

Paul Withers

Department of Astronomy
Boston University
725 Commonwealth Avenue
Boston MA 02215

Tel: (617) 353 1531
Fax: (617) 353 6463
Email: withers@bu.edu
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

Selected 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 2002
in academic work and research in planetary science

Selected Invited Presentations

- 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
- Exploring planetary ionospheres, Center for Atmospheric Research, University of Massachusetts - Lowell 2009
- The effects of solar flares on planetary ionospheres, AOGS meeting, Singapore 2009
- The Mars ionosphere: More than a Chapman layer, Armagh Observatory 2008

- The top of the martian atmosphere, University College London 2007
- Huygens at Titan, MIT 2005
- Exploring Saturn with Cassini/Huygens, Tufts University 2004

Selected 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
- 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

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

Selected 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)
- 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)

Selected 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 Safaeinili (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
- **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
- 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
- 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**, 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** and Neumann (2001) Enigmatic northern plains of Mars, *Nature*, 410, 651
- Lorenz, Lunine, **Withers**, and McKay (2001) Titan, Mars and Earth: Entropy production by latitudinal heat transport, *Geophysical Research Letters*, 28, 415 – 418