

Liming Li

Department of Physics

University of Houston, Houston, TX 77204

Email: lli7@central.uh.edu Tel: 713-743-3283

EDUCATION

- 2001-2006 Division of Geological and Planetary Sciences, Caltech
Ph. D. in Planetary Sciences. Supervisor: Dr. Andrew P. Ingersoll
- 1998–2001 Department of Geophysics, Peking University, Beijing, China
M.S. in Meteorology. Supervisor: Dr. Shikuo Liu
- 1994-1998 Department of Atmospheric Sciences, Nanjing University, Nanjing, China
B.S. with honor in Atmospheric Science

PROFESSIONAL EXPERIENCE

- 2007-2008 Research Associate, Department of Astronomy, Cornell University
Advisors: Dr. Conrath Barney, Dr. Peter Gierasch, and Dr. Don Banfield
- 2009-2012 Research Assistant Professor, Department of Earth and Atmospheric Sciences,
University of Houston
- 2012-2017 Assistant Professor, Department of Physics, University of Houston
- 2017- Associate Professor, Department of Physics, University of Houston

ACADEMIC AWARDS AND HONORS

- Selected by NASA to be a participating scientist for three instruments (Composite Infrared Spectrometer, Imaging Science Subsystem, and Visual and Infrared Mapping Spectrometer) on **Cassini** (2015-)
Note: The international flagship mission-Cassini, which is supported by NASA, the European Space Agency, and the Italian Space Agency, annually selects about eight outstanding candidates from a global pool to be participating scientists.
- Selected to be a science team member of the Microwave Radiometer on **Juno** (2015-).
Note: Juno is a NASA New Frontiers mission, which is the first polar-orbiting spacecraft to Jupiter.
- NASA Jet Propulsion Laboratory (JPL) Summer Faculty Research Program (2015).
Note: NASA JPL annually selects a few faculty members from different universities to engage in research of mutual interest to the faculty members and JPL researchers.

PUBLICATIONS IN REFEREED JOURNALS

Total 28 papers (leading author for 17) in professional journals including *Nature Geoscience*, *Nature Communications*, *Astrophysical Journal*, *Geophysical Research Letters* and *Scientific Reports*. Some papers were reported by the media including NASA official website. In addition, I have 4 more papers under review. The publications are summarized as below, in which the asteroid “*” indicates papers led by my students.

1. Fletcher, L. N., S. Guerlet, G. Orton, R. Cosentino, T. Fouchet, P. Irwin, **L. Li**, N. Gorius, F. M. Flasar, R. Morales-Juberias, Disruption of Saturn’s Quasi-Periodic Equatorial Oscillation by the Great Northern Storm, *Nature*, submitted, 2017.
2. Jiang, X., A. Kao, A. Corbett, E. Olsen, T. Pagano, A. Zhai, S. Newman, **L. Li**, Y. Yung, Influence of Droughts on Mid-tropospheric CO₂, *Journal of Atmospheric Sciences*, submitted, 2017.
3. **Li, L.** and P. J. Gierasch, Saturn’s meridional circulation, *Nature Astronomy*, submitted, 2017.

4. *Kao, A., X. Jiang, **L. Li**, J. H. Trammell, G. J. Zhang, H. Su, and Y. L. Yung, Investigation of atmospheric moisture recycling rate from observations and models, *Scientific Reports*, submitted, 2017.
5. Janssen, M. A., S. J. Bolton, S. M. Levin, V. Adumitroaie, M. D. Allison, J. K. Arballo, S. K. Atreya, A. Bellotti, S. T. Brown, S. Gulkis, A. P. Ingersoll, L. A. Jewell, C. Li, **L. Li**, J. Lunine, S. Misra, G. S. Orton, T. C. Owen, F. A. Oyafuso, D. Santos-Costa, E. Sarkissian, P. G. Steffes, and R. Williamson, The deep structure of Jupiter's atmosphere as traced by its subcloud ammonia distribution, *Geophysical Research Letters*, accepted, 2017.
6. Janssen, M. A., J.E. Oswald, S.T. Brown, S. Gulkis, S.M. Levin, S.J. Bolton, M.D. Allison, S.K. Atreya, D.Gautier, A.P. Ingersoll, J.I. Lunine, G.S. Orton, T.C. Owen, P.G. Steffes, V. Adumitroaie, A. Bellotti, L.A. Jewell, C. Li, **L. Li**, S. Misra, F.A. Oyafuso, D. Santos-Costa, E. Sarkissian, R. Williamson, J.K. Arballo, A. Kitiyakara, A. Ulloa-Severino, J.C. Chen, F.W. Maiwald, A.S. Sahakian, P.J. Pingree, K.A. Lee, A.S. Mazer, R. Redick, R.E. Hodges, R.C. Hughes, G. Bedrosian, D.E. Dawson, W.A. Hatch, D.S. Russell, N.F. Chamberlain, M.S. Zawadski, B. Khayatian, B.R. Franklin, H.A. Conley, J.G. Kempenaar, M.S. Loo, E.T. Sunada, V. Vorperion, and C.C. Wang, MWR: Microwave radiometer for the Juno mission to Jupiter, *Space Science Reviews*, in press, 2017.
7. *Pan, Y., **L. Li**, X. Jiang, G. Li, W. Zhang, A. P. Ingersoll. Earth's varying global atmospheric energy cycle in response to climate change, *Nature Communications* 8, doi:10.1038/ncomms14367, 2017. [The study was reported by the media including ScienceDaily, AccuWeather, Science Magazine, Environmental News Network, and so on \(e.g., https://www.sciencedaily.com/releases/2017/01/170124111330.htm\).](https://www.sciencedaily.com/releases/2017/01/170124111330.htm)
8. Bering, E. A., L. S. Pinsky, **L. Li**, D. Jackson, J. Chen, H. Reed, M. Moldwin, J. Kasper, J. P. Sheehan, J. Forbes, T. Heine, A. Case, M. Stevens, MarsCAT: Mars Array of ionospheric Research Satellites using the CubeSat Ambipolar Thruster, *54th AIAA Aerospace Sciences Meeting, AIAA SciTech Forum*, <http://dx.doi.org/10.2514/6.2016-1466>, 2016.
9. *Trammell, H. J., **L. Li**, Jiang, X., Pan, Y., Smith, M.A., Bering, E.A., Hörst, S.M., Vasavada, A.R., Ingersoll, A.P., Janssen, M.A. and West, R.A., 2016. Vortices in Saturn's Northern Hemisphere (2008–2015) observed by Cassini ISS. *Journal of Geophysical Research: Planets* 121, 1814-1826, 2016.
10. Sanchez-Lavega, A., E. García-Melendo, S. Perez-Hoyos, R. Hueso, M. H. Wong, A. Simon, J. F. Sanz-Requena, A. Antuñano, N. Barrado-Izagirre, I. Garate-Lopez, J. F. Rojas, T. del Rio Gaztelurrutia, J. M. Gómez-Forrellad, I. de Pater, **L. Li** and PVOL contributors, An Enduring Rapidly Moving Storm As a Guide to Saturn's Equatorial Jet Complex Structure, *Nature Communications* 7, doi:10.1038/ncomms13262, 2016. [The study was reported by the media including ScienceDaily, CAHA, Science Newsline, Pinterest, and so on \(e.g., http://www.sciencenewsline.com/summary/2016111113270090.html\).](http://www.sciencenewsline.com/summary/2016111113270090.html)
11. Dyudina, U., X. Zhang, **L. Li**, R. A. West, P. Kopparla, Y. L. Yung, A. P. Ingersoll, L. Dones, Reflected Light Curves, Spherical and Bond Albedos of Jupiter- and Saturn-like Exoplanets, *Ap. J.*, 618, 973-986, 2016.
12. *Trammell, J. H., X. Jiang, **L. Li**, A. Kao, G. J. Zhang, E. Chang, and Y. L. Yung, Temporal and spatial variability of precipitation from observation and model, *Journal of Climate* 29, 2543-2555, 2016.
13. *Trammell, J. H., X. Jiang, **L. Li**, M. Liang, M. Li, J. Zhou, E. Fetzer, and Y. L. Yung, Investigation of Precipitation Variations over Wet and Dry Areas from Observation and Model, *Advances in Meteorology*, Art. No. 981092, 2015.
14. **Li, L**, X. Jiang, H. J. Trammell, Y. Pan, J. Hernandez, B. J. Conrath, P. J. Gierasch, R. K. Achterberg, C. A. Nixon, F. M. Flasar, S. Perez-Hoyos, R. A. West, K. H. Baines, and B. Knowles, Saturn's giant storm and global radiant energy, *Geophys. Res. Lett.*, 42,

doi:10.1002/2015GL063763, 2015.

15. Simon, A. A., Li, L., Reuter, D. C., Small-scale waves on Jupiter: A reanalysis of New Horizons, Voyager, and Galileo data, *Geophys. Res. Lett.*, 42, doi:10.1002/2015GL063433, 2015.
16. Li, L., Dimming Titan revealed by the Cassini observations. *Scientific Reports*, doi:10.1038/srep08239, 2015.
17. *Trammell, H. J., L. Li, X. Jiang, M. Smith, S. Horst, and A. Vasavada, The global vortex analysis of Jupiter and Saturn based on Cassini Imaging Science Subsystem. *Icarus* 242, doi:10.1016/j.icarus.2014.07.019, 2014.
18. Li, L., R. K. Achterberg, B. J. Conrath, P. J. Gierasch, C. A., Nixon, F. M., Flasar, A. R. Vasavada, A. D. Del Genio, R. A., West, Strong Temporal Variability Over One Saturnian Year: From Voyager to Cassini. *Scientific Reports*, doi:10.1038/srep02410, 2013.
19. Li, L., K. H. Baines, M. A. Smith, R. A. West, S. Pérez-Hoyos, H. J. Trammell, A. Simon-Miller, B. Conrath, P. J. Gierasch, G. S. Orton, C. A. Nixon, G. Filacchione, P. M. Fry, and T. W. Momary, Emitted power of Jupiter based on Cassini CIRS and VIMS observations. *J. Geophys. Res.*, doi:10.1029/2012JE004191, 2012.
20. Li, L., X. Jiang, M. T. Chahine, J. Wang, Y. L. Yung, Atmospheric energetics in El Nino and La Nina years. *Journal of the Atmospheric Sciences*, 68, 3072-3078, 2011.
21. Li, L., X. Jiang, M. T. Chahine, E. T. Olsen, E. Fetzer, L. Chen, Y. L. Yung, Recycling rate of atmospheric moisture over the past two decades. *Environmental Research Letters* 6, doi:10.1088/1748-9326/6/3/034017, 2011. [Please refer to the insight news on the ERL web \(http://environmentalresearchweb.org/cws/article/news/47247\)](http://environmentalresearchweb.org/cws/article/news/47247).
22. Li, L., X. Jiang, A. P. Ingersoll, A. D. Del Genio, C. C. Porco, R. A. West, A. R. Vasavada, S. P. Ewald, B. J. Conrath, P. J. Gierasch, A. A. Simon-Miller, C. A. Nixon, R. K. Achterberg, G. S. Orton, L. N. Fletcher, K. H. Baines, Equatorial winds on Saturn and the stratospheric oscillation. *Nature Geoscience*, doi:10.1038/ngeo1292, 2011. [Please refer to the insight news \(http://www.nsm.uh.edu/news-events/stories/2011/1104_liJiang.php\)](http://www.nsm.uh.edu/news-events/stories/2011/1104_liJiang.php).
23. Li, L., C. A. Nixon, R. Achterberg, M. A. Smith, N. J. P. Gorius, X. Jiang, B. Conrath, P. Gierasch, A. A. Simon-Miller, F. M. Flasar, A. P. Ingersoll, K. Baines, R. A. West, A. R. Vasavada, S.P. Ewald, The Global Energy Balance of Titan, *Geophys. Res. Lett.* 38, Art. No. L23201, 2011. [Please refer to the highlights on the American Geophysical Union \(http://onlinelibrary.wiley.com/doi/10.1029/2012EO070017/abstract\)](http://onlinelibrary.wiley.com/doi/10.1029/2012EO070017/abstract). The paper was also selected to be the cover page of the journal of *GRL*.
24. Li, L., B. Conrath, P. Gierasch, R. Achterberg, C. A. Nixon, A. A. Simon-Miller, F. M. Flasar, D. Banfield, K. H. Baines, R. A. West, A. R. Vasavada, A. Mamoutkine, M. Segura, G. Bjoraker, G. S. Orton, L. N. Fletcher, P. Irwin, P. Read, Emitted power of Saturn, *J. Geophys. Res.*, 115, E11002, doi:10.1029/2010JE003631, 2010. [Please refer to the NASA feature story titled "Saturn is on a cosmic dimmer switch" on NASA website \(http://www.nasa.gov/mission_pages/cassini/whycassini/dimmer-switch.html\)](http://www.nasa.gov/mission_pages/cassini/whycassini/dimmer-switch.html).
25. Li, L., P. J. Gierasch, R. K. Achterberg, B. J. Conrath, F. M. Flasar, A. R. Vasavada, A. P. Ingersoll, D. Banfield, A. A. Simon-Miller, L. N. Fletcher, Strong jet and a new thermal wave in Saturn's equatorial stratosphere. *Geophys. Res. Lett.* 35(23), Art. No. L23208, 2008.
26. Li L., A. P. Ingersoll, X. Jiang, D. Feldman, and Y. L. Yung, Lorenz energy cycle of the global atmosphere based on reanalysis datasets. *Geophys. Res. Lett.* 34(16), L16813, 2007.
27. Li L., A. P. Ingersoll, A. R. Vasavada, A. A. Simon-Miller, R. K. Achterberg, S. P. Ewald, U. A. Dyudina, C. C. Porco, R. A. West, and F. M. Flasar, Waves in Jupiter's atmosphere observed by the Cassini ISS and CIRS instruments, *Icarus* 185, 416-419, 2006.
28. Li L., A. P. Ingersoll and X. L. Huang, Interaction of moist convection with zonal jets on Jupiter and Saturn, *Icarus* 180, 113-123, 2006.

29. Li L., A. P. Ingersoll, A. R. Vasavada, A. A. Simon-Miller, A. D. Del Genio, S. P. Ewald, C. C. Porco, and R. A. West, Vertical wind shear on Jupiter from Cassini images, *J. Geophys. Res.* 111, Art. No. E04004, 2006.
30. Li L., A. P. Ingersoll, A. R. Vasavada, C. C. Porco, A. D. Del Genio and S. P. Ewald, Life cycles of spots on Jupiter from Cassini images, *Icarus* 172, 9-23, 2004.
31. Li L., F. Huang, D. Chi, S. Liu, Thermal effects of the Tibetan Plateau on Rossby waves, *Advances in Atmospheric Science* 19, 901-913, 2002.
32. Li L., D. Huang, F. Qiao, S. Liu, The diabatic waves in barotropic model, *Journal of tropical meteorology* 6, 1-12, 2000.

ORAL PRESENTATIONS

• Invited Talks

1. Juno Science Meeting, Southwest Research Institute, San Antonio, TX, “The large vortices on Jupiter and Saturn with observations from Voyager, Cassini, and Juno”. September 1, 2016.
2. Society of Physics Students (SPS) Colloquium, Lee College, Baytown, TX, “Exploration of The Giant Planets in Our Solar System”. April 15, 2016.
3. Cassini Science Meeting, NASA/JPL, Pasadena, CA. “Titan’s Energy Budget and Its Temporal Variation”, October 20, 2015.
4. Cassini Science Meeting, NASA/JPL, Pasadena, CA. “Saturn’s energy budget, winds, and vortices”, October 21, 2015.
5. Juno Science Meeting, NASA/JPL, Pasadena, CA. “Comparative studies of planetary vortices”, August 13, 2015.
6. Cassini Participating Scientists Conference, NASA/JPL, Pasadena, CA. “Radiant Energy Budgets of Jupiter, Saturn, and Titan”, June 22, 2015.
7. Department of Atmospheric and Oceanic Science, Peking University, China, “Energies of Planets”, June 16, 2015.
8. Planetary Science Seminar, Division of Geological and Planetary Sciences, Caltech, CA. “Exploring Planetary Atmospheres from the Perspective of Energy”, June 2014.
9. Department Colloquium, Department of Physics and Astronomy, College of Charleston, SC. “Energy Budgets of Giant Planets and Titan”, March 2013.
10. Department Seminar, Department of Earth & Atmospheric Sciences, University of Houston, “Jupiter and Saturn Observed by Spacecraft Cassini”, April 2012.
11. Brown Bag Seminar, Department of Atmospheric Science, University of Alabama in Huntsville, AL. “Atmospheric Dynamics of the Giant Planets”. February 2011.
12. NASA Sounder Science Team Meeting, NASA, Washington DC. “Precipitation and global warming”. October 2010.
13. NASA Sounder Science Team Meeting, NASA, Washington DC. “Hydrologic recycle of atmospheric moisture”, October 2009.
14. The fiftieth year of the Geophysical Fluid Dynamics (GFD) program at the Woods Hole Oceanographic Institution, MA. “Atmospheric Jets and Waves”, July 2008.
15. NASA JPL Oceanography Section, CA. “ Atmospheric dynamics of Jupiter”, March 2007.
16. Department Colloquium, Department of Atmospheric and Oceanic Sciences, UCLA, CA. “Jovian atmosphere from observation and theory”, June 2006.

• Conferences

1. Janssen et al., 2016. Early Observations of Jupiter with Juno’s Microwave Radiometer, National Radio Science Meeting.
2. Li L., 2016. Spatiotemporal Variability of Saturn’s Zonal Winds from Cassini Multi-Instrument Observations. American Geophysical Union Fall meeting.

3. Li L., 2016. The Vortex Dynamics on the Giant Planets. Juno/MWR Science Meeting (Remote Talk).
4. Li L., 2015. Atmospheric circulation and internal heat of Gas giant planets. NASA/JPL. Juno Microwave Radiometer Meeting.
5. Li L., 2015. Seasonal Variations of Saturn's Large-Scale Cloud Structure From Cassini Multi-Instrument Observations. NASA/JPL. Juno Microwave Radiometer Meeting.
6. Li, L., et. al., 2014. Progress in studying radiant energy budgets of Jupiter, Saturn, and Titan. DPS meeting. *Bull. Am. Astron. Soc.*, 46, 2014.
7. Jiang, X., Trammell, J, Li, L., 2014, Investigation of precipitation from observations and models, *NASA NEWS Science Team Meeting*, May 29-30, 2014.
8. Li, L., 2013. Strong atmospheric variations on Saturn: From Voyager to Cassini. DPS meeting. *Bull. Am. Astron. Soc.*, 45, 2013.
9. Pan, Y., X. Jiang, E. Olsen, T. Pagano, L. Li, Y. Yung, 2013, Investigation of high latitude CO₂ variability from satellite data, AGU 2013 Fall Meeting, A21G-0135, Dec 9-13, 2013.
10. Trammell, H. J., L. Li., 2013. Atmospheric vortices on Jupiter and Saturn. DPS meeting. *Bull. Am. Astron. Soc.*, 45, 2013.
11. Jiang, X., J. H. Trammell, L. Li, Y. Yung, 2013, Investigation of Precipitation over wet and dry areas from observation and model, AGU 2013 Fall Meeting, A34E-03, Dec 9-13, 2013.
12. Li, L., et al., 2012, Energy budgets of giant planets and Titan, DPS meeting. *Bull. Am. Astron. Soc.*, 44, 2012.
13. Trammell, H. J., L. Li, M. Smith, X. Jiang, A. R. Vasavada, 2012, Seasonal changes in vortex behavior on Saturn, DPS meeting, *Bull. Am. Astron. Soc.*, 44, 2012.
14. Trammell, J. H., L. Li, 2012, Global Analysis of Vortex Activity on Jupiter and Saturn, *AGU 2012 Fall Meeting*, P13B-1939, Dec 3-7, 2012.
15. Trammell, J. H., X. Jiang, L. Li, M. Liang, J. Zhou, and Y. L. Yung, 2012, Investigation of Atmospheric Recycling Rate from Observation and Model, *AGU 2012 Fall Meeting*, H13K-06, Dec 3-7, 2012.
16. Li, L., T. H. McConnochie, A. Toigo, B. J. Conrath, P. J. Gierasch, 2011, Mechanical energies of the upper atmosphere in the high latitudes of Mars, *AGU 2011 Fall Meeting*, P21A-1653, Dec 5-9, 2011.
17. Jiang, X., L. Li, M. Chahine, E. Olsen, E. Fetzer, L. Chen, Y. Yung, 2011. Recycling rate of atmospheric moisture over the past two decades (1988-2009), *NASA Sounder Science Team Meeting*, Nov 8-11, 2011.
18. Li, L., et al., Emitted power of Saturn based on Cassini/CIRS observations, *EOS Transactions AGU*, Vol., 90, P32C-03, 2009.
19. Li, L., et al., Equatorial jets and waves based on Cassini CIRS/ISS, DPS meeting. *Bull. Am. Astron. Soc.*, 40 2008.
20. Li, L., B. J. Conrath, F. M. Flasar, and P. J. Gierasch, et al., Revisit of the thermal wind equation: application to planetary atmospheres, *EOS Transactions AGU*, Vol., 88(24), P41A-0208, 2007.
21. Li, L., A. P. Ingersoll, X. Jiang, D. Feldman, Y.L. Yung, Lorenz energy cycle of the global atmosphere based on modern datasets, *EOS Transactions American Geophysical Union*, Vol., 87(43), A13D-0969, 2006.
22. Li, L., et al., Waves in Jupiter's atmosphere observed by the Cassini ISS and CIRS instruments, DPS meeting. *Bull. Am. Astron. Soc.*, 38, 2006.
23. Li, L., A. P. Ingersoll, A. R. Vasavada, A. A. Simon-Miller, A. D. Del Genio, S. P. Ewald, C. C. Porco, R. A. West, Vertical wind shear on Jupiter from Cassini images, *EOS Transactions American Geophysical Union*, Vol., 86(46), P11C-0134, 2005.
24. Li, L., A. P. Ingersoll, and X. Huang, Interaction of moist convection with Jupiter's zonal

jets, *EOS Transactions American Geophysical Union*, **85(47)**, P51B-1428, 2004.

25. **Li, L.**, and A. P. Ingersoll, Modeling the interaction of moist convection with the zonal jets of Jupiter, DPS meeting. *Bull. Am. Astron. Soc.*, **36**, 2004.

SPACE MISSION PARTICIPATION

1. Cassini: Composite Infrared Spectrometer (**CIRS**), Imaging Science Subsystem (**ISS**), and Visual and Infrared Mapping Spectrometer (**VIMS**).
2. Juno: Microwave Radiometer (**MWR**)
3. Mars Global Surveyor (**MGS**): Thermal Emission Spectrometer (**TES**)
4. Mars Reconnaissance Orbiter (**MRO**): Mars Climate Sounder (**MCS**).
5. **Aqua** satellite: Atmospheric Infrared Sounder (**AIRS**)

SERVICE

• Department and College Service

1. College: SR1 Building Committee
2. Department: Colloquium Committee, Website Committee, and Plan Committee
3. Qualify/Candidacy Exams and Dissertation Committee for PhD Students:
Harold Justin Trammell, Yefeng Pan, James Houston Trammell,
Aaron Studwell, Roya Eftekhar, Abigail Corbett, Angela Kao, Henry Fang,
Menghao Jaing, Eric Davis,
4. Help department recruit new graduate students at Lee College, Baytown TX

• National Aeronautics and Space Administration (NASA) Service

1. Invited External Reviewer of NASA Postdoctoral Fellowships
2. Reviewer for NASA ROSES Proposals
3. Reviewer for NASA Instrument Usage Manual (Cassini Instruments)
4. Reviewer for NASA Public Data System (PDS) Version 4

• External Panel Service

Panel of NASA ROSES Proposals

• Editorial Service

Editor of *Scientific Reports* (impact factor 5.23 in 2015, a journal from Nature Publishing Group) (2014-)

• Profession/Academic review

Science, *Nature-Geosciences*, *Geophysical Research-Planets*, *Geophysical Research Letters*, *Journal of Climate*, *Icarus* (International Journal of Solar System Studies), and *Journal of the Atmospheric Sciences*