Daniel M. Westervelt, PhD

Lamont Doherty Earth Observatory, 306B Oceanography• Palisades, NY 10964
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Research and Teaching Interests

Air quality, climate change, atmospheric chemistry, surface observations, global atmospheric modeling, particulate matter, aerosol-climate interactions, aerosol health effects, environmental engineering and science

Education

Ph.D. Civil and Environmental Engineering. Carnegie Mellon University. Pittsburgh, PA. May 2013 Advisor: Peter Adams

M.S. Civil and Environmental Engineering. Carnegie Mellon University, Pittsburgh, PA. May 2009

B.S. Civil Engineering. Purdue University. West Lafayette, IN. May 2008.

Funded research grants

National Science Foundation. "Collaborative Research: Accelnet: Clean Air Monitoring and Solutions Network". $2,000,000. Lead PI. 1/1/21 – 1/1/26

Department of State, USA. "Capacity building, knowledge sharing, and air quality improvement for Anglophone and Francophone West Africa". $440,440 PI. 10/1/2021 – 10/1/2024

Department of State, USA. "International networking, knowledge sharing, and capacity building for improved air quality in four East African countries". $300,000 Lead PI. 10/1/20 – 10/1/2023

Columbia University Data Science Institute. "Application of Gaussian Mixture Regression to Obtain Useful, Actionable Air Pollution Data from Consumer-Grade, Low-Cost Monitoring Devices" 2/1/2022 – 1/31/2024. $150,000. Lead PI

US Agency for International Development. "Catalyzing Clean Air." $800,000 subaward to Columbia via World Resources Institute. Co-PI. 10/1/20 – 10/1/25

Columbia University Provost's Office. "Towards closing the air pollution data gap in sub-Saharan Africa through international collaboration and capacity building." $42,000. 7/1/2020 – 6/31/2022. Lead PI

Environmental Protection Agency. "Automated Model Reduction for Atmospheric Chemical Mechanisms". $462,025 Co-PI. 12/1/2020 – 11/30/2023.

Columbia University Data Science Institute. "Detecting and attributing spatiotemporal variations in sources of ground-level air pollution with a modeling testbed for integrating multiple noisy satellite datasets." 1/1/2020 – 12/31/2021. $200,000. Co-PI.

National Institute of Health (NIH) U2R. Advancing Public Health Research in Eastern Africa through Data Science Training (APHREA-DST). 09/01/2021 - 08/31/2026. co-I. $50,000. (Lead: Kiros Berhane CU MSPH)

Columbia University Earth Institute. 12/1/2019 – 12/31/2020 “Clean air toolbox for cities initiative”. $150,000. co PI

Columbia Center for Climate and Life. 7/1/2019 – 12/31/2022. “Towards the development of a real-time air pollution monitoring network in sub-Saharan Africa”. $201,328. Lead PI

Industrial Economics, Inc. 2/1/2020 – 12/31/2020. “Data analysis of low cost air pollution monitors in a polluted neighborhood in Accra, Ghana”. $20,000. Subcontract, Institutional PI.

Lamont-Doherty Earth Observatory, Columbia University. Columbia Climate Center. 2/1/2019-1/31/2021. “Development of an air pollution monitoring network in the megacity of Kinshasa, Democratic Republic of the Congo”. $10,000. Lead PI

National Science Foundation, Atmospheric and Geospace Science (AGS). $169,504. 9/1/18 – 9/31/20. “Local and Remote Regional Climate Responses to Regional Forcings from Short-Lived Climate Forcers”. Co-PI

National Science Foundation. Atmospheric and Geospace Science (AGS). $602,918. 11/1/16 – 10/31/20 “Understanding Forced and Natural Asian Monsoon Variability and Change in Observations and CMIP5 Models.” Co-PI

NASA Atmospheric Chemistry, Modeling, Analysis and Prediction (ACMAP). $748,955. 1/1/17 – 12/31/20. “Variability and trends in tropospheric oxidation: Interactions with regional air quality, global atmospheric composition, and climate”. Co-PI

Columbia University Global Policy Center. $200,000. 6/1/16 – 5/31/18. “Assessing future Chinese air pollution impacts on mortality in China and the U.S.” Co-PI

Columbia University Earth Institute. $15,000. 9/1/2015 – 12/19/2016. “Can satellite observations help us better understand the air quality problem in India?” Lead PI

(**Pending**) Lacuna fund Climate and Health. Expanding clean air and climate policy in West Africa with machine learning and long-term Earth observations. $350,000. Lead PI.

(**Pending**) US Dept of State. A community of practice for African air quality managers: Capacity building and knowledge sharing for air quality improvement. $440,400. Lead PI

(**Pending**) DOE E3SM opportunity “Improved Understanding of the Near-Term Hydrological Impacts of Regional Aerosols”. $60,000 co-I (UC-Riverside Lead)

(**Pending**) NIH Policy R01 "Are urban policies to reduce car dependency equitable? An interdisciplinary framework to assess impacts on pollution, neighborhoods, and adverse health outcomes)". $50,000 co-I (Columbia MSPH lead)

(Pending) Columbia World Projects. "Community Scale Clean Air Initiatives in India." $4,000,000. Co-I (Columbia SEAS lead)

Experience

Lamont Assistant Research Professor (primary appointment) 7/2021 – present
Columbia University, Lamont-Doherty Earth Observatory

Affiliate Faculty 2/2021 - present
Columbia University Data Science Institute

Science Collaborator 9/2016 - present
NASA Goddard Institute for Space Studies (NASA GISS)

Air Quality Science Advisor 11/2017 - present
United States Department of State Air Quality Monitoring program
In Cooperation with the US EPA

Associate Research Scientist 8/2015 – 6/2021
Columbia University, Lamont-Doherty Earth Observatory

Postdoctoral Research Associate in Science, Technology, and Environmental Policy 8/2013 – 8/2015
Princeton University and Geophysical Fluid Dynamics Lab (GFDL)
Advisor: Denise Mauzerall

Peer-reviewed Publications (** indicates student or postdoc advisee)

Sebastian, M., Kompalli, S. K., Kumar, V. A., Jose, S., Babu, S. S., Pandithurai, G., Singh, S., Hooda, R. K., Soni, V. K., Pierce, J. R., Vakkari, V., Asmi, E., **Westervelt, D. M**., Hyvärinen, A.-P., and Kanawade, V. P.: Observations of particle number size distributions and new particle formation in six Indian locations , Atmos. Chem. Phys., 22, 4491–4508, https://doi.org/10.5194/acp-22-4491-2022, 2022.

Raheja, Garima**, Sabi, Kokou, Hèzouwè, Sonla, Gbedjangni, Eric Kokou, McFarlane, Celeste M., Holdoli, Collins Gameli, and **Westervelt, D.M.** "A network of field-calibrated low-cost sensor measurements of PM2.5 in Lomé, Togo, over one to two years." ACS Earth and Space chemistry,6,4, 1011-1021, https://doi.org/10.1021/acsearthspacechem.1c00391, 2022.

Raheja, G**.; Harper, L.; Hoffman, A.; Gorby, Y.; Freese, L.; O'Leary, B.; Deron, N.; Smith, S.; Auch, T.; Goodwin, M.; **Westervelt, D. M**. Community-Based Participatory Research for Low-Cost Air Pollution Monitoring in the Wake of Unconventional Oil and Gas Development in the Ohio River Valley: Empowering Impacted Residents through Community Science. Environ. Res. Lett. 2022, 17 (6), 065006. https://doi.org/10.1088/1748-9326/ac6ad6. 2022

Yang, H., Huang, X., **Westervelt, D.M**., Horowitz, L.W. and Peng, W. "Socio-demographic factors shaping the future global health burden from air pollution". Accepted at Nature Sustainability, 2022

Zheng, Z.**, Fiore, A.M, **Westervelt, D.M.,** et al. "Automated machine learning to evaluate the information content of tropospheric trace gas columns for fine particle estimates over India: a modeling testbed". Submitted to JAMES, 2022.

Karambelas, A.K., Fiore, A.M., **Westervelt, D.M**., McNeill, V.F., Venkatamaran, C., Piere, J.R., Bilsback, K., and Milly, G.M. Investigating drivers of particulate matter pollution over India and the implications for radiative forcing with GEOS-Chem-TOMAS15. Under review at JGR-Atmospheres

Baublitz, C., Fiore, A.M., ..., **Westervelt, D.M**. ... Wofsy, S.C et al. Regional oxidation in the remote atmosphere explained by an observation-based reduced-form model. In review at PNAS, 2022

E. X. Bonilla , L. J. Mickley , G. Raheja , S. D. Eastham , J. J. Buonocore , A. Alencar , L. Verchot , **D. M. Westervelt** , M. C. Castro. Health impacts of smoke exposure in South America: Increased risk for populations in the Amazonian Indigenous territories. Submitted to Environmental Research: Health. 2022

Ivey, C.E., Amegah, A.K., Hodoli, C.G., Kelly, K.E., Lawal, A., Pant, P., Singh, S., Subramanian, R., Torres, I., **Westervelt D.M**., Yu. H. "To Share Or Not To Share? Academic Incentives May Hamper Public Good." Submitted to Env Sci Tech. 2022

Singh, D., Singh, J., You, Y., Smith, S., Westervelt, D.M., and Ting, M. "Impact of aerosol reductions on Asian Monsoon rainfall extremes: Insights from the record wet 2020 season". Submitted to Geophysical Research Letters, 2022.

Hancock, S.**, Fiore, A.M., **Westervelt D.M**., Correa, G., Lamarque, J.-F., Venkataraman, C., Sharma, A. "Changing PM 2.5 and related meteorology over India from 1950-2014: A new perspective from a chemistry-climate model ensemble". Submitted to Environmental Research Letters. 2022

McFarlane, C.M.**, Raheja, G.**, Malings., C., Appoh, Emmanuel K.E., Hughes, Alison Felix, and **Westervelt, D.M.** "Application of Gaussian Mixtrue Regression for the Correction of Low Cost PM2.5 Monitoring Data in Accra, Ghana". ACS Earth and Space Chemistry. 10.1021/ acsearthspacechem.1c00217, 2021

McFarlane, C**., Isevulambire, P.K., Lumbuenamo, R.S., Ndinga, A.M.E., Dhammapala, R., Jin, X., McNeill, V.F., Malings, C., Subramanian, R. **Westervelt, D.M.** (2021). First Measurements of Ambient $PM_{2.5}$ in Kinshasa, Democratic Republic of Congo and Brazzaville, Republic of Congo Using Field-calibrated Low-cost Sensors. Aerosol Air Qual. Res. https://doi.org/10.4209/aaqr.200619

M. Sebastian, V. P. Kanawade, V. K. Soni, E. Asmi, **D. M. Westervelt**, V. Vakkari, A.-P.Hyvarinen, J. R. Pierce: New Particle Formation and Growth to Climate-relevant Aerosols at a High Altitude Site in the Western Himalaya, *J. Geophys. Res.*, 2021.

Westervelt, D. M., Fiore, A. M., Baublitz, C. B., and Correa, G.: Impact of regional Northern Hemisphere mid-latitude anthropogenic sulfur dioxide emissions on local and remote tropospheric oxidants, Atmos. Chem. Phys., 21, 6799–6810, https://doi.org/10.5194/acp-21-6799-2021, 2021.

Michael R. Giordano, Carl Malings, Spyros N. Pandis, Albert A. Presto, V.F. McNeill, **Daniel M. Westervelt**, Matthias Beekmann, R. Subramanian, From low-cost sensors to high-quality data: A summary of challenges and best practices for effectively calibrating low-cost particulate matter mass sensors, Journal of Aerosol Science, Volume 158, 2021, 105833, ISSN 0021-8502, https://doi.org/10.1016/ j.jaerosci.2021.105833.

Song Liu, Jia Xing, **Westervelt, D.M.**, Shuchang Liu, Dian Ding, Arlene M. Fiore, Patrick L. Kinney, Yuqiang Zhang, Mike Z. He, Hongliang Zhang, Shovan K. Sahu, Fenfen Zhang, Bin Zhao, Shuxiao Wang, Role of emission controls in reducing the 2050 climate change penalty for PM2.5 in China, Science of The Total Environment, Volume 765, 2021, 144338,SSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2020.144338.

Westervelt, D. M., You, Y., Li, X., Ting,M., Lee, D. E., & Ming, Y. (2020).Relative importance of greenhouse gases, sulfate, organic carbon, and black carbon aerosol for South Asian monsoon rainfall changes. Geophysical Research Letters, 47, e2020GL0883 63

Malings, C., **Westervelt, D. M**., Hauryliuk, A., Presto, A. A., Grieshop, A., Bittner, A., Beekmann, M., and R. Subramanian: Application of low-cost fine particulate mass monitors to convert satellite aerosol optical depth to surface concentrations in North America and Africa, Atmos. Meas. Tech., 13, 3873–3892, https://doi.org/10.5194/amt-13-3873-2020, 2020.

Allen, R. J., Turnock, S., Nabat, P., Neubauer, D., Lohmann, U., Olivié, D., Oshima, N., Michou, M., Wu, T., Zhang, J., Takemura, T., Schulz, M., Tsigaridis, K., Bauer, S. E., Emmons, L., Horowitz, L., Naik, V., van Noije, T., Bergman, T., Lamarque, J.-F., Zanis, P., Tegen, I., **Westervelt, D. M**., Le Sager, P., Good, P., Shim, S., O'Connor, F., Akritidis, D., Georgoulias, A. K., Deushi, M., Sentman, L. T., John, J. G., Fujimori, S., and Collins, W. J.: Climate and air quality impacts due to mitigation of non-methane near-term climate forcers, Atmos. Chem. Phys., 20, 9641–9663, https://doi.org/10.5194/acp-20-9641-2020, 2020.

Westervelt, D. M., Mascioli, N. R., Fiore, A. M., Conley, A. J., Lamarque, J.-F., Shindell, D. T., Faluvegi, G., Previdi, M., Correa, G., and Horowitz, L. W.: Local and remote mean and extreme

temperature response to regional aerosol emissions reductions, Atmos. Chem. Phys., 20, 3009–3027, https://doi.org/10.5194/acp-20-3009-2020, 2020.

Baublitz, C.B, Fiore, A.M; Clifton, O.E.; Mao, J.; Li, J.; Correa, G., **Westervelt, D. M**., Horowitz, L.W., Paulot, F.; Williams, A.P.., (2020). Sensitivity of Tropospheric Ozone Over the Southeast USA to Dry Deposition. Geophysical Research Letters, 47, e2020GL087158. https://doi.org/10.1029/2020GL087158

Amiri-Farahani, A., Allen, R.J., Li, King-Fai, Nabat, P., and **Westervelt, D.M.** A La Niña-like climate response to south African biomass burning aerosol in CESM simulations. Accepted in JGR-Atmospheres, 2020. https://doi.org/10.1029/2019JD031832

Li, Xiaoqiong, Ting, Mingling, You, Yujia, Lee, Dong Eun, **Westervelt, D. M**. Ming, Yi., South Asian summer monsoon response to aerosol-forced sea surface temperatures. Vol 47, Issue 1. 2020 https://doi.org/10.1029/2019GL085329

Nicely, J. M., Duncan, B. N., Hanisco, T. F., Wolfe, G. M., Salawitch, R. J., Deushi, M., Haslerud, A. S., Jöckel, P., Josse, B., Kinnison, D. E., Klekociuk, A., Manyin, M. E., Marécal, V., Morgenstern, O., Murray, L. T., Myhre, G., Oman, L. D., Pitari, G., Pozzer, A., Quaglia, I., Revell, L. E., Rozanov, E., Stenke, A., Stone, K., Strahan, S., Tilmes, S., Tost, H., **Westervelt, D. M**., and Zeng, G.: A machine learning examination of hydroxyl radical differences among model simulations for CCMI-1, Atmos. Chem. Phys., 20, 1341–1361, https://doi.org/10.5194/acp-20-1341-2020, 2020

Westervelt, D.M., Ma, C.T., He, M.Z., Fiore, A.M, Kinney, P.L, Kioumourtzoglou, M.-A., Wang, S., Xing, J., Ding., D, Correa, G. Mid-21st century ozone air quality and health burden in China under emissions scenarios and climate change. *Environmental Research Letters.* 14, 2019, 074030, doi: https://iopscience.iop.org/article/10.1088/1748-9326/ab260b

Fanourgakis, G.S.; Kanakidou, M.; Nenes, A.; Bauer, S.E.; Bergman, T.; Carslaw, K.S.; Grini, A.; Hamilton, D.S.; Johnson, J.S.; Karydis, V.A.; Kirkevag, A.; Kodros, J.K.; Lohmann, U.; Luo, G.; Makkonen, R.; Matsui, H.; Neubauer, D.; Pierce, J.R.; Schmale, J.; Stier, P.; Tsigaridis, K.; van Noije, T.; Wang, H.; Watson-Parris, D.; **Westervelt, D.M.**; Yang, Y.; Yoshioka, M.; Daskalakis, N.; Decesari, S.; Gysel Beer, M.; Kalivitis, N.; Liu, X.; Mahowald, N.M.; Myriokefalitakis, S.; Schroedner, R.; Sfakianaki, M.; Tsimpidi, A.P.; Wu, M.; and Yu, F., 2019: Evaluation of global simulations of aerosol particle number and cloud condensation nuclei, and implications for cloud droplet formation. Atmos. Chem. Phys., doi:10.5194/acp-2018-1340

Westervelt, D. M., Conley, A. J., Fiore, A. M., Lamarque, J.-F., Shindell, D. T., Previdi, M., Mascioli, N. R., Faluvegi, G., Correa, G., and Horowitz, L. W.: Connecting regional aerosol emissions reductions to local and remote precipitation responses, *Atmos. Chem. Phys*., 18, 12461-12475, https://doi.org/10.5194/acp-18-12461-2018, 2018.

Conley, A.J., **Westervelt, D.M**., Lamarque, J.-F., Fiore, A.M., Shindell, D., Correa, G., Faluvegi, G., Horowitz, L.W. Multi-model surface temperature responses to removal of U.S. sulfur dioxide emissions. *J. Geophys Res*. 123, no. 5, 2773-2796, doi:10.1002/2017JD027411. 2018

Liu T., Marlier M.E., DeFries R.S., **Westervelt D.M**., Xia K.R., Fiore A.M., Mickley L.J., Cusworth D.H., and Milly G. Seasonal impact of regional outdoor biomass burning on air pollution in three Indian cities: Delhi, Bengaluru, and Pune. *Atmos Envirion* 172, 83-92, https://doi.org/10.1016/j.atmosenv.2017.10.024, 2018

Westervelt, D. M., A. J., Conley, A. M., Fiore, J.-F., Lamarque, D., Shindell, M., Previdi, G., Faluvegi, G., Correa, and L. W., Horowitz (2017), Multimodel precipitation responses to removal of U.S. sulfur dioxide emissions, *J. Geophys. Res. Atmos*., 122, doi:10.1002/2017JD026756.

Westervelt, D.M., L.W. Horowitz, V. Naik, A.P.K. Tai, A.M. Fiore, D.L. Mauzerall, Quantifying PM2.5-meteorology sensitivities in a global climate model, *Atmospheric Environment*, ISSN 1352-2310, http://dx.doi.org/10.1016/j.atmosenv.2016.07.040, 2016

Westervelt, D. M., Horowitz, L. W., Naik, V., Golaz, J.-C., and Mauzerall, D. L.: Radiative forcing and climate response to projected 21st century aerosol decreases, *Atmos. Chem. Phys*., 15, 12681-12703, doi:10.5194/acp-15-12681-2015, 2015

Pierce, J. R., **Westervelt, D. M**., Atwood, S. A., Barnes, E. A., and Leaitch, W. R.: New-particle formation, growth and climate-relevant particle production in Egbert, Canada: analysis from 1 year of size-distribution observations, *Atmos. Chem. Phys*., 14, 8647-8663, doi:10.5194/acp-14-8647-2014, 2014

Westervelt, D. M., Pierce, J. R., and Adams, P. J.: Analysis of feedbacks between nucleation rate, survival probability and cloud condensation nuclei formation, *Atmos. Chem. Phys*., 14, 5577-5597, doi:10.5194/acp-14-5577-2014, 2014.

D'Andrea, S. D., Hakkinen, S. A. K., **Westervelt, D. M.**, Kuang, C., Levin, E. J. T., Kanawade, V. P., Leaitch, W. R., Spracklen, D. V., Riipinen, I., and Pierce, J. R.: Understanding global secondary organic aerosol amount and size-resolved condensational behavior, *Atmos. Chem. Phys*., 13, 11519-11534, doi:10.5194/acp-13-11519-11534, 2013

Westervelt, D. M., Pierce, J. R., Riipinen, I., Trivitayanurak, W., Hamed, A., Kulmala, M., Laaksonen, A., Decesari, S., and Adams, P. J.: Formation and growth of nucleated particles into cloud condensation nuclei: model-measurement comparison, *Atmos. Chem. Phys*., 13, 7645-7663, doi:10.5194/acp-13-7645-2013, 2013

Hennigan, C. J., **Westervelt, D.M**. , I. Riipinen, G. J. Engelhart, T. Lee, J. L. Collett Jr., S. N. Pandis, P. J. Adams, and A. L. Robinson (2012), New particle formation and growth in biomass burning plumes: An important source of cloud condensation nuclei, *Geophys. Res. Lett.,* 39, L09805, doi:10.1029/2012GL050930.

Westervelt, D. M., Moore, R. H., Nenes, A., and Adams, P. J.: Effect of primary organic sea spray emissions on cloud condensation nuclei concentrations, *Atmos. Chem. Phys.,* 12, 89-101, doi:10.5194/acp-12-89-2012,2012.

Pierce, J. R., Leaitch, W. R., Liggio, J., **Westervelt, D. M**., Wainwright, C. D., Abbatt, J. P. D., Ahlm, L., Al-Basheer, W., Cziczo, D. J., Hayden, K. L., Lee, A. K. Y., Li, S.-M., Russell, L. M., Sjostedt, S. J., Strawbridge, K. B., Travis, M., Vlasenko, A., Wentzell, J. J. B., Wiebe, H. A., Wong, J. P. S., and Macdonald, A. M.: Nucleation and condensational growth to CCN sizes during a sustained pristine biogenic SOA event in a forested mountain valley, *Atmos. Chem. Phys.,* 12, 3147-3163, doi:10.5194/acp-12-3147-2012, 2012

Snow-Kropla, E. J., Pierce, J. R., **Westervelt, D. M**., and Trivitayanurak, W.: Cosmic rays, aerosol formation and cloud-condensation nuclei: sensitivities to model uncertainties, *Atmos. Chem. Phys*., 11, 4001-4013, doi:10.5194/acp-11-4001-2011, 2011

Book chapters

Donahue, N. M., Posner, L. N., **Westervelt, D. M**., Li, Z., Shrivastava, M., Presto, A. A., Sullivan, R. C., Adams, P. J., Pandis, S. N., Robinson, A. L.: Where Did This Particle Come From? Sources of Particle Number and Mass for Human Exposure Estimates. *Airborne Particulate Matter: Sources, Atmospheric Processes, and Health*. pp. 35–71., doi:10.1039/9781782626589-00035, 2016.

Invited Presentations

Department Seminar, US EPA Office of Research and Development July 2022
"Getting useful, actionable air quality data from low cost sensors in the US and abroad"

Department Seminar, US EPA Region 2 Office (NY, NJ, PR, VI) May 2022
"Getting useful, actionable air quality data from low cost sensors in the US and abroad"

Workshop on The Power of TROPOMI to bridge African science and policy April 2022
"Air quality data analysis and capacity building in Africa"

Tri-MIP 3: AerChemMIP, PDRMIP, and RAMIP Nov 2021
"Developing emulators of climate responses to regional aerosol perturbations using three coupled chemistry-climate models"

Department Seminar, North Carolina State A&T University Nov 2021
"Towards closing the air pollution data gap in sub-Saharan Africa"

Workshop on a Pilot Design for Air Quality in Africa Jun 2021
First measurements of PM2.5 in Togo and the Democratic Republic of Congo

European Geophysical Union (invited) April 2021
"Developing emulators of regional climate responses to regional aerosol perturbations using three coupled chemistry-climate models**"**

iLEAPS Early Career Meeting Nov 2020
"Towards closing the air pollution data gap in sub-Saharan Africa"

US Department of State Air Quality Fellows Seminar Sep 2020
"Towards closing the air pollution data gap in sub-Saharan Africa"

Digital Air Quality, A Systems Approach to Air Pollution Aug 2020
"Columbia University's air quality research in Africa"

MAIA Science Team Meeting (virtual due to COVID19) May 2020

Makerere University, Kampala, Uganda Aug 2019

Air Pollution in Africa: Current research and future directions at Columbia University

University of Birmingham / Population Council Air Pollution Workshop Aug 2019
Air Pollution in Africa: Current research and future directions at Columbia University

USAID Air Pollution Solutions Workshop, New York, NY April 2019
Development of a low cost air pollution sensor network in sub-Saharan Africa

Georgia Institute of Technology, Department of Earth and Atmospheric Science Feb 2019
The Atmospheric Chemistry, Air Quality, and Climate Change Nexus: From the nano to the global scale"

American Geophysical Union Fall Meeting 2018 Dec 2018
Washington, DC. "Connecting regional aerosol emissions reductions to local and remote precipitation responses". Invited, GH11C: Short-Lived Pollutants in the Human–Climate System

Columbia Mailman School of Public Health Climate and Health Department Seminar. "Mid-21st century ozone air quality in China under emissions scenarios and climate change" Sep 2018

Nanjing Agricultural University, Department of Environmental Science July 2018
"Air pollution and climate change research at Columbia"

Rutgers University, Department of Environmental Sciences Seminar May 2018
"The Air Quality – Climate Change Nexus: From the nano to the global scale"

Ball State University, Department of Environmental Management May 2018
"The Air Quality – Climate Change Nexus: From the nano to the global scale"

New York University, Department of Environmental Engineering Department Seminar. "All about atmospheric aerosols: from air quality to climate change". New York, NY Mar 2017

American Geophysical Union Fall Meeting 2016 Dec 2016
San Francisco, CA. "The impact of sulfate removal on global and regional precipitation in three coupled climate models". A11L: Tropospheric Chemistry-Climate Interactions

Lamont-Doherty Earth Observatory Ocean and Climate Physics Seminar Jan 2016
Palisades, NY. "Taming the aerosol monster: a multimodel approach to elucidating the cloud and precipitation response to regional changes in aerosol emissions"

Teaching Experience

Adjunct Professor, Tandon School of Engineering, New York University Fall 2017-Spring 2020
Courses: CE-GY 7523, Air Pollution. Graduate-level class. Overall evaluation: 4.6 / 5.0
CE-UY 3223, Introduction to Environmental Engineering

Faculty, New Jersey Scholars Program, The Lawrenceville School — Summer 2015
Taught summer course on "Climate Change and the Human Experience"

Encouraging Networks between Geoscience and Geoscience Education (ENGAGE) workshop — Jan 2015
Held in Washington, DC. Sponsored and funded by National Science Foundation.

Eberly Center for Teaching Excellence Future Faculty Program — 2012-2013
Completed teaching observations, course and syllabus development, attended seminars

Guest Lecturer, Introduction to Atmospheric Chemistry. Columbia University. Sulfate-nitrate-ammonium atmospheric thermodynamics. — Mar 2016, 2017, 2019, 2020

Guest Lecturer, Fundamentals of Atmospheric Aerosols (CU). — April 2017, 2018
Taught 2 lecture (3 hours each) on aerosol microphysics

Guest Lecturer, Fundamentals of Atmospheric Aerosols (CMU) — 2013
Taught 3 lectures on single particle dynamics, aerosol size distributions, and aerosol and cloud optical properties

Teaching and Lab Assistant, Various Classes — 2009-2013
Assisted lab sessions, taught guest lectures, held weekly office hours, administered exams, grading

Students and postdocs advised

Benjamin Yang — 2021 – present
Lamont/DEES PhD student

Garima Raheja — 2021 - present
Lamont/DEES PhD Student

Savannah Ward — Summer 2021
LDEO Summer Intern

Zhonghua Zheng — Spring 2021 – Spring 2022
Postdoctoral Research Scientist

Oreoluwa Solanke — Summer 2020
LDEO Summer intern

Sarah Hanock — Summer 2020
LDEO Summer Intern

Celeste McFarlane — Spring 2020 – Fall 2021
Undergraduate researcher (ChemE)

William Tsui — Spring 2020
PhD defense committee

Alison Fankhauser Fall 2020
PhD defense committee

Chang Wang Fall 2019
MS Environmental Engineering (Dec 2019)
Poster presented at AGU 2019

Anant Majumdar Spring 2019
Earth Institute Intern (BA Computer Science 2020).

Clara T. Ma Summer 2017
LDEO summer intern. (BS Geology and Geophysics Yale 2020)
Oral presentation given by Clara at AGU Fall Meeting 2017

Karen Xia 2015-2017
Earth Institute Intern (BS Computer Science and Statistics 2018)
Poster presented at AAAR 35th annual fall meeting.

Karen Yu 2010-2012
Undergraduate intern. (BS CMU Environmental Engineering 2012, PhD Harvard Atmospheric Science 2019)

Committees and Professional Development

LDEO Mentoring and Justice, Equity, Diversity, and Inclusion Committee (JEDI)
2019-present

Lamont Colloquium Faculty Coordinator and Committee Chair
Responsible for overseeing Colloquiium, inviting speakers. 2022-2023

Lamont Executive Committee
Junior faculty representative, 2022-2024

Meeting organizer
Clean Air Monitoring and Solutions Network, CAMS-Net, symposium at Air Sensors International Conference, May 2022

Meeting organizer
Air Quality Certificate Program in East Africa. July 25-29 2021. Online

Meeting organizer
Columbia University Air Pollution Roundtable. Nairobi, Kenya. August 26, 2019. Columbia Global Centers

Meeting co-organizer
"Air Pollution Extremes". Columbia University Initiative on Extreme Weather. November 1-2, 2018

Session Convener and Chair

"Interactions of Air Quality and Meteorology on Local to Synoptic Scales". AGU Fall Meeting 2017. New Orleans, LA and AGU Fall Meeting 2018, Washington, DC, and 2019 at San Francisco, CA.

Session Chair

"Carbonaceous Aerosols in the Atmosphere". American Association for Aerosol Research 34th annual meeting. Minneapolis, MN. Oct. 2015

Peer reviewer

Atmospheric Chemistry and Physics, Geoscientific Model Development, Atmospheric Environment, Journal of the Advances of Modeling Earth Systems, Aerosol Science and Technology, Environmental Science and Technology, Journal of Geophysical Research, Geophysical Research Letter, Nature Climate Change

President

American Association of Aerosol Research Carnegie Mellon Chapter (2012)

Secured funding and started guest speaker series, supervised creation of an air quality community awareness blog

Poster Judge, student poster competition

AGU 2014, 2016, 2017, 2018, 2019, 2020 AAAR 2014, 2015, 2016, 2019, 2020, 2021

Field Work and International Capacity Building

Accra and Kumasi, Ghana, June 2022

Lomé, Togo, July 2022

Nairobi and Mombasa, Kenya, July 2021

Accra, Ghana, February 2020

Lomé, Togo, March 2020

Nairobi, Kenya, August 2019

Kampala, Uganda, September 2019

Mumbai, India, February 2016

Outreach Activities

National Society for Black Engineers Career Workshop, Guest Speaker, November 2021

Lamont-Doherty Earth Observatory Open House Public Speaker. October 2019

New York State Science and Engineering Fair Judge, March 2017, New York, NY

Lamont-Doherty Earth Observatory Open House. Oct 2016, 2018. Palisades, NY. Designed and conducted a "clouds in a jar" experiment at the Ocean and Climate Physics booth.

Invited guest speaker, St. Thomas Aquinas College Earth Day Fair, 2016

Early career researcher panel member, 2015-2016, Various occasions at LDEO

Judge, 2012 Pittsburgh Regional Middle and High School Science Fair

Honors and awards

Fellow, Columbia Center for Climate and Life (2019-2022)

Science, Technology, and Environmental Policy Research Fellowship (2013-2014)

Dean’s Fellowship, Carnegie Mellon University (2009-2010)