Report of the IUTAM Summer School held in 2005

Report on the IUTAM - CISM Summer School on Dispersion of Particles in Turbulent Flows

Udine, Italy, September 12-16, 2005

a) Organization

The IUTAM Summer School on "Dispersion of particles in turbulent flows" was held at the International Centre for Mechanical Sciences at Udine, Italy, from September 12 to 16, 2005.

b) Lecturers

The Summer School invited the following principal lecturers:
Prof. O. Simonin, Institut de Mecanique des Fluides, Toulouse, France.
Prof. M. Reeks, University of Newcastle, Newcastle, UK.
Prof. K. Squires, Arizona State University, Tempe, USA.
Prof. S. Elghobashi, University of California, Irvine, USA.
Prof. M. Sommerfeld, Martin-Luther-University Halle-Wittenberg, Halle, Germany.
Prof. C. Crowe, Washington State University, Pullman, USA.
Prof. S. Banerjee, University of California, Santa Barbara, USA.
Prof. F. Toschi, Istituto per le Applicazioni del Calcolo, CNR, Roma, Italia.
Prof. A. Soldati, Università di Udine, Udine, Italia.
Prof. L. Portela, Kramers Laboratorium, Delft University of Technology, Netherlands
Prof. A. Taniere, Università di Udine, Udine, Italia.

c) Summer School topics

The topics covered by the main lectures included:
- Statistical and continuum modelling of turbulent reactive particulate flow (O. Simonin)
- Derivation of the Eulerian two-fluid equations for dispersed particle flows (M. Reeks)
- Large Eddy Simulations: Particle Collision/Coalescence in the frame of Euler/Lagrange Modelling (K. Squires)
- Direct Simulation of Bubbly-Flows: Particle Trajectory and Two-Fluid Approaches (S. Elghobashi)
- Recent advances of modelling in the frame of the Euler/Lagrangian approach (M. Sommerfeld)
- Particle-fluid interaction (C. Crowe)
- Direct simulations of multiphase systems (S. Banerjee)
- Lagrangian statistics in fully developed turbulence (F. Toschi)
- Identification and Dynamics of Turbulence Structures and Particle Interactions with Turbulence Structures (A. Soldati)

- Possibilities and limitations of computer simulations of dispersed turbulent Multiphase flows (L. Portela)
- Dispersion predictions based on the fluid time scale seen by discrete particles using first and second-order stochastic processes (A. Taniere)

d) Participants

Participants to the course included an international group of more than 50 scientists, professionals and graduate students coming from Europe and abroad, from Universities and Technical Research Centers

e) Scientific output

The Summer School introduced the attendees to current trends and fields of interest in the field of turbulent multiphase flows with the object of covering the current methodologies for the prediction of turbulent dispersed flows. Specific attention has been devoted to the modelling aspects and to the physical phenomena involved. The course also helped to identify the research needs for the advancement of this fundamental discipline in fluid mechanica.
The course has been organized in the format of open lectures to allow time for questions, discussions and profitable interactions among all participants.

f) Publication of Proceedings of the Summer School

No formal proceedings were published, but the lecture notes of all the lecturers were distributed to the audience during the school.

g) Financial support

The Summer School was sponsored by IUTAM, Cism, Regione Friuli Venezia Giulia, Provincia di Udine, University of Udine and CRUP.

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