International Wind Engineering Seminar 2: Indoor and Outdoor Ventilation and Dispersion

Indoor and Outdoor Ventilation and Dispersion: Thursday November 5th 12.00 noon UK time

Main Speaker

Outdoor and indoor ventilation and dispersion associated with COVID-19 transmission. Prof Bert Blocken, Eindhoven University, The Netherlands; KU Leuven, Belgium

Panel Members

Prof Ted Stathopoulos, Concordia University, Montreal, Canada

Prof Kenny Kwok, University of Sydney, Australia

Prof Yoshihide Tominaga, Niigata Institute of Technology, Japan

Dr. Eoghan Clifford NUI Galway, Republic of Ireland

Abstract

Within a time span of only a few months, the SARS-CoV-2 virus has managed to spread across the world. This virus can spread by close contact, which includes large droplet spray and inhalation of microscopic droplets, and by indirect contact via contaminated objects. This presentation addresses large droplet and aerosol dispersion in outdoor and indoor environments, associated with different types of sports activities or scenes. First, droplet and aerosol spreading in cycling pelotons is analyzed, and the wide range of often contradictory views from scientists from different fields are summarized. Second, a strategy is proposed to safely re-open and keep open indoor sports centers during the COVID-19 pandemic. Third, some recently realized and ongoing practical research projects are briefly outlined, including the measurement and reduction of aerosol concentrations in a fitness center, the measurement and reduction of aerosol concentrations in the team bus of a professional cycling team for the past Tour de France and a project on aerosol assessment in football stadia.

Speaker and panel member biographies

Professor Bert Blocken (born in1974 in Hasselt, Belgium) is a Civil Engineer holding a PhD in Civil Engineering / Building Physics. He is Full Professor at Eindhoven University of Technology (TU/e) in the Netherlands and part-time Full Professor at KU Leuven in Belgium. His main areas of expertise are urban physics, wind engineering and sports aerodynamics. He has led the design and construction of the Eindhoven Atmospheric Boundary Layer Wind Tunnel and currently acts as its Scientific Director. He has published 194 papers in international peer-reviewed journals. He is supervising a team of 6 senior researchers and 24 PhD students.

Professor Theodore (Ted) Stathopoulos is currently Professor at Concordia University, Montreal, Canada. His research in the area of wind effects on buildings and their codification has been influential in the development of codes and standards around the world. He has an extensive publication record with more than 500 articles in refereed journals and conference proceedings. He is a member of the ASCE 7 Committee on Minimum Wind Loads and the respective committee of the Canadian Code. He is a Fellow of the Canadian Academy of Engineering, the Institution of Civil Engineers and the American Society of Civil Engineers and its Structural Engineering Institute. He is the Editor of the Journal of Wind Engineering and Industrial Aerodynamics. He has been appointed Distinguished Professor in Building Physics, Urban Physics and Wind Engineering by the Technical University of Eindhoven, The Netherlands He has received an Honorary Doctorate from the Aristotle University of Thessaloniki, Greece; and another one from the Technical University of Eindhoven, The Netherlands.

Dr. Eoghan Clifford is a chartered engineering and currently works as a Senior Lecturer in Civil Engineering, NUI Galway. He is the Programme Director of the BSc Project & Construction Management at NUI Galway and the Academic Director of the CEIM Programme within the School of Engineering. He is also a visiting research fellow at the Athlone Institute of Technology. His key research and educational interests lie in the areas of fluid dynamics, cycling aerodynamics, wastewater and water engineering and the development of tools and sustainable technology that can improve outcomes in these sectors. He is also collaborating with the technical University of Eindhoven on modelling the aerodynamics of paralympic cyclists on tandem and handcycles.

Professor Kenny Kwok is a Professor of Engineering at The University of Sydney. His research interests include wind engineering, structural dynamics, vibration control, human perception of motion, and environmental fluid mechanics. His research focuses on fundamental aspects of building aerodynamics and wind-structure-occupant-damper interactions, and their practical applications in real life situations. He has published over 500 articles in journals, book chapters, invited and keynote papers, and conference papers. He is the recipient of 2019 ASCE Jack E. Cermak Medal, 2019 IAWE Senior Award and Davenport Medal, and a Life Member of Australasian Wind Engineering Society.

Prof. Yoshihide Tominaga is a Professor of Architecture and Urban Environment Division and Director of Wind and Fluid Engineering Research Center at the Niigata Institute of Technology, Japan. His area of expertise is numerical and experimental modelling of micro-scale wind flow and the related processes in the urban environment, including cross-ventilated room airflow, pedestrian wind comfort, air pollutant dispersion, snowdrift etc. He has served as chair of the wind environment committee of the Architectural Institute of Japan (AIJ), which initiated ‘AIJ guidelines for practical applications of CFD to pedestrian wind environment around buildings’ .