14th UK CONFERENCE ON WIND ENGINEERING
University of Southampton
4-6 September 2024

Welcome to 14th UK Conference on Wind Engineering at Southampton!

The full programme can be found on the conference website: https://personal.soton.ac.uk/zxie/WES2024

The 4-page papers accompanying each talk have been registered with permanent DOIs in the format of doi.org/10.5258/WES/P00XX where XX is the Paper ID. Links to each paper are included in the programme.

Location: 4th floor, Centenary Building (B100), Highfield Campus, University of Southampton, SO17 1BJ
- All talks in lecture room 4011
- Posters and refreshments in room 4013

WiFi: Guests and visitors to the University can access free WiFi using the 'WiFi Guest' account which is powered by The Cloud. Alternatively, 'eduroam' is also available to university staff and students.

Contact: wes2024@soton.ac.uk

Hosts: Prof Zheng-Tong Xie & Prof Christina Vanderwel, Department of Aeronautical and Astronautical Engineering, University of Southampton

Advisory and Scientific Committee: The Executive Committee of the Wind Engineering Society is acting as the Advisory Committee for the conference. The membership is:
- Mr Stefano Cammelli,   WSP
- Dr Bernardo Vazquez,   BuroHappold
- Dr David Hargreaves,   University of Nottingham
- Mr John Rees,   COWI
- Dr Alex To,   Arup
- Ms Anna Bagnara,   NOVA Fluid Mechanics
- Prof Zheng-Tong Xie,   University of Southampton
- Mr Daniel Hackett,   RWDI
- Dr Giulio Vita,   Ramboll
- Dr Francesco Dorigatti,   RWDI
- Dr Mingzhe He,   AKT II

The academics listed below also kindly helped review the submitted abstracts:
- Prof Bert Blocken,   Heriot-Watt University
- Dr Cung Nguyen,   University of Salford
- Prof Christina Vanderwel, University of Southampton

Many thanks for the support from Carlene Cornick, Ruby Wyness, and Kelly Carter in the Department Admin Team; to the University of Southampton Hospitality Team for organising the venue and accommodation; to the ePrints and Research Data Team at the University of Southampton Library for organising the DOIs to publish the papers; and to the UK Wind Engineering Society for all the provided support.

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Wednesday 4th September, 2024

9:00-9:55	**Registration / Tea and Coffee / Poster Setup**
9:55-10:00	**Welcome & Introduction (Christina Vanderwel and Stefano Cammelli)**
10:00-12:00	**UFM-UKUEQ Mini-Symposium (Chair: Maarten van Reeuwijk, Darren Woolf)**
10:00-10:05	Introduction - *Maarten van Reeuwijk; Imperial College London*
10:05-10:15	Urban Environmental Quality: Challenging Knowledge - *Darren Woolf; Wirth Research*
10:15-10:25	Integrating Urban Environmental Quality in urban design - *Marialena Nikolopoulou; University of Kent*
10:25-10:35	Estimating UEQ in practice - *Rubina Ramponi; Arup*
10:35-10:45	Urban Air Quality and planning. *Steve Moorcroft; AQ consultants*
10:45-10:55	Wind microclimate studies in the UK: nuances, inconsistencies, and current challenges - *Stefano Cammelli; WSP*
10:55-11:05	Using wind compliance to improve UEQ - *Giulio Vita; Ramboll*
11:05-12:00	Panel discussion
12:00-12:15	**In memoriam of John Macdonald (Cung Nguyen and Stefano Cammelli)**
12:15-13:00	**Lunch and Networking**
13:00-14:00	**Keynote – Ian Castro, *University of Southampton* (Chair: Christina Vanderwel)** **"Porous structures and vortex shedding" (Abstract 73)**
14:00-14:45	**Session 1 – Atmospheric boundary layer & climate change (Chair: Stefano Cammelli)**
14:00-14:15	Atmospheric turbulence as seen by a moving object (PID 7) - *Peter John Richards, Nicholas Kay, Stuart Norris; University of Auckland*
14:15-14:30	Future winds: a review of the likely impacts of anthropogenic climate change on wind engineering in the UK (PID 9) - *Anna Bagnara, Daniel Hackett, David Hankin, Stefano Cammelli; NOVA Fluid Mechanics Ltd, RWDI, WSP UK*
14:30-14:45	Codification of mean wind and turbulence profiles over the ocean with roughness saturation (PID 27) - *John D. Holmes; JDH Consulting*
14:45-15:15	**Tea and Coffee**
15:15-16:30	**Session 2 – Urban microclimate & wind (Chair: Bernardo Vazquez)**
15:15-15:30	Coupled mesoscale–microscale modelling of airflow at Hong Kong International Airport (PID 4) - *Chang-Chang Wang, Pak-Wai Chan, The Hong Kong Polytechnic University*
15:30-15:45	Large-eddy simulation of a diurnal cycle in a coastal urban environment (PID 42) - *Sam Owens, Owen Beckett, Andy Acred, Maarten van Reeuwijk; Imperial College London, Foster+Partners*
15:45-16:00	Drag Characteristics of a Volumetric Tree Model in Computational Fluid Dynamic Simulations (PID 34) - *Dipanjan Majumdar, Maarten van Reeuwijk; Imperial College London*
16:00-16:15	Introducing BeStPLW: A Benchmark Study on Pedestrian Level Winds (PID 1) - *Giulio Vita, Mingzhe He, Stefano Cammelli; Ramboll UK, AKT II, WSP UK*
16:15-16:30	Wind Microclimate on Balconies: Designing Climate-sensitive Outdoor Spaces (PID 37) - *Jennifer Lowther, Daniel Hackett, A. Cherian, V. RV; RWDI*

16:30-18:00	**Poster Brief** (room 4011) **and refreshments (**room 4013**) (Chair: Giulio Vita and Mingzhe He**)
	The list of 16 posters shown at the end of the Programme
19:00-21:00	**Cafeteria Dinner – Arlott Bar and Terrace Restaurant (B38)**

Thursday 5th September, 2024

8:30-9:00	**Tea and Coffee**
9:00-10:00	**Keynote – Goncalo Pedro, *RWDI* (Chair: Zheng-Tong Xie)** **"Deep dive into computation methods for microclimate" ([Abstract 74](#))**
10:00-11:00	**Session 3 – Pollutant dispersion (Chair: Matteo Carpentieri)**
10:00-10:15	Towards passive scalar reconstruction using data assimilation ([PID 45](#)) - *Uttam Cadambi Padmanaban, Bharathram Ganapathisubramani, Christina Vanderwel, Sean Symon; University of Southampton*
10:15-10:30	Towards efficient scale resolving simulation for the prediction of industrial pollutant dispersion applications ([PID 23](#)) - *Salvatore Manuel Renda, Apostolos Krassas, Eugene De Villiers, Stefano Capra; ENGYS UK, Ramboll*
10:30-10:45	Pollutant dispersion in a cross-ventilating flow through a scaled building: Wind and water tunnel measurements ([PID 40](#)) - *Subhajit Biswas, Paul Hayden, Matteo Carpentieri, Christina Vanderwel; University of Southampton, University of Surrey*
10:45-11:00	Cloud dispersion in complex flows ([PID 20](#)) – *Alan Robins, Paul Hayden, Thomas Richards, David Gallacher; University of Surrey, Guy's and St Thomas' NHS Foundation Trust*
11:00-11:30	**Tea and Coffee**
11:30-13:00	**Session 4 – Wind impact (Chair: David Hargreaves)**
11:30-11:45	Modelling the launch and collision phases of wind-borne debris ([PID 10](#)) - *David M. Hargreaves, John S. Owen; University of Nottingham*
11:45-12:00	CROSS-STORM project: developing a numerical-experimental procedure for evaluating the risk of accident on road vehicles due to the strong crosswinds generated by a thunderstorm ([PID 44](#)) - *Andi Xhelaj, Carlos Esteban Araya Reyes, Maria Pia Repetto, Luisa Pagnini, Gisella Tomasini; University of Genoa, Polytechnic of Milan*
12:00-12:15	Integrated performance prediction tool for wind-assisted ship design with a routing case study ([Abstract 30](#)) - *Andhini Zurman-Nasution, Suleyman Aykut Korkmaz, Dominic A. Hudson, Stephen R. Turnock, Joseph Banks; University of Southampton*
12:15-12:30	Finite element analysis of low-rise non-engineered timber residential buildings in Dominica under hurricane loads ([PID 62](#)) - *Sarah Esper, Dina D'Ayala, University College London*
12:30-14:00	**Lunch and Poster Discussion (**room 4013**)**
14:00-15:00	**Keynote – Janet Barlow, *University of Reading* (Chair: Zheng-Tong Xie)** **"Across-scale processes in urban environments: the ASSURE project" ([Abstract 72](#))**
15:00-16:30	**Session 5 – Across-scale processes in urban environments (Chair: David Hankin)**

15:00-15:15	An analytical solution for a surface energy balance model including water transport (Abstract 31) - *Maarten van Reeuwijk, Sue Grimmond, Chris Wilson, Sam Owens; Imperial College London, University of Reading*
15:15-15:30	Large scale wind study of the inner city of Rotterdam (PID 18) – *Nick Vlaun, Eric Terry, Actiflow*
15:30-15:45	Flow across a step change in roughness: turbulence statistics estimation via interpretable network-based modelling (Abstract 25) - *Giovanni Iacobello, Marco Placidi, Shan-Shan Ding Matteo Carpentieri; University of Surrey, University of Oxford*
15:45-16:00	Sensor measurements and large-eddy simulation of point source plumes over a complex urban terrain (PID 52) - *James C. Matthews, Matthew Coburn, M. Anwar H. Khan, Dudley E. Shallcross, Zheng-Tong Xie; University of Bristol, University of Southampton, University of the Western Cape*

16:00-16:30	**Tea and Coffee**

16:30-18:00	**Session 6 – Wind loading and building design (Chair: Steven Daniels)**
16:30-16:45	Physical Simulation of the Surface Pressure Field on a 5-Storey Residential Building and Application to Natural Ventilation (PID 26) - *Khrystyna Myroniuk, Vasyl Zhelykh, Yurii Furdas, Mike Jesson, Stergios-Aristoteles Mitoulis; University of Birmingham, Lviv Polytechnic National University*
16:45-17:00	Exploring wind engineering challenges in super-slender buildings (PID 46) - *Stefano Torre, Edoardo Ruffini; NOVA Fluid Mechanics Ltd*
17:00-17:15	Unsteady Loading of Horizontal Axis Wind Turbine Rotors by Atmospheric Turbulence (PID 14) - *J. Michael Graham, Kevin Gouder, Ian A. Milne; Imperial College London, University of Western Australia*
17:15-17:30	CFD Methodology for Air Quality Assessment (PID 60) - *Vincenzo Sessa, Mingzhe He, Steven Daniels; AKTII*
17:30-17:45	Reference pressure for wind load measurements in a turbulent boundary layer (PID 6) - *Roger Hoxey, Peter Richards, Adam Robertson*

19:00 - 22:30	**Banquet Dinner at Chilworth Manor, SO16 7PT** **Coach to depart at 19:00 outside B100, and return at 22:15 to Halls and Highfield Campus**

19:00 -	**Alternative Young Person's Social – Brewhouse & Kitchen, 47 Highfield Ln, SO17 1QD**

Friday 6th September, 2024

8:30-9:00	**Tea and Coffee**

9:00-10:00	**Keynote – Bert Blocken, *Heriot-Watt University* (Chair: Christina Vanderwel)** **"CFD for case studies environmental wind engineering: have we gotten ahead of ourselves?" (Abstract 71)**

10:00-11:00	**Session 7 – Tall-building clusters 1 (Chair: Marco Placidi)**
10:00-10:15	Fluid dynamics of Urban Tall-building clUsters for Resilient built Environments (FUTURE) (PID 59) - *Marco Placidi, Matteo Carpentieri, Alan Robins, Zheng-Tong Xie, Davide Lasagna, Janet Barlow, Sue Grimmond, Omduth Coceal; University of Surrey, University of Southampton, University of Reading*

10:15-10:30	Cluster Effects of Tall Buildings (PID 58) - *Saad Inam, Cung Nguyen, Changchang Wang, Davide Lasagna, Zheng-Tong Xie; University of Southampton*
10:30-10:45	Impact of Stably Stratified Boundary Layers on Tall Building Wake (PID 54) - *Abhishek Mishra, Matteo Carpentieri, Alan Robins, Marco Placidi; University of Surrey*
10:45-11:00	Observations of Tall-Building Wakes in Berlin's Urban Boundary Layer Using Two Doppler Wind Lidars (Abstract 53) - *Matthew Clements, Janet F. Barlow, Sue Grimmond, Daniel Fenner, William Morrison, Andreas Christen; University of Reading, University of Freiburg*

11:00-11:30	**Tea and Coffee**

11:30-13:00	**Session 8 – Tall-building clusters 2 (Chair: Alan Robins)**
11:30-11:45	Modelling wind profiles in heterogeneous urban environments using fractional derivatives (Abstract 57) - *Omduth Coceal; University of Reading*
11:45-12:00	Flow Over an Array of Very Tall Buildings with Random Heights (Abstract 56) - *Donnchadh MacGarry, Zheng-Tong Xie, Christina Vanderwel; University of Southampton*
12:00-12:15	Pollutant Dispersion and Bimodality in Tall Building Clusters (PID 55) - *Dianfang Bi, Abhishek Mishra, Marco Placidi, Alan Robins, Matteo Carpentieri; University of Surrey*

12:15-12:45	**Concluding discussions about the FUTURE project (Alan Robins)**

12:45-13:00	**Closing Ceremony (Christina Vanderwel and Stefano Cammelli)**

13:00-14:00	**Lunch**

14:00-15:00	**Optional Lab Visits to the RJ Mitchell Wind Tunnel (B17) and Fluid Dynamics Labs (B185) (walking tour departing from B100 at 14:00)**

List of Posters

1. Turbulent transport characteristics of coherent structures in ideal urban morphology based on wind tunnel experiments (PID 2) *Guoliang Chen, Chun-Ho Liu, Ziwei Mo; The University of Hong Kong, Sun Yat-sen University*

2. Turbulent boundary layers over multiscale urban arrays (PID 3) *Cameron Southgate-Ash, Sue Grimmond, Alan Robins, Marco Placidi; University of Surrey*

3. Structure of yawed wind turbine wakes in thermally neutral and stable boundary layers (PID 13) *Rose Foster, Phillip Hancock, Marco Placidi; University of Surrey*

4. Surface Pressure Fluctuations in an Atmospheric Boundary Layer (PID 15) *Joy Schmeer, Marco Placidi and David M. Birch; University of Surrey*

5. Simulation of atmospheric boundary layer in the wind tunnel facility at University of Bristol (PID 16) *Nada Taouil, H.D. Lim, B. Zang, Mahdi Azarpeyvand; University of Bristol*

6. Bridging the Gap: Embedding 3D Details into Fast Deep-Learning Model for Pedestrian-Level Wind Prediction (PID 17) *Adam Clarke, Knut Erik, Teigen Giljarhus, Luca Oggiano, Alistair Saddington, Karthik Depuru-Mohan; Cranfield University, University of Stavanger*

7. Dynamic Calibration of Low-Cost Gas Sensors for Dispersion Experiments (PID 19) *Paul Hayden, David M. Birch; University of Surrey*

8. Kinematic Similarity for Urban Aerodynamic Wind Tunnel Tests Using Retrofit Atmospheric Boundary Layer Screen Filter (PID 28) *Rakesh, Rayapureddi, Joe, Dillane, Andrew Keppel, Thomas Confrey; South East Technological University, Ireland*

9. Shading Affects the Latent Heat Flux in Vegetated Urban Areas (PID 32) *Christopher Wilson, Jon Shonk, Sylvia Bohnenstengel, Athanasios Paschalis, Maarten van Reeuwijk; Imperial College London, Met Office*

10. Small wind ram air turbine blade geometric modification for performance (PID 35) *Kiran S Gadda, Hardit R Saini, Mariana G. Avila Zaya, Nithya Venkatesan, Eldad J Avital; Queen Mary University of London, Vellore Institution of Technology*

11. A Comparison Study of Structural Wind Tunnel Tests and Code-based Approaches in Evaluating Wind Loads on Tall Buildings (PID 36) *Pietro Manica, Fabio Faseli, Tung Nguyen, Suresh Kumar, John Kilpatrick; RWDI*

12. The Need for Post-Construction Microclimate Monitoring (PID 38) *Supun Enderage, Jeniffer Lowther, Daniel Hackett; RWDI*

13. Multi-resolution heterogeneity analysis of urban flows (PID 41) *Jingzi Huang, Maarten van Reeuwijk; Imperial College London*

14. Dispersion of Passive and Dense Plumes over a Step-Change in Wall Roughness (PID 43) *C. Deebank, M. Placidi, M. Carpentieri; University of Surrey*

15. Increasing high-fidelity modelling efficiency with automated setup and validation of methodologies (PID 48) *Matthew Coburn, Zheng-Tong Xie; University of Southampton*

16. Using a virtual Doppler LiDAR and Large Eddy Simulation to quantify wind velocity measurement errors of ground-based Doppler LiDAR (PID 49) *Veronica Escobar-Ruiz, Janet F. Barlow, and Zheng-Tong Xie; University of Reading, University of Southampton*