

Preface

The second edition of the conference “Advanced many-body and statistical methods in mesoscopic systems” took place in Brasov, Romania, between 1-5.09.2014, continuing the tradition started in Constanta in 2011. This event brought together sixty-eight scientists from fifteen countries. These were well-known scientists working in the fields of nanophysics, many-body systems, and quantum information.

The conference covered a wide range of topical research directions: foundations of quantum physics, equilibrium and non-equilibrium quantum statistics/fractional statistics, quantum transport, phases and phase-transitions in mesoscopic systems/superfluidity and superconductivity, quantum electromechanical systems, quantum dissipation, dephasing, noise and decoherence, quantum information, spin systems and their dynamics, fundamental symmetries in mesoscopic systems, phase transitions, exactly solvable methods for mesoscopic systems, various extension of the random phase approximation, open quantum systems, clustering, decay and fission modes, and systematic versus random behaviour of nuclear spectra. This edition, a special section was devoted to quantum information, reflecting the growing importance of the field, with a lot of connections to nanoscale technologies, nuclear physics, and foundations of quantum physics. The latest developments in these overlapping branches, both theoretical and experimental, were addressed during the conference in Brasov.

One of the priorities of the conference was the interaction between experienced professors and young researchers, offering the M.Sc. and Ph.D. students the possibility to present their work and to discuss with their more senior colleagues.

We are grateful for the financial and organizational support from IFIN-HH, Transilvania University-Brasov (where the conference took place), and the Romanian National Authority for Scientific Research.

This conference proceedings volume brings together some of the invited and contributed talks of the conference. The editors believe that this will contain valuable reference material for applying many-body techniques to problems in mesoscopic and nuclear physics.

We thank all the participants for their contribution to the success of this conference.

D. S. Delion, D. V. Anghel, IFIN-HH, Bucharest, Romania
I. Ghiu, University of Bucharest
G. S. Paraoanu, Aalto University, Finland