



PARTICLE CHARACTERIZATION AND MULTIPHASE FLOWS MONITORING

COST Training School

Organized by

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and Fernando Garcia
Universidade de Coimbra**



European Cooperation in Science and Technology

Coimbra, 16-18 June, 2014

APPLICATION AND INFORMATION

Candidates must apply at least one month before the beginning of the course. Application forms should be sent by email to prodeq@eq.uc.pt. Please indicate whether accommodation in university guest house is required. A message of

confirmation will be sent to accepted participants. All trainees will be offered a bag and a pen drive with the course material and will have wi-fi internet access in the university premises. COST students not belonging to the University of Coimbra will be offered a scholarship (maximum 500 Euros in total) to cover accommodation (university guesthouse), meals and coffee breaks for the entire duration of the school, plus travel expenses which cannot exceed 300 Euros. Applicants willing to apply for a COST grant must send an email to the training school organizer (mgr@eq.uc.pt) with cc to the Action coordinator (cristian.marchioli@uniud.it) with the following documents: motivation for attending the school and CV. All applicants requesting COST support will receive a reply to their application before the beginning of the course. Information about travel is available on the course web site.

For further information please contact:

PRODEQ

Chemical Engineering Department, University of Coimbra

Rua Sílvia Lima, 3030-790 Coimbra, Portugal

Tel: 351239798714, Fax: 351239798703, Email: prodeq@eq.uc.pt



MONDAY June 16	TUESDAY June 17	WEDNESDAY June 18
9h: Reception of participants	<i>MULTIPHASE FLOW MONITORING (cont.)</i> 9h-13h Demonstration of monitoring techniques in the pilot rig (F. Garcia and Rui Silva, UC-Portugal)	<i>PARTICLE CHARACTERIZATION (cont.)</i> 9h-11h Optical techniques for the characterization of nano and microparticles (Dynamic Light Scattering (DLS) and Laser Diffraction Spectroscopy (LDS)) - (M Graça Rasteiro, UC-Portugal)
<i>MULTIPHASE FLOW MONITORING</i> 9h30-11h Optical coherence tomography (OCT) as a tool to measure fluid structures and rheological properties (JuhaSalmela, VTT-Finland)	13-14h30 lunch break	11h Coffee break
11h Coffee break	14h30-16h FBRM (Focused Beam Reflectance Microscopy) to evaluate particles structures in multiphase flows (Elena de la Fuente, UCM-Spain)	11h30-12h30 Measuring surface potential of particles using electrophoretic light scattering (M Graça Rasteiro, UC-Portugal)
11h30-13h Flow monitoring techniques with confocal microscopy (Mark Martinez, UBC-Canada)	16h Coffee break	12h30-14h lunch break
13-14h30 lunch break	<i>PARTICLE CHARACTERIZATION</i> 16h30-18h Measurement techniques for fibre dimensions (Paulo Ferreira, UC-Portugal)	14h-17h Particle characterization techniques lab experiments (Ana Dias and Mara Braga, UC-Portugal)
14h30-16h30 Electrical impedance tomography (EIT): a non-invasive technique for imaging multiphase flows (Pedro Faia, UC-Portugal)	SOCIAL DINNER	17h Visit to the Old University Buildings (UNESCO heritage)
16h30 Coffee break		
17h-18h Visit to the research center laboratories		

PARTICLE CHARACTERIZATION AND MULTIPHASE FLOW MONITORING

Particles are present in most of everyday products. Additionally, the processes to produce those products involve, in most cases, the flow of particulate systems in a continuous fluid, gas or liquid. Furthermore, to be able to control the flow in such processes, it is essential to know the characteristics of the particles: shape, size distribution, surface properties, etc. In fact, these properties do also determine the final product characteristics. It is then clear that the flow of particle suspensions in process units is mostly dependent on the particles characteristics and concentration.

The objective of the present training school is to provide an overview of the available techniques for multiphase flow monitoring and evaluation, especially the most recent techniques in this field, including assessment of the formation of particle structures. Complimentary, the course will provide a panorama of the most used techniques for the measurement of particles properties, both nano and micro sized particles. The trainees will have the possibility of contacting with demonstrations of modern flow inspection techniques installed in a pilot rig existing in the labs of the Chemical Engineering Department of the University of Coimbra, as well as conducting hands-on experiments of particle characterization. The training school will be particularly attractive to graduate and PhD students dealing with particulate processes.

The course is organized with the support of the COST Action FP1005 "Fibre suspension flow modeling: a key for innovation and competitiveness in the pulp and paper industry".

ECTS credits can be earned upon request (3 ECTS).

INVITED LECTURERS

JuhaSalmela is a Rheology and Process Flows Research Team Leader at the VTT Technical Research Center of Finland. His expertise is focused on rheology of complex fluids, fibre suspension flocculation dynamics and in-line measurement of rheological properties. Currently his main interests include development Optical Coherence Tomography (OCT) to study boundary layer flow properties.

Mark Martinez is Professor in Chemical and Biological Engineering, and a complimentary appointment in Mechanical Engineering, at the University of British Columbia. His work focuses on the understanding of the fluid mechanics of fibre suspensions with applications in the Pulp and Paper sector.

Pedro Faia is a Professor at the Department of Electrical Engineering and Computers of the University of Coimbra where his research interests concern the research and development of solid state chemical sensors, sensor integration techniques, Electrochemical sensor and biosensors, Impedance Spectroscopy technique and applications.

Elena de la Fuente is a Professor at the Chemical Engineering Department of the Complutense University of Madrid. Her main research topic is the study of the flocculation processes and floc properties, mainly in the papermaking industry and for the fibercement production.

Paulo Jorge Tavares Ferreira is a Professor of Chemical Engineering at the University of Coimbra. His scientific interests are focused on the Pulp and Paper field, addressing topics such as characterization, modification and functionalization of pulps, fibres, papers, fillers and pigments, surface sizing, nanocoating, printability, and characterization and uses of nanocelluloses.

M. GraçaRasteiro is a Professor of Chemical Engineering at the University of Coimbra. She is an expert on particle technology, including particle characterization, studies of particles' interaction, rheology and modeling multiphase flows. She is presently the coordinator of the Chemical Engineering Research Centre of UC.

LECTURES

All lectures will be given in English. Lecture notes will be available in the pen drive to be distributed to the participants.

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Coimbra, June 16 - 18, 2014

Application Form

(Please print or type)

Surname _____

Name _____

Affiliation _____

Address _____

E-mail _____

Phone _____ Fax _____

Do you require accommodation in university gesthouse (tick the box if YES)

Date _____ Signature _____

For further information please contact

PRODEQ

Chemical Engineering Department, University of Coimbra

Email: prodeq@eq.uc.pt

Or the course coordinator: mgr@eq.uc.pt

