

COST FP1005 TRAINING SCHOOL

BEHAVIOUR OF REGULAR AND IRREGULAR NON-SPHERICAL PARTICLES IN LAMINAR AND TURBULENT FLOWS

MAY 27-29, 2015



Overview and Objectives

Non-spherical particles in fluid flows are commonly encountered in nature and in industry. Examples include colloids, polymers, aerosols, airborne solid particles, carbon nanotubes, and fibers. Particle size ranges from nanometers to centi-meters, with loadings that may change the macroscopic flow properties. Particle dynamics in complex flows is governed by physical processes occurring at a wide range of different scales.

The TS will provide a general and unified frame of the current research on non-spherical particles in complex flows and put future research paths in perspective. This will include a wide overview of cutting-edge work in this very active area of multiphase flow research, and a selection of advanced topics with high practical and theoretical value in several areas of engineering and applied physics.

Application and contact information

Candidate COST trainees must apply at least one month before the beginning of the school. Applications must be sent by email to the local organizer, Prof. Martin Sommerfeld (martin.sommerfeld@iw.uni-halle.de) and to the Action coordinator, Dr. Cristian Marchioli (marchioli@uniud.it). The applicant must provide a motivation for attending the school and a CV. A message of confirmation will be sent to accepted COST trainees. There is no registration fee: all COST trainees will be offered a scholarship (from a minimum of 500€ up to a maximum of 650€ depending on the number of accepted trainees) to cover travel expenses, accommodation in Halle, meals and coffee breaks for the entire duration of the school. Information about travel, local transportation and hotels in Halle is available on the training school website. ECTS credits can be earned upon request.

CONTACT INFORMATION: marchioli@uniud.it

Training School Venue

**Zentrum für Ingenieurwissenschaften
Martin Luther Universität Halle Wittenberg
D-06099 Halle (Saale), Germany**

Training School Website http://www.fp1005.cism.it/pages/FP1005_ts2015.html

Invited Lecturers

G. Ahmadi (Clarkson University, USA)

CFD modelling of complex particles in laminar and turbulent flows

- Transport and deposition of nano/microparticles and fiber in ducts using RANS and sublayer models
- Transport and deposition of particles and fibers in turbulent flows using DNS method
- Respiratory deposition of ellipsoidal particles and fibers

C. Marchioli (University of Udine, Italy)

Eulerian-Lagrangian methods for small non-spherical particles in turbulent flow

- Theoretical framework and phenomenology of particle-turbulence interactions
- Euler-Lagrange methods for Direct and Large-Eddy simulation of non-spherical particles
- Applications to turbulent dispersion of elongated fibers in shear flow

G.P. Romano (University of Roma "La Sapienza", Italy)

Experimental techniques for two phase flows and sprays laden with complex particles

- General overview on experimental techniques for two phase flow measurements
- Single point and multipoint systems. Imaging techniques. Discrimination and phase separation algorithms
- Two-phase flow measurements in shear layers.

M. Sommerfeld (Martin-Luther Universitat, Germany)

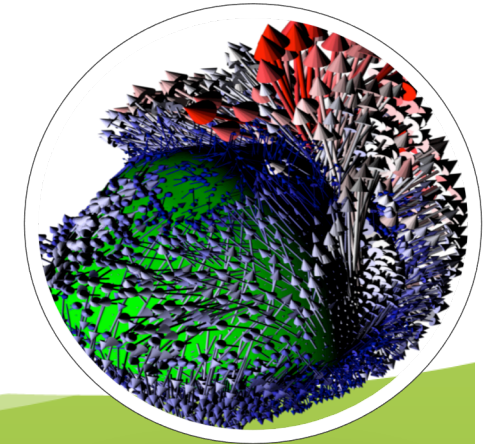
Fluid dynamic characteristics of agglomerates, modelling agglomeration, non-spherical particle-wall collisions

- Lattice-Boltzmann method applied for fluid dynamic characterization of agglomerates
- Lagrangian agglomeration models with applications to spray drying
- Experimental analysis of non-spherical particle wall collisions

B. van Wachem (Imperial College London, UK)

Treatment of non-spherical particle motion, immersed boundary method, large-scale modelling of gas-solid/gas-liquid flows

- Direct Numerical Simulations and the application of Quaternions for describing non-spherical particles
- Application of Immersed Boundary Methods to predict the behaviour of non-spherical particles
- Four-way coupled simulations of turbulent flows laden with non-spherical particles



TIME	WEDNESDAY, MAY 27 2015	TIME	THURSDAY, MAY 28 2015	TIME	FRIDAY, MAY 29 2015
08:30 – 09:15	<i>Registration</i>	9:00 – 10:00	Romano (1/3)	9:00 – 10:00	Marchioli (3/3)
09:15 – 09:30	<i>Welcome, Introduction</i>	10:00 – 11:00	Romano (2/3)	10:00 – 11:00	Ahmadi (3/3)
09:30 – 10:30	Marchioli (1/3)	11:00 – 11:30	<i>Coffee break</i>	11:00 – 11:30	<i>Coffee break</i>
10:30 – 11:00	<i>Coffee break</i>	11:30 – 12:30	Van Wachem (1/3)	11:30 – 12:30	Sommerfeld (3/3)
11:00 – 12:00	Marchioli (2/3)	12:30 – 14:00	<i>Lunch break</i>	12:30 – 14:00	<i>Lunch break</i>
12:00 – 13:30	<i>Lunch break</i>	14:00 – 15:00	Van Wachem (2/3)	14:00	<i>End of TS</i>
13:30 – 14:30	Sommerfeld (1/3)	15:00 – 16:00	Ahmadi (2/3)		
14:30 – 15:30	Sommerfeld (2/3)	16:00 – 16:30	<i>Coffee break</i>		
15:30 – 16:00	<i>Coffee break</i>	16:30 - 17:30	Van Wachem (3/3)		
16:00 – 17:00	Romano (1/3)	17:30 - 18:30	Ahmadi (2/3)		