Lu Zhang

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Research Interests

I am interested in how global warming affects atmospheric aerosol properties, aerosol–cloud interactions, radiative forcing, and how these processes feed back to Arctic climate change.

Education

Ph.D., Meteorology **2014 – 2017**
University of Chinese Academy of Sciences, Beijing, China
Dissertation: *Long-term measurements and modelling studies of aerosol hygroscopicity in Lin'an, China.*

M.S., Meteorology **2011 – 2014**
Chinese Academy of Meteorological Sciences, Beijing, China
Thesis: *Long-term measurements of the influence of relative humidity on aerosol scattering properties in the Yangtze River Delta of China.*

B.S. (Hons.), Atmospheric Sciences **2007 – 2011**
Lanzhou University, Lanzhou, China
Excellent Graduate of Lanzhou University; GPA: 3.64/4.00.

Research Experience

Postdoctoral Researcher **2024 – present**
Department of Environmental Sciences, Aarhus University, Roskilde, Denmark
Leading research on **aerosol–cloud interactions** and their role in **Arctic climate change**, with a particular focus on how ice-nucleating particles (INPs) influence mixed-phase cloud properties and cloud feedbacks under global warming. Integrating **satellite observations**, **ground-based measurements**, and **climate modelling** to reduce uncertainties in Arctic climate projections.

Guest Researcher **2023 – 2024**
Department of Geosciences, University of Oslo, Oslo, Norway
Applied the Norwegian Earth System Model (**NorESM**) to assess the influence of **organic aerosol hygroscopicity** on **cloud condensation nuclei (CCN) activity** and its implications for **radiative forcing**. Designed and implemented sensitivity experiments to quantify climate impacts of hygroscopicity variability.

Postdoctoral Researcher **2020 – 2023**
Department of Geophysics, Tel Aviv University, Tel Aviv, Israel
Investigated **aerosol–cloud interactions** and **aerosol hygroscopicity** of biomass burning aerosols over the South-Eastern Atlantic Ocean. Conducted shipborne and airborne field data analysis to quantify the role of **black carbon**, **brown carbon**, and **iron oxides** in aerosol optical properties and climate effects.

Student Assistant **2011 – 2017**
University of Chinese Academy of Sciences, Beijing, China
Conducted in situ aerosol experiments at multiple observation stations across China. Measured aerosol optical, chemical, and microphysical properties, contributing to long-term datasets for climate and air quality studies.

Academic Service and Professional Activities

- **Editorial and Peer Review**
  Guest Editor for *Atmosphere*. Reviewer for *Atmospheric Chemistry and Physics*, *Geophysical Research Letters*, *Atmospheric Measurement Techniques*, *Remote Sensing*, and *Atmosphere*.
- **Mentorship**
  Co-supervisor of two Master's students
  Tutor at the Climate Academy
- **Conference and Community Engagement**

Assisted in organizing the 31st Annual Meeting of the Chinese Meteorological Society, Beijing
Guide of National 12th Five-Year Plan Science and Technology Innovation Achievements Exhibition, Beijing

Honors, Awards, and Funding

- Excellent Graduate, Lanzhou University, China
- Excellent graduate of ISCS, Nanjing, China
- Postdoctoral Scholarship, Tel Aviv University, Israel
- Secured ATMO-ACCESS funding (2023), France

Selected Presentations and Posters

- **2025** *Long-term trend of elemental carbon in the high Arctic*. NOSA Conference, Aarhus, Denmark.
- **2024** *Organic aerosol hygroscopicity and volatility*. University of Oslo, Oslo, Norway.
- **2017** *The influence of relative humidity on aerosol scattering properties*. American Geophysical Union Fall Meeting, San Francisco, USA.
- **2016** *The influence of relative humidity on aerosol scattering properties*. Beijing, China.

Selected Publications

First- and Corresponding-author

- Che, H., **Zhang, L.***, Segal-Rozenhaimer, M., Dang, C., Zuidema, P., Sedlacek, A. (2025) *Aerosol hygroscopicity over the South-East Atlantic Ocean during the biomass burning season: Part II – Influence of sea salt and burning conditions on CCN hygroscopicity*. **Atmospheric Chemistry and Physics**.
- **Zhang, L.***, Segal-Rozenhaimer, M., Che, H., Dang, C., Sun, J., Kuang, Y., Howell, S., Formenti, P. (2024) *Aerosol hygroscopicity over the South-East Atlantic Ocean during the biomass burning season: Part I – From the perspective of scattering enhancement*. **Atmospheric Chemistry and Physics**, https://doi.org/10.5194/acp-24-13849-2024. Also available as **EGUsphere [preprint]**, https://doi.org/10.5194/egusphere-2023-2319.
- **Zhang, L.***, Segal-Rozenhaimer, M., Che, H., Dang, C., Sedlacek, A., Lewis, E., Dobracki, A., Wong, J., Formenti, P., Howell, S., Nenes, A. (2022) *Light absorption by brown carbon over the South-East Atlantic Ocean*. **Atmospheric Chemistry and Physics**, 14(22).
- **Zhang, L.**, Sun, J., Shen, X., Che, H., Ma, Q., Zhang, Y., Zhang, X., Ogren, J. (2015) *Observations of relative humidity effects on aerosol light scattering in the Yangtze River Delta of China*. **Atmospheric Chemistry and Physics**, 15(14), 8439–8454.

Collaborative

- Che, H., Segal-Rozenhaimer, M., **Zhang, L.**, Dang, C., Howell, S., Formenti, P. (2023) *Aerosol hygroscopicity over the South-East Atlantic Ocean during the biomass burning season: Part II – From the perspective of cloud condensation nuclei*. **Atmospheric Chemistry and Physics** (In preparation).
- Che, H., Segal-Rozenhaimer, M., **Zhang, L.**, Dang, C., Zuidema, P., Dobracki, A., Sedlacek, A., Coe, H., Wu, H., Taylor, J., Zhang, X., Redemann, J., Haywood, J. (2022) *Cloud processing and weeklong ageing significantly affect the biomass burning aerosols over the south-eastern Atlantic*. **Communications Earth & Environment**, 3, 182.
- Che, H., Segal-Rozenhaimer, M., **Zhang, L.**, Dang, C., Zuidema, P., Sedlacek, A., Zhang, X., Flynn, C. (2022) *Seasonal variations in fire conditions are important drivers to the trend of aerosol optical properties over the south-eastern Atlantic*. **Atmospheric Chemistry and Physics**, 14(22).
- Dang, C., Segal-Rozenhaimer, M., Che, H., **Zhang, L.**, Formenti, P., Taylor, J., Dobracki, A., Purdue, S., Wong, J., Nenes, A., Sedlacek, A., Coe, H., Redemann, J., Zuidema, P., Howell, S., Haywood, J. (2022) *Biomass burning and marine aerosol processing over the Southeast Atlantic Ocean: A TEM single-particle analysis*. **Atmospheric Chemistry and Physics**, 14(22).
- Shen, X., Sun, J., Kivekäs, N., Kristensson, A., Zhang, X., Zhang, Y., **Zhang, L.**, Fan, R., Qi, X., Ma, Q., Zhou, H. (2018) *Spatial distribution and occurrence probability of regional new particle formation events in Eastern China*. **Atmospheric Chemistry and Physics**, 18(2), 587–599.
- Qi, X., Sun, J., **Zhang, L.**, Shen, X., Zhang, X., Zhang, Y. (2018) *Aerosol hygroscopicity during the haze red-alert period in December 2016 at a rural site of the North China Plain*. **Journal of Meteorological Research**, 32, 38–48.
- Zhang, Z., Zhang, X., Zhang, Y., Wang, Y., Zhou, H., Shen, X., Che, H., Sun, J., **Zhang, L.** (2017) *Characteristics of chemical composition and role of meteorological factors during heavy aerosol pollution*

episodes in northern Beijing area in autumn and winter of 2015. **Tellus B: Chemical and Physical Meteorology**, 69(1), DOI: 10.1080/16000889.2017.1347484.

- Zhong, J., Zhang, X., Wang, Y., Sun, J., Zhang, Y., Wang, J., Tan, K., Shen, X., Che, H., **Zhang, L.**, Zhang, Z., Qi, X., Zhao, H., Ren, S., Li, Y. (2017) *Relative contributions of boundary-layer meteorological factors to the explosive growth of $PM_{2.5}$ during the red-alert heavy pollution episodes in Beijing in December 2016*. **Journal of Meteorological Research**, 31, 809–819.
- Che, H., Zhang, X., **Zhang, L.**, Wang, Y., Zhang, Y., Shen, X., Ma, Q., Sun, J., Zhong, J. (2017) *Prediction of size-resolved number concentration of cloud condensation nuclei and long-term measurements of their activation characteristics*. **Scientific Reports**, 7:5819.
- Sun, J., **Zhang, L.**, Shen, X., Che, H., Zhang, Y., Fan, R., Ma, Q., Yue, Y., Yu, X. (2016) *A review of the effects of relative humidity on aerosol scattering properties*. **Acta Meteorologica Sinica**, 74(5), 672–682.
- Che, H., Zhang, X., Wang, Y., **Zhang, L.**, Shen, X., Zhang, Y., Ma, Q., Sun, J., Zhang, Y., Wang, T. (2016) *Characterization and parameterization of aerosol cloud condensation nuclei activation under different pollution conditions*. **Scientific Reports**, 6:24497.
- Shen, X., Sun, J., Zhang, X., Zhang, Y., **Zhang, L.**, Che, H., Ma, Q., Yu, X., Yue, Y., Zhang, Y. (2015) *Characterization of submicron aerosols and effect on visibility during a severe haze-fog episode in the Yangtze River Delta, China*. **Atmospheric Environment**, 120, 307–316.