

## Preface

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The “International Topical Conference on Plasma Science: Advanced Plasma Concepts” was hosted by Instituto Superior Técnico, Lisbon and the University of Algarve, Faro, Portugal, during the period 24–28 September 2012. The conference was organized by Padma Kant Shukla, (Ruhr University Bochum, Germany), Robert Bingham (RAL, United Kingdom) and José Tito Mendonça, (IST, Portugal). The scientific activity belongs to a series of successful meetings, which started at the Abdus Salam International Centre for Theoretical Physics, Trieste, in 1989, and which has also been taking place at various other locations, including Faro and Lisbon in Portugal, and Santorini in Greece.

The aim the conference was to promote a broad area of knowledge, exploring the main advances in theory and applications of plasma physics. The purpose was also to provide training for young scientists from all over the world and to give them the opportunity to interact with senior scientists in an informal manner. The main focus of the scientific program was on strongly coupled ultracold plasmas, quantum plasmas, collisionless shocks and beams, intense laser-plasma interactions and plasma-based particle acceleration, and inertial and magnetic

confinement fusion. A selected number of papers in these areas appears in this special issue.

The editors would like to thank workshop secretary Mrs. Anabela Gonçalves and the local organizers David Resendes, Rui Guerra, José Figueiredo, and Manuel Alonso for their excellent support and help during the activity. In addition, the organizers thank the speakers and attendees for their contributions which have resulted in the success of the conference. Specifically, we appreciate the speakers for delivering excellent lectures and talks, and for supplying well-prepared manuscripts for publication in the present special issue.

During the preparation of this special issue, the shocking news reached us that the Editor of Journal of Plasma Physics and Co-Editor of this special issue Professor Padma Kant Shukla unexpectedly passed away on 26 January 2013, during his travel to New Delhi, India, to receive the prestigious Hind Rattan (Jewel of India) Award. Padma was one of the world’s most renowned plasma physicists with more than 1500 authored papers, and he inspired and mentored many young scientific talents around the world. We have lost not only a great scientist, but also a dear colleague, collaborator and friend.

\* Deceased.