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Fei Yao

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Summary

Dr. Fei Yao, male, born in March 1992, is currently a Research Scientist at the National Centre for Earth Observation (NCEO) and the School of GeoSciences at the University of Edinburgh. He has long been dedicated to interdisciplinary research in environmental and Earth sciences, with a primary focus on the socioeconomic drivers of atmospheric composition variations and their impacts on energy, the environment, and public health. As of November 2025, he has published 20 peer-reviewed articles in top-tier journals, including 10 as first/corresponding authors. His research provides critical scientific foundations for understanding and addressing global climate change, improving air quality, advancing public health, and promoting renewable energy development.

Employment

Research Scientist (Open–ended), NCEO and School of GeoSciences, University of Edinburgh	2023.04 – Present
Postdoctoral Research Associate, School of GeoSciences, University of Edinburgh	2022.03 – 2023.03
Research Consultant (Part–time), Edinburgh Innovations Limited, University of Edinburgh	2021.10 – 2022.02

Education

The University of Edinburgh, PhD in Atmospheric and Environmental Sciences	2018.09 – 2022.03
Peking University, MSc in Geography: Urban and Regional Planning	2015.08 – 2018.07
East China Normal University, BSc in Geographic Information System	2011.09 – 2015.07

Research Grants

Ongoing (1)

1. Natural Environment Research Council. 2018.04 – Present. **Key Personnel**.

Completed (11)

11. CEOI 16th Call Flagship Proposal on behalf of UK Space Agency (UKSA). 2024.01 – 2025.03. Participant.
10. Global Change and IT Small Grants, School of GeoSciences, University of Edinburgh. 2023.01 – 2024.07. **PI**.
9. Google Cloud Research Credits Program and Earth Engine Uplift Program. 2022.10 – 2024.01. **PI**.
8. Centre for Earth Observation Instrumentation (CEOI). 2022.05 – 2023.03. **Key Personnel**.
7. IT Small Grants, School of GeoSciences, University of Edinburgh. 2021.01 – 2021.07. **PI**.
6. Shenzhen Science and Technology Program (No. JCYJ20170412150910443). 2017.07 – 2020.07. Participant.
5. Peking University Shenzhen Graduate School Dean's Fund (No. 201607). 2017.01 – 2017.06. **PI**.
4. Peking University Shenzhen Graduate School Dean's Fund (No. 2015017). 2016.01 – 2016.06. **PI**.
3. Peking University Shenzhen Graduate School Dean's Fund (No. 2015022). 2016.01 – 2016.06. Participant.
2. National Innovation & Entrepreneurship Training Program (No. 201410269099). 2014.10 – 2015.06. **PI**.
1. National Innovation & Entrepreneurship Training Program (No. 201410269093). 2014.10 – 2015.06. Participant.

Teaching and Other Public Services

- Tutor & Demonstrator at the University of Edinburgh: *Earth's Atmospheric Composition* (Spring 2020, 2021), *Visual Analytics* (Spring 2019), *Welcome Week Computing Induction* (Autumn 2019).
- Referee for Academic Journals: *Environmental Science & Technology*, *Remote Sensing of Environment*, *ISPRS Journal of Photogrammetry and Remote Sensing*, *Sustainable Cities and Society*, *Atmospheric Environment*, etc.

Honors and Awards (Selected)

5. National Scholarship, awarded by Ministry of Education of the People's Republic of China, 2013, 2016, 2017.
4. Excellent Graduate, awarded by Peking University, Jun 2018.
3. Exceptional Award for Academic Innovation, awarded by Peking University, Dec 2016 and 2017.
2. 2016 IACP Best Student Paper Award, awarded by International Association for China Planning (IACP), July 2016.
1. Excellent Graduate, awarded by Shanghai Municipal Education Commission, May 2015.

Publications (*: Corresponding authors; #: Co-first authors)

In revision, in review, submitted, in preparation (3)

23. **Yao, F.***, Palmer, P.I., Zhao, H.*, Liu, J.*, Hu, N. and Yin, K., 2025. Global commerce, particulate matter pollution, and solar energy yield gaps. In preparation for a high-profile journal.
22. **Yao, F.***, Palmer, P.I., Wang, X., Wang, Y., Lee, G.T., Wang, H., Feng, L., Henze, D.Z. and Park, R.J. 2025. The added value of GEMS geostationary satellite observations NO_2 for constraining NO_x emissions and its implications for air quality modelling. In preparation for *Atmospheric Chemistry and Physics*.
21. Liu, J.*, Zheng, Z., **Yao, F.*** and Li, W.F.*, 2025. A multi-view machine learning approach for delivering personalized air pollution risk information in urban landscapes. Submitted to *Landscape and Urban Planning*.

Peer-reviewed (20, including 10 as first/corresponding authors, >50% in CAS Q1/TOP/Nature Index journals)

20. Yin, K.$^{\#}$, **Yao, F.**$^{\#}$, Luo, N., Gao, M., Lu, X.* and Yi, B.*, 2025. Substantial reduction of solar photovoltaic potential in China by an extreme dust event. Accepted for publication in *Communications Earth & Environment*.
19. Wang, H., Maslanka, W., Palmer, P.I.*, Wooster, M.J., Wang, H., Yao, F., Feng, L., Wu, K., Lu, X.* and Fan, S.*, 2025. Using Geostationary–Satellite–Derived Sub–Daily Fire Radiative Power Variability versus Prescribed Diurnal Cycles to Assess the Impact of African Fires on Tropospheric Ozone. Accepted for publication in *Atmospheric Chemistry and Physics*. doi: 10.5194/egusphere-2025-2594.
18. **Yao, F.***, Palmer, P.I., Liu, J., Chen, H. and Wang, Y., 2025. Attribution of Solar Energy Yield Gaps due to Transboundary Particulate Matter Pollution Associated with Trade Across Northeast Asia. *Environmental Science & Technology*, 59(29), pp.15092–15100. doi: 10.1021/acs.est.5c05935.
17. Liu, J.$^{\#}$, **Yao, F.**$^{\#}$, Chen, H.* and Zhao, H.*, 2025. Quantifying the source—receptor relationships of $PM_{2.5}$ pollution and associated health impacts among China, South Korea, and Japan: A dual perspective and an interdisciplinary approach. *Environmental Health Perspectives*, 133(3-4), p.047011. doi: 10.1289/EHP14550.
16. Wang, Y., Wang, H., **Yao, F.***, Stouffs, R. and Wu, J.*, 2024. An integrated framework for jointly assessing spatiotemporal dynamics of surface urban heat island intensity and footprint: China, 2003–2020. *Sustainable Cities and Society*, 112, p.105601. doi: 10.1016/j.scs.2024.105601.
15. Marvin, M.R.*, Palmer, P.I., Yao, F., Latif, M.T. and Kahn, M.F., 2024. Uncertainties from biomass burning aerosols in air quality models obscure public health impacts in Southeast Asia. *Atmospheric Chemistry and Physics*, 24(6), pp.3699–3715. doi: 10.5194/acp-24-3699-2024.
14. **Yao, F.*** and Palmer, P.I., 2022. Source Sector Mitigation of Solar Energy Generation Losses Attributable to Particulate Matter Pollution. *Environmental Science & Technology*, 56(12), pp.8619–8628. doi: 10.1021/acs.est.2c01175.
13. Liu, J.*, Li, J. and Yao, F., 2022. Source-receptor relationship of transboundary particulate matter pollution between China, South Korea and Japan: Approaches, current understanding and limitations. *Critical Reviews in Environmental Science and Technology*, 52(21), pp.3896-3920. doi: 10.1080/10643389.2021.1964308.
12. Wu, J.*, Wang, Y., Liang, J. and Yao, F., 2021. Exploring common factors influencing $PM_{2.5}$ and O_3 concentrations in the Pearl River Delta: Tradeoffs and synergies. *Environmental Pollution*, 285, p.117138. doi: 10.1016/j.envpol.2021.117138.
11. Mogno, C.*, Palmer, P.I., Knote, C., Yao, F. and Wallington, T.J., 2021. Seasonal distribution and drivers of surface fine particulate matter and organic aerosol over the Indo-Gangetic Plain. *Atmospheric Chemistry and Physics*, 21(14), pp.10881-10909. doi: 10.5194/acp-21-10881-2021.
10. **Yao, F.*** and Palmer, P.I., 2021. A model framework to reduce bias in ground-level $PM_{2.5}$ concentrations inferred from satellite-retrieved AOD. *Atmospheric Environment*, 248, p.118217. doi: 10.1016/j.atmosenv.2021.118217.
9. Guo, H., Zhan, Q., Ho, H.C., Yao, F., Zhou, X., Wu, J. and Li, W.*, 2020. Coupling mobile phone data with machine learning: How misclassification errors in ambient $PM_{2.5}$ exposure estimates are produced? *Science of The Total Environment*, 745, p.141034. doi: 10.1016/j.scitotenv.2020.141034.
8. Guo, H., Li, W.*, Yao, F., Wu, J., Zhou, X., Yue, Y. and Yeh, A.G., 2020. Who are more exposed to $PM_{2.5}$ pollution: A mobile phone data approach. *Environment international*, 143, p.105821. doi: 10.1016/j.envint.2020.105821.
7. Wu, J., Liang, J., Zhou, L., Yao, F. and Peng, J.*, 2019. Impacts of AOD Correction and Spatial Scale on the Correlation between High-Resolution AOD from Gaofen-1 Satellite and In Situ $PM_{2.5}$ Measurements in Shenzhen City, China. *Remote Sensing*, 11(19), p.2223. doi: 10.3390/rs11192223.
6. **Yao, F.**, Wu, J.*, Li, W.* and Peng, J., 2019. A spatially structured adaptive two-stage model for retrieving ground-level $PM_{2.5}$ concentrations from VIIRS AOD in China. *ISPRS Journal of Photogrammetry and Remote Sensing*, 151, pp.263-276. doi: 10.1016/j.isprsjprs.2019.03.011.
5. **Yao, F.**, Wu, J.*, Li, W. and Peng, J., 2019. Estimating Daily $PM_{2.5}$ Concentrations in Beijing using 750-M VIIRS IP AOD Retrievals and a Nested Spatiotemporal Statistical Model. *Remote Sensing*, 11(7), p.841. doi: 10.3390/rs11070841.
4. **Yao, F.**, Si, M., Li, W.* and Wu, J.*, 2018. A multidimensional comparison between MODIS and VIIRS AOD in estimating ground-level $PM_{2.5}$ concentrations over a heavily polluted region in China. *Science of the Total Environment*, 618, pp.819-828. doi: 10.1016/j.scitotenv.2017.08.209.
3. Wang, Z., Yao, F., Li, W. and Wu, J.*, 2017. Saturation Correction for Nighttime Lights Data Based on the Relative NDVI. *Remote Sensing*, 9(7), p.759. doi: 10.3390/rs9070759.
2. Wu, J., Yao, F., Li, W.* and Si, M., 2016. VIIRS-based remote sensing estimation of ground-level $PM_{2.5}$ concentrations in Beijing–Tianjin–Hebei: A spatiotemporal statistical model. *Remote Sensing of Environment*, 184, pp.316-328. doi:

10.1016/j.rse.2016.07.015.

1. **Yao, F.**, Ye, K. and Zhou, J.*, 2015. Automatic image classification and retrieval by analyzing plant leaf features. *Journal of Zhejiang A&F University*, 32(3), pp.426-433. doi: 10.11833/j.issn.2095-0756.2015.03.015.

Non-peer-reviewed grey literature (1)

1. **Yao, F.**, 2017. Impacts of "source" and "sink" landscape patterns on ground–level $PM_{2.5}$ concentrations in Beijing–Tianjin–Hebei, China. *Won the First Prize in the 25th Challenge Cup at Peking University.*

PRESENTATIONS (SELECTED)

12. NCEO Science Conference 2025, Virtual, 2025.09.03–05.
    Oral: The added value of GEMS geostationary satellite observations of NO_2 for regional air quality modelling.
11. AGU24, Washington, D.C., US, 2024.12.09–13.
    Oral: Impacts of Air Pollutant Emissions on Solar Energy Generation.
    Poster: Mapping Asian anthropogenic NO_x emissions using GEMS NO_2 and the Adjoint of GEOS-Chem.
10. National Earth Observation Conference 2024, York, UK, 2024.09.10–12.
    Oral: Inverse modelling of SO_2 and NO_x emissions over Asia using GEMS geostationary satellite observations.
    Keynote: Commerce, pollution, and solar energy yield gaps.
9. ESA ATMOS 2024, Bologna, Italy, 2024.07.01–05.
    Oral: Estimating hourly nitrogen oxide emissions across Asia using GEMS geostationary satellite data. link.
    Poster: Automated Detection and Attribution of Methane Super-Emitters Using Sentinel-2 Satellite Data and Deep Learning.
8. The EGU General Assembly 2024, Vienna, Austria, 2024.04.14–19.
    Highlight Oral: Impacts of Air Pollutant Emissions on Solar Energy Generation. doi: 10.5194/egusphere-egu24-4715.
    Highlight Poster: Estimating Hourly Nitrogen Oxide Emissions Across Asia Using Data from the GEMS Geostationary Satellite. doi: 10.5194/egusphere-egu24-3198.
7. SAGES 2023 Annual Science meeting, Aberdeen, UK, 2023.05.16–17.
    Oral: How do air pollutant emissions influence solar energy generation?
6. The 51st Azure Space Atmospheric Science Graduate Forum of Peking University (**Invited**), Virtual, 2021.07.31.
    Oral: Source Sector Mitigation of Solar Energy Generation Losses Attributable to Particulate Matter Pollution.
5. The 24th Azure Space Atmospheric Science Graduate Forum of Peking University (**Invited**), Virtual, 2020.05.30.
    Oral: A model framework to reduce bias in ground-level $PM_{2.5}$ concentrations from satellite-retrieved AOD.
4. The 1st GEOS-Chem Europe Meeting, Virtual, 2020.09.01–02.
    Poster: A model framework to reduce bias in ground-level $PM_{2.5}$ concentrations from satellite-retrieved AOD.
3. The 9th International GEOS-Chem Meeting, Cambridge, MA, US, 2019.05.06–09.
    Poster: $PM_{2.5}$ over China inferred from MAIAC AOD and GEOS-Chem: preliminary results.
2. Palmer Group Meeting, Edinburgh, UK, 2019.02.15.
    Oral: AWS Cloud for Atmospheric Scientists.
1. The 10th International Association for China Planning Conference, Beijing, China, 2016.06.30–07.03.
    Oral: Remote sensing estimation of ground-level $PM_{2.5}$ concentrations in Beijing-Tianjin-Hebei: A spatiotemporal statistical model.