



# 17th UIT Summer School HEAT TRANSFER AND FLUID FLOW IN MULTIPHASE SYSTEMS

Certosa di Pontignano, loc. Pontignano 5, 53019 Castelnuovo Berardenga, Siena, Italy

Monday 4 September 2017 – Friday 8 September 2017

Directors: Prof. Luisa Rossetto, Prof. Davide Del Col – Università di Padova

Addressing problems of heat and mass transfer in two-phase systems is a common situation for those involved in research or design in process engineering and energy engineering. The complexity of the phenomena and the resulting multiplicity of analyses and simulation techniques imply that the tools available to the researchers and designers require specific training which generally is not provided on undergraduate or master courses.

The XVII UIT Summer School aims at providing the most effective theoretical, experimental and computational tools to address these problems. In addition, this year the School includes two sessions devoted to applications of two-phase systems: on Wednesday a session on “Heat pipes and thermal control”; on Friday a session on thermal fluid processes in the use of “Phase Change Materials”.

The invitation to participate is open to PhD students carrying out a thesis on a subject related to multiphase fluid-dynamics, but participation is also open to university and industry researchers and to professionals in the energy sector interested in learning the fundamentals, the experimental techniques and the numerical approach for the study and design of two-phase systems.

## Programme

	Monday 4 September	Tuesday 5 September	Wednesday 6 September	Thursday 7 September	Friday 8 September
			<b>Session on Heat pipes and thermal control</b>		<b>Session on Phase Change Materials</b>
8.30	D. Del Col Condensation: fundamentals, experimentation, calculation methods.	L. Rossetto Flow boiling: fundamentals, experimentation, heat transfer enhancement.	G. Zummo Thermal management of electronics with mechanically pumped two-phase flow loops.	M. Magnini CFD simulations of two-phase flows with interface tracking techniques.	G. Ziskind Theory, experimentation and numerical modelling of thermal-fluid processes in PCMs.
10.15	<b>Coffee break</b>	<b>Coffee break</b>	<b>Coffee break</b>	<b>Coffee break</b>	<b>Coffee break</b>
10.45	D. Del Col CFD modelling of film condensation inside channels. Dropwise condensation.	A. Cioncolini Microscale flow boiling: theory and modelling.	S. Filippeschi Heat pipes and two-phase thermosyphons: working principles, theory and classification.	M. Magnini Lubrication theory applied to the analysis of thin liquid films in capillary flows.	G. Ziskind Thermal energy storage and thermal management using PCMs: heat transfer enhancement and advanced modelling.
12.30					
13.00	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
14.15	P. Di Marco Pool boiling: fundamentals, experimentation, modelling.	A. Cioncolini Analysis and modelling of annular liquid-vapour flow.	S. Filippeschi Recent advances in heat pipes and thermosyphons: experiments and numerical simulations.	A. Soldati Interfaces and droplets in turbulent flow.	M. Perino Application of phase change materials in buildings.
16.00	<b>Coffee break</b>	<b>Coffee break</b>		<b>Coffee break</b>	
16.30	P. Di Marco Advances in pool boiling, enhancement techniques.	W. Mauro Flow boiling of refrigerants: from low to high reduced pressure.		A. Soldati Interfaces and droplets in turbulent flow.	
18.15					
20.00	<b>Dinner</b>	<b>Dinner</b>	<b>Dinner</b>	<b>Dinner</b>	<b>Dinner</b>

## Lecturers

- Andrea Cioncolini, The University of Manchester – UK
- Davide Del Col, Università degli Studi di Padova – Italy
- Paolo Di Marco, Università degli Studi di Pisa – Italy
- Sauro Filippeschi, Università degli Studi di Pisa – Italy
- Mirco Magnini, Ecole Polytechnique Federale de Lausanne – Switzerland
- William Mauro, Università degli Studi di Napoli – Italy
- Marco Perino, Politecnico di Torino – Italy
- Luisa Rossetto, Università degli Studi di Padova – Italy
- Alfredo Soldati, TU Wien, Austria
- Gennady Ziskind, Ben-Gurion University of the Negev, Israel
- Giuseppe Zummo, ENEA – 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 17<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 3<sup>rd</sup> to the afternoon of Friday 8<sup>th</sup>. Upon request, participants can remain until the morning of Saturday 9<sup>th</sup> (breakfast included).

The 50% of registration fee (€ 350,00) must be paid **before August 11, 2017**, 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.

To apply, please complete (in PDF or RTF format) the registration form, and kindly send it by e-mail to <info@lacertosadipontignano.com> **before August 11, 2017**,

## 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 the topics addressed in the program.

Additional info about the Summer School can be found on the website: <http://www.uitonline.eu>.

For additional questions and requests, please contact:

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Prof. Davide Del Col, Co-director of 17th UIT Summer School, Secretary of UIT Steering Committee ([davide.delcol@unipd.it](mailto:davide.delcol@unipd.it))