



## 18th UIT Summer School

# Advanced experimental techniques in heat and mass transfer

Certosa di Pontignano, 53019 Castelnuovo Berardenga, Siena, Italy,

Monday 3 September, 2018 – Friday 7 September, 2018

Director: Prof. Paolo Di Marco – Università di Pisa

Using experimental techniques in addressing problems of heat and mass transfer is a common situation for engineers and researchers dealing with energy. The complexity of phenomena as well as the variety of measurement techniques and instrumentations require in-depth knowledge and specific training that usually fall beyond the MSc programs.

The 18<sup>th</sup> UIT Summer School is devoted to provide engineers, PhD students and post-doc researchers with the most effective experimental techniques in such problems. Numerous examples from both standard and leading-edge engineering problems of fluid dynamics and heat transfer will help enlightening and grasping both foundations and applications of this challenging subject.

The invitation to participate is open to PhD students carrying out a thesis involving experimental aspects, but participation is also open to university and industry researchers as well as to professionals in the energy sector interested in both learning the fundamentals and getting acquainted with the most powerful experimental techniques.

## Programme

	Monday 3 September	Tuesday 4 September	Wednesday 5 September	Thursday 6 September	Friday 7 September
8.30	Di Marco What do we measure? The application of heat transfer physical laws to measurement techniques	Ficco Volume and mass flow rate measurement	Rainieri - Tanda Restoration of convective heat flux fields from IR and LCD thermographic images	Mauro Measurements in two-phase flows	Morini Measurements in microchannels
10.15	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10.45	Merlone Metrology: the science behind sciences. Measurement theory.	Farina Impulse response acoustics measurements	Farina Acoustics thermography	Coghe Signal processing in frequency domain	Cavalleri Special topics 2. Radiative properties: measurement theory and instrumentation
12.30	Lunch	Lunch	Lunch*	Lunch	Lunch
14.15	Merlone Temperature, thermal or thermodynamic measurements?	Tanda Measurement of thermal fields by LCD thermography and Schlieren	Coghe Data analysis and signal processing in time domain	Coghe Theory and applications of LDV and PIV	Scotto Special topics 3. Thermophysical properties: measurement theory and instrumentation
16.00	Coffee break	Coffee break		Coffee break	Coffee break
16.30	Messa Special topics 1. IR Thermography: measurement theory and instrumentation.	Ambrosini Measurement of thermal fields in transparent media by other optical techniques		De Paoli Theory and applications of PTV	Di Marco Optical image processing: from contour determination to evaluation of forces
18.15					
20.00	Dinner	Dinner	Dinner	Dinner	Dinner

\* On Wednesday 5th, the lunch is at 12:45 and the lesson in the afternoon starts and ends 15 min in advance with respect to the scheduled time.

## Contributors

- Dario Ambrosini, Università degli Studi di L'Aquila – Italy
- Anna Cavalleri – Giorgio Pera, Perkin Elemer – Italy
- Aldo Coghe, Politecnico di Milano – Italy
- Marco De Paoli, TU Wien – Austria
- Paolo Di Marco, Università degli Studi di Pisa – Italy
- Angelo Farina, Università degli Studi di Parma – Italy
- Giorgio Ficco, Università degli Studi di Cassino – Italy
- William Mauro, Università degli Studi di Napoli “Federico II” - Italy
- Andrea Merlone, Istituto Nazionale di Ricerca Metrologica, Torino – Italy
- Francesco Messa, FLIR Systems – Italy
- Gianluca Morini, Università degli Studi di Bologna – Italy
- Sara Rainieri, Università degli Studi di Parma – Italy
- Piero Scotto, TA Instruments, Modena – Italy
- Giovanni Tanda – Università degli Studi di Genova – Italy

## Lecture Notes

Before the beginning of the Summer School the slideshows and/or notes of the lectures will be made available for download in a restricted access area of the UIT website (<http://www.uitonline.eu>).

## Location

The 18<sup>th</sup> Summer School will be held at [Certosa di Pontignano](#) (Siena); further information can be gathered directly at Certosa website.

## Application and fees

The registration fee is 700,00 Euros and includes attendance to the Summer School, coffee breaks during the lessons, and full board treatment from the dinner of Sunday 2<sup>nd</sup> to the lunch of Saturday 8<sup>th</sup>. Each participant is kindly asked to confirm at the reception his/her presence at the lunch of Saturday 8<sup>th</sup>.

The 50% of registration fee (€ 350,00) must be paid **before August 3rd, 2018**, following the instructions given within the attached registration form. The remaining 50% (€ 350,00) must be paid directly during the check-in at Certosa di Pontignano

Please, to apply download and complete (in PDF or RTF format) the registration form, and kindly send it by e-mail **before August 3rd, 2018** to [info@lacertosadipontignano.com](mailto:info@lacertosadipontignano.com) and [adriano.lezzi@unibs.it](mailto:adriano.lezzi@unibs.it).

## Credits for PhD Students

PhD Students can gain credits according to the regulation of their own PhD School. In addition to the Attendance Certificate, a Proficiency Certificate can be obtained upon submission of a report on one of topics addressed in the program.

Additional info about the Summer Schools can be found on the website: [www.uitonline.eu](http://www.uitonline.eu)

For any further questions and requests, please contact:

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