

## **PAWEL K MISZTAL**

### ***Biographical Sketch***

Dr. Pawel Misztal is an assistant professor in the Department of Civil, Architectural and Environmental Engineering at the University of Texas at Austin. He is a founder and director of the UT Sniffer Lab where his research group focuses on fundamental discoveries and big research questions in air quality and human health. He is an expert in novel time-resolved measurements of volatile organic compounds (VOCs) and has more than 10 years of experience measuring atmospheric chemical composition at different spatiotemporal scales outdoors and indoors. Earlier, as a research specialist in the Department of Environmental Science, Policy, and Management, at the University of California, Berkeley, he led the first direct regional airborne VOC emission measurements in California to evaluate air quality models used by the California Air Resources Board.

Dr. Misztal is an author on more than 50 peer reviewed papers and is currently a UT Austin PI on several large air quality and related projects including NOAA AC4, HEI Energy, A.P. Sloan, FEMA DHS, and DOE Integrated Field Laboratories. He is a recipient of NSF Faculty CAREER award. Dr. Misztal and his research group have fingerprinted various pollution plumes and quantified emission factors from numerous conventional and unconventional sources including wastewater treatment plants, heated asphalts, environmental microbes, and a vast number of volatile chemical products. Dr. Misztal is a proponent of the novel measurements of rich volatile chemical markers for quantified source apportionment, understanding human chemical and microbial exposures, and treating air quality holistically indoors and outdoors.

CURRICULUM VITAE  
**PAWEL KONRAD MISZTAL**

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**EDUCATION**

University of California at Berkeley	Environmental Science, Policy and Management	Postdoc	2015
The University of Edinburgh, UK	Chemistry	PhD	2010
Maria Curie-Sklodowska University in Lublin, Poland	Chemistry	MS	2003
Maria Curie-Sklodowska University in Lublin, Poland	Chemistry and Physics	BS	2001

**PROFESSIONAL EXPERIENCE - Academic**

University of Texas at Austin	Assistant Professor	2019 – Present
University of California at Berkeley	Research Specialist	2015 – 2018
The University of Edinburgh	Laboratory Demonstrator	2007 – 2010
John Paul II Catholic University of Lublin	Research Assistant	2004 – 2007

**HONORS AND AWARDS**

2022 Alcalde’s Texas 10 Inspiring Professor Alumni Award, April 29, 2022.

NSF Faculty CAREER Award “CAREER: SPatiotemporal INvestigation of Urban Pollution and Air Quality (SPIN-UP-AQ)”, June 2022 – June 2027.

Outstanding Reviewer Award 2018 by Biogeosciences, 2019.

Invited Speech at Texas Academy of Medicine, Engineering, Science and Technology (TAMEST) 2022 Conference, “Indoor Air Quality and Health”, San Antonio, TX June 20-22, 2022.

Opinion featured by CNN: “Rabbit gene turns houseplant into air detoxifier”, 2019.

Invited Lecturer at the International Graduate Course on Biogenic Volatile Organic Compounds at University of Copenhagen, Denmark, November 4-8, 2019.

Featured by Mother Jones article “Caution to the Wind”, May 27, 2021.

Highlighted by New York Times in science guide to cleaning and disinfection, May 5, 2022.

Invited Webinar “What’s in your cleaner and why should you care?” in the series of “Aerosols, Fomites, and Air Quality: what research says about the impact of cleaning on health”, Cleaning Industry Research Institute (CIRI), June 24, 2021.

**PROFESSIONAL SERVICE/LEADERSHIP**

Associate Editor: *Frontiers in Forests and the Global Change* (2020 – present).

Guest Editor of *Atmospheres’ Special Issue “Heterogeneous Processes on Surfaces in the Atmosphere and Indoors”* (2021).

Member of an EPA STAR grant proposal evaluation panel (2021).

Member of an NSF CAREER proposal evaluation panel (2022, 2023).

Member of a DOE proposal evaluation panel (2022).

Reviewer/referee (2015 – present): *Nature Communications, Environmental Science & Technology, Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Measurement Techniques,*

*Biogeosciences, Geophysical Research Letters, Journal of Geophysical Research, Agricultural and Forest Meteorology, Biogeochemistry, Plant Physiology and Biochemistry, Indoor Air, Building and Environment, Geoscientific Model Development, Scientific Reports, Global Change Biology, PLOS ONE, Frontiers in Chemistry, Nature ISME Multidisciplinary Journal of Microbial Ecology, Angewandte Chemie, Communications Biology, Elementa, New Phytologist, Environmental Science, Processes and Impacts, Environmental Science: Atmospheres.*

Member of the “Climate Change and Urbanization Track” Technical Chair Committee of the Indoor Air 2024 Conference, Honolulu, July 7-11, 2024.

Chair and co-convenor of the AGU 2022 Oral and Poster Sessions “Connecting Atmospheric Chemistry of Indoor and Outdoor Environments”, Chicago, IL, December 12-16, 2022.

Member of the “Chemical Assessment of Air Cleaning Technologies” Panel of the National Institute of Standards and Technology (2021 – present).

Chair of Healthy Buildings 2021 America sessions and research workshop, Virtual, January 18-20, 2022.

Lead convener of the European Geosciences Union session “Volatile Organic Compounds in the Atmosphere: Sources, Sinks and Transformations”, General Assembly 2019, Vienna, Austria, 7-12 April, 2019.

Session chair of Healthy Buildings 2017 Europe Conference, Lublin 2-5 July 2017. Session title: “Chemical Pollutants – Sources and Fates”.

Co-convenor of the European Geosciences Union session “Biosphere-Atmosphere Exchange, Biosynthesis, and Oxidation of Volatile Organic Compounds Across Terrestrial and Marine Ecosystems”, BG1.11, EGU General Assembly, Vienna, Austria, April 12-17, 2015.

Chair and convener of the oral session “Biosphere-Atmosphere Exchange, Biosynthesis, and Oxidation of Volatile Organic Compounds Across Terrestrial and Marine Ecosystems”, B22G, AGU Fall Meeting, San Francisco 9-13 December 2013.

Chair and convener of the poster session “Biosphere-Atmosphere Exchange, Biosynthesis, and Oxidation of Volatile Organic Compounds Across Terrestrial and Marine Ecosystems”, B23A, AGU Fall Meeting, San Francisco 9-13 December 2013.

Chair and convener of the oral session “Measurements and Modeling of Biogenic Volatile Organic Compounds Across Terrestrial and Marine Ecosystems and the Atmosphere I”, B44C, AGU Fall Meeting, San Francisco 3-7 December 2012.

Chair and convener of the poster session “Measurements and Modeling of Biogenic Volatile Organic Compounds Across Terrestrial and Marine Ecosystems and the Atmosphere II”, B51E, AGU Fall Meeting, San Francisco 3-7 December 2012.

Co-chair and co-convenor of oral sessions “Exchange Dynamics of Volatile Organic Compounds Between Plant Ecosystems and Atmosphere”, B53A and B54A, AGU Fall Meeting, San Francisco 5-9 December 2011.

Co-chair of poster session “Exchange Dynamics of Volatile Organic Compounds Between Plant Ecosystems and Atmosphere”, B51E, AGU Fall Meeting, San Francisco 5-9 December 2011.

## **PROFESSIONAL SOCIETY AFFILIATIONS**

Association of Environmental Engineering and Science Professors (AEESP)	2023 – current
American Society for Engineering Education (ASEE)	2021 – current
American Society of Civil Engineers (ASCE)	2019 – current
International Society of Indoor Air Quality and Climate (ISIAQ)	2016 – current
American Chemical Society (ACS)	2015 – current
American Society for Microbiology (ASM)	2018 – current
American Geophysical Union (AGU)	2009 – current
Royal Society of Chemistry (RSC)	2007 – current
FLUXNET	2008 – current

## **INTERVIEWS & MEDIA EVENTS/MENTIONS**

1. CNN, Jack Guy, “Rabbit gene turns houseplant into air detoxifier”, 21 Dec 2018.
2. AAAS, EurekAlert, Nat Levy, “COVID-19 has led to more deep cleaning: Which disinfectants and masks work best together?”, 29 April 2020.
3. Chemistry World, Nina Notman, “Human Chemical Communication”, 21 Sept 2020.

4. Medium, Mary Huber, “What’s That smell?”, 29, April 2021.
5. MotherJones, Madison Pauly, “Caution to the Wind”, 27 May 2021.
6. The Dallas Morning News, Sophie Austin, “Decades after closure of lead smelter, voices rise against other West Dallas polluters”, 22 August 2021.
7. KVUE abc TV, “No, plug-in air-fresheners are not safe for pets”, Nov 17, 2021.
8. New York Times, Melinda Wenner Moyer, “You’re Cleaning All Wrong”, May 5, 2022.

## RESEARCH GRANTS AND CONTRACTS

*Funded projects since starting at UT Austin in Fall 2019. Asterisk (\*) denotes grants where Dr. Misztal is lead PI for UT Austin.*

<i>Role and Co-Investigators</i>	<i>Title</i>	<i>Agency</i>	<i>Grant Total (My Share)</i>	<i>Grant Period</i>
Misztal (PI)*				
Adams (co-PI, Goldstein, Dannemiller (co-PI)	Chemistry of Homes: Environmental Microbes and Moisture (CHEMM)	A.P. Sloan	\$780,000 [25%]	1/1/19- 12/31/23
Misztal (co-PI)	RAPID: COVID Response: Identifying practices that minimize exposure to disinfection byproducts	NSF	\$190,337 [33%]	05/1/20- 04/30/21
Hildebrandt-Ruiz (PI), Novoselac (co-PI)				
Hildebrandt-Ruiz (PI), Misztal (co-PI)	Novel Measurements of Hydrocarbons in the Eagle Ford Shale	TARC	\$19,350 [50%]	04/01/20- 06/30/21
Misztal (PI)*	Emissions from Engineered Wood Samples with Different Binder Systems	HBN	\$25,000 [75%]	08/2020- 09/2021
Misztal (PI)*	Speciated measurements of VOCs in New York City by an in situ GC-TOF-MS for the characterization of primary emissions in urban air”	US Department of Commerce NOAA	\$249,956 [50%]	05/01/2021 - 04/30/2024
Claflin (co-PI)				
Misztal (co-PI)	Improving firefighter safety on firegrounds involving lithium-ion batteries	FEMA DHS	\$1,097,874 [33%]	01/01/2022- 12/31/2024
Ezekoye (PI)				
Mullins (co-PI)				
Misztal (co-PI)	Predictive, source-oriented modeling and measurements to evaluate community exposures to air pollutants and noise from unconventional oil and gas development	HEI Energy	\$2,499,960 [12%]	01/01/2022- 12/31/2024
Hildebrandt Ruiz (PI)				
coPIs: Matsui, Allen, Jia, Henneman, Wylie, Peng				

Misztal (PI)*	Mobile Air Quality Measurements in Austin region (pilot study)	VPR: WCWH	\$20,000 [100%]	11/2020— 08/2022
Misztal (PI)*, Hildebrandt (co-PI)	Novel Mobile Air Quality Measurements and VOC Source Apportionment in Central Texas	TARC	\$10,000 [75%]	04/01/2022 – 03/31/2023
Misztal (PI)*	Evaluation of Air Quality in UT Classrooms and Laboratories via Novel Spatiotemporal Measurements of Volatile Organic Compounds: Towards Enhancement of Students' Learning Comfort and Healthy Environment	UT Green Fund	\$49,575 [75%]	08/2022- 07/2023
Misztal (PI)*	CAREER: SPatiotemporal INvestigation of Urban Pollution and Air Quality (SPIN-UP-AQ)	NSF	\$670,812 [100%]	06/2022- 06/2027
Misztal (co-PI), Passalaqua (PI)	Southeast Texas Urban IFL: Equitable Solutions for Communities Caught between Floods and Air Pollution	DOE	\$27,000,000 [~5%]	09/2022- 05/2027

#### OTHER FUNDED AND UNFUNDED RESEARCH COLLABORATIONS

Meredith, Werner, Misztal* et al. (multi-collaborative effort with 50 participants, 20 research groups and 13 institutions)	B2-WALD (Biosphere 2 – Rainforest Water, Atmosphere and Life Dynamics)	Multiple funding sources		2019 - present
Goldstein, Nazaroff, Misztal (co-I)	Abundance, Sources, and Fates of Organic Chemicals in Residential Environments	A.P. Sloan	\$750,000	2016-2018

#### UNIVERSITY COMMITTEE ASSIGNMENTS

Departmental	Member, CAEE Distinguished Lecture Series Committee	2019-present
	Member, CAEE Department Search Committee for Building Energy and Environments	2020, 2023
	Member, CAEE Student Experience Committee	2021-present
	Member, CAEE Doctoral Qualification Exam	2020-present

## COURSES TAUGHT

CE388R/EVE377K Novel Air Quality Measurement Techniques, Graduate/Crosslisted, F21, F22, F23  
ARE102 (co-taught) Introduction to Architectural Engineering, Undergraduate, F21, F22  
CE 397/EVE377K Air Quality, Aerosols and Health, Graduate/Crosslisted, F21, F22, F23  
CE 397 – Novel Air Quality Measurement Techniques, Graduate, F19, F20  
CE 369R – Indoor Air Quality, Undergraduate, Sp20, Sp21, Sp22, Sp23  
CE 397C – Master’s Research, Graduate  
CE W397C – Master’s Research, Graduate  
CE 698A – Thesis, Graduate  
CE 397D, CE 697D – Dissertation Research. Graduate  
CE 999W – Dissertation, Graduate

## STUDENT RESEARCH AND ADVISING

### Students/Postdoctoral Researchers Supervised at UT Austin (Misztal Students)

**Graduate Research Assistants/PhD** – Daniel Blomdahl (NSF Fellow), Chou-Hsien Lin, Benjamin Marshall, Anna Neville, Evelyn Deveraux, Benjamin Kienzle, Olivia Brady

**Undergraduate Research Assistants** – Ishika Chandhok

**Postdoctoral Researchers** – Dr. Leif Jahn

**Research Associates** – Dr. Shahana Khurshid

**Graduated** - Emma Hall (MSE), Elena Christopher-Allison (MSE), Rileigh Robertson (MSE), Paulien Aerts

### PhD Dissertation Committee, Master Thesis Committee (Non-Misztal Students)

**Departmental of Civil, Architectural and Environmental Engineering** – Mark Campmier, Sarah Chambliss, Mengjia Tang, David Jarma, Samuel Brodfuehrer, Andre Fuqua, Ting-Yu Dai, Jordan French,

**Departmental of Chemical Engineering** – Catherine Masoud, Nirvan Bhattacharyya, Pearl Abue, Mrinali Modi, Kristi McPherson, Katarina Konon

## REFEREED, ARCHIVAL PUBLICATIONS

[Google Scholar](#), [ORCID](#), h-index: 42, i10-index: 68, Citations: 5071 (as of December 2023).

*Underlined and bold are Misztal UT students, Underlined and italic are other mentored UT students \* denotes Misztal’s UT postdocs, # denotes a mentored student outside of UT*

56. **Jahn, L.G.\***, Bhattacharyya, N., **Blomdahl, D.**, Tang, M., Abue, P., Novoselac, A., Hildebrandt Ruiz, L., & **Misztal, P.K.** (2023). Influence of Application Method on Disinfectant Byproduct Formation during Indoor Bleach Cleaning: A Case Study on Phenol Chlorination. ACS ES&T Air, 1(1).  
<https://doi.org/10.1021/acsestair.3c00011>

55. Zhang, J., Liu, J., Ding, X., He, X., Zhang, T., Zheng, M., Choi, M., Isaacman-VanWertz, G., Yee, L., Zhang, H. and **Misztal, P.**, et al. 2023. New formation and fate of Isoprene SOA markers revealed by field data-constrained modeling. Nature Climate and Atmospheric Science, 6(1), p.69.

54. Bhattacharyya, N., Tang, M., **Blomdahl, D.C., Jahn, L.G.\***, Abue, P., Allen, D.T., Corsi, R.L., Novoselac, A., **Misztal, P.K.** and Hildebrandt Ruiz, L., 2023. Bleach Emissions Interact Substantially with Surgical and KN95 Mask Surfaces. *Environmental Science & Technology*, 57(16), pp.6589-6598.
53. Kristensen, K., Lunderberg, D.M.#, Liu, Y., **Misztal, P.K.**, Tian, Y., Arata, C., Nazaroff, W.W. and Goldstein, A.H., 2023. Gas–Particle Partitioning of Semivolatile Organic Compounds in a Residence: Influence of Particles from Candles, Cooking, and Outdoors. *Environmental Science & Technology*, 57(8), pp.3260-3269.
52. **Jahn, L.G.\***, Tang, M., **Blomdahl, D., Bhattacharyya, N., Abue, P.**, Novoselac, A., Ruiz, L.H. and **Misztal, P.K.**, 2023. Volatile organic compound (VOC) emissions from the usage of benzalkonium chloride and other disinfectants based on quaternary ammonium compounds. *Environmental Science: Atmospheres*, doi:10.1039/D2EA00054G.
51. Molinier#, B., Arata#, C., Katz, E.F., Lunderberg, D.M., Liu, Y., **Misztal, P.K.**, Nazaroff, W.W. and Goldstein, A.H., 2022. Volatile Methyl Siloxanes and Other Organosilicon Compounds in Residential Air. *Environmental Science & Technology*.
50. Fritz, H., Bastami, S., Lin, C., Nweye, K., To, T., Chen, L., Le, D., Ibarra, A., Zhang, W., Park, J. Y., Waites, W., Tang, M., **Misztal, P.**, Novoselac, A., Thomaz, E., Kinney, K. and Nagy, Z.: Design, fabrication, and calibration of the Building Environment and Occupancy (BEVO) Beacon: A rapidly-deployable and affordable indoor environmental quality monitor, *Build. Environ.*, 222, 109432, doi:10.1016/J.BUILDENV.2022.109432, 2022.
49. Sreeram, A., Adwani, D., Arras, B., **Blomdahl, D.**, Misztal, P. and Bhasin, A., 2022. Comprehensive evaluation of the oxidative gas based aging method for loose asphalt mixtures. *Construction and Building Materials*, 352, p.129011.
48. Sreeram, A., **Blomdahl, D. C., Misztal, P.K.**, Bhasin, A.: High Resolution Chemical Fingerprinting and Real-Time Oxidation Dynamics of Asphalt Binders using Vocus Proton Transfer Reaction (PTR-TOF) Mass Spectrometry. *Fuel*, 320, p.123840, 10.1016/j.fuel.2022.123840, 2022.
47. Werner, C., Meredith, L. K., Ladd, S. N., Ingrisch, J., Kübert, A., Haren, J. v., Bahn, M., Bailey, K., Bamberger, I., Beyer, M., **Blomdahl, D.**, Byron, J., Daber, E., Deleeuw, J., Dippold, M. A., Fudyma, J., Gil-Loaiza, J., Honeker, L. K., Hu, J., Huang, J., Klüpfel, T., Krechmer, J., Kreuzwieser, J., Kühnhammer, K., Lehmann, M. M., Meeran, K., **Misztal, P. K.**, Ng, W.-R., Pfannerstill, E., Pugliese, G., Purser, G., Roscioli, J., Shi, L., Tfaily, M., and Williams, J.: Ecosystem fluxes during drought and recovery in an experimental forest, *Science*, 374, 1514–1518, doi:10.1126/science.abj6789, 2021.
46. **Hall, E.C.**, Haines, S.R., Marciniak, K., Goldstein, A.H., Adams, R.I., Dannemiller, K.C. and **Misztal, P.K.**: Varying humidity increases emission of volatile nitrogen-containing compounds from building materials. *Building and Environment*, p.108290, 2021.
45. Haines, S.R., **Hall, E.C.**, Marciniak, K., **Misztal, P.K.**, Goldstein, A.H., Adams, R.I. and Dannemiller, K.C., 2021. Microbial growth and volatile organic compound (VOC) emissions from carpet and drywall under elevated relative humidity conditions. *Microbiome*, 9(1), pp.1-20.
44. Arata, C.#, **Misztal, P.K.**, Tian, Y., Lunderberg#, D.M., Kristensen, K., Novoselac, A., Vance, M.E., Farmer, D.K., Nazaroff, W.W. and *Goldstein, A.H.*: Volatile organic compound emissions during HOMEChem. *Indoor air*, 1– 19, 2021.
43. Cash, J.M.#, Langford, B., Di Marco, C., Mullinger, N.J., Allan, J., Reyes-Villegas, E., Joshi, R., Heal, M.R., Acton, W.J.F., Hewitt, C.N. and **Misztal, P.K.**, et al.: Seasonal analysis of submicron aerosol in Old Delhi using high-resolution aerosol mass spectrometry: chemical characterisation, source apportionment and new marker identification. *Atmospheric Chemistry and Physics*, 21(13), pp.10133-10158, 2021.
42. Lunderberg, D.M.#, **Misztal, P.K.**, Liu, Y., Arata, C.#, Tian, Y., Kristensen, K., Weber, R.J., Nazaroff, W.W. and Goldstein, A.H., 2021. High-resolution exposure assessment for volatile organic compounds in two California residences. *Environmental Science & Technology*, 55(10), pp.6740-6751.
41. Lunderberg, D.M.#, Liu, Y., **Misztal, P.K.**, Arata, C.#, Tian, Y., Kristensen, K., Nazaroff, W.W. and Goldstein, A.H.: Intake Fractions for Volatile Organic Compounds in Two Occupied California Residences. *Environmental Science & Technology Letters*, 8(5), pp.386-391, 2021.

- 40.Liang, Y.#, Jen, C.N., Weber, R.J., **Misztal, P.K.** and Goldstein, A.H.: Chemical composition of PM 2.5 in October 2017 Northern California wildfire plumes. *Atmospheric Chemistry and Physics*, 21(7), pp.5719-5737, 2021.
- 39.Zhang, M.#, Xiong, J., Liu, Y., **Misztal, P.K.** and Goldstein, A.H.: Physical–Chemical Coupling Model for Characterizing the Reaction of Ozone with Squalene in Realistic Indoor Environments. *Environmental Science & Technology*, 55(3), pp.1690-1698, 2021.
- 38.Kim J.#, *Goldstein A.H.*, Chakraborty R., Jardine K., Weber R., Sorensen P.O., Wang S., Faybishenko B., **Misztal P.K.** and Brodie E.L.: Measurement of Volatile Compounds for Real-Time Analysis of Soil Microbial Metabolic Response to Simulated Snowmelt. *Front. Microbiol.* 12:679671. doi: 10.3389/fmicb.2021.679671, 2021.
- 37.Liu, Y., **Misztal, P. K.**, Arata, C., Weschler, C. J., Nazaroff, W. W. and *Goldstein, A. H.*: Observing ozone chemistry in an occupied residence, *Proc. Natl. Acad. Sci.*, 118(6), doi:10.1073/PNAS.2018140118, 2021.
- 36.Tian, Y., Arata, C.#, Boedicker, E., Lunderberg, D. M., Patel, S., Sankhyan, S., Kristensen, K., **Misztal, P. K.**, Farmer, D. K., Vance, M., Novoselac, A., Nazaroff, W. W. and Goldstein, A. H.: Indoor Emissions of Total and Fluorescent Supermicron Particles during HOMEChem, *Indoor Air*, doi:10.1111/ina.12731, 2021.
- 35.Heald, C. L., Gouw, J. De, Goldstein, A. H., Guenther, A. B., Hayes, P. L., Hu, W., Isaacman-Vanwertz, G., Jimenez, J. L., Keutsch, F. N., Koss, A. R., **Misztal, P.K.**, Rappenglück, B., Roberts, J. M., Stevens, P. S., Washenfelder, R. A., Warneke, C. and Young, C. J.: Contrasting Reactive Organic Carbon Observations in the Southeast United States (SOAS) and Southern California (CalNex), *Environ. Sci. Technol.*, doi:10.1021/acs.est.0c05027, 2020.
- 34.Roberts, S.C., **Misztal, P.K.**, and Langford, B.: Decoding the social volatilome by tracking rapid context-dependent odour changes. *Philosophical Transactions of the Royal Society B*, 10.1098/rstb.2019.0259, 2020.
- 33.Lunderberg, D. M.#, Kristensen, K., Tian, Y., Arata, C., **Misztal, P.K.**, Liu, Y., Kreisberg, N., Katz, E. F., Decarlo, P. F., Patel, S., Vance, M. E., Nazaroff, W. W. and Goldstein, A. H.: Surface Emissions Modulate Indoor SVOC Concentrations through Volatility-Dependent Partitioning, *Environ. Sci. Technol.*, doi:10.1021/acs.est.0c00966, 2020.
- 32.Dayan, C.#, Fredj, E., **Misztal, P.K.**, Gabay, M., Guenther, A. B. and Tas, E.: Emission of biogenic volatile organic compounds from warm and oligotrophic seawater in the Eastern Mediterranean, *Atmos. Chem. Phys.*, 20(21), 12741–12759, doi:10.5194/acp-20-12741-2020, 2020.
- 31.Haines, S. R., Adams, R. I., Boor, B. E., Bruton, T. A., Downey, J., Ferro, A. R., Gall, E., Green, B. J., Hegarty, B., Horner, E., Jacobs, D. E., Lemieux, P., **Misztal, P. K.**, Morrison, G., Perzanowski, M., Reponen, T., Rush, R. E., Virgo, T., Alkhayri, C., Bope, A., Cochran, S., Cox, J., Donohue, A., May, A. A., Nastasi, N., Nishioka, M., Renninger, N., Tian, Y., Uebel-Niemeier, C., Wilkinson, D., Wu, T., Zambrana, J. and Dannemiller, K. C.: Ten questions concerning the implications of carpet on indoor chemistry and microbiology, *Build. Environ.*, 170, 2020.
- 30.Arata, C.#, Heine, N., Wang, N., **Misztal, P.K.**, Wargoeki, P., Beko, G., Williams, J., Nazaroff, W.W., Wilson, K.R. and *Goldstein, A.H.*: Heterogeneous Ozonolysis of Squalene: Gas-Phase Products Depend on Water Vapor Concentration. *Environmental Science & Technology*, 53, 14441-14448, 2019.
- 29.Liu, Y., **P.K. Misztal**, J. Xiong, Y. Tian, C. Arata, R.J. Weber, W.W. Nazaroff, *A.H. Goldstein*, Characterizing sources and emissions of volatile organic compounds in a northern California residence using space- and time-resolved measurements, *Indoor Air*, 29 (4), 630–644, DOI: 10.1111/ina.12562, 2019.
- 28.Kristensen, K., D.M. Lunderberg#, Y. Liu, **P.K. Misztal**, Y. Tian, C. Arata, W.W. Nazaroff, *A.H. Goldstein*, Sources and Dynamics of Semivolatile Organic Compounds in a Single-Family Residence in Northern California, *Indoor Air*, 29 (4), 645–655, DOI: 10.1111/ina.12561, 2019.
- 27.Xiong, J.Z. He, X.Tang, **P.K. Misztal**, and *A.H. Goldstein*, Modeling the Time-Dependent Concentrations of Primary and Secondary Reaction Products of Ozone with Squalene in a University Classroom, *Environ. Sci. Technol.*, 53, 14, 8262-8270, DOI: 10.1021/acs.est.9b02302, 2019.
- 26.Lunderberg, D.#, K. Kristensen, Y. Liu, **P.K. Misztal**, Y. Tian, C. Arata, R. Wernis, N. Kreisberg, W.W. Nazaroff, and *A.H. Goldstein*, Characterizing Airborne Phthalate Concentrations and Dynamics in a



- Normally Occupied Residence, *Environ. Sci. Technol.*, 53, 137,337-7346, DOI: 10.1021/acs.est.9b02123, 2019.
25. **Misztal, P. K.**, Lymperopoulou, D. S., Adams, R., Scott, R., Lindow, S., Bruns, T., Taylor, J. W., Uehling, J., Bonito, G., Vilgalys, R., and *Goldstein, A. H.*: Emission Factors of Microbial Volatile Organic Compounds from Environmental Bacteria and Fungi, *Environmental Science & Technology*, 10.1021/acs.est.8b00806, 2018.
24. Arata, C., K.J. Zarzana, **P.K. Misztal**, Y. Liu, S.S. Brown, W.W. Nazaroff, and *A.H. Goldstein*, Measurement of NO<sub>3</sub> and N<sub>2</sub>O<sub>5</sub> in a Residential Kitchen, *Environ. Sci. Technol. Lett.*, 5 (10), pp 595–599, DOI: 10.1021/acs.estlett.8b00415, 2018.
23. Isaacman-VanWertz, G., Massoli, P., O'Brien, R., Lim, C., Franklin, J. P., Moss, J. A., Hunter, J. F., Nowak, J. B., Canagaratna, M. R., **Misztal, P. K.**, Arata, C., Roscioli, J. R., Herndon, S. T., Onasch, T. B., Lambe, A. T., Jayne, J. T., Su, L., Knopf, D. A., *Goldstein, A. H.*, Worsnop, D. R., and Kroll, J. H.: Chemical evolution of atmospheric organic carbon over multiple generations of oxidation, *Nature Chemistry*, 10.1038/s41557-018-0002-2, 2018.
22. Liu, Y., **P.K. Misztal**, J. Xiong, Y. Tian, C. Arata, W.W. Nazaroff, *A.H. Goldstein*, Detailed investigation of ventilation rates and airflow patterns in a northern California residence, *Indoor Air*, 1–13, DOI: 10.1111/ina.12462, 2018.
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6. Karl, T., **Misztal, P. K.**, Jonsson, H. H., Shertz, S., *Goldstein, A. H.*, and Guenther, A. B.: Airborne flux measurements of BVOCs above Californian oak forests: Experimental investigation of surface and entrainment fluxes, OH densities and Dahmköhler numbers, *J Atmos Sci*, 10.1175/jas-d-13-054.1, 2013.
5. **Misztal, P. K.**, *Heal, M. R.*, Nemitz, E. and *Cape, J. N.*, Development of PTR-MS selectivity for structural isomers: Monoterpenes as a case study, *International Journal of Mass Spectrometry* 310, pp. 10-19, 2012.
4. **Misztal, P. K.**, Nemitz, E., Langford, B., Di Marco, C. F., Phillips, G. J., Hewitt, C. N., MacKenzie, A. R., Owen, S. M., Fowler, D., *Heal, M. R.* and *Cape, J. N.*, Direct ecosystem fluxes of volatile organic compounds from oil palms in South-East Asia, *Atmospheric Chemistry and Physics* 11, pp. 8995-9017, 2011.
3. Hewitt, C. N., Ashworth, K., Boynard, A., Guenther, A., Langford, B., MacKenzie, A. R., **Misztal, P. K.**, Nemitz, E., Owen, S. M., Possell, M., Pugh, T. A. M., Ryan, A. C. and Wild, O., Ground-level ozone influenced by circadian control of isoprene emissions, *Nature Geoscience* 4, pp. 671-674, 2011.
2. **Misztal, P. K.**, Owen, S. M., Guenther, A. B., Rasmussen, R., Geron, C., Harley, P., Phillips, G. J., Ryan, A., Edwards, D. P., Hewitt, C. N., Nemitz, E., Siong, J., *Heal, M. R.*, and *Cape, J. N.*: Large estragole fluxes from oil palms in Borneo, *Atmospheric Chemistry and Physics*, 10, 4343-4358, 10.5194/acp-10-4343-2010, 2010.
1. Langford, B., **Misztal, P. K.**, Nemitz, E., Davison, B., Helfter, C., Pugh, T. A. M., MacKenzie, A. R., Lim, S. F., and Hewitt, C. N.: Fluxes and concentrations of volatile organic compounds from a South-East Asian tropical rainforest, *Atmospheric Chemistry and Physics*, 10, 8391-8412, 10.5194/acp-10-8391-2010, 2010.

## BOOK CHAPTERS

1. Misztal P.K.: Measuring rapid changes in plant volatiles at different spatial levels. In: Blande, J., Glinwood, R. (eds): Deciphering chemical language of plant communication, pp. 95 -114. Springer, 2016.

## INVITED TALKS AND SEMINARS

1. **Misztal, P.K.**, *What Controls the Diversity and Variability of BVOC Emissions from Bacteria and Fungi?* Gordon Research Conference, Biogenic Hydrocarbons & the Atmosphere, Girona, Spain. 26 Jun – 1 Jul 2016. (Invited)
2. **Misztal, P.K.**, *Tracking the sources of volatile organic compounds in an occupied home.* Healthy Buildings Europe 2017, Lublin, Poland. 2-5 Jul 2017. (Invited)
3. **Misztal, P.K.**, *Probing indoor microbial VOC emissions with PTR-TOF-MS.* Healthy Buildings Europe 2017, Lublin, Poland. 2-5 Jul 2017. (Invited)
4. **Misztal, P.K.**, *Emission of microbial volatile organic compounds by bacteria and fungi.* American Chemical Society (California Section) meeting, USDA, Albany, CA. 25 Jan 2018.
5. **Misztal, P.K.**, *Field measurements of human VOC bioeffluents using PTRMS.* Indoor Air 2018 Conference, Philadelphia, PA. 22-27 Jul 2018. (Invited)
6. **Misztal, P.K.**, *How do microbial volatile organic compounds affect chemistry of indoor environments?* Chemistry of Indoor Environments (CIE) Conference, Boulder, CO. 24-26 Oct 2018. (Invited)
7. **Misztal, P.K.**, *Emission of biogenic volatile organic compounds from humans and microbes.* EU COST Indoorpollnet indoor air network: The University of York, 13-14 Dec 2018. (Invited)
8. **Misztal, P.K.**, *Humans, Microbiomes and Air Quality.* Chemical Engineering Seminar, UT Austin, 28 Aug 2019 (Invited).
9. **Misztal, P.K.**, *BVOC Emissions from Humans and Microbes*, invited lecture, University of Copenhagen, 7 Nov 2019 (Invited).
10. **Misztal, P.K.**, *Air Quality and Human Health*, invited talk, University of Aarhus, Denmark, 6 Nov 2019 (Invited).
11. **Misztal, P.K.**, *Airborne Flux Measurements*, invited lecture, University of Copenhagen, Denmark. 5 Nov 2019 (Invited).
12. **Misztal, P.K.**, *Microbial and non-microbial volatile organic compounds from indoor materials subjected to dust and moisture.* ESES-ISIAQ Conference, Kaunas, Lithuania. 18-22 Aug 2019 (presented by Glenn Morrison) (Invited).
13. **Misztal, P.K.**, *Interactions between Chemistry and Microbiology in Carpets based on CHEMM Measurements*, Ohio State University, Columbus, OH, 30-31 Jul 2019 (Invited).
14. **Misztal, P.K.**, *Future Directions in Understanding Human Volatilome*, Indoor Air 2020 Conference, November 1-5, 2020 (Invited).
15. **Blomdahl D.**, *Chemical Exposure to disinfection byproducts interacting on personal face masks*, RIG Sensors Seminar Series, University of Texas at Austin, October 9, 2020. <https://youtu.be/6xwzePtGt>
16. **Misztal, P.K.**, *What's in your cleaner and why should you care?* Invited Webinar in the series of “Aerosols, Fomites, and Air Quality: what research says about the impact of cleaning on health”, Cleaning Industry Research Institute (CIRI), June 24, 2021 (Invited).
17. **Misztal, P.K.**, *Mobile Air Quality Measurements in Austin and the Region*, Invited Webinar, “Environmental Sensing Panel”, Whole Communities Whole Health – Interdisciplinary Seminar Series, July 22, 2021 (Invited).
18. **Misztal, P.K.**, *Novel Ultrasensitive Spatiotemporal Measurements of Volatile Organic Compounds Including Air Toxics in the Metropolitan Austin Area and Beyond*, Air Quality Professionals Forum, First Quarter 2022 Meeting, CAPCOG Austin (virtual), 2022 (Invited).
19. **Misztal, P.K.**, *Health Impacts of Indoor Air Quality*, Texas Academy of Medicine, Engineering, Science and Technology (TAMEST), San Antonio, June, 22, 2022 (invited).
20. **Misztal, P.K.**, *Novel ultrasensitive spatiotemporal measurements of volatile organic compounds including air toxics in Texas*, UT Dallas, September 23-24, 2022 (invited).
21. **Misztal, P.K.**, *Novel Ultrasensitive Spatiotemporal Measurements of Volatile Organic Compounds Outdoors and Indoors*, Northwestern University, May 12, 2023.

## COMMUNITY OUTREACH/EDUCATION/PUBLIC SERVICE

1. Hosting Region 6 EPA directors and staff and demonstrating novel mobile AQ measurements, Beaumont/Port Arthur, TX, February 28, 2023.
2. Del Valle Day Outreach Event (co-hosted by WCWH): demonstration of molecule building and mobile Sniffer lab real-time measurements, Austin, TX, June 3, 2023.
3. Community outreach “What’s in you?” in East Austin (co-organized with C2H), demonstration of air quality impacts from candle burning. Austin, June 10, 2023.
4. Air Quality Measurement Demonstration and Outreach at the Community Coalition for Health (C2H) Event at Del Valle, Austin, November 19, 2022.
5. Community Outreach as part of UT Whole Communities Whole Health, Novel Mobile Air Quality measurements in vulnerable communities and fingerprinting odor and pollution plumes, 2019-2021.
6. Volunteer at American Chemical Society (California Section) Event “Chemistry Helps Feed The World”. Demonstrating to the public Molecule Building of Plant’s Volatiles and Scents. John Muir National Historic Site, Martinez, CA. 22 April 2017.

## CONFERENCE PROCEEDINGS AND OTHER PRESENTATIONS

Underlined and bold are *Misztal* UT students, Underlined and italic are other mentored UT students \* denotes *Misztal*’s UT postdocs, # denotes a mentored student outside of UT

1. Phillips, G.; Di Marco, C.; **Misztal, P.**; Nemitz, E.; Farmer, D.; Kimmel, J.; Jimenez, J.. 2008 Ambient aerosol in Southeast Asia: high resolution aerosol mass spectrometer measurements over oil palm (*Elaeis guineensis*). *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., A11C-0123.
2. Nemitz E., **Misztal P.**, Langford B., Oram D., Phillips G., Di Marco C., Davison B., Hewitt N., Cape N. (2008) Fluxes and in-canopy gradients of biogenic volatile organic compounds above contrasting South East Asian land uses. *Eos Trans. AGU* 89, Abstract A14C-07.
3. **Misztal, P.K.**; Langford, B.; Cape, J.N.; Nemitz, E.; Helfter, C.; Di Marco, C.; Phillips, G.; Owen, S.; Davison, B.; Heal, M.R.; Hewitt, C.N.; Fowler, D.. 2008 Biogenic VOC emissions from rainforest and oil palm plantations in South East Asia (contribution to OP3 and ACES projects). [Poster] In: NCAS Atmospheric Science Conference, Bristol, UK, 8 - 10 Dec 2009.
4. **Misztal, P.K.**; Langford, B., Di Marco, C.F., Phillips, G. J., Hewitt, N.C., Cape, J. N., Heal, M. R., Nemitz, E. (2009) PTR-MS measurements of concentrations and fluxes of biogenic VOCs in the humid tropics - rain forest vs. oil palm plantation. [oral] 4th International Conference on Proton Transfer Reaction Mass Spectrometry and its Applications, Obergurgl, Austria, 16 - 21 Feb 2009. Innsbruck, Austria, Innsbruck University Press, 120-124.
5. **Misztal, P.K.**; Cape, J.N.; Langford, B.; Nemitz, E.; Helfter, C.; Owen, S.; Heal, M.R.; Hewitt, C.N.; Fowler, D. (2009) BVOC fluxes from oil palm canopies in South East Asia. *Geophysical Research Abstracts*, 11, EGU2009-12061-1.
6. Karl, T, Guha, A, Peischl, J, **Misztal, P K**, Jonsson, H, Goldstein, A H, Ryerson, T B (2011), Mapping methane emission sources over California based on airborne measurements. Abstract A41B-0092 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
7. Tyndall, G.S., Orlando, J.J., Volkamer, R., Waxman, E., Thalman, R.M., Kim, S., **Misztal, P.K.**, Karl, T., Hasson, A.S., Vu, K.K., Scruggs, A.K., Maitra, S., Taraborrelli, D. (2011) Reactions of Isoprene and Some of its Reaction Products, Abstract A21I-06 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
8. Guenther, A.B., Harley, P. C., Karl, T., Turnipseed, A., Goldstein, A. H., **Misztal, P.K.**, Potosnak, P. (2011) Improving processes and parameterizations in the Model of Emissions of Gases and Aerosols from Nature version 2.1 (MEGAN2.1) using eddy covariance measurements of volatile organic compound fluxes (Invited), Abstract B53A-05 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
9. Goldstein, A.H., Fares, S., Gentner, D.R., Park, J., Weber, R., Ormeno, E., Holzinger, R., **Misztal, P.K.**, Karl, T., Guenther, A.B., Fischer, M.L., Harley, R.A., Karlik, J.F. (2011) New observations of VOC emissions and concentrations in, above, and around the Central Valley of California, Abstract A32B-09 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

10. **Misztal, P.K.**, Karl, T., Guha, A., Weber, R., Jonsson, H., Guenther, A.B., Goldstein A.H. (2011) Fluxes and concentrations of BVOCs from CABERNET aircraft campaign over California, Abstract B51E-0438 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
11. **Misztal, P.K.**, Karl, T., Jiang, X., Avise, J.C., Scott, K., Jonsson, H., Guenther, A.B., Goldstein A.H. (2012) Constraining isoprene emission factors using airborne flux measurements during CABERNET, Abstract B51E-0607 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
12. **Misztal, P.K.**, Romer, P., Duffey, K., Cohen, R.C., Kaser, L., Seco, R., Park, J-H, Kim, S., Guenther, A.B., and Goldstein, A.H. (2013) Biogenic VOC Oxidation is Modulated by Anthropogenic Pollution in the South East US, Abstract A23G-04. Presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
13. Mcavey, K. M., Groff, C. J., Xiong, F., Seeley, J. V., Starn, T., Feiner, P. A., ..., **Misztal, P. K.**, ... & Shepson, P. B. (2014, December). Study of the impact of organic nitrate production on ozone production in a southeastern mixed forest environment using a 0-D photochemical model. In AGU Fall Meeting Abstracts (Vol. 1, p. 3203).
14. Feiner, P. A., Brune, W. H., ..., **Misztal, P. K.**, ... & Koss, A. (2014, December). Atmospheric Oxidation in a Southeastern US Forest: Examination of the Discrepancies Between Modeled and Observed OH in a Forest Environment. In AGU Fall Meeting Abstracts (Vol. 1, p. 3195).
15. Goldstein, A.H., Isaacman, G., **Misztal, P.K.**, Yee L., Olson, K., Moss, J., Kreisberg, N., Hering S., Park, J.-H., Kaser, L., Seco, R., Guenther, A., Su, L., Mak, J., Holzinger, R., Hu, W., Campuzano-Jost P., Palm, B., Day, D., Jimenez, J., Koss, A., De Gouw, J. (2014) Observing BVOC Emissions, Oxidation, Deposition, and Interactions with Anthropogenic Pollutants to Form SOA in the Southeast United States, Abstract A33M-01. Presented at 2014 Fall Meeting, AGU San Francisco, Calif., 15-19 Dec.
16. Amador-Muñoz, O., **Misztal, P.K.**, Weber, R., Drozd, G., Worton, D., Goldstein, A.H. (2014) Optimization of H<sub>3</sub>O<sup>+</sup>/O<sub>2</sub><sup>+</sup> Dual-mode Ionization in PTR-MS for Simultaneous Detection of Alkanes, Olefins and Aromatic Compounds, Abstract A23D-3268. Presented at 2014 Fall Meeting, AGU San Francisco, Calif., 15-19 Dec.
17. **Misztal, P.K.**, Arata, C., Su L., Park, J.-H., Holzinger, R., Seco, R., Kaser, L., Mak, J., Guenther, A., Goldstein, A.H. (2014) The Bidirectional Exchange of VOCs between a Mixed Forest and the Atmosphere in the Southeast US, Abstract A33C-3198. Presented at 2014 Fall Meeting, AGU San Francisco, Calif., 15-19 Dec.
18. **Misztal, P.K.**, Guenther, A.B., and Goldstein A.H. (2015) Observations of Vertical Gradients in Composition, Oxidation States, and Diurnal Dynamics for a Comprehensive Suite of VOCs from 10 to 525 m in the San Joaquin Valley, California. Presented at 2015 AGU Fall Meeting. AGU, 2015.
19. Goldstein, A.H., Isaacman-VanWertz, G.A., Yee, L., Zhang, H., **Misztal, P.K.**, Wernis, R.A., Kreisberg, N.M., Hering, S.V., Seco, R., Guenther, A.B. and Su, L., 2016, February. Using Molecular Tracers to Understand BVOC Interactions with Anthropogenic Pollutants in the Southeast US and Amazonia. In AGU Fall Meeting Abstracts.
20. Arata, C., **Misztal, P.K.**, Isaacman-VanWertz, G.A., Yee, L., Franklin, J.P., O'Brien, R., Lim, C.Y., Massoli, P., Lambe, A.T., Nowak, J.B. and Onasch, T.B., 2016, February. Oxidation of Tree Oil Containing a Complex Mixture of Sesquiterpenes: Keeping Track of the Carbon. In AGU Fall Meeting Abstracts.
21. Romer, P., Duffey, K., Wooldridge, P.J., Brune, W.H., Miller, D.O., Feiner, P.A., Zhang, L., Goldstein, A.H., Olson, K.F., **Misztal, P.K.** and De Gouw, J.A., 2016, February. On the Response of Ozone to Temperature at Low NO<sub>x</sub> Concentrations. In AGU Fall Meeting Abstracts.
22. **Misztal, P.K.**, Su, L., Park, J., Holzinger, R., Nguyen, T., Teng, A., St Clair, J.M., Wennberg, P.O., Crounse, J., Seco, R. and Karl, T., 2016, February. Flux observations of isoprene oxidation products above a South East US forest point to chemical conversions on leaf canopy surface. In AGU Fall Meeting Abstracts.
23. Meredith, L.K., Gil-Loaiza, J., Roscioli, J.R., Shorter, J.H., Krechmer, J.E., Tfaily, M.M., U'Ren, J., **Misztal, P.K.**, Singer, E., Commane, R. and Buzzard, V., 2019. Integrating Soil Genomics into the Study of Biosphere-Atmosphere Trace Gas Fluxes. AGUFM, 2019, pp.A32D-01.
24. Daber, L.E., Bramberger, I., Ladd, N., Kreuzwieser, J., **Misztal, P.K.**, Meredith, L.K. and Werner, C., 2019. Plant carbon allocation in tropical forests under drought stress-Shifting the balance between primary and secondary metabolism such as CO<sub>2</sub> and VOC emissions. AGUFM, 2019, pp.B11O-2181.

25. Werner, C., Daber, L.E., Bramberger, I., Ladd, N., Yáñez-Serrano, A.M., Fasbender, L., **Misztal, P.K.**, Meredith, L.K. and Kreuzwieser, J., 2019. Link between plant volatile organic compound (VOC) emissions and CO<sub>2</sub> metabolism from sub-molecular to ecosystem scales by 13 C-labelling. AGUFM, 2019, pp.B110-2195.
26. Haines S., Hall E. C., **Misztal P. K.**, Goldstein A. H., Adams R. I., and Dannemiller K. C., „Measuring Microbial Growth and MVOC Emissions in Carpet and Drywall Under Elevated Relative Humidity”, AAAR Conference, 2020.
27. Tang M., Corsi R., Siegel J., **Misztal P.**, and Novoselac, A, “Testing and Evaluation of Ozone Removal Air Cleaning Devices for Improving IAQ, ASHRAE AP-1579, Online, July 15, 2020.
28. **Blomdahl D.**, Meredith, L., Werner, C., Ladd, N., Langford, B., Nemitz, E., van Haren, J., Bamburger, I., Purser, G., Byron, J., and **Misztal, P.** “Biogenic VOC emissions under drought and temperature stress, EGU General Assembly 2020, Online, 4 – 8 May 2020, EGU2020-10910.
29. **Blomdahl D.**, “Biogenic VOC emissions under drought and temperature stress: implications for climate change and air quality”, Environmental and Water Resource Engineering Research Seminar Series, University of Texas at Austin, April 9, 2020.
30. **Emma C Hall**, Sarah Haines, Karen C. Dannemiller, Katarzyna Marciniak, Robin Weber, Allen H Goldstein, Rachel Adams, and **Pawel K Misztal**: Full House: Microbial and Nonmicrobial Volatile Organic Compounds Competing for “Residency” in Indoor Environments at Cycling Relative Humidity. The 16th Conference of the International Society of Indoor Air Quality & Climate (Indoor Air 2020), Paper ID: ABS-1211, 2020.
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**PROFESSIONAL EXPERIENCE – Non-academic**

UK Research and Innovation/NERC	Research Scientist	2018 – 2019
National Center for Atmospheric Research	Visiting Researcher	2010 – 2011
NERC Centre for Ecology & Hydrology	Research Student	2007 – 2010