

VITAE

STEPHEN WESLEY BOUGHER

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EDUCATION:

Ph.D.	1985	University of Michigan (Aeronomy)
M.S.	1980	University of Colorado (Astrogeophysics)
B.A.	1977	Northwestern University (Physics)

Thesis : *Venus Thermospheric Circulation*
Advisors : Drs. A. F. Nagy and R. G. Roble

MAJOR FIELD:

Planetary Atmospheres : the application of remote sensing techniques and modeling schemes to determine the chemistry, energetics, and dynamics of the upper atmospheres of the Earth and other planets. Mesosphere, thermosphere, and ionosphere physics. Emphasis on comparative study of terrestrial and jovian planet processes. Mars upper atmosphere science.

PROFESSIONAL EMPLOYMENT HISTORY:

2003-2015	NCAR Affiliate Scientist. High Altitude Observatory, National Center for Atmospheric Research, Boulder, Colorado
2002-date	Collegiate Research Professor. Atmospheric, Oceanic, and Space Sciences Department (AOSS), U. of Michigan, Ann Arbor
1995-2002	Associate/Assistant Research Scientist. Lunar and Planetary Laboratory (LPL), U. of Arizona, Tucson.
1986-1995	Senior Research Associate/Research Associate. LPL, U. of Arizona, Tucson, Arizona.
1984-1986	Postdoctoral Fellow. National Center for Atmospheric Research, Boulder, Colorado.

HONORS AND AWARDS:

- 1987 Nominated for NCAR outstanding publications award for the period 1982-1987. Paper : Venus Mesosphere and Thermosphere II. Global Circulation, Temperature, and Density Variations, *Icarus*, **68**, 284-312, 1986.
- 1999 NASA Group Achievement Award : Mars Global Surveyor Solar Array Anomaly Recovery and Aerobraking Team.
- 2004 OVPR Outstanding Research Achievement Award, U. of Michigan.
- 2007 CoE Outstanding Research Scientist Award, U. of Michigan.
- 2007 NASA Group Achievement Award: Mars Reconnaissance Orbiter Nav Team.
- 2009 OVPR Andrew F. Nagy Collegiate Research Professorship (2009-2014), U. of Michigan.
- 2011 NASA Group Achievement Award: MRO Accelerometer Science Team.

PROFESSIONAL SOCIETIES:

American Geophysical Union (since 1980)

Int'l Association of Geomagnetism and Aeronomy (since 1985)

Division of Planetary Sciences -AAS (since 1986)

Committee on Space Research - COSPAR (since 1992)

TEACHING AND MENTORING :

Classes Taught

Assisted with Arizona/PTY5 517 (Planetary Atmospheres) - F87.

Michigan/AOSS-749 (AOSS Seminar) F04, W05, F05 - 2004 to 2005.

Undergraduate Student Mentoring

Student programmer, George Hong (Arizona/ECE) - 1993 to 1995.

Space Grant student, Jennifer Babicke (Arizona/CME) - 1997 to 1998.

UROP student, Brian Steers (Michigan/AERO) - 2005 to 2006.

REU student, Brian Steers (Michigan/AERO) - 2006.

REU student, Kim Zoldak (California Univ. of Pa.) - 2008.

Graduate Student Mentoring and Advising

M.S. student, Shunbin Zhang (Arizona/PTY5) - 1994 to 1996.

Ph.D student, Paul Withers (Arizona/PTY5) - 1998 to 2003.

Ph.D student, Jared Bell (Michigan/AOSS) - 2003 to 2008.

Ph.D student, Amanda Brecht (Michigan/AOSS) - 2006 to 2011.

Ph.D student, Tami McDunn (Michigan/AOSS) - 2006 to 2012.

Ph.D student, Chuanfei Dong (Michigan/AOSS) - 2011 to date.

NASA MISSION PARTICIPATION:

Pioneer Venus Guest Investigator. Analysis of PVO data (1988-1992).

Mars Global Surveyor Mission. Aerobraking team (1995-1999).

1999 Mars Climate Orbiter, Aerobraking Team (1999).

2001 Mars Odyssey Orbiter, Aerobraking Team (2001-2002).

2005 Mars Reconnaissance Orbiter, Co-I and Accelerometer Facility Team Member (2002-2010).

Venus Express Participating Scientist funding. Analysis of SPI-CAV data (2006-2015).

Mars Scout 2013: The Great Escape (Phase A Study). Chief Scientist. Volatile escape (2007-2008).

Mars Scout 2013: MAVEN (Phases D-E). Co-I. Volatile Escape (2012-2016).

NASA and NSF PROGRAM PARTICIPATION:

Early Career NASA Programs—————

Venus Guest Investigator Program, 1988-1992. Analysis of multiple PVO datasets.

Venus Data Analysis Program, 1993-1995. Analysis of PVO entry NMS datasets.

Space Physics/SRT Program, 1992-1993. Earth's mesosphere and UV variations.

NASA Planetary Atmospheres Program—————

PATM, 1990-2004. Mars upper atmosphere neutral and ion structure and global dynamics.

PATM, 1993-2007. Jupiter thermospheric energetics and dynamics. Jupiter TGCM development.

PATM, 2004-2008. Titan TGCM development and applications.

PATM, 2008-2011. Venus thermospheric structure and nightglow. Venus TGCM upgrades.

PATM, 2012-2015. Jupiter GITM development and applications for JUNO mission.

NASA Mars Programs—————

MGS Data Analysis Program, 2001-2003. MGS/RS ionospheric data.

MGS Critical Data Products Program, 2003-2004. MTGCM contributions to MARSGRAM-2005.

Mars Data Analysis Program, 1999-2010. MGS and Odyssey Accelerometer plus MGS-ER density data.

Mars Data Analysis Program, 2010-2013. MRO/MCS, Accelerometer and MEX/SPICAM data analysis.

MAVEN Critical Data Products Program, 2010-2012. MTGCM contributions to 2013 MAVEN Mission.

NSF AST, ATM and AGS Programs—————

NSF AST Program, 1996-2002. Comparative Aeronomy.

NSF AST Program, 2004-2007. Venus - Titan Aeronomy.

NSF ATM Program, 2006-2012. Mars Whole Atmosphere Climate Model (MWACM) development.

MAJOR PROFESSIONAL SERVICE:

Review Panels

NCAR Scientific Computing Division, Review Panel : 1993 thru 1996

NASA Planetary Atmospheres and Astronomy Review Panels: 1991, 2001, 2009

NASA Mars Data Analysis Review Panels: 2000 through 2002

NASA Outer Planets Research Program Review Panel : 2004

NASA and NAS Advisory Panels and Committees

NASA Planetary System Science MOWG : 2000 to 2002.

NASA Mars Surveyor '05 Science Definition Team : 2001.

NASA Mars Telecom Orbiter Science Definition Team : 2004.

NAS/NRC COMPLEX Committe Member : 2003 to 2006.

MEPAG Goals Committee Member : 2003 to 2008.

University of Michigan Committees

AOSS Executive Committee : 2008-2009; 2011-2013.

AOSS Awards Committee : 2005-2006; 2009-2010

SACUA Research Policy Committee : 2007 to 2010.

CoE Faculty Committee for Discipline : 2011 to 2012.

Editing

Lead-editor of UA Space Science Series book, "Venus II": 1993 to 1997

Associate-editor of Geophys. Res. Lett. : 1994 to 1997

Associate-editor of J. Geophys. Res. (Space Physics) : 2002 to 2006

AGU and COSPAR Leadership

AGU Session Convener and Chair: 1987, 2001, 2003, 2006, 2007.

COSPAR Vice-Chair of Sub-Commission C3: 2002 to 2010.

COSPAR Chair of Sub-Commission C3: 2010 to 2014.

PUBLICATIONS - PEER REVIEWED ONLY:

1. Stewart, A. I. F., J.-C. Gerard, D. W. Rusch, and S. W. Bougher, Morphology of the Venus ultraviolet night airglow, **J. Geophys. Res.**, **85**, 7861-7870, (1980).
2. Gerard, J.-C., A. I. F. Stewart, and S. W. Bougher, The altitude distribution of the Venus ultraviolet nightglow and implications on vertical transport, **Geophys. Res. Lett.**, **8**, 633-636, (1981).
3. Bougher, S. W., and T. E. Cravens, A two-dimensional model of the nightside ionosphere of Venus: Ion energetics, **J. Geophys. Res.**, **89**, 3837-3842, (1984).
4. Keating, G. M., J. L. Bertaux, S. W. Bougher, T. E. Cravens, R. E. Dickinson, A. E. Hedin, V. A. Krasnopolsky, A. F. Nagy, J. Y. Nicholson III, L. J. Paxton, and U. von Zahn, *The Venus International Reference Atmosphere*, Ch. IV - Models of Venus neutral upper atmosphere: Structure and composition, **Adv. in Space Research**, **5**, 117-172, (1985).
5. Dickinson, R. E., and S. W. Bougher, Venus mesosphere and thermosphere: I. Heat budget and thermal structure, **J. Geophys. Res.**, **91**, 70-80, (1986).
6. Bougher, S. W., R. E. Dickinson, E. C. Ridley, R. G. Roble, A. F. Nagy, T. E. Cravens, Venus mesosphere and thermosphere II. Global circulation, temperature, and density variations, **Icarus**, **68**, 284-312, (1986).
7. Keating, G. M., and S. W. Bougher, Neutral upper atmospheres of Venus and Mars, **Adv. in Space Research**, **7**, **12**, 57-71, (1987).
8. Dickinson, R. E., R. G. Roble, and S. W. Bougher, Radiative cooling in the NLTE region of the mesosphere and lower thermosphere - Global energy balance, **Adv. in Space Research**, **7**, **10**, 5-15, (1987).
9. Bougher, S. W., R. E. Dickinson, E. C. Ridley, R. G. Roble, Venus mesosphere and thermosphere III. Three-dimensional general circulation with coupled dynamics and composition, **Icarus**, **73**, 545-573, (1988).
10. Bougher, S. W., and R. E. Dickinson, Mars mesosphere and thermosphere: I. Global mean heat budget and thermal structure, **J. Geophys. Res.**, **93**, 7325-7337, (1988).
11. Bougher, S. W., R. E. Dickinson, R. G. Roble, and E. C. Ridley, Mars thermospheric general circulation model : Calculations for the arrival of Phobos at Mars, **Geophys. Res. Lett.**, **15**, **15**, 1511-1514, (1988).

12. Bougher, S. W., J. C. Gerard, A. I. F. Stewart, and C. G. Fesen, The Venus nitric oxide night airglow: Calculations based on the Venus thermospheric general circulation model, **J. Geophys. Res.**, **95**, 6271-6285, (1990).
13. Bougher, S. W., R. G. Roble, E. C. Ridley, and R. E. Dickinson, The Mars thermosphere II. General circulation with coupled dynamics and composition, **J. Geophys. Res.**, **95**, 14811-14827, (1990).
14. Fox, J. L., and S. W. Bougher, Structure, luminosity, and dynamics of the Venus thermosphere, **Space Sci. Rev.**, **55**, pp. 357-489, (1991).
15. Bougher, S. W., and R. G. Roble, Comparative terrestrial planet thermospheres: 1. Solar cycle variation of global mean temperatures, **J. Geophys. Res.**, **96**, 11045-11056, (1991).
16. Hood, L. L., Z. Huang, and S. W. Bougher, Mesospheric effects of solar ultraviolet variations: Further analysis of SME IR ozone and Nimbus 7 SAMS temperature data, **J. Geophys. Res.**, **96**, 12989-13002, (1991).
17. E. Lellouch, J. J. Goldstein, S. W. Bougher, G. Paubert, and J. Rosenqvist, Absolute wind measurements in the middle atmosphere of Mars, **Ap. J.**, **383**, #1, 401-406, (1991).
18. Keating, G. M., and S. W. Bougher, Venus thermospheric response to short-term solar variations, **Adv. in Space Research**, **12**, **9**, 111-128, (1992).
19. Barth, C. A., A. I. F. Stewart, S. W. Bougher, D. M. Hunten, S. A. Bauer, and A. F. Nagy, **Mars, Ch. 5.7: Aeronomy of the Current Martian Atmosphere**, U. of Arizona Press, 1054-1089, (1992).
20. Stewart, A. I. F., M. J. Alexander, R. R. Meier, L. J. Paxton, S. W. Bougher, and C. G. Fesen, Atomic oxygen in the Martian thermosphere, **J. Geophys. Res.**, **97**, 91-102, (1992).
21. Keating, G. M. and S. W. Bougher, Isolation of major Venus thermospheric cooling mechanism and implications for Earth and Mars, **J. Geophys. Res.**, **97**, 4189-4197, (1992).
22. Bougher, S. W., E. C. Ridley, C. G. Fesen, and R. W. Zurek, Mars mesosphere and thermosphere coupling: Semidiurnal tides, **J. Geophys. Res.**, **98**, 3281-3295, (1993).
23. Zhang, M., J. G. Luhmann, S. W. Bougher, and A. F. Nagy, The ancient oxygen exosphere of Mars: Implications for atmosphere evolution, **J. Geophys. Res.**, **98**, 10915-10924, (1993).

24. Alexander, M. J., A. I. F. Stewart, S. C. Solomon, and S. W. Bougher, Local-time asymmetries in the Venus thermosphere, **J. Geophys. Res.**, **98**, 10849-10872, (1993).
25. Kasprzak, W. T., H. B. Niemann, A. E. Hedin, S. W. Bougher, and D. M. Hunten, Composition measurements by the Pioneer Venus Mass Spectrometer during Orbiter entry, **Geophys. Res. Lett.**, **20**, 2747-2750, (1993).
26. Kasprzak, W. T., H. B. Niemann, A. E. Hedin, and S. W. Bougher, Wave-like perturbations observed at low altitudes by the Pioneer Venus Orbiter Neutral Mass Spectrometer during entry, **Geophys. Res. Lett.**, **20**, 2755-2759, (1993).
27. Bougher, S. W., and W. J. Borucki, Venus O₂ visible and IR nightglow: Implications for lower thermosphere dynamics and chemistry, **J. Geophys. Res.**, **99**, 3759-3776, (1994).
28. Bougher, S. W., D. M. Hunten, and R. G. Roble, CO₂ cooling in terrestrial planet thermospheres, **J. Geophys. Res.**, **99**, 14609-14622, (1994).
29. E. Lellouch, J. J. Goldstein, J. Rosenqvist, S. W. Bougher, and G. Paubert, Global circulation, thermal structure, and carbon monoxide distribution in Venus' mesosphere in 1991, **Icarus**, **110**, 315-339, (1994).
30. Bougher, S. W., D. M. Hunten, and R. G. Roble, CO₂ Cooling in Terrestrial Planet Thermospheres, **Earth, Moon, and Planets**, **67**, 31-33, (1995).
31. Bougher, S. W., Comparative thermospheres: Venus and Mars, **Adv. in Space Research**, **15**, #4, 21-45, (1995).
32. Fox, J. L., P. Zhou, and S. W. Bougher, The Martian Thermosphere/Ionosphere at High and Low Solar Activities, **Adv. in Space Research**, **17**, 11, 203-218, (1995).
33. Bougher, S. W. and R. J. Phillips, Introduction to the Venus II Special Section, **J. Geophys. Res.**, **101**, 4523-4524, (1996).
34. Zhang, S., S. W. Bougher, and M. J. Alexander The impact of gravity waves on the Venus thermosphere and O₂ IR nightglow, **J. Geophys. Res.**, **101**, 23195-23205, (1996).
35. Kasprzak, W. T., G. M. Keating, N. C. Hsu, A. I. F. Stewart, W. B. Coldwell, and S. W. Bougher, Solar Cycle Behavior of the Thermosphere, **Venus II, CH. 2.3**, pp. 225-258, U. of Arizona Press, (1997).

36. Bougher, S. W., M. J. Alexander, and H. G. Mayr, Upper Atmosphere Dynamics : Global Circulation and Gravity Waves, **Venus II, CH. 2.4**, pp. 259-292, U. of Arizona Press, (1997).
37. Lellouch, E., T. Clancy, D. Crisp, A. Kliore, D. Titov, and S. W. Bougher, Monitoring of Mesospheric Structure and Dynamics, **Venus II, CH. 3.1**, pp. 295-324, U. of Arizona Press, (1997).
38. Bougher, S. W., and R. G. Roble, "Thermosphere", pp. 819-825, in *The Encyclopedia of Planetary Sciences*, Eds. J. H. Shirley and R. W. Fairbridge, Chapman and Hall, London, (1997).
39. Bougher, S. W., J. M. Murphy, and R. M. Haberle, Dust Storm Impacts on the Mars Upper Atmosphere, **Adv. in Space Research, 19, 8**, 1255-1260, (1997).
40. Bougher, S. W. and H. Shinagawa, The Mars thermosphere-ionosphere : Predictions for the arrival of Planet-B, **Earth, Planets, Space, 50**, 247-257, (1998).
41. Keating, G. M. *et al.*, The Structure of the Upper Atmosphere of Mars : In-situ Accelerometer Measurements from Mars Global Surveyor, **Science, 279**, 1672-1676, (1998).
42. Niemann, H. B., and NMS team, The Planet-B Neutral Gas Mass Spectrometer, **Earth, Planets, and Space, 50, #9**, 785-792, (1998).
43. Shinagawa, H., and S. W. Bougher, A two-dimensional MHD model of the solar wind interaction with Mars, **Earth, Planets, and Space, 51**, 55-60, (1999).
44. Bougher, S. W., S. Engel, R. G. Roble, and B. Foster, Comparative Terrestrial Planet Thermospheres : 2. Solar Cycle Variation of Global Structure and Winds at Equinox, **J. Geophys. Res., 104**, 16591-16611, (1999).
45. Bougher, S. W., G. M. Keating, R. W. Zurek, J. M. Murphy, R. M. Haberle, J. Hollingsworth, and R. T. Clancy, Mars Global Surveyor Aerobraking : Atmospheric Trends and Model Interpretation, **Adv. in Space Research, 23, #11**, 1887-1897, (1999).
46. Keating, G. M., N. C. Hsu, R. H. Tolson, S. W. Bougher, J. Lyu, and T. J. Schellenberg, Extensions to the Venus International Reference Atmosphere (VIRA) Thermospheric Model, **Adv. in Space Research, 23, #11**, (1999).
47. Bougher, S. W., S. Engel, R. G. Roble, and B. Foster, Comparative Terrestrial Planet Thermospheres : 3. Solar Cycle Variation of Global Structure and Winds at Solstices, **J. Geophys. Res., 105**, 17669-17689, (2000).

48. Bougher, S. W., D. P. Hinson, J. M. Forbes, and S. Engel, MGS Radio Science Electron Density Profiles and Implications for the Neutral Atmosphere, **Geophysical Res. Lett.**, **28**, 3091-3094, (2001).
49. Forbes, J. M., M. E. Hagan, S. W. Bougher, and J. L. Hollingsworth, Kelvin Wave Propagation in the Upper Atmospheres of Mars and Earth, **Adv. in Space Research**, **27**, #11, 1791-1800, (2001).
50. Bougher, S. W., E. Chassefiere, J.-J. Berthelier, and P. Touboul, THERMOPAC/ADIP : A Generic Package for Long-Term Monitoring of the Martian Thermosphere, **Adv. in Space Research**, **29**, #2, 203-208, (2002).
51. Justus, C. G., B. F. James, S. W. Bougher, A. F. C. Bridger, R. M. Haberle, J. R. Murphy, and S. Engel, MARS-GRAM 2000 : A Mars atmospheric model for engineering purposes, **Adv. in Space Research**, **29**, (2002).
52. Bougher, S. W., R. G. Roble, and T. J. Fuller-Rowell, "Simulations of the Upper Atmospheres of the Terrestrial Planets", in *AGU Monograph : Comparative Aeronomy in the Solar System*, Eds. M. Mendillo, A. F. Nagy, and J. H. Waite, (2002).
53. Witasse, O., et al; Prediction of a CO₂⁺⁺ Layer in the Atmosphere of Mars, **Geophysical Res. Lett.**, **29**, 8,, 10.1029/2002GL014781, (2002).
54. Forbes, J. M., A. F. C. Bridger, M. E. Hagan, S. W. Bougher, J. L. Hollingsworth, G. M. Keating, and J. R. Murphy, Nonmigrating Tides in the Thermosphere of Mars, **J. Geophys. Res.**, **107**, 10.1029/2001JE001582, (2002).
55. Withers, P. G., S. W. Bougher, and G. M. Keating, The effects of topographically-controlled thermal tides in the Martian upper atmosphere as seen by the MGS Accelerometer, **Icarus**, **164**, 14-32, (2003).
56. Bougher, S. W., S. Engel, D. P. Hinson, and J. R. Murphy, MGS Radio Science Electron Density Profiles : Interannual variability and implications for the neutral atmosphere, **J. Geophys. Res.**, **109**, E3, E03010, 10.1029/2003JE002154, (2004).
57. Majeed, T, J. H. Waite, Jr., S. W. Bougher, R. V. Yelle, G. R. Gladstone, J. C. McConnell, and A. Bhardwaj, The ionospheres-thermospheres of the giant planets, **Adv. Space Res.**, **33**, 197, (2004).
58. Bougher, S. W., J. H. Waite, Jr., T. Majeed, G. R. Gladstone, Jupiter Thermospheric General Circulation Model (JTGCM): Global Structure and Dynamics Driven by Auroral and Joule Heating, **J. Geophys. Res.**, **110**, E04008, doi:10.1029/2003JE002230, (2005).

59. Majeed, T., J. H. Waite, Jr., S. W. Bougher, and G. R. Gladstone, Processes of equatorial thermal structure of Jupiter : An analysis of the Galileo temperature profile with a 3-D model. **J. Geophys. Res.**, **110**, E12007, doi:10.1029/2004JE002351, (2005).
60. Lillis, R. J., J. H. Engel, D. L. Mitchell, D. A. Brain, R. P. Lin, S. W. Bougher, and M. H. Acuna, Probing upper thermosphere neutral densities at Mars using electron reflectrometry, **Geophys. Res. Lett.**, **32**, L23204, doi:10.1029/2005GL024337, (2005).
61. Brain, D. A.; Halekas, J. S.; Peticolas, L. M.; Lin, R. P.; Luhmann, J. G.; Mitchell, D. L.; Delory, G. T.; Bougher, S. W.; Acua, M. H.; Rme, H. On the origin of aurorae on Mars, **Geophys. Res. Lett.**, **33**, L01201, 10.1029/2005GL024782, (2006).
62. Bougher, S. W., J. R. Murphy, J. M. Bell, M. A. Lopez-Valverde, and P. G. Withers, Polar warming in the Mars lower thermosphere : Seasonal variations owing to changing insolation and dust distributions, **Geophys. Res. Lett.**, **33**, L02203, doi:10.1029/2005GL024059, (2006).
63. Bougher, S. W., J. R. Murphy, J. M. Bell, and R. W. Zurek, Prediction of the structure of the martian upper atmosphere for the Mars Reconnaissance Orbiter (MRO) mission, **Mars**, 2, 10-20, doi:10.1555/mars.2006.0002, (2006).
64. Bougher, S. W., S. Rafkin, and P. Drossart, Dynamics of the Venus Upper Atmosphere: Outstanding Problems and New Constraints Expected from Venus Express, **Planetary and Space Sciences**, **54**, 1371-1380, doi:10.1016/j.pss.2006.04.23, (2006).
65. Fillingim, M. O., L. M. Peticolas, R. J. Lillis, D. A. Brain, J. S. Halekas, D. L. Mitchell, R. P. Lin, D. Lummerzheim, S. W. Bougher, and D. L. Kirchner, Model calculations of electron precipitation induced ionization patches on the nightside of Mars, **Geophys. Res. Lett.**, **34**, L12101, doi:10.1029/2007GL029986 (2007).
66. Tolson, R. H., G. M. Keating, R. W. Zurek, S. W. Bougher, C. J. Justus, and D. C. Fritts, Application of Accelerometer Data to Atmospheric Modeling During Mars Aerobraking Operations, **AIAA J. Spacecraft and Rockets**, **44**, #6, 1172-1179, (2007).
67. Baird, D. T., R. Tolson, S. W. Bougher, and B. Steers, Zonal Wind Calculation from MGS Accelerometer and Rate Data, **AIAA J. Spacecraft and Rockets**, **44**, #6, 1180-1187, (2007).
68. Schubert, G., S. W. Bougher, C. C. Covey, A. D. Del Genio, A. S. Grossman, J. L. Hollingsworth, S. S. Limaye, amd R. E. Young, Venus Atmosphere Dynamics: A Continuing Enigma, **AGU Geophysical Monograph #176, Exploring Venus as a Terrestrial Planet**, pp. 101-120, (2007).

69. Bell, J. M., S. W. Bougher, and J. R. Murphy, Vertical dust mixing and the interannual variations in the Mars thermosphere, **J. Geophys. Res.**, **112**, E12002, doi:10.1029/2006JE002856, (2007).
70. Lillis, R. J., S. W. Bougher, D. L. Mitchell, D. A. Brain, R. P. Lin, and M. H. Acuna, Continuous monitoring of nightside upper thermospheric mass densities in the Martian southern hemisphere over 4-Martian years using electron reflectometry, **Icarus**, **194**, 562-574, doi:10.1016/j.icarus.2007.09.031, (2007).
71. Lillis, R. J., H. V. Frey, M. Manga, D. L. Mitchell, R. P. Lin, M. H. Acuna, and S. W. Bougher, An improved crustal magnetic field map of Mars from electron reflectometry: Highland volcano magnetic history and the end of the Martian dynamo, **Icarus**, doi:10.1016/j.icarus.2007.09.032, (2007).
72. Shematovich, V. I., D. V. Bisikalo, J.-C. Gerard, C. Cox, S. W. Bougher, and F. LeBlanc, Monte Carlo model of electron transport for the calculation of Mars dayglow emissions, **J. Geophys. Res.**, **113**, E02011, doi:10.1029/2007JE002938, (2008).
73. Bougher, S. W., P.-L. Blelly, M. Combi, J. L. Fox, I. Mueller-Wodarg, A. Ridley, and R. G. Roble, Neutral Upper Atmosphere and Ionosphere Modeling, **Space Sci. Reviews**, **139**, 107-141, doi:10.1007/s11214-008-9401-9, (2008).
74. Mueller-Wodarg, I. C. F., D. F. Strobel, J. I. Moses, J. H. Waite, J. Crovisier, R. V. Yelle, S. W. Bougher, and R. G. Roble, Neutral Atmospheres, **Space Sci. Reviews**, **139**, doi:10.1007/s11214-008-9404-6, (2008).
75. Huestis, D. L., S. W. Bougher, J. L. Fox, M. Galand, R. E. Johnson, J. I. Moses, J. Pickering, and R. V. Yelle, Cross Sections and Reaction Rates for Comparative Planetary Aeronomy, **Space Sci. Reviews**, **139**, 63-105, doi:10.1007/s11214-9383-7, (2008).
76. De La Haye, V., J. H. Waite, T. E. Cravens, S. W. Bougher, I. P. Robertson, and J. M. Bell, Heating Titan's Upper Atmosphere, **J. Geophys. Res.**, **113**, A11314, doi:10.1029/2008JA013078, (2008).
77. Lillis, R. J., S. W. Bougher, D. L. Mitchell, D. A. Brain, R. P. Lin, and M. H. Acuna, Continuous monitoring of nightside upper thermospheric mass densities in the martian southern hemisphere over 4 martian years using electron reflectometry, **Icarus**, **194**, 562-574, doi:10.1016/j.icarus.2007.09.031, (2008).
78. Bougher, S. W., T. M. McDunn, K. A. Zoldak, and J. M. Forbes, Solar Cycle Variability of Mars Dayside Exospheric Temperatures: Model Evaluation of Underlying Thermal Balances, **Geophys. Res. Lett.**, **36**, L05201, doi:10.1029/2008GL036376, (2009).

79. Majeed, T, J. H. Waite, Jr., S. W. Bougher, and G. R. Gladstone, Processes of auroral thermal structure at Jupiter: Analysis of multispectral temperature observations with the JTGCM, **J. Geophys. Res.**, **114**, E07005, doi:10.1029/2008JE003194, (2009).
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