WILLIAM P. BAHNFLETH, Ph.D., P.E.

EDUCATION

Ph.D.	Mechanical Engineering	University of Illinois at Urbana-Champaign	1989
B.Mus. (Highest Hons.)	Music	University of Illinois at Urbana-Champaign	1988
M.S.	Mechanical Engineering	University of Illinois at Urbana-Champaign	1980
B.S. (Highest Hons.)	Mechanical Engineering	University of Illinois at Urbana-Champaign	1979

PROFESSIONAL EXPERIENCE

2005 – present	Professor of Architectural Engineering
12/2016 – 6/2017	Guest Professor, Technical University of Denmark
2002 – 2019	Director, Indoor Environment Center
1/2002 – 7/2002	Visiting Professor, University of Wisconsin-Madison
2000 – 2005	Associate Professor of Architectural Engineering, The Pennsylvania State University
1994 – 2000	Assistant Professor of Architectural Engineering, The Pennsylvania State University
1989 – 1994	Senior Consultant, ZBA, Incorporated, Cincinnati, OH
1985 - 1989	Principal Investigator, US Army Construction Engineering Research Laboratory, Champaign, IL

RESEARCH INTERESTS

Indoor air quality, Indoor bioaerosol control, Ultraviolet air and surface disinfection, HVAC system energy efficiency, District energy systems, Thermal energy storage

PROFESSIONAL AFFILIATIONS

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
American Society of Mechanical Engineers, Member (ASME)
International Society of Indoor Air Quality and Climate (ISIAQ)
International Building Performance Simulation Association (IBPSA) (1989-present)

PROFESSIONAL ACTIVITIES (highlights)

Chair, ASHRAE Epidemic Task Force (March 2020 – present)
Clean Air Act Advisory Committee (2019-2021)
President, ASHRAE (2013-2014)
Indoor Environmental Quality Global Alliance – founder and 1st Vice-President (2014 – present)
Committee on Protecting Occupants of DOD Buildings from Chemical and Biological Release (2006-2007)
Working Group on the Potential of Enhanced Building Filtration in Reduction of Anthrax Morbidity and Mortality Following a Bioterrorism Attack. Alfred P. Sloan Foundation (2005-2006)

HONORS AND AWARDS

ASHRAE: Exceptional Service Award, 2008; Technical and Symposium Best Paper Award, 2007; Fellow, 2005; Distinguished Service Award, 1998; Technology Award, 1st Place, 1995, Louise and Bill Holladay Distinguished Fellow Award, 2018; E.K. Campbell Award of Merit, 2019; Donald Bahnfleth Environmental Health Award, 2019; F. Paul Anderson Award, 2020
ASME: Fellow, 2012; Best Paper, ASME/AIChE Heat Transfer Conference, 1984
ISIAQ: Fellow, 2016
Penn State Engineering Alumni Society, World Class Engineering Faculty Award 2016
National Science Foundation Graduate Fellowship, 1979-1982

SELECTED PUBLICATIONS (of more than 170)

Tang, J., W. Bahnfleth, P. Bluyssen, G. Buonanno, J. Jimenez, J. Kurnitski, Y. Li, S. Miller, C. Sekhar, L. Morawska, L. Marr, A. Melikov, W. Nazaroff, P. Nielsen, R. Tellier, P. Wargocki, S. Dancer. 2021. Dismantling myths on the airborne transmission of severe acute respiratory syndrome coronavirus (SARS-CoV-2). 2020 Journal of Hospital Infection.

Morawska, L., J. Tang, W. Bahnfleth, P. Bluyssen, A. Boerstra, G. Buonanno, J. Cao, S. Dancer, A. Floto, F. Franchimon, C. Haworth, J. Hogeling, C. Isaxon, J., L. Jimenez, J. Kurnitski, Y. Li, M. Loomans, G. Marks, L. Marr, L. Mazzarella, A. Melikov, S. Miller, D. Milton, W. Nazaroff, P. Nielsen, C. Noakes, J. Peccia, X.

Querol, C. Sekhar, O. Seppänen, S. Tanabe, R. Tellier, K-W Tham, P. Wargocki, A. Wierzbicka, M. Yao. 2020. How can airborne transmission of COVID-19 indoors be minimised? Environment International. v. 142, 7 pages.
Kowalski, W., W. Bahnfleth, M. Ragues, R. Moeller. 2019. The Cluster Model of Ultraviolet Disinfection Explains Tailing Kinetics. J. Applied Microbiology. 12 pages. doi.org/10.1111/jam.14527
Firrantello, J. and W. Bahnfleth. 2017. Simulation and monetization of collateral airborne infection risk improvements from UVGI for coil maintenance. Science and Technology for the Built Environment, 24(2): 135-148.
Jeong, J., J. Bem, W. Bahnfleth, J. Freihaut, and B. Thran. 2009. Critical review of aerosol particle transport models for building HVAC ducts. *ASCE Journal of Architectural Engineering* 15(3):74-83.
Bahnfleth, W., P. Saekow, J. Firrantello, and P. Kremer. 2012. Semi-Quantitative and Formal Metrics for Multizone Air Flow Model Quality Assessment. *International Journal of HVAC&R Research 18(1-2):252-263.*
Wang, Y., C. Sekhar, W. Bahnfleth, K. W. Cheong, J. Firrantello 2016. Effectiveness of an ultraviolet germicidal irradiation system in enhancing cooling coil energy performance in a hot and humid climate. Energy and Buildings 130:321-329.
Martin, S., C. Dunn, J. Freihaut, W. Bahnfleth, J. Lau, A. Nedeljkovic-Davidovic. 2008. Ultraviolet germicidal irradiation: current best practices. *ASHRAE Journal* 50(8): 28-36.
Firrantello, J., P Aumpansub, W. Bahnfleth, B. Hu, J. Freihaut, B. Thran, S. Hutchens. 2007. Effects of HVAC system and building characteristics on exposure of occupants to short duration point source aerosol releases. *ASCE Journal of Architectural Engineering* 13(2):84-94.
National Research Council. 2007. "Protecting building occupants and operations from biological and chemical airborne threats." Committee on Protecting Occupants of DOD Buildings from Chemical and Biological Release. Washington, DC. National Academies Press. 152 pages. ISBN 0-309-10956-6.
Hitchcock, P., M. Mair, T. Inglesby, J. Gross, D. Henderson, T. O'Toole, J. Ahern-Seronde, W. Bahnfleth, T. Brennan, H. Burroughs, C. Davidson, W. Delp, D. Ensor, R Gomory, P. Olsiewski, J. Samet, W. Smith, A. Streifel, R. White, and J. Woods. 2006. Reducing exposure to aerosolized infectious agents in a building; recommendations of the Working Group on HVAC Systems to Reduce Risks Posed by Biological Attacks. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, And Science* 4(1): pp. 1-15.
National Research Council. 2003. Review of EPA Homeland Security Efforts: Safe Buildings Program Research Implementation Plan. Review of EPA Homeland Security Efforts: Committee on the Safe Buildings Program. Washington, DC: National Academies Press. 38 pages. ISBN 0-309-52823-2.
Kowalski, W., W. Bahnfleth and A. Musser. 2003. Modeling bioterrorism defense systems in a commercial office building. *ASCE Journal of Architectural Engineering* 9(2):86-96.
Kowalski, W. and W. Bahnfleth. 2000. Effective UVGI system design through improved modeling. *ASHRAE Transactions* 106(2): 721-730.
Kowalski, W., W. Bahnfleth and T. Whittam. 1999. Filtration of airborne microorganisms: modeling and prediction. *ASHRAE Transactions* 105(2): 4-17.

SELECTED SPONSORED RESEARCH (of approximately $5 million in awards as PI or co-PI)

- Optical Radiation as an Engineering Control for SARS-CoV-2 and Other Coronaviruses. Penn State COVID seed grant program.
- Field Measurements and Modeling of UVC Cooling Coil Irradiation for HVAC Energy Use Reduction (1738-URP). American Society of Heating, Refrigerating and Air-Conditioning Engineers.
- Impact of Air Return Strategy on Building Energy Consumption and Indoor Air Quality. National Center for Energy Management and Building Technologies
- Rapid semi-empirical tool for estimating air flow in facilities (T-PR-1984). Combating Terrorism Technical Support Office, Technical Support Working Group, Department of Homeland Security
- Indoor bioaerosol reservoir characterization and deposition/resuspension rate determination. Department of the Army.
- Resuspension characteristics and surface sampling protocol for indoor bioaerosol contaminants. Department of the Army
- Determination of protocols and test methods for devices intended to provide cost effective bioaeorsol control in ducted HVAC systems with germicidal UV radiation. National Center for Energy Management and Building Technologies