YIXIN GUO

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PROFESSIONAL EXPERIENCE

Tenure-track Assistant Professor at Earth, Ocean and Atmospheric Sciences (EOAS) Thurst, Function Hub, HKUST (GZ) *Mar. 2024 - present*
Postdoctoral Researcher at Peking University *May 2023 - Feb. 2024*
Postdoctoral Researcher jointed between Peking University and International Institute for Applied Systems Analysis (IIASA, Austria) *Oct 2020 - Apr. 2023*
Postgraduate Research Associate at Princeton School of International and Public Affairs, Princeton University *Dec. 2019 - Aug. 2020*
Short-term consultant at the World Bank *July-Oct. 2017*

EDUCATION

M.A. and Ph.D. in Public Affairs and Environmental Studies at Princeton School of International and Public Affairs, Princeton University *2014 - 2019*
Advisor: *Denise L. Mauzerall* (American Geophysical Union Fellow; William S. Tod Professor of Civil and Environmental Engineering and Public and International Affairs)
Dissertation: *Mitigating Environmental and Health Damages: Opportunities From Changes in Agricultural Production and Food Consumption Practices in China*

B.S. in Atmospheric and Oceanic Sciences at School of Physics, Peking University *2010 - 2014*

PUBLICATIONS (*DENOTES CORRESPONDING AUTHOR)

1. Li L., **Guo Y.***, Xu J., Ye X., Li D., Liu Z., Ti C., Liu X., Zhang L.*, Opportunities to Mitigate PM2.5 and Nitrogen Deposition through Agricultural NH3 Control Strategies in China's Beijing-Tianjin-Hebei Region, ***Environmental Science and Technology***, 2025, https://doi/10.1021/acs.est.5c02485
2. **Guo Y.**, Zhao H., Winiwarter W. *et al.* Aspirational Nitrogen Interventions Accelerate Air Pollution Abatement and Ecosystem Protection, ***Science Advances*** , https://doi.org/10.1126/sciadv.ado0112. (2024) [**IIASA news:** https://iiasa.ac.at/news/aug-2024/nitrogen-interventions-as-key-to-better-health-and-robust-ecosystems]
3. **Guo Y.**, Zhang L., Winiwarter W. *et al.* Ambitious nitrogen abatement is required to mitigate future global PM2.5 air pollution towards the World Health Organization air quality targets, ***One Earth***, (2024)
4. **Guo Y**, Tan H, Zhang L, *et al.* Global Food loss and waste embodies unrecognized harms to global air quality and biodiversity hotspots, ***Nature Food (IF 20.43)*** (2023), https://doi.org/10.1038/s43016-023-00810-0 [**Chinese Society for Industrial Ecology 2023 Best Paper Award**]
5. J Xu, M Lu, **Guo Y***, L Zhang*, *et al* Summertime urban ammonia emissions may be substantially underestimated in Beijing, China ***Environmental Science and Technology (IF 11.357)***, (2023), https://doi.org/10.1021/acs.est.3c05266
6. **Guo Y***, He P, Searchinger, T.D., *et al.* Environmental and human health trade-offs in potential Chinese dietary shifts, ***One Earth (IF 14.944)*** (2022), https:// doi.org/10.1016/j.oneear.2022.02.002
7. **Guo Y**, Chen, Y., Searchinger, T.D. *et al.* Air quality, nitrogen use efficiency and food security in China are improved by cost-effective agricultural nitrogen management. ***Nature Food (IF 20.43)*** 1,

648–658 (2020). https://doi.org/10.1038/s43016-020-00162-z [**ESI hot and highly cited paper (top 1 percent of citations for given field; Nature Food news:** https://www.nature.com/articles/s43016-020-00167-8]

8. **Guo Y**, Liu J, Mauzerall D L, *et al.* Long-lived Species Enhance Summertime Attribution of North America Ozone to Upwind Sources, ***Environmental Science and Technology (IF 11.357)***, (2017) 51 (9), 5017-5025 DOI: 10.1021/acs.est.6b05664

9. Ma R, Zhang B, **Guo Y**, *et al* . Mitigation potential of global ammonia emissions and related health impacts in the trade network. ***Nature Communications (IF 17.694)*** 12, 6308 (2021). https://doi.org/10.1038/s41467-021-25854-3

10. Liu Z, Ying H, Chen M, Bai J, Xue Y, Yin Y, Batchelor W, Du M, **Guo Y**, *et al.* Optimization of China' s maize and soy production can ensure feed sufficiency at lower nitrogen and carbon footprints, ***Nature Food (IF 20.43)*** 2, 426–433 (2021). https://doi.org/10.1038/s43016-021-00300-1

11. Chen Y, Zhang L, Henze D, Zhao Y, Lu X, Winiwarter W, **Guo Y**, *et al*, Inter-annual variation of reactive nitrogen emissions and their impacts on PM2.5 air pollution in China during 2005-2015, (2021), ***Environmental Research Letters (IF 6.947)*** https://doi.org/10.1088/1748-9326/ac3695

12. Liu L, Xu W, Lu X, Zhong B, **Guo Y** *et al.* Exploring global changes in agricultural ammonia emissions and their contribution to nitrogen deposition since 1980 ***Proc. Natl. Acad. Sci. (IF 12.777)***, (2022),119 (14) e2121998119, https://doi.org/10.1073/pnas.2121998119

13. Wen Xu, Yuanhong Zhao, Zhang Wen, Yunhua Chang, Yuepeng Pan, Yele Sun, Xin Ma, Zhipeng Sha, Ziyue Li, Jiahui Kang, Lei Liu, Aohan Tang, Kai Wang, Ying Zhang, **Yixin Guo**, *et al.* Increasing importance of ammonia emission abatement in PM2.5 pollution control, (2022), ***Science Bulletin (IF 20.577)*** DOI: 10.1016/j.scib.2022.07.021

14. Liu L, et al. Modeling global oceanic nitrogen deposition from food systems and its mitigation potential by reducing overuse of fertilizers ***Proc. Natl. Acad. Sci. (IF 12.777)***, 120.17 (2023): e2221459120.

15. Liu Z., Rieder H., Schmidt C., Mayer M., **Guo Y.**, *et al.* Optimal reactive nitrogen control pathways identified for cost-effective PM2.5 mitigation in Europe (2023) ***Nature Communications*** https://doi.org/10.1038/s41467-023-39900-9

16. Pan D., Mauzerall D., Wang R., Guo X., Puchalski M., **Guo Y.**, *et al.* Regime shift in secondary inorganic aerosol formation and nitrogen deposition in the rural United States. ***Nature Geosciences*** (2024). https://doi.org/10.1038/s41561-024-01455-9

17. Li B, Liao H, Li K, Wang Y, Zhang L, **Guo Y**, Liu L, Li J, Jin J, Yang Y, Gong C. Unlocking nitrogen management potential via large-scale farming for air quality and substantial Co-benefits. ***National Science Review***. 2024 Sep 13:nwae324.

18. Chen, Y., Zhao, Y., Zhang, L. **Yixin Guo**, *et al.* High-resolution inventories for Reactive Nitrogen Emissions from China's livestock during 2005–2022. ***Scientific Data*** 12, 1062 (2025). https://doi.org/10.1038/s41597-025-05394-x

HONORS AND PROFESSIONAL SERVICE

"Nitrogen interventions improve air quality and ecosystem health" selected for the 2024 Top 10 Scientific Achievements in Biogeochemical Nitrogen Cycles by the Nitrogen Working Group of Soil Science Society of China *2025*

China Association for Science and Technology 9th Future Female Scientist Program (10 female scientists selected each year) *2025*

Guangzhou - HKUST (GZ) joint research funding (rmb 250000; 2025A03J3871), reactive nitrogen emission reduction potentials and benefits for global air pollution management, PI *2025-2027*

Guangzhou Municiple Bureau of Science and Technology Qihang Program (rmb 50000; 2025A04J4404), ammonia emissions in global trade networks and their contribution to global PM2.5 pollution: past and future evolvements, PI *2025-2027*

Chinese Society for Industrial Ecology 2023 Best Paper Award *2024*

Elected to Sigma Xi Scientific Research Honor Society *2024*

"Agricultural ammonia mitigation potentials and benefits for PM2.5 air pollution mitigation" selected for the 2023 Top 10 Scientific Achievements in Biogeochemical Nitrogen Cycles by the Nitrogen Working Group of Soil Science Society of China *2024*
"Ammonia mitigation opportunities in international trade network" selected for the 2021 Top 10 Scientific Achievements in Biogeochemical Nitrogen Cycles by the Nitrogen Working Group of Soil Science Society of China *2023*
IOP Outstanding Reviewer Award *2023*
IOP Trusted Reviewer Award *2022*
Green Talent Award (25 outstanding young scientists selected globally), German Federal Ministry of Education and Research *2022*
Chinese Postdoc Special Support Scientific Grant (rmb 180,000; 2022T150005), China Postdoctoral Science Foundation *2022*
International Fellowship for Postdoc Researchers (rmb 600,000; YJ20210002), China Postdoctoral Science Foundation *2021*
PKU (Peking University)- IIASA (International Institute for Applied Systems Analysis) postdoctoral fellowship *2020-2022*
Graduate School Dean's Completion Fellowship, Princeton University *2019-2020*
Princeton Institute for International and Regional Studies Graduate Funding, Princeton University *2018*
Princeton School of International and Public Affairs Graduate Fellowship, Princeton University *2014-2019*
Award for excellent undergraduate research by Bases for Cultivation of Talents of Geophysical Sciences, Peking University *2013*
Samsung Scholarship, for top 3% physics-major students, Peking University *2012-2013*
Merit Student, Peking University *2012-2013*
Meritorious winner for Mathematical Contest in Modeling (MCM) *2013*
1st Prize of National Olympiad in Chemistry in Provinces, China Chemistry Federation *2009*

TEACHING

HKUST(GZ)
Global Environmental Challenges: Science, Technology, and Policy (EOAS6000G) *Spring 2025*
Princeton University, Teaching Assistant
The Environment: Science and Policy (WWS/ENV350) *Spring 2018 and Spring 2019*

HKUST(GZ) Doctoral Students (primary adviser)
Ziru Lan, G1
Lingze Meng, G1
Yue Zhang, G1

Doctoral Students (committee member and/or co-advisor)
Lu Li (Peking University)
Jialin Deng (Peking University)

HKUST(GZ) Red Bird Mphil (RBM) Students (primary adviser)
Yulei Yang, G1

HKUST(GZ) Postdoctoral Fellows
Ning Chai (2024-present)

Senior Thesis Advisees

Jinrong Peng (China University of Geosciences (Wuhan), 2024; rising RBM student for 2025 Fall) [**awarded "excellent undergraduate thesis instructor"**]

ADMINISTRATIVE RESPONSIBILITIES AT HKUST(GZ)

EOAS Thrust Postgraduate Admission Committee, Member (Fall 2024 - present)
Red Bird Mphil (RBM) Selection and Admission Faculty Advisory Board, Member (Fall 2024 - present)

PROFESSIONAL ACTIVITIES

Editorial board member
Nature Scientific Report;

Journal referee
Nature Climate Change;
Nature Food;
Nature Sustainability;
One Earth;
Proceedings of the National Academy of Science;
Communications Earth and Environment;
Journal of Environmental Management;
Atmospheric Chemistry and Physics;
Environmental Research Letters;
Atmospheric Environment;
Earth Critical Zone;
Scientific Data;
Regional Environmental Change

Conference Session Convener
Convener: 7th International Workshop on Regional Air Quality Management in Rapidly Developing Economic Regions (7RAQM) (Guangzhou) *May 2024*

INVITED SEMINARS AND CONFERENCE PRESENTATIONS

(Invited) *Mitigating reactive nitrogen pollution from food systems and integrated environmental and health benefits assessment*, 3rd interdisciplinary research forum for Human Sustainable Development: past, present and future (Guangzhou) *expected August 2025*
(Invited) *Health impacts of food producers' airborne exposure*, "Three foci for food to leverage SDGs and beyond" interdisciplinary workshop (Guangzhou) *expected August 2025*
(Invited) *Managing Nitrogen for Clean Air, Ecosystem Health and Climate Mitigation*, annual meeting of AOGS Asia Oceania Geoscience Society (Singapore) *expected July 2025*
(Invited) *Mitigating reactive nitrogen pollution from food systems for improving air quality and ecosystem health*, Atmospheric Science seminar series at SUSTech (Shenzhen) *May 2025*
(Invited) *Multi-dimensional atmospheric and environmental health benefits of nitrogen abatement strategies*, the 3rd young scientist meeting of China Environmental Society (Hangzhou) *April 2025*
(Invited) *Environmental and health benefits of nitrogen emission controls under future SSP-RCP emission pathways*, the 7th atmospheric ozone pollution mitigation conference (Hefei) *April 2025*
The 3rd Atmospheric chemistry, atmospheric environment and health young scholar forum (Beijing) *Nov 2024*

(Invited) *Potentials of aspirational nitrogen interventions in improving future global air quality under climate mitigation scenarios* at the 2024 International Conference on Air Benefit and Cost and Attainment Assessment and Symposium on Atmospheric Haze Chemistry (ABACAS) (Shanghai) *Sep 2024*
Nitrogen shares in air pollution and scope of feasible interventions at the 21th annual meeting of AOGS (Asia Oceania Geoscience Society) (Korea) *June 2024*
Nitrogen abatement opportunities for improving air quality and ecosystem health at the 7th International Workshop on Regional Air Quality Management in Rapidly Developing Economic Regions (7RAQM) (Guangzhou) *May 2024*
A nitrogen perspective for addressing air pollution and beyond at the Nature Conference on Air Pollution and Climate Change (Beijing) *May 2024*
(Invited) *Overlooked Opportunities of Nitrogen Abatement For Improving Near-term Global Air Quality, Human and Ecosystem Health* at the American Geophysical Union Annual Meeting (San Francisco) *Dec 2023*
(Invited) *Mitigating Reactive Nitrogen and Associated Environmental Damages Through Transforming Our Food Systems* at ReCLEAN seminar series (jointed between ETH, EPFL, PSI, WSL and EAWAG Zurich) (online) *Oct 2023*
(Invited) *Mitigating Reactive Nitrogen pollution: present and future perspectives* at the Earth, Oceanic and Atmospheric Sciences (EOAS) Thrust of HongKong University of Science and Technology (Guangzhou) *Sep 2023*
(Invited) *Mitigating Reactive Nitrogen Loss and Associated Environmental Damages: Opportunities from Changes in Food Production, Consumption and Supply Chains* at the 20th annual meeting of AOGS (Asia Oceania Geoscience Society) (Singapore) *Aug 2023*
Food system strategies and their benefits for air quality, climate and ecosystems at the 4th Biogeochemical Nitrogen Cycle Forum (Beijing) *2023*
Environmental and Health Co-benefits of Sustainable Food System Strategies at American Geophysical Union Annual Meeting (San Francisco and online) *2022*
Poster entitled 'Environmental and Health Co-benefits of Sustainable Food System Strategies in China' for Asian Conference on Meteorology (online) *2022*
Mitigating Reactive Nitrogen Losses and Associated Environmental Damages in China at the 8th Global Nitrogen Conference (Berlin and online) *2021*
(Invited) *Implications of improving food production and consumption for ammonia emissions and air pollution* at the Center for Agricultural Resources Research in the Chinese Academy of Sciences, Shijiazhuang, China *2021*
(Invited) *Ammonia Emissions and Air Quality Under Various Chinese Diets* at the 25th Annual Meeting For Atmospheric Pollution Management and Controls at Xi'an, China *2021*
(Invited) *Effects of cost-effective agricultural nitrogen management on air quality and food security* at the College of Resources and Environmental Sciences of China Agriculture University (online) *2021*
(Invited) *Ammonia Emission Mitigation Strategies and Consequent Environmental Effects in China* at the 2nd Sino-Korean Air Quality Forum (online) *2020*
(Invited) *Air Quality, Nitrogen Use Efficiency And Food Security in China Are Improved by Cost-effective Agricultural Nitrogen Management* at China Agriculture University (online) *2020*
(Invited) *Agricultural Production and Consumption Strategies in China: Benefits for Air Quality, Nitrogen Use Efficiency, Climate and Dietary Health* at Atmospheric and Oceanic Science Seminar series at Peking University, Beijing, China *2019*
Mitigating Reactive Nitrogen Loss and Associated Environmental Damages: Opportunities from Changes in Production and Consumption in China at American Geophysical Union Annual Meeting, San Francisco, CA *2019*
Third Plenary Meeting of International Nitrogen Management System, Edinburgh, Scotland *2018*
Effectiveness of Agricultural Ammonia Control Strategies for Mitigating PM2.5 Pollution in China at Ammonia Workshop hosted by the Environment and Climate Change Agency of the Canadian government, Ottawa, Canada *2018*
High-yield High-efficiency Agriculture Conference, Kunming, China *2017*

(Invited) *Reducing Nitrogen Pollution from Crop Fertilizer Use and Manure Management* at Atmospheric Science Seminar of Cornell University, Ithaca, NY *2017*
Long-lived Species Enhance Summertime Attribution of North America Ozone to Upwind Sources at American Geophysical Union Annual Meeting, San Francisco, CA *2016*
Chinese Environmental Scholars Forum, Princeton, NJ *2016*
Community Earth System Model Annual workshop, Breckenridge, CO *2016*
Poster at Princeton E-ffiliates Partnership second annual Retreat, Princeton, NJ *2015*
Poster at American Geophysical Union Annual Meeting, San Francisco, CA *2014*

REFERENCES

Denise L. Mauzerall (mauzeral@princeton.edu) (PhD advisor)
Princeton School of Public and International Affairs and Department of Civil and Environmental Engineering, Princeton University
Timothy D. Searchinger (tsearchi@princeton.edu) (PhD co-advisor)
Princeton School of Public and International Affairs, Princeton University
Lin Zhang (zhanglg@pku.edu.cn) (PhD co-advisor and postdoc advisor)
Department of Atmospheric and Oceanic Sciences at School of Physics, Peking University
Wilfried Winiwarter (winiwart@iiasa.ac.at) (postdoc advisor)
Energy, Climate, and Environment (ECE), International Institute for Applied Systems Analysis
Junfeng Liu (jfliu@pku.edu.cn) (undergraduate advisor)
College of Urban and Environmental Sciences, Peking University