

Preface

This book presents recent experimental and theoretical advances in fluid dynamics and contains invited lectures and contributions presented at the International Enzo Levi Spring School 2011 held in the Instituto Nacional de Investigaciones Nucleares, 6–7 May 2011, and the XVI National Congress of the Fluid Dynamics Division of the Mexican Physical Society, held in Boca del Rio, Veracruz, Mexico, 25–29 October 2011.

The Spring School is organized every year in honour of Prof. Enzo Levi, a well known Mexican scientist that dedicated his research to the study of fluids. He was one of the founders of the Instituto de Ingeniería (Engineering Institute) of the Universidad Nacional Autónoma de México (UNAM), and of the Instituto de Tecnología del Agua (Institute for Water Technology) of the UNAM. He was the mentor of several generations of Mexican Engineers.

During the two day school, lectures are given by well known national and international scientists. In 2010 a wide variety of topics were presented, ranging from nonlinear dynamics and multiphase flow to star formation. About 50 researchers and a 100 graduate and undergraduate students, mostly from Mexican universities and institutes, attended the meeting.

The Annual Fluid Dynamics Congress has a different format. It lasts 5 days and has invited contributions and short oral presentations on original research. There is also a Gallery of Fluid Motion where photographs of special beauty and scientific interest compete. In 2010, the XV Meeting had about 70 attendees. The scope of this congress is very wide. It is traditionally held in parallel with the National Congress of Physics, with which we share one of the invited lectures. This year Prof. Nadine Aubry from Carnegie Melon University gave the main lecture on microfluidics. At the moment of the congress there was a large spill of oil in the Gulf of Mexico so one of the invited lectures was offered by an expert on the subject, Dr. Hermilo Ramírez from The Mexican Oil Institute. Dr. Luis Manuel Farfán from CICESE gave a talk on Tropical Cyclones in the Pacific Ocean and their impact in Mexico. The last invited lecture was given by Dr. Tereza Cavazos also from CICESE, on the challenges Mexico has to face due to the change of climate.

The short oral presentations are organized by themes: CFD, Geophysics, Astrophysics, Multiphase Flow, Porous Media, Viscous Flow, Heat Transfer, Rheology, Granular Flow and Viscous Flow.

The book is aimed to 4th year undergraduate and graduate students, and to scientists in the field of physics, engineering and chemistry that have interest in fluid dynamics from the experimental and theoretical point of view. The material includes recent advances in experimental and theoretical fluid dynamics and is adequate for both teaching and research. The invited lectures are introductory and avoid the use of complicated mathematics. The other selected contributions are also adequate to fourth year undergraduate and graduate students.

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