

CURRICULUM VITAE¹

Youtong Zheng

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RESEARCH INTERESTS

Modeling, theory, and observation of clouds and their roles in climate and climate change;
Aerosol-cloud-climate interactions; Hierarchical modeling

EDUCATION

2012-2018 **Ph.D.**, Atmospheric Science, University of Maryland at College Park (UMCP),
MD, U.S

- Dissertation title: *Satellite retrieval of updrafts and cloud condensation nuclei concentrations at cloud bases*

2008-2012 **B.S.**, Atmospheric Science, Nanjing University of Information, Science and
Technology (NUIST), Nanjing, China

PROFESSIONAL EXPERIENCE

2023-present **Assistant Professor**, Department of Earth and Atmospheric Sciences,
University of Houston, Houston, TX, U.S

Visiting Research Collaborator, Program in Atmospheric and Oceanic
Sciences, Princeton University/Geophysical Fluid Dynamics Lab (GFDL),
Princeton, NJ, U.S

2021-2023 **Associate Research Scholar**, Program in Atmospheric and Oceanic Sciences,
Princeton University/Geophysical Fluid Dynamics Lab (GFDL), Princeton, NJ,
U.S

2020-2021 **Assistant Research Scientist**, Earth System Science Interdisciplinary Center
(ESSIC), UMCP, MD, U.S

2018-2020 **Postdoc Associate**, ESSIC, UMCP, MD, U.S

2013-2014 **Visiting student**, Institute of Earth Science, Hebrew University of Jerusalem,
Jerusalem, Israel

- Advisor: Daniel Rosenfeld

2012-2018 **Graduate Research Assistant**, Department of Atmospheric and Oceanic
Sciences, UMCP, MD, U.S

- Advisor: Zhanqing Li and Daniel Rosenfeld

AWARDS

2022 Presidential Frontier Faculty Professorship, University of Houston

2021 Finalist of Lawrence Fellowship, Lawrence Livermore National Lab

2019 Yuxiang Young Scholar Award (**top 5** among Chinese earth scientists within five years)

¹ Updated March 23, 2023

- of obtaining Ph.D.), Chinese-American Oceanic and Atmospheric Association
- 2017 Ann G. Wylie Dissertation Fellowship, UMCP
- 2017 Chinese Government Award for Outstanding Students Abroad (**top ~500** worldwide across all disciplines), China Scholarship Council
- 2016 Outstanding Graduate Assistant Award (**top 2%** of graduate assistants), UMCP
- 2016 Ann Wylie Green Fund Scholarship Award, UMCP

PEER-REVIEWED PAPERS (* Corresponding author)

- **Under Review**

[33] Lauer et al., (including **Y. Zheng**) (2023), High aerosol sensitivity of convective clouds over the Amazon.

- **Published**

[32] Zhang H., **Zheng, Y.***, S.S. Lee, and Z. Li (2023), Surface-atmosphere decoupling prolongs the cloud lifetime under warm advection due to reduced entrainment drying. In print, *Geophysical Research Letters*.

[31] Su T., Z. Li, and **Y. Zheng** (2023), Cloud-surface coupling alters the morning transition from stable to unstable boundary layer. *Geophysical Research Letters*, 50(5), e2022GL102256.

[30] Lee, S.S. et al. (including **Y. Zheng**) (2023), Impacts of an aerosol layer on a mid-latitude continental system of cumulus clouds: how do these impacts depend on the vertical location of the aerosol layer? *Atmospheric Chemistry and Physics*, 23(1), 273-286.

[29] **Zheng, Y.***, and Y. Ming (2022), Low-level cloud budgets across sea ice edges. *Journal of Climate*, 36(1), 1-16.

[28] Su T., Z. Li, **Y. Zheng**, et al. (2022), Aerosol-boundary layer interactions modulate the entrainment process. *npj Climate and Atmospheric Science*, 5(1), 64.

[27] Lee, S.S. et al. (including **Y. Zheng**) (2022), Examination of aerosol impacts on convective clouds and precipitation in two metropolitan areas in East Asia: how varying depths of convective clouds between the areas diversify those aerosol effects? *Atmospheric Chemistry and Physics*, 22(13), 9059-9081.

[26] Xu R., et al. (including **Zheng Y.**) (2022), Contrasting impacts of forest on cloud cover based on satellite observations. *Nature communications*, 13(1), 1-12.

[25] Su T., **Y. Zheng** and Z. Li (2022), A methodology to determine coupling and decoupling of continental clouds from lidar and meteorological data. *Atmospheric Chemistry and Physics*, 22(2), 1453-1466.

[24] **Zheng, Y.***, H. Zhang, D. Rosenfeld, S.S. Lee, T. Su, and Z. Li (2021), Idealized large-eddy simulations of stratocumulus advecting over cold water. Part 1: Boundary layer decoupling. *Journal of the Atmospheric Sciences*, 78(12), 4089-4102.

[23] Lee S.S. et al. (including **Zheng Y.**) (2021), Mid-latitude mixed-phase stratocumulus clouds and their interactions with aerosols: how ice processes affect microphysical, dynamical and thermodynamic development in those clouds and interactions?. *Atmospheric Chemistry and Physics*, 21(22), 16843-16868.

[22] **Zheng Y.***, Y. Zhu, D. Rosenfeld, and Z. Li (2021), Climatology of cloud-top radiative cooling in marine shallow clouds, *Geophysical Research Letters*, 48, e2021GL094676.

- [21] **Zheng, Y.***, H. Zhang and Z. Li (2021). Role of Surface Latent Heat Flux in Shallow Cloud Transitions: A Mechanism-Denial LES Study, *Journal of the Atmospheric Sciences*, 78(9), 2709-2723.
- [20] **Zheng, Y.***, D. Rosenfeld and Z. Li (2021). Sub-Cloud Turbulence Explains Cloud-Base Updrafts for Shallow Cumulus Ensembles: First Observational Evidence. *Geophysical Research Letters*, 48(6), e2020GL091881.
- [19] Zhao, P., Li, Z., Xiao, H., Wu, F., **Zheng, Y.**, Cribb, M. C., ... & Zhou, Y. (2020). Distinct aerosol effects on cloud-to-ground lightning in the plateau and basin regions of Sichuan, Southwest China. *Atmospheric Chemistry and Physics*, 20(21), 13379-13397.
- [18] Su, T., Li, Z., **Zheng, Y.**, Luan, Q., & Guo, J. (2020). Abnormally shallow boundary layer associated with severe air pollution during the COVID-19 lockdown in China. *Geophysical Research Letters*, 47(20), e2020GL090041.
- [17] Guo, J., Chen, X., Su, T., Liu, L., **Zheng, Y.**, Chen, D., ... & Li, Y. (2020). The climatology of lower tropospheric temperature inversions in China from radiosonde measurements: roles of black carbon, local meteorology, and large-scale subsidence. *Journal of Climate*, 33(21), 9327-9350.
- [16] **Zheng, Y.***, D. Rosenfeld and Z. Li (2020), A more general paradigm for understanding the decoupling of stratocumulus-topped boundary layers: the importance of horizontal temperature advection, *Geophysical Research Letters*, e2020GL087697.
- [15] **Zheng, Y.***, M. Sakradzija, S. Lee, and Z. Li (2020), Theoretical understanding of the linear relationship between convective updrafts and cloud-base height. Part II: Continental conditions. *Journal of the Atmospheric Sciences*, 77, 1313–1328
- [14] Zhang, J., **Zheng, Y.**, Li, Z., Xia, X., & Chen, H. (2020). A 17-year climatology of temperature inversions above clouds over the ARM SGP site: The roles of cloud radiative effects. *Atmospheric Research*, 237, 104810.
- [13] **Zheng, Y.*** and Z. Li (2019), Episodes of warm air advection causing cloud-surface decoupling during MARCUS, *Journal of Geophysical Research: Atmospheres*. 124. doi: 10.1029/2019JD030835.
- [12] Li Z., et al. (including **Zheng, Y.**) (2019), East Asian Study of Tropospheric Aerosols and Impact on Regional Cloud, Precipitation, and Climate (EAST-AIRCPC), *Journal of Geophysical Research: Atmospheres*. 124. doi: 10.1029/2019JD030758.
- [11] Zhang, J., Chen, H., Zhu, Y., Shi, H., **Zheng, Y.**, Xia, X., Teng, Y., Wang, F., Han, X., Li, J., Xuan, Y (2019), A Novel Method for Estimating the Vertical Velocity of Air with a Descending Radiosonde System. *Remote Sens.*, 11, 1538.
- [10] **Zheng, Y.*** (2019). Theoretical understanding of the linear relationship between convective updrafts and cloud-base height for shallow cumulus clouds. Part I: Maritime conditions. *Journal of the Atmospheric Sciences*, 76(8), 2539-2558.
- [9] **Zheng, Y.***, Rosenfeld, D., Zhu, Y., & Li, Z. (2019). Satellite-based estimation of cloud top radiative cooling rate for marine stratocumulus. *Geophysical Research Letters*, 46, 4485– 4494.
- [8] Rosenfeld, D., Zhu, Y., Wang, M., **Zheng, Y.**, Goren, T., & Yu, S. (2019). Aerosol-driven droplet concentrations dominate coverage and water of oceanic low-level clouds. *Science*, 363(6427), eaav0566.

- [7] **Zheng, Y.***, D. Rosenfeld and Z. Li (2018), Estimating the decoupling degree of subtropical marine stratocumulus decks from satellite, *Geophysical Research Letters*, 45. doi: 10.1029/2018GL078382.
- [6] **Zheng, Y.***, D. Rosenfeld and Z. Li (2018), The relationships between cloud top radiative cooling rates, surface latent heat fluxes, and cloud-base heights in marine stratocumulus. *Journal of Geophysical Research: Atmospheres*, 123. doi:10.1029/2018JD028579.
- [5] **Zheng, Y.***, D. Rosenfeld and Z. Li (2016), Quantifying cloud base updraft speeds of marine stratocumulus based on cloud top radiative cooling, *Geophysical Research Letters*, 2016GL071185, doi: 10.1002/2016GL071185.
- [4] Rosenfeld, D., **Y. Zheng**, Eyal Hashimshoni, Mira Krüger, Anne Jefferson, Xing Yu, Y. Zhu, G. Liu, Z. Yue, Baruch Fischman, David Giguzin, Tom Goren, Ulrich Pöschl, Meinrat O. Andreae (2016), Satellite retrieval of cloud condensation nuclei concentrations by using clouds as CCN chambers, *Proceedings of the National Academy of Sciences*, 201514044.
- [3] **Zheng, Y.*** and D. Rosenfeld (2015), Linear relation between convective cloud base height and updrafts and application to satellite retrievals, *Geophysical Research Letters*, 42, doi:10.1002/2015GL064809.
- [2] **Zheng, Y.**, D. Rosenfeld, and Z. Li (2015), Satellite inference of thermals and cloud base updraft speeds based on retrieved surface and cloud base temperatures, *J. Atmos. Sci.*, 72(6), 2411–2428.
- [1] Rosenfeld, D., B. Fishman, **Y. Zheng**, T. Goren, and D. Giguzin (2014), Combined satellite and radar retrievals of drop concentration and CCN at convective cloud base, *Geophysical Research Letters*, 2014GL059453, doi:10.1002/2014GL059453.

INVITED SEMINARS/TALKS

- 2022 Department of Atmospheric Physics, **Nanjing University of Information Science and Technology**, Nanjing, China. (virtual)
- 2022 Department of Earth, Atmospheric, and Planetary Sciences, **Purdue University**, West Lafayette, Indiana Park.
- 2022 Department of Earth and Atmospheric Sciences, **University of Houston**, Houston, Texas.
- 2021 Department of Atmospheric and Oceanic Sciences, **University of Maryland**, College Park, Maryland. (virtual)
- 2021 Institute of Earth, Ocean, and Atmospheric Sciences, **Rutgers University**, New Brunswick, New Jersey. (virtual)
- 2021 Environmental and Climate Sciences Department, **Brookhaven National Laboratory**, Long Island, New York. (virtual)
- 2021 Cloud Precipitation Center, **NASA Goddard Space Flight Center**, Greenbelt, Maryland. (virtual)
- 2021 **Lawrence Livermore National Lab**, Livermore, California. (virtual)
- 2021 GFDL and AOS program, **Princeton University**, Princeton, New Jersey. (virtual)
- 2020 Department of Atmospheric and Oceanic Sciences, **McGill University**, Montreal, Canada. (virtual)

- 2020 12th Symposium on Aerosol - Cloud - Climate Interactions, **AMS 100th Annual Meeting**, Boston, Massachusetts.
- 2017 Department of Atmospheric Science, **Nanjing University**, Nanjing, China.
- 2017 AeroCenter, **NASA Goddard Space Flight Center**, Greenbelt, Maryland.
- 2017 **Max Planck Institute for Chemistry**, Mainz, Germany.
- 2017 **Max Planck Institute for Meteorology**, Hamburg, Germany.
- 2016 **Chinese Academy of Meteorological Sciences**, Beijing, China.
- 2014 Institute of Earth Science, **Hebrew University of Jerusalem**, Jerusalem, Israel.

TEACHING EXPERIENCE

- 2019~present co-Mentor, Haipeng Zhang, Ph.D. candidate at UMCP
Modeling of marine stratocumulus-topped boundary layer (Pubs. [24] [32])
- 2016 Teaching Assistant, AOSC625: *Remote Sensing of Atmospheric Properties by Satellite*, UMCP, MD

SERVICES

- 2023 Session chair (with Emily de jong and Peng Wu), “Aerosol-cloud interactions in warm clouds” in 15th Symposium on Aerosol - Cloud - Climate Interactions, American Meteorological Society
- 2022 Session chair (with Franziska Glassmeie and Zhaoyi Shen), “Aerosol-cloud interactions in warm clouds” in 14th Symposium on Aerosol - Cloud - Climate Interactions, American Meteorological Society
- 2021-2025 (expected) Committee member of cloud measurements and cloud modeling, ARM User Executive Committee, U.S. Department of Energy
- 2021 Proposal reviewer for U.S. National Science Foundation
- 2021 Panelist, NASA ROSES Panel review
- 2021 Session chair (with Zhaoyi Shen), “Aerosol-cloud interactions in warm clouds” in 13th Symposium on Aerosol - Cloud - Climate Interactions, American Meteorological Society
- 2018, 2021 Judge, Outstanding Student Paper Awards, AMS Annual Meeting
- 2016-present Reviewer for: *Nature Geo.*; *J. Climate*; *Geophys. Res. Lett.*; *J. Atmos. Sci.*; *Atmos. Chem. Phys.*; *Remote Sens. of Ent.*; *JGR-Atmos.*; *Nat. Sci. Report*; *Solar Energy*; *City and Environmental Interactions*; *Remote Sens.*; *Adv. Atmos. Sci.*; *Atmosphere*; *Symmetry*; *Atmos. Oceanic Sci. Lett.*
- 2014-2017 Student Representative, Atmospheric Science Committee, American Geophysical Union

TRAVEL GRANTS

- 2017 Travel grant for 2017 NOAA satellite conference, ESSIC
- 2017 NASA travel support for 2017 ACAM conference, NASA Langley Research Center
- 2016 Jacob Goldhaber Travel Award, UMCP

2015 AGU Fall Meeting Travel Grant, AGU

SKILLS

- Programming: Python, Fortran, IDL
- Models: System for Atmospheric Modeling (SAM), GFDL AM4.0/CM4.0, Machine Learning