Xuan Wang

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PROFESSIONAL APPOINTMENTS

Assistant Professor November 2019-
School of Energy and Environment, City University of Hong Kong, Hong Kong SAR, China
Postdoctoral Fellow October 2017-2019
School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, USA

EDUCATION

Ph. D. in Environmental Chemistry at Massachusetts Institute of Technology August 2017
M.Sc. in Environmental Science and Engineering at Tsinghua University July 2012
B.Eng. in Environmental Engineering at Nankai University June 2009

TEACHING

SEE5201: *Air Pollution and Atmospheric Chemistry* (Graduates), CityU 2020-
SEE4204: *Environmental Systems Modeling* (UG), CityU 2020-
SEE4219: *Air Quality Modeling* (UG), CityU 2021-
SEE2201: *Fundamentals of Environmental Engineering* (UG, partly contribute), CityU 2020-

PROFESSOINAL ACTIVITIES

Early Career Board member, *ACS ES&T Air* 2023-
Member, the American Geophysical Union (AGU), and the European Geophysical Union (EGU)
Journal reviewers for:
ACS Earth and Space Chemistry, Atmospheric Chemistry and Physics, Atmospheric Environment, Communication Earth and Environment, Environmental Science and Technology, Environmental International, Geoscientific Model Development, Geophysical Research Letter, Journal of Geophysical Research, Nature Communication, and Nature Geosciences.
Proposal reviewer for:
National Science Foundation of the United States (NSF), National Natural Science Foundation of China (NSFC), and Guangdong Basic and Applied Basic Research Fund Committee.

ADVISING

PhD students supervised: Leyang Liu (2020-), Hongqing Luo (2020-), Xi Liu (2021-), Yixuan Chen (2022-), Yanjun Guo (2022-), Yuxin Sun (2023-)
PhD students co-supervised: Erandani L. Widana Arachchige (2022-), Dushantha S. J. Wijendra Naidhelage (2022-), Oluwafemi E. Adeyeri (2022-)
MSc students supervised: Hao Xing (2020-2021), Jinrong Cai (2021-2022)
Postdocs and research staff supervised: Xiao He (2021), Shuoyuan Chen (2023-)

UNIVERSITY SERVISE

Program leader, Minor in Atmospheric and Climate Science	2022-
Member, School Research Committee	2022-
Member, School Research Degree Programme (RPg) Committee	2021-

PUBLICATIONS (# designates work of student or staff supervised)

Zhang, B, Chellman, NJ, Kplan, JO, Mickley, LJ, Ito, T, **Wang, X**, Wensman, SM, McCrimmon, D, Steffensen, JP, & McConnell, JR, Improved biomass burning emissions from 1750 to 2010 using ice core records and inverse modeling, *Nature Communications*, 15, 3651, 2024.

Zhai, S, McConnell, JR, Chellman, NJ, Legrand, M, Opel, T, Meyer, H, Jaeglé, L, Confer, K, Fujita, K, **Wang, X** & Alexander, B, Anthropogenic Influence on Tropospheric Reactive Bromine Since the Pre-industrial: Implications for Arctic Ice-Core Bromine Trends, *Geophysical Research Letters*, vol. 51, no. 5, e2023GL107733, 2024.

#Adeyeri, OE, Zhou, W, Ndehedehe, CE & **Wang, X**, Global vegetation, moisture, thermal and climate interactions intensify compound extreme events, *Science of the Total Environment*, vol. 912, 169261. https://doi.org/10.1016/j.scitotenv.2023.169261,2024.

Xie, X, Zhang, Y, Liang, R, Chen, W, Zhang, P, **Wang, X**, Zhou, Y, Cheng, Y & Liu, J, Wintertime Heavy Haze Episodes in Northeast China Driven by Agricultural Fire Emissions', *Environmental Science and Technology Letters*, vol. 11, no. 2, pp. 150-157, 2024.

#Adeyeri, OE, Zhou, W, Ndehedehe, CE, **Wang, X**, Ishola, KA & Laux, P, Minimizing uncertainties in climate projections and water budget reveals the vulnerability of freshwater to climate change, *One Earth*, doi:10.1016/j.oneear.2023.12.013, 2024.

Chen, Y, Liu, S, Zhu, L, Seo, S, Richter, A, Li, X, Ding, A, Sun, W, Shu, L, **Wang, X**, Valks, P, Hendrick, F, Koenig, TK, Volkamer, R, Bai, B, Wang, D, Pu, D, Sun, S, Li, J, Zuo, X, Fu, W, Li, Y, Zhang, P, Yang, X & Fu, T-M, Global Observations of Tropospheric Bromine Monoxide (BrO) Columns From TROPOMI', *Journal of Geophysical Research: Atmospheres*, vol. 128, no. 24, e2023JD039091, 2023.

Zhai, S, Swanson, W, McConnell, JR, Chellman, N, Opel, T, Sigl, M, Meyer, H, Wang, X, Jaeglé, L, Stutz, J, Dibb, JE, Fujita, K & Alexander, B, Implications of Snowpack Reactive Bromine Production for Arctic Ice Core Bromine Preservation, *Journal of Geophysical Research: Atmospheres*, vol. 128, no. 20, e2023JD039257, 2023.

Huang, W, Huang, R-J, Duan, J, Lin, C, Zhong, H, Xu, W, Gu, Y, Ni, H, Chang, Y & **Wang, X**, Size-Dependent Nighttime Formation of Particulate Secondary Organic Nitrates in Urban Air, *Journal of Geophysical Research: Atmospheres*, vol. 128, no. 18, e2022JD038189,2023.

#Adeyeri, OE, Zhou, W, Laux, P, **Wang, X**, Dieng, D, Widana, LAE & Usman, M , Land use and land cover dynamics: Implications for thermal stress and energy demands, *Renewable and Sustainable Energy Reviews*, vol. 179, 113274. 2023

#W. N. D. Sandaruwan, J, Zhou, W, Cheung, Pky, Du, Y & **WANG, X**, Characteristics and Formation of Two Leading Marine Heatwave Modes in the North Indian Ocean during Summer and Their Implications for Local Precipitation, *Journal of Climate*, vol. 36, no. 10, pp. 3385–3402, 2023.

#Adeyer, OE, Zhou, W, Laux, P, Ndehedehe, CE, **Wang, X**, Usman, M & Akinsanola, AA, Multivariate drought monitoring, propagation, and projection using bias-corrected general circulation models', *Earth's Future*, vol. 11, no. 4, e2022EF003303, 2023.

#He, X, Zheng, X, You, Y, Zhang, S, Zhao, B, **Wang, X**, Huang, G, Chen, T, Cao, Y, He, L, Chang, X, Wang, S & Wu, Y, Comprehensive chemical characterization of gaseous I/SVOC emissions from heavy-duty diesel vehicles using two-dimensional gas chromatography time-of-flight mass spectrometry, *Environmental Pollution*, vol. 305, 119284, 2023.

Zhang, Y, Zhou, W, **Wang, X**, Wang, X, Zhang, R, Li, Y & Gan, J, IOD, ENSO, and seasonal precipitation variation over Eastern China, *Atmospheric Research*, vol. 270, 106042, 2022.

Zhang, B, Shen, H, Yun, X, Zhong, Q, Henderson, BH, **Wang, X**, Shi, L, Gunthe, SS, Huey, LG, Tao, S, Russell, AG & Liu, P, Global Emissions of Hydrogen Chloride and Particulate Chloride from Continental Sources, *Environmental Science and Technology*, vol. 56, no. 7, pp. 3894–3904, 2022.

Swanson, WF, Holmes, CD, Simpson, WR, Confer, K, Marelle, L, Thomas, JL, Jaeglé, L, Alexander, B, Zhai, S, Chen, Q, **Wang, X** & Sherwen, T, Comparison of model and ground observations finds snowpack and blowing snow aerosols both contribute to Arctic tropospheric reactive bromine, *Atmospheric Chemistry and Physics*, vol. 22, no. 22, pp. 14467-14488, 2022.

#He, X, Zheng, X, Zhang, S, **Wang, X**, Chen, T, Zhang, X, Huang, G, Cao, Y, He, L, Cao, X, Cheng, Y, Wang, S & Wu, Y, Comprehensive characterization of particulate intermediate-volatility and semi-volatile organic compounds (I/SVOCs) from heavy-duty diesel vehicles using two-dimensional gas chromatography time-of-flight mass spectrometry, *Atmospheric Chemistry and Physics*, vol. 22, no. 21, pp. 13935-13947, 2022.

Travis, KR, Crawford, JH, Chen, G, Jordan, CE, Nault, BA, Kim, H, Jimenez, JL, Campuzano-Jost, P, Dibb, JE, Woo, J-H, Kim, Y, Zhai, S, **Wang, X**, Mcduffie, EE, Luo, G, Yu, F, Kim, S, Simpson, IJ, Blake, DR, Chang, L & Kim, MJ, Limitations in representation of physical processes prevent successful simulation of PM2.5 during KORUS-AQ, *Atmospheric Chemistry and Physics*, vol. 22, no. 12, pp. 7933-7958, 2022.

Wang, H, Peng, C, **Wang, X**, Lou, S, Lu, K, Gan, G, Jia, X, Chen, X, Chen, J, Wang, H, Fan, S, Wang, X & Tang, M, N_2O_5 uptake onto saline mineral dust: a potential missing source of tropospheric $ClNO_2$ in inland China, *Atmospheric Chemistry and Physics*, vol. 22, no. 3, pp. 1845-1859, 2022.

#Adeyeri, OE, Zhou, W, **Wang, X**, Zhang, R, Laux, P, Ishola, KA & Usman, M, The trend and spatial spread of multisectoral climate extremes in CMIP6 models, *Scientific Reports*, vol. 12, 21000, 2022.

Mao, J, Zhao, T, Keller, CA, **Wang, X**, Mcfarland, PJ, Jenkins, JM & Brune, WH, Global Impact of Lightning-Produced Oxidants, *Geophysical Research Letters*, vol. 48, no. 21, e2021GL095740, 2021.

Wang, X, Jacob, DJ, Downs, W, Zhai, S, Zhu, L, Shah, V, Holmes, CD, Sherwen, T, Alexander, B, Evans, MJ, Eastham, SD, Neuman, JA, Veres, P, Koenig, T, Volkamer, R, Huey, GL, Bannan, TJ, Percival, CJ, Lee, BH & Thornton, JA, Global tropospheric halogen (Cl, Br, I) chemistry and its impact on oxidants, *Atmospheric Chemistry and Physics*, vol. 21, no. 18, pp. 13973–13996, 2021.

Angelucci, AA, Furlani, TC, **Wang, X**, Jacob, DJ, VandenBoer, TC & Young, CJ, Understanding Sources of Atmospheric Hydrogen Chloride in Coastal Spring and Continental Winter, *ACS Earth and Space Chemistry*, vol. 5, no. 9, pp. 2507-2516, 2021.

Zhai, S, **Wang, X**, Mcconnell, JR, Geng, L, Cole‐Dai, J, Sigl, M, Chellman, N, Sherwen, T, Pound, R, Fujita, K, Hattori, S, Moch, JM, Zhu, L, Evans, M, Legrand, M, Liu, P, Pasteris, D, Chan, YC, Murray, LT & Alexander, B, Anthropogenic Impacts on Tropospheric Reactive Chlorine Since the Preindustrial, *Geophysical Research Letters*, vol. 48, no. 14, e2021GL093808, 2021.

Chan, YC, Evans, MJ, He, P, Holmes, CD, Jaeglé, L, Kasibhatla, P, Liu, XY, Sherwen, T, Thornton, JA, **Wang, X**, Xie, Z, Zhai, S & Alexander, B, Heterogeneous Nitrate Production Mechanisms in Intense Haze Events in the North China Plain, *Journal of Geophysical Research: Atmospheres*, vol. 126, no. 9, e2021JD034688, 2021.

Shah, V, Jacob, DJ, Thackray, CP, **Wang X**, Sunderland EM, Dibble, TS, Saiz-Lopez, A, Černušák, I, Kellö, V, Castro, PJ, Wu, R & Wang,C, Improved Mechanistic Model of the Atmospheric Redox Chemistry of Mercury, *Environmental Science and Technology*, doi:10.1021/acs.est.1c03160, 2021.

Zhai, S, Jacob, DJ, **Wang, X**, Liu, Z, Wen, T, Shah, V, Li, K, Moch, JM, Bates, KH, Song, S, Shen, L, Zhang, Y, Luo, G, Yu, F, Sun, Y, Wang, L, Qi, M, Tao, J, Gui, K, Xu, H, Zhang, Q, Zhao, T, Wang,

Y, Lee, HC, Choi, H & Liao, H, Control of particulate nitrate air pollution in China, *Nature Geoscience*, https://doi.org/10.1038/s41561-021-00726-z, 2021.

Gunthe, SS, Liu, P*, Panda, U, Raj, SS, Sharma, A, Darbyshire, E, Reyes-villegas, E, Allan, J, Chen, Y, **Wang, X**, Song, S, Pöhlker, ML, Shi, L, Wang, Y, Kommula, SM, Liu, T, Ravikrishna, R, McFiggans, G, Mickley, LJ, Martin, ST, Pöschl, U, Andreae, MO & Coe, H, Enhanced aerosol particle growth sustained by high continental chlorine emission in India, *Nature Geoscience*, 14, pp. 77-84, 2021.

Zhai, S, Jacob, DJ, Brewer, JF, Li, K, Moch, JM, Kim, J, Lee, S, Lim, H, Lee, HC, Kuk, SK, Park, RJ, Jeong, JI, **Wang, X**, Liu, P, Luo, G, Yu, F, Meng, J, Martin, RV, Travis, KR, Hair, JW, Anderson, BE, Dibb, JE, Jimenez, JL, Campuzano-Jost, P, Nault, BA, Woo, J-H, Kim, Y, Zhang, Q & Liao, H, Relating geostationary satellite measurements of aerosol optical depth (AOD) over East Asia to fine particulate matter ($PM_{2.5}$): insights from the KORUS-AQ aircraft campaign and GEOS-Chem model simulations, *Atmospheric Chemistry and Physics*, vol. 21, no. 22, pp. 16775-16791, 2021.

June, NA, **Wang, X**, Chen, L-WA, Chow, JC, Watson, JG, Wang, X, Henderson, BH, Zheng, Y & Mao, J*, Spatial and Temporal Variability of Brown Carbon in the United States: Implications for Direct Radiative Effects, *Geophysical Research Letters*, vol. 47, no. 23, e2020GL090332, 2020.

Liu, D, He, C, Schwarz, JP & **Wang, X**, Lifecycle of light-absorbing carbonaceous aerosols in the atmosphere, *npj Climate and Atmospheric Science*, vol. 3, 40, 2020.

Shah, V, Jacob, DJ, Moch, JM, **Wang, X** & Zhai, S, Global modeling of cloud water acidity, precipitation acidity, and acid inputs to ecosystems, Atmospheric Chemistry and Physics, vol. 20, no. 20, pp. 12223-12245, 2020.

Wang, X., D. J. Jacob, X. Fu, T. Wang, M. L. Breton, M. Hallquist, Z. Liu, E. E. McDuffie, and H. Liao: Effects of Anthropogenic Chlorine on $PM_{2.5}$ and Ozone Air Quality in China. *Environmental Science and Technology*, 2020.

Shen, L., D. J. Jacob, M. Santillana, **X. Wang** and W. Chen: An adaptive method for speeding up the numerical integration of chemical mechanisms in atmospheric chemistry models: application to GEOS-Chem version 12.0.0. *Geoscientific Model Development*, 13**,** 2475-2486, 2020.

Horowitz, H. M., C. Holmes, A. Wright, T. Sherwen, **X. Wang**, M. Evans, J. Huang, L. Jaeglé, Q. Chen, S. Zhai and B. Alexander: Effects of Sea Salt Aerosol Emissions for Marine Cloud Brightening on Atmospheric Chemistry: Implications for Radiative Forcing. *Geophysical Research Letters*, 47**,** e2019GL085838, 2020.

Travis, KR, Heald, CL, Allen, HM, Apel, EC, Arnold, SR, Blake, DR, Brune, WH, Chen, X, Commane, R, Crounse, JD, Daube, BC, Diskin, GS, Elkins, JW, Evans, MJ, Hall, SR, Hintsa, EJ, Hornbrook, RS, Kasibhatla, PS, Kim, MJ, Luo, G, McKain, K, Millet, DB, Moore, FL, Peischl, J, Ryerson, TB, Sherwen, T, Thames, AB, Ullmann, K, **Wang, X**, Wennberg, PO, Wolfe, GM & Yu, F, Constraining remote oxidation capacity with ATom observations, *Atmospheric Chemistry and Physics*, vol. 20, no. 13, pp. 7753-7781, 2020.

Shah, V, Jacob, DJ, Moch, JM, **Wang, X** & Zhai, S, Global modeling of cloud water acidity, precipitation acidity, and acid inputs to ecosystems, *Atmospheric Chemistry and Physics*, vol. 20, no. 20, pp. 12223-12245, 2020.

Zhu, L, Jacob, DJ, Eastham, SD, Sulprizio, MP, **Wang, X**, Sherwen, T, Evans, MJ, Chen, Q, Alexander, B, Koenig, TK, Volkamer, R, Huey, LG, Le Breton, M, Bannan, TJ & Percival, CJ, Effect of sea salt aerosol on tropospheric bromine chemistry, *Atmospheric Chemistry and Physics*, vol. 19, no. 9, pp. 6497-6507, 2019.

Zhai, S, Jacob, DJ, **Wang, X**, Shen, L, Li, K, Zhang, Y, Gui, K, Zhao, T & Liao, H, Fine particulate matter (PM2.5) trends in China, 2013-2018: separating contributions from anthropogenic emissions and meteorology, *Atmospheric Chemistry and Physics*, vol. 19, no. 16, pp. 11031-11041, 2019.

Wang, X, Jacob, DJ, Eastham, SD, Sulprizio, MP, Zhu, L, Chen, Q, Alexander, B, Sherwen, T, Evans, MJ, Lee, BH, Haskins, JD, Lopez-Hilfiker, FD, Thornton, JA, Huey, GL & Liao, H, The role of chlorine in global tropospheric chemistry, *Atmospheric Chemistry and Physics*, vol. 19, no. 6, pp. 3981-4003, 2019.

Wang, X, Heald, CL, Liu, J, Weber, RJ, Campuzano-Jost, P, Jimenez, JL, Schwarz, JP & Perring, AE, Exploring the observational constraints on the simulation of brown carbon, *Atmospheric Chemistry and Physics*, vol. 18, no. 2, pp. 635-653, 2018.

Wang, X, Heald, CL, Sedlacek, AJ, de Sá, SS, Martin, ST, Alexander, ML, Watson, TB, Aiken, AC, Springston, SR & Artaxo, P, Deriving brown carbon from multiwavelength absorption measurements: method and application to AERONET and Aethalometer observations, *Atmospheric Chemistry and Physics*, vol. 16, no. 19, pp. 12733-12752, 2016.

Wang, X, Heald, CL, Ridley, DA, Schwarz, JP, Spackman, JR, Perring, AE, Coe, H, Liu, D & Clarke, AD, Exploiting simultaneous observational constraints on mass and absorption to estimate the global direct radiative forcing of black carbon and brown carbon, *Atmospheric Chemistry and Physics*, vol. 14, no. 20, pp. 10989-11010, 2014. [Featured as Nature Research Highlight, Nov. 6, 2014]

Wang, X, Wang, Y, Hao, J, Kondo, Y, Irwin, M, Munger, JW & Zhao, Y, Top-down estimate of China's black carbon emissions using surface observations: Sensitivity to observation representativeness and transport model error, *Journal of Geophysical Research: Atmospheres*, vol. 118, no. 11, pp. 5781-5795, 2013.

Wang, Y, **Wang, X**, Kondo, Y, Kajino, M, Munger, JW & Hao, J, Black carbon and its correlation with trace gases at a rural site in Beijing: Top-down constraints from ambient measurements on bottom-up emissions, *Journal of Geophysical Research: Atmospheres*, vol. 116, no. D24, 24304, 2011.

PRESENTATIONS

Conferences/Workshops: HKUST-GZ EOAS Forum (Guangzhou, China, January 2024), American Geophysical Union Fall Meeting (San Francisco, CA, US, December 2023), Young Scientist Workshop on Photochemical Air Pollution in HK and GBA (Hong Kong, China, May 2023), American Geophysical Union Fall Meeting (San Francisco, CA, US, December 2020), the 9th International GEOS-Chem Meeting (Cambridge, MA, US, May 2019), American Geophysical Union Fall Meeting (Washington DC, US, December 2018), the 1st Regional GEOS-Chem Asia Meeting (Nanjing, China, May 2018), American Geophysical Union Fall Meeting (New Orleans, LA, US, December 2017), the 8th International GEOS-Chem Meeting (Cambridge, MA, US, May 2017), the 7th International GEOS-Chem Meeting (Cambridge, MA, US, May 2015), American Geophysical Union Fall Meeting (San Francisco, CA, US, December 2014), American Geophysical Union Fall Meeting (San Francisco, CA, US, December 2013), New England Atmospheric Chemistry Symposium (Cambridge, MA, US, November 2013), the 6th International GEOS-Chem Meeting (Cambridge, MA, US, May 2013).

Invited seminars: Institute of Earth Environment, Chinese Academic of Sciences (July 2023), Nankai University (July 2023), CityU SEE Tech Talk Series on Air Pollution and Society (May 2020), Tianjin University (Jan 2019), University of Science and Technology of China (December 2018).