004) Getting your hands on Mars data and some sample science (2004) Withers, NSF CEDAR Aeronomy Meeting, Sante Fe, NM, 27 June - 2 July. Talk at Comparative Aeronomy on Earth and Mars workshop.
- **Withers** and Mendillo (2004) Testing simple parameterizations for the basic characteristics of the martian ionosphere, Spring AGU meeting, Abstract #SA24A-05
- **Withers**, Martinis, Moore, Wilson, Wroten, and Mendillo (2004) Theoretical simulations of the martian ionosphere and comparisons to observations, Spring AGU meeting, Abstract SA14A-04

Martian Upper Atmosphere

- **Withers** and Lollo (2010) Thermospheric variability MCDP work, MAVEN Project Science Group meeting, Berkeley, CA, 20-22 October 2010
- Pratt, Russo, **Withers**, Bertaux and Montmessin (2010) Observations of thermal tides in the atmosphere of Mars by the SPICAM instrument, DPS meeting, Abstract #30.01
- **Withers**, Bertaux, Montmessin, Pratt and Russo (2009) Observations of tides and temperatures in the martian atmosphere by Mars Express SPICAM stellar occultations, EGU meeting, Abstract EGU2009-5355
- **Withers** and Matta (2009) Research at Boston University on the upper atmosphere of Mars, Workshop on coordinated upper atmospheric research at Mars, ESTEC, 17-19 March 2009
- **Withers** (2008) New data products from the Mars Odyssey Accelerometer: Report on scientific implications, data processing, validation and archiving, Third International Workshop on the Mars Atmosphere: Modeling and Observations, Williamsburg, VA, 10-13 November 2008, Abstract #9035
- **Withers**, Bendersky, Keller, and Murphy (2008) Upper atmospheric density profiles from the Mars Odyssey Accelerometer: Report on data processing, archiving plans, and scientific analysis, DPS meeting, Abstract #14.07
- **Withers** (2006) Analysis of Accelerometer data from aerobraking, Mars Odyssey Project Science Group Meeting, 14 - 17 November, 2006, Mauni Lani hotel, Big Island, Hawaii
- **Withers**, Murphy, Gueth, Bougher, and Mendillo (2006) Mars Odyssey Accelerometer results, DPS meeting, Abstract #73.03
- **Withers** (2006) Determination of upper atmospheric properties on Mars and other bodies using satellite drag/aerobraking measurements, European Planetary Science Congress (invited presentation), Berlin, 18-22 September
- Bougher, Keating, and **Withers** (2004) Mars aerobraking data and its interpretation with applications to future Mars missions, 35th COSPAR Scientific Assembly, Abstract #COSPAR04-A-00358

- **Withers**, Bougher, and Keating (2003) Identification of topographically-controlled thermal tidal modes in the martian upper atmosphere, 6th International Mars Conference, July 20 - 25, Pasadena, CA, Abstract #3069
- Bougher, Engel, and **Withers** (2003) The NCAR Mars Thermospheric General Circulation Model: A review, Mars atmosphere modelling and observations workshop, Granada, Spain, January 13-15, 2003
- **Withers**, Bougher, and Keating (2002) Winds in the martian upper atmosphere from MGS aerobraking density profiles, Fall AGU meeting, Abstract #P61C-0353
- **Withers**, Bougher, and Keating (2002) Measurements of winds in the martian upper atmosphere from the MGS Accelerometer, DPS meeting, Abstract #5.05
- **Withers**, Bougher, and Keating (2002) MGS Accelerometer-derived profiles of upper atmospheric pressures and temperatures: Similarities, differences, and winds, Spring AGU meeting, Abstract #P41A-10
- Bougher, Keating, Forbes, Murphy, Hollingsworth, Wilson, and **Withers** (2001) The upper atmospheric wave structure of Mars as determined by Mars Global Surveyor, Fall AGU meeting, Abstract #P32E-12
- **Withers**, Bougher, and Keating (2001) Unpredictable day-to-day variability in the martian upper atmosphere, DPS meeting, Abstract #19.29
- **Withers**, Bougher, and Keating (2001) Harmonic analysis of zonal density structures in martian upper atmosphere, Spring AGU meeting, Abstract #P41A-05
- **Withers** and Bougher (2001) Understanding the martian upper atmosphere with the MGS Accelerometer, 4th Lunar and Planetary Laboratory internal conference
- Keating, Tolson, Wilson, Dwyer, Bougher, **Withers**, and Forbes (2001) Persistent planetary-scale wave-2 and wave-3 density variations observed in Mars upper atmosphere from MGS accelerometer experiment, 26th EGS General Assembly, Session #PS2.02
- Keating, Dwyer, Wilson, Tolson, Bougher, **Withers**, Forbes (2000) Evidence of large global diurnal Kelvin wave in Mars upper atmosphere, DPS meeting, Abstract #50.02
- Bougher, **Withers**, Murphy, Roble, and Keating (2000) Longitude structure in the Mars upper atmosphere : Characterization and model simulations (Solicited Key Note Paper), 33rd COSPAR Scientific Assembly, Abstract #C3.2-0011
- **Withers**, Bougher, and Keating (2000) New results from the Mars Global Surveyor Accelerometer, LPSC, Abstract #1268
- **Withers**, Bougher and Keating (1999) The martian upper atmosphere during phase 2 of Mars Global Surveyor aerobraking: comparison to predictions, Fifth International Conference on Mars, Abstract #6073
- **Withers** and Bougher (1999) The Martian upper atmosphere as revealed by Mars Global Surveyor's aerobraking, 2nd Lunar and Planetary Laboratory internal conference

Venus

- **Withers** (2010) Oscillations in Venus neutral atmosphere, VEX/MEX radio science team meeting, Sugarbowl, CA, 3-4 August 2010

- **Withers** (2010) Rediscovering old datasets, VEX/MEX radio science team meeting, Sugarbowl, CA, 3-4 August 2010
- Mueller-Wodarg, Rosenblatt, Bruinsma, Yelle, Svedhem, Forbes, **Withers**, Keating and Lopez-Valverde (2010) The polar thermosphere of Venus, 38th COSPAR meeting, Bremen, Germany, Abstract C31-0009-10
- **Withers** (2010) The nightside ionosphere of Mars, VEX/MEX radio science team meeting, Bonn, Germany, 18-19 March 2010
- **Withers** (2010) Venera 15/16 ionospheric profiles, VEX/MEX radio science team meeting, Bonn, Germany, 18-19 March 2010
- Paetzold, Haeusler, Tellmann, Bird, Hinson, Tyler and **Withers** (2009) The ionospheres of Venus and Mars - A comparison of Venus Express and Mars Express observations, DPS meeting, Abstract #48.04
- Mueller-Wodarg, Bruinsma, Forbes, Yelle, Keating, **Withers**, and Lopez-Valverde (2008) The structure of Venus' upper atmosphere and forthcoming measurements by the Venus Express Atmospheric Drag Experiment, 37th COSPAR meeting, Montreal, Abstract C33-0023-08
- Keating, Mueller-Wodarg, Forbes, Yelle, Bruinsma, **Withers**, Lopez-Valverde, Theriot and Bougher (2008) Future drag measurements from Venus Express, 37th COSPAR meeting, Montreal, Abstract C33-0024-08

Atmospheric Structure Profiles from Planetary Entry Probes

- **Withers** (2010) Trajectory and atmospheric structure reconstruction from entry probes: Demonstration of a real-time reconstruction technique using a simple direct-to-Earth radio link, DPS meeting, Abstract #30.11
- **Withers** and Catling (2010) Results from the Phoenix Atmospheric Structure Experiment, 7th International Planetary Probe Workshop, 14-18 June 2010, Barcelona, Spain
- **Withers** (2010) Radio tracking of Phoenix during its landing on Mars, VEX/MEX radio science team meeting, Bonn, Germany, 18-19 March 2010
- **Withers** and Catling (2009) Preliminary reconstruction of martian atmospheric structure from Phoenix entry measurements, Fall AGU meeting, Abstract #P54B-08
- **Withers** (2009) A simple method for supporting future landers by predicting surface pressure on Mars, AOGS meeting, Abstract #PS08-A021, Singapore
- Tellmann, **Withers**, Paetzold, Haeusler, Tyler and Hinson (2009) The polar atmosphere as seen by the radio science experiment MaRS on Mars Express, Third International Workshop on Mars Polar Energy Balance and the CO₂ Cycle, Abstract #7024, Seattle, WA, 21-24 July 2009
- **Withers** and Tellmann (2009) Simplifying the martian carbon dioxide cycle: An empirical method for predicting surface pressure, Third International Workshop on Mars Polar Energy Balance and the CO₂ Cycle, Abstract #7009, Seattle, WA, 21-24 July 2009
- **Withers** (2009) MEX surface pressure measurements, VEX/MEX radio science team meeting, Cologne, 16-17 April 2009
- **Withers**, Barnes, Justus, Justh, Kass, Montabone and Rafkin (2008) Comparison of atmospheric observations and predictions for the atmospheric entries of Spirit and Opportunity, LPSC, Abstract #2175

- Ball, Mueller-Wodarg, Lewis, Zarnecki, Hathi, Leese, Towner, Ferri, Colombatti, Fulchignoni, and **Withers** (2006) Huygens Atmospheric Structure Instrument entry accelerometer: Application to Mars and Venus, 4th International Planetary Probe Workshop, June 27 - 30, Pasadena, CA
- **Withers** (2005) Atmospheric profiles from Spirit and Opportunity, Spring AGU meeting, Abstract P24A-02
- Montabone, Lewis, Read, and **Withers** (2005) The weather on Mars at the time of MERs and Beagle 2 landing, European Geosciences Union Meeting, Abstract EGU05-A-09628
- **Withers** (2004) Should we believe atmospheric temperatures measured by entry accelerometers travelling at “slow” near-sonic speeds?, 2nd International Planetary Probe Workshop, August 23 - 27, NASA Ames
- **Withers**, Towner, Hathi, and Zarnecki (2003) Review of the trajectory and atmospheric structure reconstruction for Mars Pathfinder, International Workshop on Planetary Probe Atmospheric Entry and Descent Trajectory Analysis and Science, Lisbon, Portugal, October 6 - 9, 2003
- **Withers** (2003) Scientific uses of crude telemetry during Mars atmospheric entry, DPS meeting, Abstract #14.24
- **Withers**, Zarnecki, Towner, and Hathi (2002) Trajectory reconstruction for Beagle 2, 6th Huygens Descent Trajectory Working Group Meeting, Pasadena, CA
- **Withers**, Hathi, Towner, and Zarnecki (2002) Development of software for analysing entry accelerometer data in preparation for the Beagle 2 mission to Mars: Towards a publicly available toolkit, LPSC, Abstract #1203
- **Withers** (2001) Technical Report to the Open University on atmospheric structure reconstruction using the Beagle 2 accelerometer, presentation to the Open University upon completion of report

Other Topics

- **Withers**, Lorenz, and Neumann (2002) Errors in Viking Lander atmospheric profiles discovered using MOLA topography, LPSC, Abstract #1294
- **Withers** and Neumann (2002) Enigmatic northern plains of Mars, Geoplanets Summer School, Italy
- Grier and 25 colleagues, including **Withers** (2001) Defining long term goals and setting priorities for education and outreach, 2003 to 2013 - Panel Report, DPS meeting, Abstract #19.29
- **Withers** and Neumann (2001) A test of the martian northern ocean hypothesis, 4th Lunar and Planetary Laboratory internal conference
- **Withers** and Neumann (2001) Ridges in the martian northern plains, 33rd Brown-Vernadsky Microsymposium, Houston, TX
- **Withers** (2001) Meteor storm evidence against the recent formation of lunar crater Giordano Bruno, 4th Lunar and Planetary Laboratory internal conference
- **Withers** (2001) Meteor storm evidence against the recent formation of lunar crater Giordano Bruno, LPSC, Abstract #1007

- **Withers** and Lorenz (2001) Simple tests of simple climate models, Spring AGU meeting, Abstract #U32A-05
- **Withers** and Neumann (2000) Shallow ridges in the martian northern plains, Fall AGU meeting, Abstract #P62B- 02
- Lorenz, Lunine, **Withers**, and McKay (2000) Latitudinal temperature contrasts on Titan and the principle of maximum entropy production, DPS meeting, Abstract #17.07
- **Withers** (2000) Angle of repose-limited shapes of asteroids, 3rd Lunar and Planetary Laboratory internal conference
- **Withers** (2000) Angle of repose-limited shapes of asteroids, LPSC, Abstract #1270