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### EDUCATION

**2001-2006**      **Dept. of Environmental Science & Engineering**

*California Institute of Technology*

Ph. D. in Environmental Science & Engineering

**1998-2001**      **Dept. of Geophysics**

*Peking University, Beijing*

M.S. in Meteorology (Focus on Atmospheric Dynamics)

**1994-1998**      **Dept. of Atmospheric Sciences**

*Nanjing University of Information Science and Technology*

B.S. with honors in Atmospheric Science

### PROFESSIONAL EXPERIENCE

- Professor, Department of Earth & Atmospheric Sciences, University of Houston (09/2019-Present)
- Atmospheric Science Graduate Advisor, Department of Earth & Atmospheric Sciences, University of Houston (09/2011-Present)
- Associate Professor, Department of Earth & Atmospheric Sciences, University of Houston (09/2013-08/2019)
- Assistant Professor, Department of Earth & Atmospheric Sciences, University of Houston (09/2008-08/2013)
- Postdoctoral Scholar, Jet Propulsion Laboratory, California Institute of Technology (09/2006-08/2008)
- NASA Orbital Carbon Observatory 2 (OCO2) Science Team Member (2011-Present)
- NASA Atmospheric Infrared Sounder Science Team Member (2006-Present)
- Editor for Scientific Reports: Nature Publishing Group (2014-Present)
- American Meteorological Society Member
- American Geophysical Union Member

### RESEARCH EXPERIENCE

- Professor, Department of Earth & Atmospheric Sciences, University of Houston (2019-Present)
- Associate Professor, Department of Earth & Atmospheric Sciences, University of Houston (2013-2019)
- Assistant Professor, Department of Earth & Atmospheric Sciences, University of Houston (2008-2013)
- Postdoctoral Scholar to Dr. Moustafa Chahine, JPL, California Institute of Technology (2006-2008)
- Graduate Research Assistant to Prof. Yuk L. Yung, California Institute of Technology (2001-2006)

### TEACHING EXPERIENCE

- Teaching Assistant for GE 152: Atmospheric Radiation, Caltech      2004, 2005
- Teaching Assistant for GE 173: Topics in Atmosphere and Ocean Dynamics, Caltech      2005

• Instructor for GEOL 6396:	Atmospheric Science Seminar, UH	2008-2024
• Instructor for GEOL 3380:	Physical Meteorology, UH	2009-2024
• Instructor for GEOL 6328:	Atmospheric Data Analysis & Statistics, UH	2009, 2013, 2015, 2016
• Instructor for GEOL 1350:	Introduction to Meteorology, UH	2010-2024
• Instructor for GEOL 6397:	Atmospheric Radiation, UH	2010- 2024
• Instructor for GEOL 3378:	Principle of Atmospheric Sciences, UH	2010-2024

## PROFESSIONAL REVIEWS

Journal of Geophysical Research-Atmospheres

Geophysical Research Letters

Journal of Climate

Nature-Geosciences

Nature-Communications

Nature-Scientific Reports

Advances in Space Research

Atmospheric Chemistry and Physics

Global Biogeochemical Cycles

Journal of the Atmospheric Sciences

## AWARDS AND HONORS

- NASA Orbital Carbon Observatory 2 (OCO2) Science Team Member (2011-Present)
- NASA Atmospheric Infrared Sounder Science Team Member (2006-Present)
- NASA Group Achievement Award to AIRS Science Team, 2007
- Li Ming Fellowship in California Institute of Technology, 2004
- Academic Excellence Fellowship in Peking University, 2000
- Guang Cai Fellowship in Peking University, 2000
- Academic Excellence Fellowship in Nanjing University of Information Science and Technology, 1998
- Excellent Student Leader Honor & First Prize Scholarship in Nanjing University of Information Science and Technology, 1997
- Academic Excellence Fellowship in Nanjing University of Information Science and Technology, 1996
- Excellent Student Leader Honor & Scholarship at Nanjing University of Information Science and Technology, 1995

## RESEARCH INTERESTS AND PROJECTS

*I have received eleven research grants with a total funding of ~\$3.4 million.*

- Carbon Cycle

My primary research investigates the carbon cycle through satellite observations and model simulations. The research involves retrieving CO<sub>2</sub> from satellites, analyzing the CO<sub>2</sub> variability, and simulating and inverting CO<sub>2</sub> surface sources/sinks with the chemistry and transport models. We generated the first global map of mid-tropospheric CO<sub>2</sub> from the AIRS instrument and found that the CO<sub>2</sub> concentrations are not distributed uniformly in the mid-troposphere for the first time. I also work on retrieving CO<sub>2</sub> profiles from OCO-2, which can help to better understand the vertical structure for CO<sub>2</sub> over the global domain. In addition to retrieving CO<sub>2</sub> from satellites, I also investigated the atmospheric variability of CO<sub>2</sub> and controlling processes. We identify the influences of Semi-Annual Oscillation, El Nino-Southern Oscillation, South Atlantic Walker circulation, Stratospheric Sudden Warming, Annular Mode, and drought on mid-tropospheric CO<sub>2</sub> for the first time [Jiang et al., 2010, 2012a, 2012b, 2013a, 2013b, 2015, 2016, 2017, 2019]. I am also interested in using chemistry and transport models to simulate and inverse possible sources and sinks of CO<sub>2</sub> at the surface. Some of my studies on the simulation of CO<sub>2</sub> and its

associated climate changes have already been published in important journals [Jiang et al., 2007, 2008, 2010, 2012a, 2012b, 2013a, 2013b, 2015, 2016, 2017, 2019, 2021, 2023].

- Hydrological Cycle

I am also interested in investigating the hydrological cycle and energy cycle through satellite data and general circulation models. Based on the latest data sets of precipitation and water vapor from satellites, we have found that precipitation increased by  $\sim 3.0\%$  per decade and decreased by  $\sim 4.7\%$  per decade in the high-precipitation area and low-precipitation area, respectively. The opposite precipitation trends between the high-precipitation and low-precipitation areas imply that extreme weather patterns intensified in response to global warming [Li et al., 2011]. Our recent paper [Kao et al., 2018] suggests that the current atmospheric models can quantitatively capture the characteristics of the recycling rate from the observation. It was also found that global warming due to the historic increase of greenhouse gases can influence the temporal variations of precipitation over wet and dry areas [Trammell et al., 2015; Kao et al., 2017]. In addition to the hydrological cycle, we explored the Lorenz energy cycle using three independent meteorological data sets. It was found that the efficiency of Earth's atmosphere as a heat engine increased in response to climate change. This result was published in Nature Communications [Pan et al., 2017].

- Variability of Ozone

Ozone recovery is difficult to detect since total column ozone exhibits strong interannual variability (IAV) associated with dynamical processes and climate change. A primary motivation for studying the IAV of column ozone is to separate the anthropogenic perturbations of the ozone layer from natural variability. The ozone distribution in the atmosphere is determined by a combination of photochemistry and transport. I have already investigated the pattern of observed changes in the ozone layer and their associated climate changes, using statistical methods outlined in my papers [Jiang et al., 2004, 2005, 2008a, 2008b]. Using a chemistry-transport model, I carried out the first realistic simulation of the quasi-biennial oscillation (QBO) and the beat between QBO and the annual cycle (QBO-AB) signal in the column ozone from 1979 to 2002 [Jiang et al., 2004]. In addition, I used an idealized model and successfully revealed the characteristic pattern of the downward propagation of QBO and upward propagation of QBO-AB [Jiang et al., 2005]. The model results are similar to those exhibited in the satellite data. Jiang et al. [2008a, 2008b] successfully investigated the interannual variability of column ozone in the high latitudes. We also found that 3-D GEOS Chemistry-Climate Model can simulate the impact of El Niño-Southern Oscillation on ozone variability well [Wang et al., 2011]. I am interested in using 3-D chemistry and transport models to study the interannual variability of ozone in the polar region, emphasizing the influence of solar variability and the feedback of ozone on radiation and meridional circulation. I am also interested in utilizing the global and regional air quality models (e.g., GEOS-Chem, RAQMS, and CMAQ) to investigate air quality.

- Planetary Atmosphere

In addition to the terrestrial atmosphere, I am also interested in the atmosphere on other planets and moons. By combining observations of cloud and atmospheric temperature taken by two instruments on the Cassini spacecraft, we found for the first time that there is a significant temporal variation in the strength of the high-altitude equatorial jet on Saturn, which was published in Nature Geosciences [Li et al., 2011]. We finished the first global analysis of the atmospheric vortices on Saturn using observations from the Cassini spacecraft [Trammell et al., 2014]. We also used the long-term Cassini observations to conduct the first investigation of the temporal variation of Saturn's vortex dynamics from 2008 to 2015 [Trammell et al., 2016]. With the new discovery, scientists are getting a new picture of the general circulations on Saturn. The comparative studies of atmospheric systems between Earth and other astronomical bodies provide a new perspective to understanding climate change on Earth.

**PUBLICATIONS IN REFEREED JOURNALS**

\* indicate papers written by graduate students.

**Jiang, X.**, C. D. Camp, R. Shia, D. Noone, C. Walker, and Y. L. Yung, Quasi-biennial oscillation and quasi-biennial oscillation-annual beat in the tropical total column ozone: A two-dimensional model simulation, *Journal of Geophysical Research-Atmospheres*, 109 (D16), art. no. D16305, 2004. [IF = 4.26]

Ruzmaikin, A., J. Feynman, **X. Jiang**, D. C. Noone, A. M. Waple, and Y. L. Yung, The pattern of northern hemisphere surface air temperature during prolonged periods of low solar output, *Geophysical Research Letters*, 31 (12), art. no. L12201, 2004. [IF = 5.58]

Ruzmaikin, A., J. Feynman, **X. Jiang**, and Y. L. Yung, Extratropical signature of the quasi-biennial oscillation, *Journal of Geophysical Research-Atmospheres*, 110 (D11), art. no. D11111, 2005. [IF = 4.26]

Natraj, V., **X. Jiang**, R. L. Shia, X. L. Huang, J. S. Margolis, and Y. L. Yung, Application of principal component analysis to high spectral resolution radiative transfer: A case study of the O-2 A band, *Journal of Quantitative Spectroscopy & Radiative Transfer*, 95 (4), 539-556, 2005. [IF = 2.71]

**Jiang, X.**, D. B. A. Jones, R. Shia, D. E. Waliser, and Y. L. Yung, Spatial patterns and mechanisms of the Quasi-Biennial Oscillation-Annual Beat of ozone, *Journal of Geophysical Research*, 110, D23308, 2005. [IF = 4.26]

**Jiang, X.**, W. Ku, R. Shia, Q. Li, J. W. Elkins, R. G. Prinn, and Y. L. Yung, The Seasonal Cycle of N<sub>2</sub>O: Analysis of Data, *Global Biogeochemical Cycles*, 21, doi: 10.1029/2006GB002691, 2007a. [IF = 5.96]

**Jiang, X.**, S. J. Eichelberger, D. L. Hartmann, and Y. L. Yung, Influence of doubled CO<sub>2</sub> on ozone via changes in the Brewer-Dobson circulation, *Journal of the Atmospheric Sciences*, 64, 2751-2755, 2007b. [IF = 3.58]

Li, L., A. P. Ingersoll, **X. Jiang**, D. Feldman, and Y. L. Yung, Lorenz energy cycle of the global atmosphere based on reanalysis datasets, *Geophysical Research Letters*, 34, doi:10.1029/2007GL029985, 2007. [IF = 5.58]

**Jiang, X.**, S. Pawson, C. D. Camp, E. Nielsen, R. Shia, T. Liao, K. Jeev, V. Limpasuvan, and Y. L. Yung, Interannual variability and trends in extratropical ozone. Part I: Northern hemisphere, *Journal of the Atmospheric Sciences*, 65, 3013-3029, 2008a. [IF = 3.58]

**Jiang, X.**, S. Pawson, C. D. Camp, E. Nielsen, R. Shia, T. Liao, K. Jeev, V. Limpasuvan, and Y. L. Yung, Interannual variability and trends in extratropical ozone. Part II: Southern hemisphere, *Journal of the Atmospheric Sciences*, 65, 3030-3041, 2008b. [IF = 3.58]

**Jiang, X.**, Q. Li, M. Liang, R. Shia, M. T. Chahine, E. T. Olsen, L. L. Chen, and Y. L. Yung, Simulation of Upper Troposphere CO<sub>2</sub> from two-dimensional and three-dimensional models, *Global Biogeochemical Cycles*, 22, doi:10.1029/2007GB003049, 2008c. [IF = 5.96]

Chahine, M. T., L. Chen, P. E. Dimotakis, **X. Jiang**, Q. Li, E. T. Olsen, Y. L. Yung, T. S. Pagano, and J. Randerson, Satellite remote sounding of mid-tropospheric CO<sub>2</sub>, *Geophysical Research Letters*, 35, doi:10.1029/2008GL035022, 2008. [IF = 5.58]

- Yung, Y. L., M. C. Liang, **X. Jiang**, C. Lee, B. Bezard, and E. Marcq, Evidence for carbonyl sulfide (OCS) conversion to CO in the lower atmosphere of Venus, *Journal of Geophysical Research*, 114, doi:10.1029/2008JE003094, 2009. [IF = 4.26]
- Kuai, L., R. Shia, **X. Jiang**, K. Tung, and Y. Yung, Non-stationary synchronization of equatorial QBO with SAO in observation and model, *Journal of the Atmospheric Sciences*, 1654-1664, 2009. [IF = 3.58]
- Kuai, L., R. Shia, **X. Jiang**, K. Tung, and Y. Yung, Modulation of the period of the Quasi-Biennial Oscillation by the solar cycle, *Journal of the Atmospheric Sciences*, 2418-2428, 2009. [IF = 3.58]
- Jiang, X.**, M. T. Chahine, E. T. Olsen, L. L. Chen, and Y. L. Yung, Interannual Variability of Mid-tropospheric CO<sub>2</sub> from Atmospheric Infrared Sounder, *Geophysical Research Letters*, 37, doi: 10.1029/2010GL042823, 2010. (It was listed as Selected Scientific Publications on NASA AIRS website.) [IF = 5.58]
- Li, L., **X. Jiang**, A. Ingersoll, A. Del Genio, C. Porco, R. West, A. Vasavada, S. Ewald, B. Conrath, P. Gierasch, A. Simon-Miller, C. Nixon, R. Achterberg, G. Orton, L. Fletcher, K. Baines, High Altitude Equatorial Jet Changes on Saturn, *Nature-Geosciences*, doi:10.1038/NGEO1292, 2011. (It was reported by the UH News entitled “Observations from the Cassini Spacecraft Provide Details of Saturn’s Winds” at [http://www.nsm.uh.edu/news-events/stories/2011/1104\\_liJiang.php](http://www.nsm.uh.edu/news-events/stories/2011/1104_liJiang.php).) [IF = 21.53]
- Wang\*, J., S. Pawson, B. J. Tian, Y. L. Yung, and **X. Jiang**, El Niño-Southern Oscillation in tropical and mid-latitude column ozone, *Journal of the Atmospheric Sciences*, doi:10.1175/JAS-D-11-045.1, 2011a. [IF = 3.58]
- Li, L., C. A. Nixon, R. K. Achterberg, M. A. Smith, N. J. Gorius, **X. Jiang**, B. J. Conrath, P. J. Gierasch, A. A. Simon-Miller, F. M. Flasar, K. B. Baines, A. P. Ingersoll, R. A. West, A. Vasavada, and S. Ewald, The Global Energy Balance of Titan, *Geophysical Research Letters*, 38, doi:10.1029/2011GL050053, 2011. (It was selected as the cover page for the Geophysical Research Letters and highlighted by the editor. Please refer to “Evaluating the Global Energy Balance of Titan” at <http://www.agu.org/cgi-bin/highlights/highlights.cgi?action=show&doi=10.1029/2011GL050053&jc=gl>.) [IF = 4.25]
- Li, L., **X. Jiang**, M. T. Chahine, E. T. Olsen, E. Fetzer, L. Chen, and Y. L. Yung, Recycling rate of atmospheric moisture over the past two decades (1988-2009), *Environmental Research Letters*, doi:10.1088/1748-9326/6/3/034017, 2011. (It was highlighted by the editor of Environmental Research Letters. Please refer to “Insight: how has the recycling rate of atmospheric moisture changed over the past 20 years? (<http://environmentalresearchweb.org/cws/article/news/47247>)”.) [IF = 6.95]
- Wang\*, J., **X. Jiang**, M. T. Chahine, M. C. Liang, E. T. Olsen, L. L. Chen, S. Licata, T. Pagano, and Y. L. Yung, The influence of Tropospheric Biennial Oscillation on mid-tropospheric CO<sub>2</sub>, *Geophysical Research Letters*, doi:10.1029/2011GL049288, 2011b. [IF = 5.58]
- Li, L., **X. Jiang**, M. T. Chahine, J. Wang\*, and Y. L. Yung, The mechanical energies of the global atmosphere in El Niño and La Niña Years, *Journal of the Atmospheric Sciences*, 68, 3072-3078, 2011. [IF = 3.58]
- Pagano, T. S., E. T. Olsen, M. T. Chahine, A. Ruzmaikin, H. Nguyen, and **X. Jiang**, Monthly Representations of Mid-tropospheric Carbon Dioxide from the Atmospheric Infrared Sounder, *Proc. of SPIE*, 8158, doi:10.1117/12.894960, 2011. [IF = 1.11]

- Jiang, X.**, M. T. Chahine, Q. Li, M. Liang, E. T. Olsen, L. Chen, J. Wang\*, and Y. L. Yung, CO<sub>2</sub> semi-annual oscillation in the middle troposphere and at the surface, *Global Biogeochemical Cycles*, 26, doi:10.1029/2011GB004118, 2012. [IF = 5.96]
- Lee\*, D., J. Wang\*, **X. Jiang**, Y. Lee, and K. Jang, Comparison between atmospheric chemistry model and observations utilizing the RAQMS-CMAQ linkage, *Atmospheric Environment*, 61, 85-93, 2012. [IF = 4.01]
- Li, K.F., **X. Jiang**, M. C. Liang, and Y. L. Yung, Impacts of SORCE irradiance on the simulation of 11-year solar cycle in total column ozone, *Atmospheric Chemistry and Physics*, 12, 1-26, 2012. [IF = 6.1]
- Jiang, X.**, J. Wang\*, E. T. Olsen, T. Pagano, L. L. Chen, and Y. Yung, Influence of Stratospheric Sudden Warming on AIRS mid-tropospheric CO<sub>2</sub>, *Journal of the Atmospheric Sciences*, 2566-2573, 2013. [IF = 3.58]
- Li, L., R. K. Achterberg, B. J. Conrath, P. J. Gierasch, M. A. Smith, A. A. Simon-Miller, C. A. Nixon, G. S. Orton, F. M. Flasar, **X. Jiang**, K. H. Baines, R. Morales-Juberias, A. P. Ingersoll, A. R. Vasavada, A. D. Del Genio, R. A. West, and S. P. Ewald, Strong temporal variation over one Saturnian year: From Voyager to Cassini, *Scientific Reports*, doi:10.1038/srep02410, 2013. [IF = 4.99]
- Jiang, X.**, J. Wang\*, E. T. Olsen, M. Liang, T. S. Pagano, L. Chen, S. J. Licata, and Y. L. Yung, Influence of El Nino on mid-tropospheric CO<sub>2</sub> from Atmospheric Infrared Sounder and Model, *Journal of the Atmospheric Sciences*, doi:10.1175/JAS-D-11-0282.1, 2013. [IF = 3.58]
- 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*, doi:10.1016/j.icarus.2014.07.019, 2014. [IF = 3.16]
- Pagano, T. S., E. T. Olsen, H. Nguyen, A. Ruzmaikin, **X. Jiang**, and L. Perkins, Global variability of midtropospheric carbon dioxide as measured by the Atmospheric Infrared Sounder, *Journal of Applied Remote Sensing*, 8, doi:10.1117/1.JRS.8.084984, 2014. [IF = 1.53]
- Jiang, X.**, E. T. Olsen, T. S. Pagano, H. Su, and Y. L. Yung, Modulation of mid-tropospheric CO<sub>2</sub> by the South Atlantic Circulation, *Journal of the Atmospheric Sciences*, doi:10.1175/JAS-D-14-0340.1, 2015. [IF = 3.58]
- 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. [IF = 2.1]
- 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, *Geophysical Research Letters*, 42, 2144-2148, 2015. [IF = 5.58]
- Trammell\*, H. J., L. Li, **X. Jiang**, Y. Pan\*, M. A. Smith, E. A. Bering III, S. M. Horst, A. R. Vasavada, A. P. Ingersoll, M. A. Janssen, R. A. West, C. Porco, A. A. Simon, and K. H. Baines, Vortices in Saturn's northern hemisphere (2008-2015) observed by Cassini ISS, *Journal of Geophysical Research*, 121, 1814-1826, 2016. [IF = 4.26]

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*, doi:10.1175/JCLI-D-15-0325, 2016. [IF = 5.38]

Newman, S., X. Xu, K. R. Gurney, Y. K. Hsu, K. F. Li, **X. Jiang**, R. Keeling, S. Feng, D. O'Keefe, R. Patarasuk, K. W. Wong, P. Rao, M. L. Fischer, and Y. L. Yung, Toward consistency between trends in bottom-up CO<sub>2</sub> emissions and top-down atmospheric measurements in the Los Angeles megacity, *Atmospheric Chemistry and Physics*, 16, 3843-3863, doi:10.5194/acp-16-3843-2016, 2016. [IF = 6.13]

**Jiang, X.**, D. Crisp, E. T. Olsen, S. Kulawik, C. E. Miller, T. S. Pagano, M. Liang, and Y. L. Yung, CO<sub>2</sub> annual and semi-annual cycles from multiple satellite retrievals and models, *Earth and Space Science*, doi:10.1002/2014EA000045, 2016. (It was listed as Selected Scientific Publications on NASA OCO-2 website.) [IF = 3.54]

Souri, A. H., Y. Choi, X. Li, A. Kotsakis, and **X. Jiang**, A 15-year climatology of wind pattern impacts on surface ozone in Houston, Texas, *Atmospheric Research*, doi:10.1016/j.atmosres.2016.02.007, 2016. [IF = 5.37]

Pan\*, Y., L. Li, **X. Jiang**, G. Li, W. Zhang, X. Wang, and A. P. Ingersoll, Earth's changing global atmospheric energy cycle in response to climate change, *Nature Communications*, doi:10.1038/ncomms14367, 2017. (It was reported by ScienceDaily, Science Magazine, Environmental News Network, and NASA Astrobiology Magazine.) [IF = 17.69]

**Jiang, X.**, A. Kao\*, A. Corbett\*, E. Olsen, T. Pagano, A. Zhai\*, S. Newman, L. Li, and Y. L. Yung, Influence of droughts on mid-tropospheric CO<sub>2</sub>, *Remote Sensing*, doi:10.3390/rs9080852, 2017. (It was listed as Selected Scientific Publications on NASA AIRS website.) [IF = 4.51]

Corbett\*, A., **X. Jiang**, X. Xiong, A. Kao\*, and L. Li, Modulation of mid-tropospheric methane by El Niño, *Earth & Space Science*, 4, doi:10.1002/2017EA000281, 2017. [IF = 3.54]

Kao\*, A., **X. Jiang**, L. Li, H. Su, and Y. Yung, Precipitation, circulation, and cloud variability over the past two decades, *Earth & Space Science*, 4, doi:10.1002/2017EA000319, 2017. [IF = 3.54]

Laskar, A., L. Lin, **X. Jiang**, and M. Liang, Assessments of variability of CO<sub>2</sub> in Taipei, Taiwan and influences of long-range transport by data from ex situ multiple isotope analyses, OCO-2 satellite retrievals, and assimilated Carbon Tracker model products, *Earth & Space Science*, 5, doi:10.1029/2018EA000415, 2018. [IF = 3.54]

Studwell\*, A., L. Li, **X. Jiang**, K. H. Baines, P. M. Fry, T. W. Momary, and U. A. Dyudina, Saturn's global zonal winds explored by Cassini/VIMS 5-micron images, *Geophysical Research Letters*, 45, doi:10.1029/2018GL078139, 2018. [IF = 5.58]

Li, L., **X. Jiang**, R. A. West, P. J. Gierasch, S. Perez-Hoyos, A. Sanchez-Lavega, L. N. Fletcher, J. J. Fortney, B. Knowles, C. Porco, K. H. Baines, P. M. Fry, A. Mallama, R. K. Achterberg, A. A. Simon, C. A. Nixon, G. S. Orton, U. A. Dyudina, S. P. Ewald, and R. W. Schmude Jr., Less absorbed solar energy and more internal heat for Jupiter, *Nature Communications*, doi:10.1038/s41467-018-06107-2, 2018. [IF = 17.69]

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Yung, Y., J. Long, J. H. Jiang, S. Fan, **X. Jiang**, and R. Shia, Effect of the Quasi-biennial Oscillation on carbon monoxide in the stratosphere, *Earth & Space Science*, *6*, doi: 10.1029/2018EA000534, 2019. [IF = 3.54]

**Jiang, X.**, and Y. Yung, Global patterns of Carbon Dioxide variability from satellite observations, *Annual Review of Earth and Planetary Sciences*, *47*, doi: 10.1146/annurev-earth-053018-060447, 2019. [IF = 16.3]

Li, L., R. A. West, M. E. Kenyon, C. A. Nixon, P. M. Fry, D. Wenkert, M. Hofstadter, **X. Jiang**, E. C. Creedy\*, A. Sanchez-Lavega, K. H. Baines, A. Mallama, R. Hu, R. K. Achterberg, S. Aslam, D. Banfield, U. Dyudian, J. J. Fortney, A. P. Ingersoll, A. Kleinbohl, L. Fletcher, S. Limaye, M. S. Marley, M. D. Smith, K. M. Soderlund, L. J. Spilker, and C. L. Young, Radiant Energy Budgets and Internal Heat of Planets and Moons, A white paper to Planetary Science and Astrobiology Decadal Survey 2023-2032, *Bulletin of American Astronomical Society*, *53*, doi:10.3847/25c2cfef.0d20e989, 2020. [IF = 7.8]

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