



SOLARI LECTURE 2022

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

Detailed Programme

17:00 Opening of the Solari Lectures

Luca Bruno, ANIV PresidentAims of the Solari LecturesShuyang Cao, IAWE Secretary GeneralIAWE greetingsDavide and Matteo SolariWelcome greetingsAlberto Zasso, In-Vento XVII ChairmanWelcome in Milan

17:15 Solari Lecture 2022



Guido Buresti

chairman of the lecture Former full professor in Fluid Dynamics - Dept. Civil and Industrial Engineering, Univ. Pisa, Italy Introduction to the lecture



Gianluigi Rozza

invited speaker

Full Professor in Numerical Analysis and Scientific Computing at SISSA MathLab International School for Advanced Studies (SISSA), Trieste, Italy

Reduced-Order Models in Wind Engineering:

fundamentals and applications

Engineers are continuously called to build simplified models of intricate problems and phenomena. They traditionally apply the so-called Simplified Physics Approach to build models and codify them. Wind Engineers often employ Proper Orthogonal Decomposition (POD), also in the wake of the referential works of Giovanni Solari. The so-called Reduced Order Models (ROMs) include the above and many other approaches. ROMs 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 designoriented applications. The lecture will provide a wide rigorous general modelling framework, and discuss the past, present and future applications in bluff body aerodynamics and wind engineering.

18:00Discussion18:30Closure

Gianluigi Rozza Short Bio

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 applications in Aero-Naval-Mechanical with 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)

<u>Honors and awards</u>: 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).







