
Lecturers

Prof. Dr. Dieter Bothe

heads the Institute of Mathematical Modeling and Analysis at the Center of Smart Interfaces, TU Darmstadt

Prof. Dr.-Ing. Günter Brenn

heads the Institute of Fluid Mechanics and Heat Transfer at the TU Graz

Prof. Dr.-Ing. Joachim Domnick

heads the Surface Technology Lab at the Hochschule Esslingen

Dr.-Ing. Christoph Hassa

heads the combustor research at the DLR Institute of Propulsion Technology, Cologne

Prof. Dr.-Ing. Udo Fritsching

heads the group Multiphase Flow, Heat- and Mass Transfer at the IWT, University of Bremen

Dr.-Ing. Philipp Leick

Investigates the fundamentals of fuel injection processes at the Bosch central research laboratories in Renningen

Prof. Fabrice Lemoine

heads the Laboratoire d'Énergétique et de Mécanique Théorique et Appliquée at the Université de Lorraine, Nancy

Priv.-Doz. Dr. Ilia V Roisman

is a senior researcher at the Institute of Fluid Mechanics and Aerodynamics at the TU Darmstadt

Prof. Eran Sher

Faculty of Aerospace Engineering, Technion – Israel Institute of Technology

Prof. Dr.-Ing. Peter Stephan

heads the Institute of Technical Thermodynamics at the TU Darmstadt

Prof. Dr.-Ing. Cameron Tropea

heads the institute of Fluid Mechanics and Aerodynamics at the TU Darmstadt

Prof. Dr. techn. Peter Walzel

heads the Institute of Mechanical Process Engineering at the TU Dortmund

Prof. Dr.-Ing. Bernhard Weigand

heads the Institute of Aerospace Thermodynamics at the University of Stuttgart

Day 1: Fundamentals

- 8:30 Registration, Distribution of Lecture Notes
9:00 Welcome, Introductions, Overview of the Course (*Tropea*)
9:30 Techniques of Atomization: Overview of Atomizers and Their Applications (*Tropea*)
10:30 Coffee
11:00 Fluid Mechanics Fundamentals (*Brenn*)
12:00 Lunch
13:00 Design of spraying devices I (*Walzel*)
13:45 Fundamentals of Atomization (*Roisman*)
14:30 Coffee
15:00 Heat and Mass Transfer Drops (*Brenn*)
15:45 Secondary Atomization (*Roisman*)
16:30 Discussion of Participant Cases
17:30 Close of First Day with Beer and Pretzels
-

Day 2: Modeling and Simulation

- 9:00 Fundamentals of Modelling (*Roisman*)
9:45 A Survey on Direct Numerical Simulation Methods for Multiphase Flows (*Bothe*)
10:30 Coffee
11:00 Direct Numerical Simulation of Primary Jet Breakup (*Weigand*)
12:30 Lunch
13:30 Volume-of-Fluid Method for Multiphase Flows (*Bothe*)
14:15 Drop-Drop Interactions (*Brenn*)
15:00 Coffee
15:30 Drop/Wall Interaction (*Roisman*)
16:15 Spray/Wall Interaction (*Tropea*)
17:00 Close of Second Day
19:00 Short Course Dinner
-

Day 3: Characterisation and Diagnostics

- 9:00 Spray Characterisation – Quantifiers and Standards (*Tropea*)
9:45 Imaging Techniques (*Leick*)
10:30 Coffee
11:00 Laser Diffraction Techniques (*Domnick*)
11:30 Phase Doppler Techniques (*Tropea*)
12:30 Lunch
13:30 Other Optical Techniques (*Tropea*)
14:15 Measurement of Drop Temperature and Composition (*Lemoine*)
15:15 Coffee
15:45 Characterization of Droplet Drying (*Brenn*)
16:30 Powder production in spray processes (*Fritsching*)
17:15 Assorted Solids and Fluids
Exhibition of Spray Equipment and Spray Diagnostic Equipment (also during lunch and second coffee break)
-

Day 4: Applications & Advanced Topics

- 9:00 Droplet Impingement Cooling with Evaporation (*Stephan*)
9:45 Flash Boiling Atomization (*Sher*)
10:30 Coffee
11:00 Atomizers for Fuel Injection (*Leick*)
11:45 Design of spraying devices II (*Walzel*)
12:30 Lunch
13:30 Spray Painting (*Domnick*)
14:15 Air-Blast Atomizers and their Applications (*Hassa*)
15:00 Close of Short Course
-