Yaowei Li

Dept of Earth, Atmospheric, & Planetary Sciences, Massachusetts Institute of Technology
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EDUCATION

Harvard University 09/2018-05/2024

Ph.D. in Environmental Science & Engineering, Secondary Field in Computational Science & Engineering

- Thesis: *New Insights into Aerosol Properties, Perturbations, and Radiative Effects in the Stratosphere and Upper Troposphere* (Advisor: Frank Keutsch)

M.S. in Environmental Science & Engineering 05/2022

Peking University 09/2014-06/2018

B.S. in Environmental Science (with honor, class rank: 1/28), and B.A. in Economics

- Thesis: *Development and Application of Drone-based VOC Monitoring Platform* (Advisor: Qi Chen)

PROFESSIONAL EXPERIENCE

NOAA Climate & Global Change Postdoctoral Fellow, MIT & Caltech 08/2024-present

Hosts: Susan Solomon (MIT) & Paul Wennberg (Caltech)

Postdoctoral Fellow, Harvard University 05/2024-08/2024

Advisor: Frank Keutsch

Graduate Research Assistant, Harvard University 09/2018-05/2024

Advisor: Frank Keutsch

Summer Undergraduate Research Assistant, Harvard University 06/2017-09/2017

Advisor: Scot Martin

Undergraduate Research Assistant, Peking University 01/2016-06/2018

Advisor: Qi Chen

GRANTS & FUNDS

- NOAA Climate & Global Change Postdoctoral Fellowship, NOAA Climate Program Office 2024-2026
- Foster and Coco Stanback Postdoctoral Fellowship, Division of GPS at Caltech Extended to 2026
- FY 2024 EMSL Large-Scale Research Funding (as an Investigator), US Department of Energy 2023-2025
- AAAR 41st Annual Conference Student Travel Grant, American Association for Aerosol Association 2023
- GSAS Professional Development Fund, Harvard University 2022
- Clare Marie Doris Innovation Fund in Engineering and Applied Sciences, Harvard University 2018-2019
- Chen Shouren Overseas Research Summer Fund, Peking University 2017

AWARDS & HONORS

- Houghton Postdoctoral Fellowship, Department of EAPS at MIT (declined) 2024
- NASA Group Achievement Award for the DCOTSS Airborne Mission 2024
- AMS 2024 Best Student Presentation Award, American Meteorological Society 2024
- AGU 2022 Outstanding Student Presentation Award (OSPA), American Geophysical Union 2023
- Certificate of Distinction in Teaching, Harvard University 2020
- Beijing Outstanding Graduate Award (Highest honor for graduate set by the government of Beijing) 2018
- Tang Xiaoyan Environmental Science and Innovation Scholarship 2018
- Best Poster Award, 5th International Conference on Environment Simulation and Pollution Control 2017
- National Scholarship, Chinese Ministry of Education 2016 & 2017
- Chongto Environmental Science Scholarship, Peking University 2016
- Robin Li Scholarship, Peking University 2015
- First Prize Spark Scholarship, Peking University 2015, 2016, 2017

PUBLICATIONS (*Google Scholar*)

Under review & submitted

1. **Li, Y.**, Santer, B. D., Solomon, S., Thompson, D. W. J., Fu, Q., "Detectable Global Temperature Responses to Wildfires and Volcanic Eruptions" (*under review*)
2. Sharpe, S., **Li, Y.**, et al., "Chemical imaging of individual stratospheric particles sampled over North America." (*under review*)
3. Zhang, J., **Li, Y.**, Sullivan, J., Zhu, T., Catena, A., Schwab, M., Guo, Y., Mao, J., Teora, A., Schwab, J., "Revealing the formation and control of NYC downwind coastal high ozone via TEMPO observations." (*under review*)
4. Bai, B., Vandergrift, G. W., Liang, Y., **Li, Y.**, Cheng, Z., Wang, Y., Shin, N., Keutsch, F. N., Lambe, A. T., China, S., Ng, N. L., Liu, P., "Dynamic evolution of mass and physical properties of atmospheric organic aerosol under solar irradiance." (*under review*)
5. Ye, Q., Albores, I., Frey, S., Helstrom, E., Krechmer, J., **Li, Y.**, Shutter, J., Cox, J., Canagaratna, M., Keutsch, F., Kroll, J., "Changes in volatile organic compound composition from an oxidation-based air cleaner." (*under review*)
6. Atlas, R., Ueyama, R., Kim, S., Bui, P., Dean-Day, J., **Li, Y.**, Dykema, J., Keutsch, F., Podglajen, A., "Upper-level turbulence in the North American and Asian summer monsoon regions sampled in recent aircraft campaigns." (*under review*)
7. Chen, X., Wang, J., Peterson, D. A., **Li, Y.**, Julstrom, W., Keutsch, F., Dykema, J., "Particle coating influences pyrocumulonimbus smoke radiative forcing and stratospheric warming: Insights from 2019-2020 Australian megafires." (*under review*)
8. Guan, J., Santer, B., Wang, P., Fu, Q., Garcia, R., **Li, Y.**, Stone, K., Kinnison, D., Zhang, J., Chiodo, G., Lamarque J.F., Solomon, S., "Human Influence on the Ozone Layer Detectable by the 1960s" (*under review*)

Peer reviewed

21. **Li, Y.**, Dykema, J., Peterson, D., Feng, X., Shen, X., June, N., Fromm, M., McHardy, T., Jacquot, J., Pittman, J., Daube, B., Wofsy, S., Dean-Day, J., Rapp, A., Bowman, K., Cziczo, D., Mickley, L., Pierce, J., Keutsch, F. (2025) "Enhanced radiative cooling by large aerosol particles from wildfire-driven thunderstorms." (accepted in *Science Advances*)
20. Shen, X., Jacquot, J., **Li, Y.**, Sharpe, S., Dykema, J., Schill, G., Bowman, K., Homeyer, C., Fraund, M., Moffet, R.,

Olayemi, T., Pittman, J., Rivera-Adorno, F., Murphy, D., Smith, J., Laskin, A., Keutsch, F., Cziczo, D. **(2025)**. "Stratospheric aerosol perturbation by tropospheric biomass burning and deep convection." *Nature Geoscience*, DOI: 10.1038/s41561-025-01821-1

19. Howar, L. and 26 others, including **Li, Y. (2025)**. "Conditions necessary for chlorine activation in the midlatitude summer lower stratosphere." *Journal of Geophysical Research: Atmospheres*, DOI: 10.1029/2025JD043786

18. Tahsini, N., Zhang, S., Goss, M., Frey, S., **Li, Y.**, Smith, J., Allen, N., Pang, M., Williamson, R., Keutsch, F., Kroll, J. **(2025)**. "Mitigation of indoor ozone and secondary products from 222 nm germicidal UV using commercial air cleaners." *ACS ES&T Air*, DOI: 10.1021/acsestair.5c00138

17. Bowman, K. and 35 others, including **Li, Y. (2025)**. "The Dynamics and Chemistry of the Summer Stratosphere (DCOTSS) Project." *Bulletin of the American Meteorological Society*, DOI: 10.1175/BAMS-D-24-0177.1

16. **Li, Y.**, Zhang, C., Su, W., Jiang, S., Nie, D., Wang, Y., Wang, Y., He, H., Chen, Q., Martin, S. T., Ye, J. **(2025a)**. "Copter-type UAV-based sensing in atmospheric chemistry: recent advances, applications, and future perspectives." *Environmental Science & Technology*, DOI: 10.1021/acs.est.5c00074

15. Santer, B. D., Solomon, S., Thompson, D. W. J., Fu, Q., **Li, Y. (2025)**. "Human influence on climate detectable in the late 19th century." *Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.2500829122

14. An, Z., Wang, D., Yang, S., Deng, J., Li, X., **Li, Y.**, Jiang, J. **(2025)**. "Organic fingerprints of condensable particulate matter from ultralow-emission stationary sources in China." *ACS ES&T Air*, DOI: 10.1021/acsestair.5c00006

13. An, Z., Yin, R., Zhao, X., Li, X., Yuan, Y., Guo, J., Li, Y., Li, X., Li, D., **Li, Y.**, Wang, D., Yan, C., He, K., Worsnop, D. R., Keutsch, F. N., Jiang, J. **(2024)**. "Molecular and seasonal characteristics of organic vapors in urban Beijing: insights from Vocus-PTR measurements." *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-24-13793-2024.

12. Zhang, J., Zhu, T., Catena, A., **Li, Y.**, Schwab, M., Liu, P., Asa-Awuku, A., Schwab, J. **(2024)**. "Technical note: Quantified organic aerosol subsaturated hygroscopicity by a simple optical scatter monitor system through field measurements." *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-24-13445-2024.

11. Barber, V., LeMar, L., **Li, Y.**, Zhang, J., Keutsch, F. N., Kroll, J. H. **(2024)**. "Enhanced organic nitrate formation from peroxy radicals in the condensed phase." *Environmental Science & Technology Letters*, DOI: 10.1021/acs.estlett.4c00473.

10. **Li, Y.**, Pedersen, C., Dykema, J., Vernier, J. P., Vattioni, S., Pandit, A. K., Stenke, A., Asher, E., Thornberry, T., Todt, M. A., Bui, T. P., Dean-Day, J., Keutsch, F. N. **(2023b)**. "In situ measurements of perturbations to stratospheric aerosol and modeled ozone and radiative impacts following the 2021 La Soufrière eruption." *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-23-15351-2023.

9. Barber, V. P., Goss, M. B., Franco Deloya, L. J., LeMar, L. N., **Li, Y.**, Helstrom, E., Canagaratna, M., Keutsch, N. F., Kroll, J. H. **(2023)**. "Indoor air quality implications of germicidal 222 nm light." *Environmental Science & Technology*, DOI: 10.1021/acs.est.3c05680

8. **Li, Y.**, Bai, B., Dykema, J., Shin, N., Lambe, A. T., Chen, Q., Kuwata, M., Ng, N. L., Keutsch, F. N., Liu, P. **(2023a)**. "Predicting real refractive index of organic aerosols from elemental composition." *Geophysical Research Letters*, DOI: 10.1029/2023GL103446

7. Zheng, Y., Miao, R., Zhang, Q., **Li, Y.**, Cheng, X., Liao, K., Koenig, T. K., Ge, Y., Tang, L., Shang, D., Hu, M., Chen, S., Chen, Q. **(2023)**. "Secondary formation of submicron and supermicron organic and inorganic aerosols in a highly polluted urban area." *Journal of Geophysical Research: Atmospheres*, DOI: 10.1029/2022JD037865

6. Ye, Q., Goss, M. B., Krechmer, J. E., Majluf, F., Zaytsev, A., **Li, Y.,** Roscioli, J. R., Canagaratna, M., Keutsch, F. N., Heald, C. L., Kroll, J. H. **(2022)**. "Product distribution, kinetics, and aerosol formation from the OH oxidation of dimethyl sulfide under different RO2 regimes." *Atmospheric Chemistry and Physics*, DOI: 10.5194/acp-22-16003-2022

5. **Li, Y.**, Dykema, J., Deshler, T. and Keutsch, F., **(2021b)**. "Composition dependence of stratospheric aerosol shortwave radiative forcing in northern midlatitudes." *Geophysical Research Letters*, DOI: 10.1029/2021GL094427

4. **Li, Y.**, Liu, B., Ye, J., Jia, T., Khuzestani, R. B., Sun, J. Y., Cheng, X., Zheng, Y., Li, X., Wu, C., Xin, J., Wu, Z.,

Tomoto, M. A., McKinney, K. A., Martin, S. T., Li, Y. J., Chen, Q. **(2021a)**. "Unmanned aerial vehicle measurements of volatile organic compounds over a subtropical forest in China and implications for emission heterogeneity." *ACS Earth and Space Chemistry*, DOI: 10.1021/acsearthspacechem.0c002713

3. Ye, Q., Krechmer, J.E., Shutter, J.D., Barber, V.P., **Li, Y.**, Helstrom, E., Franco, L. J., Cox, J. L., Hrdina, A. I. H., Goss, M. B., Tahsini, N., Canagaratna, M., Keutsch, F. N., Kroll, J. H. **(2021)**. "Real-time laboratory measurements of VOC emissions, removal rates, and byproduct formation from consumer-grade oxidation-based air cleaners." *Environmental Science & Technology Letters*, DOI: 10.1021/acs.estlett.1c0077
2. Zheng, Y., Cheng, X., Liao, K., **Li, Y.**, Li, Y. J., Huang, R. J., Hu, W., Liu, Y., Zhu, T., Chen, S., Zeng, L., Worsnop, D. R., Chen, Q. **(2020)**. "Characterization of anthropogenic organic aerosols by TOF-ACSM with the new capture vaporizer." *Atmospheric Measurement Techniques*, DOI: 10.5194/amt-13-2457-2020
1. Liu, B., Wu, C., Ma, N., Chen, Q., **Li, Y.**, Ye, J., Martin, S. T., Li, Y. J. **(2020)**. "Vertical profiling of fine particulate matter and black carbon by using unmanned aerial vehicle in Macau, China." *Science of the Total Environment*, DOI: 10.1016/j.scitotenv.2019.136109

FIELD EXPERIENCE

- **Science Team Member**, NASA INSPYRE aircraft mission (Earth Venture Suborbital-4) 2025-present
- **Instrument Co-PI**, NOAA SABRE WB-57 aircraft mission 2022-present
- **Instrument Co-PI**, NASA DCOTSS ER-2 aircraft mission (Earth Venture Suborbital-3) 2019-2025
- **Instrument Lead**, Munich Urban Air Quality Campaigns (ground station) 2023-2025
- **Team Member**, AIRLESS campaign in Beijing on air pollution and human health (ground station) 2017

INVITED TALKS

- The Department of Environmental Science at Stockholm University, Stockholm, October 2025
- Atmospheric Chemistry Gordon Research Seminar (GRS), Newry, ME, August 2025
- Civil and Environmental Engineering (CEE) Seminar at Texas A&M University, College Station, TX, February 2025
- Atmospheric and Oceanic Sciences at McGill University, Montreal, QC, October 2024
- Atmospheric Integrated Research at the University of California, Irvine, CA, October 2024
- Seinfeld Symposium, Caltech, CA, September 2024
- Department of Earth, Environmental, and Planetary Sciences, Brown University, RI, September 2024
- Environmental Molecular Sciences Laboratory (EMSL) Seminar, PNNL, Richland, WA, July 2024
- 2024 American Meteorological Society (AMS) Annual Meeting, Baltimore, MD, January 2024
- Engineering Special Seminar, School of Engineering at Westlake University, Hangzhou, January 2024
- College of Environmental Sciences and Engineering at Peking University, Beijing, January 2024
- The Department of Atmospheric Sciences at Zhejiang University, Virtual, December 2023
- VolImpact Seminar, DFG (German Research Foundation) Research Unit, Virtual, November 2023
- Earth, Atmospheric, and Planetary Sciences (EAPS) Seminar at Purdue University, West Lafayette, IN, April 2023
- The Department of Atmospheric Sciences at Texas A&M University, College Station, TX, January 2023

CONFERENCE PRESENTATIONS

- **Li, Y.**, et al., Jan. 2025, Oxygenated organic aerosols in Munich: Molecular characterization, seasonal variability, and influence of biomass burning. **AMS Annual Meeting 2025**, New Orleans, LA (Talk)
- **Li, Y.**, et al., Jun. 2024, Radiative effects of organic aerosols in the stratosphere and upper troposphere. **AMS 22nd Middle Atmosphere Conference**, Burlington, VT (Poster)
- **Li, Y.**, et al., Apr. 2024, Variations in stratospheric aerosol layer and aerosol microphysical processes following the 2021 La Soufrière eruption: insights from in situ and satellite observations. **EGU General Assembly 2024**, Vienna, Austria (Poster)
- **Li, Y.**, et al., Jan. 2024, *In situ* measurements of perturbations to stratospheric aerosol and modeled ozone and radiative impacts following the 2021 La Soufrière eruption. **AMS Annual Meeting 2024**, Baltimore, MD (Talk)
- **Li, Y.**, et al., Dec. 2023, Radiative impacts of pyrocumulonimbus smoke in the upper troposphere: insights from *in-situ* aircraft observations and microphysical modelling. **AGU Fall Meeting 2023**, San Francisco, CA (eLightning talk)
- **Li, Y.**, et al., Nov. 2023, Morphological and chemical properties of stratospheric aerosols from *in situ* and offline measurements. **NASA DCOTSS 2023 Science Team Meeting**, Norman, OK (Talk)
- **Li, Y.**, et al., Oct. 2023, Predicting Real Refractive Index of Organic Aerosols from Elemental Composition. **AAAR 41st Annual Conference**, Portland, OR (Talk)
- **Li, Y.**, et al., Oct. 2023, Aerosol Perturbations in the Upper Troposphere and Lower Stratosphere due to Volcanic and Wildfire Injections: Insights from the DCOTSS Airborne Mission. **AAAR 41st Annual Conference**, Portland, OR (Talk)
- **Li, Y.**, et al., Aug. 2023, Organic-containing Aerosols in the Upper Troposphere and Lower Stratosphere (UT/LS): Climate and Chemical Impacts. **Atmospheric Chemistry Gordon Research Conference 2023**, Newry, ME (Poster)
- **Li, Y.**, et al., Jan. 2023, Aircraft measurements of aerosol microphysics in 2021 La Soufrière volcanic plumes and their stratospheric impacts. **NASA DCOTSS 2022 Science Team Meeting**, College Station, TX (Talk)
- **Li, Y.**, et al., Dec. 2022, Microphysical and Chemical Characterization of Aerosols in the Stratosphere and Upper Troposphere: Influence of Biomass Burning. **AGU Fall Meeting 2022**, Chicago, IL (Poster)
- **Li, Y.** et al., Oct. 2022, Volcanic and Wildfire Perturbations of Aerosols in the Stratosphere and Upper Troposphere during the NASA DCOTSS Airborne Mission. **the 7th SPARC General Assembly**, Boulder, CO (Poster)
- **Li, Y.**, et al., Dec. 2021, Estimation of the Elemental Composition of Organic Aerosols in the Mid-latitude Lower Stratosphere over the Continental US. **AGU Fall Meeting 2021**, Virtual (Poster)
- **Li, Y.**, et al., Apr. 2021, Composition Dependence of Stratospheric Aerosol Radiative Forcing. **EGU General Assembly 2021**, Virtual (Talk)
- **Li, Y.**, et al., Dec. 2020, Unmanned Aerial Vehicle Measurements of Volatile Organic Compounds over a Subtropical Forest in China and Implications for Emission Heterogeneity. **AGU Fall Meeting 2020**, Virtual (Talk)
- **Li, Y.**, et al., Dec. 2019, Measurements of α-Pinene Ozonolysis Products Uptake to Submicron Aerosols at A Broad Range of Tropospheric Temperatures. **AGU Fall Meeting 2019**, San Francisco, CA (Talk)
- **Li, Y.**, et al., Nov. 2017, Detection of Non-refractory $PM_{2.5}$ chemical composition by Time-of-Flight Aerosol Chemical Speciation Monitor equipped with a Capture Vaporizer. **the 5th International Conference on Environmental Simulation and Pollution Control**, Beijing, China (Poster)

TEACHING & MENTORING EXPERIENCE

Teaching Fellow / Teaching Assistant:

- GENED 1137 - The Challenge of Human Induced Climate Change: Transitioning to a Post Fossil Fuel Future (Spring 2023, Harvard University)

- EPS/ESE 162 - Hydrology (Fall 2020, Harvard University)
- 12730070 - China's Energy and Environmental Challenges (Spring 2016, Peking University)

Guest Lecturer:

- CHEM 610 - Environmental Chemistry (Spring 2025, University of Tennessee, Knoxville)
- ESE/EPS 166 - State-of-the-Art Harvard Climate Observatory and Associated Instrumentation (Spring 2024 and 2025, Harvard University)
- SEE 3201 - Atmospheric Science – An Introductory Survey (Spring 2024, City University of Hong Kong)
- PUM 6306 - Energy, Climate Change and Sustainable Development in China (Spring 2023, Shanghai Jiao Tong University)

Teaching Certificate from Harvard Derek Bok Center for Teaching & Learning (2024)

Student Mentor:

- Research mentor for 4 undergraduate students: Brahm Erdmann, Emmanuel Rassou, Bella Nesti, Ploy Assawaphadungsit
- Research mentor for 2 graduate students: Sophie Abou-Rizk, Michael Gee
- Graduate Qualifying Exam mentor for 2 graduate students: Mona Dai, Lucas Estrada
- Graduate School Application mentor for 2 students: Yi Xia, Daniel Adjei

PROFESSIONAL ACTIVITIES & SERVICE

- **Co-Chair** for the 2027 Atmospheric Chemistry Gordon Research Seminar (GRS) 2025-present
- **Committee member**: AGU Atmospheric Science Section Early Career Committee 2024-present
- **Program Chair** of the AMS 22nd Conference on Middle Atmosphere 2023-2024
- **Committee member**: AMS Middle Atmosphere committee 2023-present
- **Instrument Co-PI** (mini-MOUDI instrument) for NOAA SABRE airborne mission 2022-present
- **Instrument Co-PI** (DPOPS & mini-MOUDI instruments) for NASA DCOTSS airborne mission 2019-present
- **Session chair** for AAAR 2023 Annual Conference 2023
- **Session chair** for NASA DCOTSS Science Team Meetings 2021, 2023
- **Organizer** of the Harvard Stratospheric Supergroup Meeting series 2021-2022
- **Host** for the Harvard Atmospheric & Environmental Chemistry (AEC) Seminar series 2019-present
- **Conference student presentation judge/reviewer**: AGU (2023, 2024), AAAR (2023)
- **Proposal reviewer** for *NASA Earth Science ROSES Program (2024), NOAA Climate Program (2025)*
- **Journal reviewer** for *JGR-Atmosphere* | *Atmospheric Chemistry and Physics* | *Environmental Health Perspectives* | *Atmospheric Environment* | *Urban Climate* | *Meteorological Applications* | *Environmental Science: Atmospheres* | *Communications Earth & Environment*
- **Professional Memberships**: AGU, AMS, AAAR, EGU

OUTREACH

- **Speaker** at Climate Change Seminar for K-12 students, Cambridge, MA 2024

- **Speaker** at Harvard SEAS Lightening Talks on Sustainability and Climate 2024
- **Mentor** in Harvard SEAS Research Mentorship Program (RMP) for undergraduate students 2024
- **Mentor** in Harvard Graduate Admissions Assistance Program (GAAP) 2023
- **Presenter** at Harvard Undergraduate Research Opportunities (HUROS) Fair 2023
- **Scientific instrument showcase** at the 4th Annual Harvard Nexus Event 2023
- **Science outreach interview participant** at Superheroes of Science 2022
- **Vice President** of the Harvard Chinese Students and Scholars Association (HCSSA) 2021-2022
- **Student Group Leader** at Harvard Graduate School of Arts and Sciences (GSAS) 2021-2022
- **Judge** of the National Collegiate Research Conference 2021
- **Member of the Standing Committee**, 35th Student Union, Peking University 2017-2018
- **President** of the Youth Volunteer Association in College of Environmental Sciences and Engineering (CESE), Peking University 2015-2016
- **STEM Class Tutor** in a K-12 school, Hebei, China 2014-2017