

## Strongly Coupled Coulomb Systems

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2006 J. Phys. A: Math. Gen. 39

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## PREFACE

# Strongly Coupled Coulomb Systems

This special issue contains papers presented at the International Conference on Strongly Coupled Coulomb Systems (SCCS) which was held during the week of 20–24 June 2005 in Moscow, Russia. The Moscow conference was the tenth in a series of conferences. The previous conferences were organized as follows.

- 1977: Orleans-la-Source, France, as a NATO Advanced Study Institute on Strongly Coupled Plasmas (organized by Marc Feix and Gabor J Kalman)
- 1982: Les Houches, France (organized by Marc Baus and Jean-Pierre Hansen)
- 1986: Santa Cruz, California, USA (hosted by Forrest J Rogers and Hugh E DeWitt)
- 1989: Tokyo, Japan (hosted by Setsuo Ichimaru)
- 1992: Rochester, NY, USA (hosted by Hugh M Van Horn and Setsuo Ichimaru)
- 1995: Binz, Germany (hosted by Wolf Dietrich Kraeft and Manfred Schlanges)
- 1997: Boston, Massachusetts, USA (hosted by Gabor J Kalman)
- 1999: St Malo, France (hosted by Claude Deutsch and Bernard Jancovici)
- 2002: Santa Fe, New Mexico, USA (hosted by John F Benage and Michael S Murillo)

After 1995 the name of the series was changed from ‘Strongly Coupled Plasmas’ to the present name in order to extend the topics of the conferences.

The planned frequency for the future is once every three years. The purpose of these conferences is to provide an international forum for the presentation and discussion of research accomplishments and ideas relating to a variety of plasma liquid and condensed matter systems, dominated by strong Coulomb interactions between their constituents.

Strongly coupled Coulomb systems encompass diverse many-body systems and physical conditions. Each meeting has seen an evolution of topics and emphasis as new discoveries and new methods appear. This year, sessions were organized for invited presentations and posters on dense plasmas and warm matter, astrophysics and dense hydrogen, non-neutral and ultracold plasmas, dusty plasmas, condensed matter 2D and layered charged-particle systems, Coulomb liquids, and statistical theory of SCCS. Within each area new results from theory, simulations and experiments were presented. In addition, a special symposium was held one evening to explore the questions on high-energy-density matter generated by intense heavy ion beams and to discuss the outlook for applications to industry.

As this special issue illustrates, the field remains vibrant and challenging, being driven to a great extent by new experimental tools and access to new strongly coupled conditions. This is illustrated by the inclusion of developments in the areas of warm matter, dusty plasmas, condensed matter and ultra-cold plasmas.

In total, 200 participants from 17 countries attended the conference, including 42 invited speakers. The individuals giving presentations at the conference, including invited plenary and topical talks and posters, were asked to contribute to this special issue and most have done so. We trust that this special issue will accurately record the contents of the conference, and provide a valuable resource for researchers in this rapidly evolving field.

We would like to thank the members of the International Advisory Board and all members of the Programme Committee for their contributions to the conference. Of course, nothing

would have been possible without the dedicated efforts of the Local Organizing Committee, in particular Igor Morozov and Valery Sultanov. We wish to thank the Russian Academy of Sciences, the Institute for High Energy Densities, the Institute of Problems of Chemical Physics, the Moscow Institute of Physics and Technology, the Ministry of Education and Science of the Russian Federation, the Russian Foundation for Basic Research, the Moscow Committee of Science and Technologies, the Russian Joint Stock Company 'Unified Energy System of Russia', and The International Association for the Promotion of Co-operation with Scientists from the New Independent States (NIS) of the Former Soviet Union for sponsoring this conference.

**Vladimir E Fortov, Kenneth I Golden and Genri E Norman**

**Guest Editors**