

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: <i>New Insights into Aerosol Properties, Perturbations, and Radiative Effects in the Stratosphere and Upper Troposphere</i> (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: <i>Development and Application of Drone-based VOC Monitoring Platform</i> (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

• FY 2024 EMSL Large-Scale Research Funding (as an Investigator), US Department of Energy	2023-2025
• AAAR 41 st 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

• NOAA Climate & Global Change Postdoctoral Fellowship, UCAR	2024-2026
• Foster and Coco Stanback Postdoctoral Fellowship, Division of GPS at Caltech	Extended to 2026

- 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, & in preparation

1. **Li, Y.**, et al., “Enhanced radiative cooling by large aerosol particles from pyrocumulonimbus.” (*under review*)
2. **Li, Y.**, et al., “Copter-type UAV-based sensing in atmospheric chemistry: recent advances, applications, and future perspectives.” (*under review*)
3. Santer, B. D., Solomon, S., Thompson, D. W. J., Fu, Q., **Li, Y.**, “Human influence on climate detectable in the late 19th century.” (*submitted*)
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.” (*submitted*)
5. An, Z., Wang, D., Yang, S., Deng, J., Li, X., **Li, Y.**, Jiang, J., “Organic fingerprints of condensable particulate matter from ultralow-emission stationary sources in China.” (*submitted*)
6. **Li, Y.**, et al., “Airborne Portable Optical Particle Spectrometer (POPS) for particle concentration and size distribution measurements in the stratosphere and upper troposphere.” (*in preparation*)

Peer reviewed

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*, 24, 13793–13810, DOI: 10.5194/acp-24-13793-2024.
11. 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*, 24, 13445–13456, DOI: 10.5194/acp-24-13445-2024.
12. 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*, 11(9), 975-980, DOI: 10.1021/acs.estlett.4c00473.
13. **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*, 23, 15351–15364, DOI: 10.5194/acp-23-15351-2023.

14. 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*, 57(42), 15990-15998. DOI: 10.1021/acs.est.3c05680
15. **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*, 50(12), e2023GL103446. DOI: 10.1029/2023GL103446
16. 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*, 128(4), e2022JD037865. DOI: 10.1029/2022JD037865
17. 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*, 22(24), 16003-16015. DOI: 10.5194/acp-22-16003-2022
18. **Li, Y.**, Dykema, J., Deshler, T. and Keutsch, F., (2021b). “Composition dependence of stratospheric aerosol shortwave radiative forcing in northern midlatitudes.” *Geophysical Research Letters*, 48(24), e2021GL094427. DOI: 10.1029/2021GL094427
19. **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*, 5(2), 247-256. DOI: 10.1021/acsearthspacechem.0c002713
20. 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*, 8(12), 1020-1025. DOI: 10.1021/acs.estlett.1c0077
21. 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*, 13(5), 2457-2472. DOI: 10.5194/amt-13-2457-2020
22. 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*, 709, 136109. DOI: 10.1016/j.scitotenv.2019.136109

INVITED TALKS

- 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 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

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- 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., 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, DPOPS: 2021 science operations, data products, updates for 2022. **NASA DCOTSS 2021 Science Team Meeting**, Virtual (Talk)
- 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:

- ESE/EPS 166 - State-of-the-Art Harvard Climate Observatory and Associated Instrumentation (Spring 2024, 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

- **Committee member:** AGU Atmospheric Science Section Early Career Committee-DEI Subcommittee 2024-present
- **Organizing committee** 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), AAAR (2023)
- **Proposal reviewer** for *NASA Earth Science ROSES Program (2024)*
- **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

FIELD EXPERIENCE

- **Instrument Lead** in Munich Urban Air Quality Campaigns (ground station) 2023-present
- **Instrument Co-PI** in NOAA SABRE WB-57 aircraft mission 2022-present
- **Instrument Co-PI** in NASA DCOTSS ER-2 aircraft mission 2019-present
- **AIRLESS** campaign in Beijing on air pollution and human health (ground station) 2017

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