Tianning Su

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EDUCATION

08/2016-12/2021	University of Maryland (UMD), USA
Degree:	**Ph.D.** in Atmospheric Sciences
Dissertation:	Remote sensing of aerosol and the planetary boundary layer, and exploring their interactions. *[Link]*

09/2012-06/2016	Peking University, China
Degree:	**B.S.** in Atmospheric Sciences

PROFESSIONAL EXPERIENCE

08/2023-Present	Climate Analysis Group
	Lawrence Livermore National Laboratory, USA
Position:	**Postdoctoral Research Staff Member**

01/2022-08/2023	Earth System Science Interdisciplinary Center
	University of Maryland, College Park, USA
Position:	**Postdoctoral Researcher**

HONORS & AWARDS

2022   Charles Caramello Distinguished Dissertation Award, UMD(Top 4 in all disciplines per year)(*News*)

2021   AOSC Best Dissertation Award, UMD

2021   Ann G. Wylie Dissertation Fellowship, UMD

2021   Outstanding Overseas Chinese Student Award

2020   Best Student Oral Presentation, 100th AMS Annual Meeting (*News*)

2020   Helmut Landsberg Outstanding Peer Reviewed Publication Award, UMD

2020   Graduate School Summer Fellowship, UMD

2019   Green Fund Award, UMD

2016   Dean's Fellowship, UMD

2016   Excellent Thesis for Undergraduate Student, AOS, Peking University

2014   President's Fellowship for Undergraduate Research, Peking University

PROFESSIONAL ACTIVITIES

- Guest Editor for *Remote Sensing* and *Atmosphere*
- Primary Organizer for the Special Issue, *Remote Sensing of Aerosols, PBL, and Clouds [Link]*
- Board Member 2021-2023: *Chinese-American Oceanic and Atmospheric Association (COAA)*
- Member: *American Geophysical Union; American Meteorological Society*
- Panelist, *NASA* ROSES Panel review; Reviewer for proposals of *NASA* and *NSF*
- Reviewer for *22 Peer-reviewed journals (Total reviews: 100)*

RECENT INVITED TALKS

1. Coupling between cloud and land surface changes aerosol-cloud interactions, ***AGU Annual Meeting 2023***, 12/2023. (Invited Oral Presentation)
2. Decoding the Dialogue Between Clouds and Land, ***Stanford University***, *Earth System Science*, 11/2023. (In-person Seminar)
3. Coupling between aerosol, boundary layer, and cloud: a lidar-based study, ***University of Wyoming***, *Department of Atmospheric Science*, 02/2023. (In-person Seminar)
4. Coupling between aerosol, boundary layer, and cloud, ***Lawrence Livermore National Laboratory, Climate Analysis Group,*** 03/2023. (Virtual Seminar)
5. New remote sensing methods to determine PBL depth and coupling of continental clouds with surface from lidar, ***NASA,*** *the AeroCenter-Cloud Precipitation Center of GSFC,* 02/2022. (Virtual Seminar)

PUBLICATIONS: (*Google Scholar; ResearchGate*)

First authors / Corresponding author:

1. **Su, T.** and Zhang, Y. Deep Learning Driven Simulations of Boundary Layer Cloud over the US Southern Great Plains. Under Review for ***Geoscientific Model Development***
2. Roldán, N.†, **Su, T.***, Li, Z.*. Refining Planetary Boundary Layer Height Retrievals from Micropulse-lidar at Multiple ARM Sites Around the World. Under Review *(†supervised student, *corresponding author)*
3. **Su, T.** and Zhang, Y. Deep-Learning-derived Planetary Boundary Layer Height from Conventional Meteorological Measurements. Under Discussion for ***Atmospheric Chemistry and Physics [Link]***
4. **Su, T.** et al. Constraining Effects of Aerosol-Cloud Interaction by Accounting for Coupling between Cloud and Land Surface. Under review
5. **Su, T.** et al. Untangling relationships between clouds and surface fluxes based on cloud coupling regimes. Under review
6. **Su, T.**, and Z. Li, 2024: Decoding the dialogue between clouds and land, ***Eos [Link]***
7. **Su, T.**, Li, Z., Zheng, Y., 2023. Cloud-surface coupling alters the morning transition from stable to unstable boundary layer. ***Geophys. Res. Lett***. *[Link]* (*ASR Highlight*)

8. **Su, T.**, Li, Z., Zheng, Y., Wu, T., Wu, H., and Guo, J., 2022a. Aerosol-boundary layer interaction modulated entrainment process. *npj Climate and Atmospheric Science*. *[Link] (ASR Highlight)*

9. **Su, T.**, Zheng, Y. and Li, Z., 2022b. Methodology to determine the coupling of continental clouds with surface and boundary layer height under cloudy conditions from lidar and meteorological data. *Atmos. Chem. Phys. [Link]* (*Highlight in ARM Annul Report (Page 28); ASR Highlight*)

10. **Su, T.**, Li, Z. and Kahn, R., 2020a. A new method to retrieve the diurnal variability of planetary boundary layer height from lidar under different thermodynamic stability conditions. *Remote Sensing of Environment*. *[Link] [Dataset]*

11. **Su, T.** et al., 2020b. The significant impact of aerosols vertical structure on lower-atmosphere stability and its critical role in aerosol-PBL interaction. *Atmos. Chem. Phys. [Link]* (*ASR Highlight*)

12. **Su, T.** et al., 2020c. Abnormally shallow boundary layer associated with severe air pollution during the COVID-19 lockdown in China. *Geophysical Research Letters*. *[Link]*

13. **Su, T.**, Laszlo, I., Li, Z., Wei, J. and Kalluri, S., 2020d. Refining aerosol optical depth retrievals over land by constructing the relationship of spectral surface reflectances through deep learning: Application to Himawari-8. *Remote Sensing of Environment*. *[Link]* (*UMD Highlight*)

14. **Su, T.**, Li, Z. and Kahn, R., 2018. Relationships between the planetary boundary layer height and surface pollutants derived from lidar observations over China: regional pattern and influencing factors. *Atmos. Chem. Phys. [Link]* (*UMD Highlight*)

15. **Su, T.** et al., 2017a. An intercomparison of long-term planetary boundary layer heights retrieved from CALIPSO, ground-based lidar, and radiosonde measurements over Hong Kong. *J. Geophys. Res. Atmos. [Link]*

16. **Su, T.** et al., 2017b. An intercomparison of AOD-converted PM2.5 concentrations using different approaches for estimating aerosol vertical distribution. *Atmos. Environ. [Link]*

17. **Su, T.** et al., 2017c. The Evolution of Springtime Water Vapor Over Beijing Observed by a High Dynamic Raman Lidar System: Case Studies. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. *[Link]*

18. Guo, J. +*, **Su, T.** +*. et al. 2019. Declining Summertime Local-Scale Precipitation Frequency Over China and the United States, 1981-2012: The Disparate Roles of Aerosols. *Geophys. Res. Lett.* (*corresponding author; +co-first author) [Link]*

19. Guo, J.*, **Su, T.***, et al. 2017. Declining frequency of summertime local-scale precipitation over eastern China from 1970 to 2010 and its potential link to aerosols. *Geophys. Res. Lett.* (*corresponding author) [Link]*

Co-author:

20. Li, Z. and **Su, T.**, 2024, Revealing the coupling process between aerosol, PBL, and cloud: Identification and mechanisms. In **AIP Conference Proceedings** (Vol. 2988, No. 1). AIP Publishing. *[Link]*

21. Wang, J., Su, H., Wei, C., Zheng, G., Wang, J., **Su, T.** et al. 2023. Black-carbon-induced regime transition of boundary layer development strongly amplifies severe haze. ***One Earth.*** *[[Link](#)]*

22. Xian, T., Guo, J., Zhao, R., **Su, T.** and Li, Z. 2023. The impact of urbanization on mesoscale convective systems in the Yangtze River Delta region of China: Insights gained from observations and modeling. ***J. Geophys. Res. Atmos.*** *[[Link](#)]*

23. Jin et al. (including **Su, T**), 2022. Differentiating the contributions of particle concentration, humidity, and hygroscopicity to aerosol light scattering at three large cities in China, ***J. Geophys. Res. Atmos.*** *[[Link](#)]*

24. Jin et al. (including **Su, T**), 2022. The different sensitivities of aerosol optical properties to particle concentration, humidity, and hygroscopicity between the surface level and the upper boundary layer in Guangzhou, China. ***Science of The Total Environment***. *[[Link](#)]*

25. 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***. *[[Link](#)]*

26. Guo. et al. (including **Su, T**), 2021. Investigation of near-global daytime boundary layer height using high-resolution radiosondes: First results and comparison with ERA-5, MERRA-2, JRA-55, and NCEP-2 reanalyses. ***Atmospheric Chemistry and Physics***. *[[Link](#)]*

27. Wei, J., Li, Z., Xue, W., Sun, L., Fan, T., Liu, L., **Su, T.** and Cribb, M., 2021. The ChinaHighPM10 dataset: generation, validation, and spatiotemporal variations from 2015 to 2019 across China. ***Environment International***. *[[Link](#)]*

28. Wei, J., Li, Z., Lyapustin, A., Sun, L., Peng, Y., Xue, W., **Su, T.** and Cribb, M., Reconstructing 1-kmresolution high-quality PM2. 5 data records from 2000 to 2018 in China: spatiotemporal variations and policy implications. ***Remote Sensing of Environment.*** *[[Link](#)]*

29. Guo, J., Chen, X., **Su, T.** et al. 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*** *[[Link](#)]*

30. Han, W., Li, Z., Wu, F., Zhang, Y., Guo, J., **Su, T.** et al. 2020. The mechanisms and seasonal differences of the impact of aerosols on daytime surface urban heat island effect. ***Atmos. Chem. Phys.*** *[[Link](#)]*

31. Han, W., Li, Z., Guo, J., **Su, T.**, Chen, T., Wei, J. and Cribb, M., 2020. The Urban–Rural Heterogeneity of Air Pollution in 35 Metropolitan Regions across China. ***Remote Sensing*** *[[Link](#)]*

32. Wei, J., Li, Z., Sun, L., Peng, Y., Zhang, Z., Li, Z., **Su, T.** et al. 2019. Evaluation and uncertainty estimate of next-generation geostationary meteorological Himawari-8/AHI aerosol products. ***Science of The Total Environment*** *[[Link](#)]*

33. Chu, Y., Li, J., Li, C., Tan, W., **Su, T.** et al. 2019. Seasonal and diurnal variability of planetary boundary layer height in Beijing: Intercomparison between MPL and WRF results. ***Atmospheric Research*** *[[Link](#)]*

34. Li, J., Li, C., Zhao, C. and Su, T., 2016. Changes in surface aerosol extinction trends over China during 1980–2013 inferred from quality-controlled visibility data. ***Geophys. Res. Lett***. *[[Link](#)]*

TEACHING EXPERIENCE:

Teaching Assistant and Occasional Lecturer at University of Maryland*:*

AOSC 424: *Remote Sensing of the Atmosphere and Ocean, 2021 (undergraduate-level course)*;

AOSC 625: *Remote Inference of Atmospheric Properties by Satellite, 2021 (graduate-level course).*

RELATED LINKS

1. ARM Dataset developed by T.SU. 2. 2022 ARM Annul Report (Page28 highlighted Su et al. 2022)