ART 2022

Summer School on
Advanced Research in Turbomachinery (ART)

27 June-1 July 2022
Florence, Italy

ART 2022

An event organized by the Department of Industrial Engineering (DIEF) of the University of Florence

The school will take place in the Historic Centre of Florence, an UNESCO World Heritage Site.

Lectures will be held by Professors and Researchers from DIEF, who are presently working in the corresponding fields of research., as well as former colleagues now working in industry. Inspiring keynote speeches are also offered.

Relevant advances in the field of Turbomachinery research will be addressed, including:

- turbomachinery aerodynamics
- aeroelasticity and aeroacoustics
- heat transfer and cooling
- two-phase flows
- radial machinery and turbochargers
- uncertainty quantification
- wind energy
- multi-scale modeling
- gas turbine combustion
- hydrogen use in turbomachinery

Keynote Speakers:

Prof. A. Nix (West Virginia University, USA)

Prof. G. Paniagua (Purdue University, USA)

Prof. C.O. Paschereit (TU Berlin, Germany)

Prof. R. Sandberg (Melbourne University, Australia)

Dr. A. Robertson (NREL,USA) USA)

With the support of:

AIM SEA
Associazione Italiana delle Macchine a fluido e dei Sistemi per l'Energia e l'Ambiente

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website: http://art.dief.unifi.it   e-mail: art.summerschool@dief.unifi.it

Welcome to the 2022 Summer School on
"Advanced Research in Turbomachinery" (ART)

The school is aimed at providing young engineering professionals with an overview on some of the most relevant issues of the present turbomachinery research.

For each topic, the current state of the art is first presented, both from a theoretical and a technical point of view. Concrete examples of applied research are then presented, with special focus on the latest developments and breakthrough technologies.

The lectures are held by Professors and Researchers from DIEF. Special thanks are due to the sponsors and to former researchers from DIEF, who will also contribute with some relevant lectures.

Under the auspices of:

COMUNE DI FIRENZE

REGIONE TOSCANA

Registration fees [1]	
Early bird registration (before May 30th, 2022)	€ 500
Standard registration (from May 20th to June 25th [2], 2022)	€ 550
Accompanying person [3]	€ 100

[1] The Registration includes:
    1) Access to all sessions during the 5-day school
    2) Conference kit and digital proceedings
    3) Welcome cocktail, coffee breaks and lunches (see program)
    4) Social dinner
    5) Guided walk through Florence city center and wine tasting

[2] Please note that - due to organizing issues - no registration will be accepted after June 25th, 2022 @ 22:00 p.m. CEST

[3] The registration includes only: welcome cocktail, lunches, social dinner and the guided walk through Florence city center with wine tasting

Cancellation policy	
Before May 25th, 2022	90% of the registration fee will be reimbursed
From May 25th to June 12th, 2022	50% of the registration fee will be reimbursed
After June 12th, 2022	no reimbursement

Technical Program

	Monday, June 27th	Tuesday, June 28th	Wednesday, June 29th	Thursday, June 30th	Friday, July 1st
8:30 - 8:45	Welcome speech				
8:45 - 10:00	Keynote K1	Keynote K3	Keynote K4	Session H1	Session F1
10:00 - 11:15	Keynote K2	Session T2	Session W2	Session H2	Session F2
11:15 - 11:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:30 - 12:45	Session I1	Session T3	Session W3	Session H3	Session F3
12:45 - 13:45	Lunch	Lunch	Lunch	Lunch	Closing lunch
13:45 - 14:00	Session M4	Session T4	Keynote K5	Session I3	
15:00-16.15	Session M5	Session T5	Session W5	Visit to DIEF experimental facilities LINEA and THT Labs	
16:15 - 16:30	Break	Break	Break		
16:30 - 17:45	Session M6	Session T6	Session I2		

Legend: General interest | Technical session | Industry session | Breaks

Leisure activities

DAY	TIME	ACTIVITY
Monday, June 27th	18:00	Opening reception
Tuesday, June 28th	18:30	Walkaround in the city center and wine tasting
Wednesday, June 29th	19:00	Florence sightseeing from the river by boat
Thursday, June 30th	20:30	Social dinner

[4] The technical program is subject to change. The final program will be released before the registration opening.

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ENGINEERING

Sessions

Session #	Speaker	Title
Keynotes		
K1	Prof. C.O. Paschereit	Hydrogen combustion
K2	Prof. G. Paniagua	Turbomachinery of Pressure Gain Combustion Systems
K3	Prof. R. Sandberg	Scale resolving simulations and machine learning for CFD
K4	Prof. A. Nix	Gas turbine components heat transfer and cooling
K5	Dr. A. Robertson	Research trends in floating offshore wind energy
Technical sessions		
Monday, June 28th		
M4	Dr. A. Giusti (Imperial College)	Advanced numerical models for gas turbine turbulent combustion
M5	Prof. M. Marconcini	Centrifugal pumps/compressors performance, design and optimization
M6	Dr. S. Salvadori (Polito)	Advanced turbomachinery applications
Tuesday, June 29th		
T2	Dr. L. Mazzei - Dr. T. Bacci	Combustor - turbine interactions
T3	Prof. A. Andreini	Multi-physics and multi-scale modelling of gas turbines components
T4	Dr. R. Da Soghe (Ergon Research)	Secondary air systems: review and applications
T5	Prof. D. Fiaschi - Dr. L. Talluri	Modeling of real gases in turbomachinery
T6	Dr. A. Bianchini	Recent developments in wind turbine technology and research
Wednesday, June 30th		
W2	Prof. M. Marconcini	The role of turbulence transition in turbomachinery aerodynamics
W3	Prof. R. Pacciani	Numerical modeling of transition in turbomachinery
W5	Dr. F. Balduzzi	Turbocharger technology
Thursday, July 1st		
H1	Prof. C. Carcasci	Modular analysis of energy systems
H2	Dr. A. Picchi	Experimental methods for gas turbine heat transfer investigation
H3	Dr. L. Romani	Dynamic pressure measurements in turbomachinery applications: the case of vaneless diffuser rotating stall
Friday, July 2nd		
F1	Dr. M. Carnevale (Univ. of Bath)	Uncertainty quantification in computational fluid dynamics for turbomachinery
F3	Dr. F. Poli	Turbomachinery aeromechanics: aerodynamically induced vibrations
F4	Dr. L. Pinelli - Dr. F. Taddei	Turbomachinery noise: numerical methods and experimental techniques
Industry sessions		
I1	A. Scotti del Greco (Baker Hughes)	Introduction to gas turbine perfomance maps
I2	ANSYS, Convergent Science, Centaur	CFD for turbomachinery - An industrial perspective
I3	Dr. L. Baldassarre (Baker Hughes) Dr. A. Peschiulli (AvioAero)	Synergy betweeen industry and academia. Relevant examples from hydrogen compression and aeroengine combustors