

## Introduction

This special issue is devoted to the 6th edition of the Summer School on Methods and Models of Kinetic Theory (M&MKT 2012), held in Porto Ercole (Tuscany, Italy), on June 3-9, 2012, with the participation of about fifty young and senior researchers, coming from several countries of Europe and from Japan. The School is mainly aimed at presenting the updated state-of-the-art for important topics of significant interest in the field of kinetic theory and of its applications, considering both theoretical and numerical methods, relevant to the true Boltzmann equation as well as to other kinetic models. It is addressed especially to Ph.D. students, Post-Docs, and young researchers with some past experience, or else with a new interest, in these areas of Mathematical Physics.

The 6th edition of the School was focused on three main courses of 6 hours each,

1. Coagulation -Fragmentation models,
2. Multi-scale methods with application to magnetically confined plasmas,
3. Statistical mechanics and dynamics of long-range interacting systems,

which were delivered, respectively, by three distinguished experts in the field, Klemens Fellner (Graz), Claudia Negulescu (Toulouse), and Stefano Ruffo (Firenze).

Beside the courses, a cycle of seminars was given by K. Aoki (Kyoto), L. Barletti (Firenze), A. Bobylev (Karlstad), F. Conforto (Messina), and F. Golse (Paris).

Further information on the school, including the list of participants, can be obtained from the web site:

<http://calvino.polito.it/~mmkt>

In the frame of the aims and scopes of this Journal, the present issue publishes three extensive survey papers summarizing the contents of the three main courses of the 2012 edition.

The Scientific Committee of the School

- K. Aoki, Kyoto University, Japan
- A. V. Bobylev, Karlstad University, Sweden
- L. Desvillettes, École Normale Supérieure de Cachan, France
- G. Frosali, Università di Firenze, Italy
- R. Monaco, Politecnico di Torino, Italy
- G. Spiga, Università degli Studi di Parma, Italy
- G. Toscani, Università di Pavia, Italy