



International Advanced School on THUNDERSTORM OUTFLOWS AND THEIR IMPACT ON STRUCTURES

March 9-13, 2020, Genova, Italy

Organized by:

Department of Civil, Chemical and Environmental Engineering, University of Genova (Italy) with the sponsorship of International Association for Wind Engineering.

Supported by:

The International Advances School (IAS) is part of the project THUNDERR - Detection, simulation, modelling and loading of thunderstorm outflows to design wind-safer and cost-efficient structures - that has received funding from the European Research Council under the European Union's Horizon 2020 research and innovation program, grant agreement N°. 741273.

Key Dates:

Late registration: by March 9, 2020

School: March 9-13, 2020

Venue:

Hotel Bristol Palace, Via XX Settembre, 35 - 16121 Genova, Italy (<https://www.hotelbristolpalace.it/it>)

1. The Thunderr project

The safety and sustainability of built environment with regard to natural actions are primary goals of engineering. Wind is the most destructive natural phenomenon. Evaluating its actions is therefore crucial for society and its economy.

Wind climatology is often dominated by cyclones and thunderstorms. The properties of cyclones are known since the 1920s. Their actions on construction are well established since the 1960s and engineering still uses these models. Thunderstorms are complex and devastating phenomena that result in actions often more intense than cyclonic ones. Despite this awareness, there is not yet a model of thunderstorm winds and their actions on structures as that established over half century ago for cyclones. This is a major shortcoming that gives rise to unsafe and/or overly expensive works.

THUNDERR is an acronym of THUNDERstorm that expresses the Roar of the ERC project carried out at the University of Genova. It aims to detect thunderstorms, to create a database of wind records and weather scenarios, to conduct unprecedented laboratory tests and CFD simulations, to formulate thunderstorm models suitable for atmospheric sciences and structural design, to improve the format of wind actions, of engineering practice and of codification, to make building safer and more sustainable, to bring about a profound impact on society and its economy.

2. Aims and Topics

The International Advanced School will cover synoptic, mesoscale and thunderstorm meteorology, wind storms and climate changes, wind monitoring and thunderstorm detection, downburst modelling and signal analysis, laboratory and CFD simulation of downbursts, Monte Carlo simulation of wind velocity fields, fundamentals of bluff-body aerodynamics, wind loading and response of structures to thunderstorm outflows, full-scale monitoring of structures, damage induced by local storms, research and codification perspectives.

Researchers and students in universities and research and educational institutes, relevant engineers and governors are all very welcome to join the IAS.

2. Lecturers (in alphabetical order)



Bert Blocken
TU/e Eindhoven, The Netherlands and KU Leuven, Belgium



Guido Buresti
Università di Pisa, Italy



Massimiliano Burlando
Università di Genova, Italy



Ashraf El Damatty
University of Western Ontario, Canada



Horia Hangan
University of Western Ontario, Canada



Ahsan Kareem
University of Notre Dame, Indiana, USA



Frank Lombardo
University of Illinois at Urbana-Champaign, USA



Leigh Orf
University of Wisconsin-Madison, USA



Maria Pia Repetto
Università di Genova, Italy



Giovanni Solari
Università di Genova, Italy



Ted Stathopoulos
Concordia University, Montreal, Canada



Yukio Tamura
Chongqing University, Chongqing, China



Uwe Ulbrich
Freie Universität, Berlin, Germany

3. Schedule

MONDAY March 9, 2020		
Timetable	Lecturer	Topic
10:00-10:50	Giovanni Solari	Course Introduction and THUNDERR Project
11:00-11:50	Uwe Ulbrich	Synoptic and mesoscale meteorology
12:00-12:50		
13:00-14:00	<i>Lunch Break</i>	
14:00-14:50	Massimiliano Burlando	Wind monitoring and thunderstorm detection
15:00-15:50		
16:00-16:50	Uwe Ulbrich	Wind storms and climate changes
17:00-17:50		

TUESDAY March 10, 2020		
Timetable	Lecturer	Topic
9:00-9:50	Giovanni Solari	Downburst modelling and signal analysis
10:00-10:50	Horia Hangan	Laboratory simulation of downbursts
11:00-11:50		
12:00-12:50		
13:00-14:00	<i>Lunch Break</i>	
14:00-14:50	Bert Blocken	Fundamentals of CFD simulations
15:00-15:50		
16:00-16:50		
17:00-17:50	Ahsan Kareem	Monte Carlo simulation of wind velocity fields

WEDNESDAY March 11, 2020		
Timetable	Lecturer	Topic
9:00-9:50	Leigh Orf	CFD simulation of downbursts
10:00-10:50		
11:00-11:50	Guido Buresti	Fundamentals of bluff-body aerodynamics
12:00-12:50		
13:00-14:00	<i>Lunch</i>	

THURSDAY March 12, 2020		
Timetable	Lecturer	Topic
9:00-9:50	Frank Lombardo	Downburst wind loading of structures
10:00-10:50		
11:00-11:50	Ahsan Kareem	Gust front factor technique
12:00-12:50	Giovanni Solari	Thunderstorm response spectrum technique
13:00-13:50	<i>Lunch Break</i>	
14:00-14:50	Maria Pia Repetto	Full-scale monitoring of structures
15:00-15:50		
16:00-16:50	Ashraf El Damatty	Thunderstorms and transmission lines
17:00-17:50		

FRIDAY March 13, 2020		
Timetable	Lecturer	Topic
9:00-9:50	Yukio Tamura	Damage to buildings and structures by severe local storms and wind speed estimations
10:00-10:50		
11:00-11:50	Ted Stathopoulos	Perspectives of research on the effects of non-synoptic winds on buildings
12:00-12:50	Ted Stathopoulos	Non-synoptic winds on buildings: wind standards and codes of practice perspectives
13:00-14:30	<i>Closure and Lunch</i>	

4. Tuition Fees

The tuition fee covers the registration to the school, teaching material and lunches on March 9-13, 2020.

Registration Fee: € 225

5. Sign-Up Registration and fee payment

Please fill out the registration form available at <https://forms.gle/ur6hXzw9tmvRyVuDA>

In case of problems with the registration procedure, please contact the IAS Secretary who will send you the form via email.

Payment of the fee on line will be managed by the UniGe payment service, following the procedure below:

1- Register and request UniGePASS credentials at <https://registrazioneunigepass.unige.it/signup>

2- With UniGePASS credentials (username & password) access the webpage

<https://servizionline.unige.it/unigeshop/negozio/listaProdotti?idCategoria=16>

In the UniGeShop webpage, under the Category "IAS Thunderr", select the Product "International Advanced School on Thunderstorm". The corresponding cost will automatically show up under Tuition Fee (Section 4) based on the date of access.

3- Confirm the purchase and proceed with the payment.

In case of problems with the payment procedure, please contact the IAS Secretary.

6. Accommodation

The IAS Secretariat is not responsible for hotel reservations. Please make your own hotel reservation in advance.

If you need assistance for hotel choice, please contact the IAS Secretary.

THUNDERR principal investigator

Prof. Giovanni Solari

International advisory board

Prof. Bert Blocken

Prof. Horia Hangan

Prof. Ahsan Kareem

Prof. Ted Stathopoulos

Prof. Yukio Tamura

Prof. Uwe Ulbrich

Local organizing committee

Prof. Giovanni Solari (Coordinator)

Prof. Massimiliano Burlando (Coordinator)

Prof. Luisa Carlotta Pagnini

Prof. Giuseppe Piccardo

Prof. Maria Pia Repetto (Coordinator)

Prof. Federica Tubino

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