



Italian Association for Wind Engineering



International Association for Wind Engineering

## SOLARI LECTURES

Excellence and innovation in  
Wind Science and Engineering



*At the end of 2020 the Italian Association for Wind Engineering lost one of its founding fathers and past Presidents. The whole international community of Wind Engineering lost one of its most distinguished members, and past president of the International Association for Wind Engineering. His scientific and institutional contribution has deeply marked the evolution of Wind Science and Engineering worldwide.*

*The Italian Association for Wind Engineering aims at celebrating and renewing his longest lasting legacy in innovating Wind Science and Engineering by excellent studies. The Solari Lectures are dedicated to emerging, innovative topics in and around the broad field of Wind Engineering, reviewed by excellent scholars.*

*The Lectures are hosted during the ANIV biannual International Conference on Wind Engineering IN-VENTO, under the umbrella of the International Association for Wind Engineering.*

# SOLARI LECTURE 2022

Politecnico di Milano, Dept. of Mechanics, Campus Bovisa, Lecture Hall De Carli  
via Durando 10, Building B9 - Milan  
September 4<sup>th</sup>, 2022, 5 p.m. CET

## Reduced-Order Models in Wind Engineering *fundamentals and applications*

### Short abstract:

*Wind Engineers are continuously called to build simplified models of intricate problems and phenomena. The so-called Reduced Order Models are useful to provide a deep insight into huge amount of experimental data harvested from wind tunnel tests or computational simulations, and/or to surrogate expensive high-fidelity models in uncertainty quantification, optimization or design-oriented applications. The lecture will provide a rigorous general modelling framework, and discuss the past, present and future applications in bluff body aerodynamics and wind engineering.*

### Invited speaker

**Gianluigi Rozza** is Full Professor in Numerical Analysis and Scientific Computing at SISSA MathLab – International School for Advanced Studies, Trieste, Italy.

Master of Science in Aerospace Engineering (2002) at Politecnico di Milano, PhD in Applied Mathematics (2005) at Ecole Polytechnique Fédérale de Lausanne, Switzerland.

Research Assistant (2002-06), Researcher and Lecturer (2008-12) at École Polytechnique Fédérale de Lausanne; Post Doctoral Associate Researcher (2006-08) at Massachusetts Institute of Technology, Boston MA, USA; Researcher (2012-14) and Associate Tenured Professor (2014-17) at International School for Advanced Studies, Trieste, Italy.

His research interests include: Numerical Analysis, Numerical Simulation, Scientific Computing; Reduced Order Modelling and Methods with special focus on viscous flows and complex geometrical parametrizations; Efficient Reduced-Basis Methods for parametrized PDEs and a posteriori error estimation; Computational Fluid Dynamics with applications in Aero-Naval-Mechanical Engineering and Environmental Fluid Dynamics; Fluid-Structure Interaction Problems; Parametrized Navier-Stokes Equations for Bifurcations and stability of flow; Optimal Control, Flow Control based on PDEs, Optimal Shape Design, Shape Optimization, Shape Reconstruction, Shape Registration; Uncertainty quantification, data assimilation, parameter estimation; Machine Learning, Deep Learning, Neural Networks.

Author of about 180 scientific papers receiving more than 4500 citations (H-index 32)

Recipient of Bill Morton CFD Prize (2004) by Institute of Computational Fluid Dynamics, University of Oxford (UK), ECCOMAS Ph.D Award (2005) by European Community on Computational Methods in Applied Sciences, Springer Computational Science and Engineering Prize (2009), ECCOMAS Jacques Louis Lions Award in Computational Mathematics (2014), ERC consolidator grant 'Advanced Reduced Order Methods with Applications in Computational Fluid Dynamics' (AROMA-CFD, 2016-2021), ERC-Proof of Concept Grant 'Advanced Reduced Groupware Online Simulation'(ARGOS, 2022).

