

Preface

Every two years since 1984 a series of Spanish–French Schools on Numerical Simulation in Physics and Engineering has been developed, being one of the most important events in the area of Applied Mathematics in Spain. These schools have been supported by the *Sociedad Española de Matemática Aplicada (SeMA)* since the founding of the society in 1991, with the collaboration of the French Embassy in Spain. Since the 2006 edition the School also benefits from the support of the French *Société de Mathématiques Appliquées et Industrielles (SMAI)*. In the article “*The Spanish–French School Jacques-Louis Lions on Numerical Simulation in Physics and Engineering (1984-2006)*”, written by Professor Michel Bernadou, one of its main proponents, and published in the SeMA Bulletin n. 43, the reader can find additional information about the various editions of the School.

The venue of the School has moved along different towns of the Spanish geography: Santiago de Compostela (1984), Benalmádena in Málaga (1986), Madrid (1988), Santiago de Compostela (1990), Benicassim (1992), Sevilla (1994), Oviedo (1996), Córdoba (1998), Laredo (2000), Jaca (2002), Cádiz (2004), Castro Urdiales (2006) and Valladolid (2008). In the current fourteenth edition, the organization has been commissioned to the research group Mathematical and Numerical Models in Engineering and Applied Sciences (M2NICA) of the Department of Mathematics at the *Universidade da Coruña*. The conference venue is located at the School of Nautical Science and Naval Engines of the *Universidade da Coruña* and will take place from 6th to 10th September, 2010.

The scientific activities move around four monographic courses of four hours each. The courses aim to enhance the interdisciplinary nature of the School, showing in this issue the role of mathematical modeling and numerical simulation in applications mainly arising from both Industry and the Environment. They also correspond to contents that have not been included in previous editions of the School. Along with the courses, six one hour specialized lectures are given to complement the courses, in some cases, and to present alternative themes of great interest, in other cases. A poster session showing various recent original contributions in various fields of numerical simulation in science and engineering is also included in the schedule of the School.

This book includes the documentation delivered to participants by the professors of the courses and conferences as well as a brief summary of the posters. The School also hosts the roundtable, “*Training in numerical simulation for industry*”, with the involvement of two French and two Spanish participants, whose activity in numerical simulation is conducted outside the academic sphere, to give their vision of the training skills that have

been relevant to their professional career. The aim is that their actions serve as a starting point for discussion. During the development of the School, the annual SeMA Awards to a Young Researcher and to the Best Article published in the *Boletín de SeMA* in 2009 are delivered.

The hosting of the School is a great pleasure for the *Universidade da Coruña* and, in particular, for the organizing group. We expect and hope that this edition meets the expectations set by all participants.

Acknowledgements

The celebration of the XIV Spanish–French Jacques-Louis Lions School on Numerical Simulation in Physics and Engineering and the final edition of this book have been made possible through the collaboration of a number of individuals and public and private institutions. We want to use this section to show our sincere gratitude to all of them.

First, we thank the professors for their availability to accept the invitation and their dedication in preparing their presentations, the material delivered to participants and the lecture notes in this book. We also want to highlight the availability of the scientific committee.

We are specially grateful to the different institutions and their sponsoring agencies, without whose support and provided fundings it would be impossible to hold the School: the Universidade da Coruña through its Vicerrectorado de Investigación, the Ministry of Science and Innovation through a Special Action grant, the Xunta de Galicia through the Network Computing and Consulting of Galicia, the singular research project Consolider I–Math through the funding of the activity inside it, the French Embassy in Spain, the *Sociedad Española de Matemática Aplicada (SeMA)* and the *Société de Mathématiques Appliquées et Industrielles (SMAI)* for their support in the organization, the Council of A Coruña for the reception of the speakers to visit its site, and the research group M2NICA of the *Universidade da Coruña*, for their co-financing support. Some of these grants benefit from FEDER funds.

We also would like to mention in these lines our special acknowledgement to the responsables of the School of Nautical Science and Naval Engines of the *Universidade da Coruña* and their administration staff for their availability and the excellent treatment given to welcome us in their site.

We wish to record our gratitude to the Department of Mathematics of the *Universidade da Coruña* for their cooperation.

We also thank the University Press Service their willingness to include this book as a number of its series of publications, as well as all the work done for editing it.

Finally, we must mention the work done by the local organizing committee members, whose dedication and enthusiasm in all tasks have contributed to the success of the present edition of the School in A Coruña.