

PREFACE

The first Winter Institute on Foundations of Quantum Theory and Quantum Optics was held very successfully during 1–13 January, 2000 at the Satyendra Nath Bose National Centre for Basic Sciences in Kolkata, India. It brought together an impressive number of physicists from all over the world interested in the fundamental aspects of quantum theory and quantum optics. There were pedagogic lectures as well as discussions in study groups in different focused areas of research, and at the end of the meeting a proposal emerged for holding such Winter Institutes once in every two years.

Planning of the second Winter Institute on Foundations of Quantum Theory and Quantum Optics took long – it got rolling when Professor Sushanta Dattagupta, Director of the S.N. Bose Centre offered to host the Winter Institute at his Centre for the second time. The scope of the Winter Institute is quite broad and its aim is to play a proactive role in seeding and sustaining research collaborations in the emerging areas of quantum mechanics, quantum optics and mesoscopic physics. In the light of recent explosive growth in the area of Quantum Information Processing, the second Winter Institute was expected to focus on this area in a major way. In the aftermath of 11 September, 2001 and the ensuing war in the neighbourhood, there were large-scale cancellations of participation from abroad and the initial planning could not be materialized in its entirety. Nevertheless, during the 9 working days (2–11 January, 2002 with a break on a Sunday) of the second Winter Institute, the academic programme was packed, and there were 37 invited talks and 9 contributed papers on topics involving quantum entanglement and nonlocality, quantum tunneling, quantum teleportation, quantum computation, measurement and decoherence, stochastic quantum mechanics, formulation of a maximally classical and realistic quantum theory, fundamental light-matter interactions, etc. – both experimental and theoretical. There were intense discussion sessions almost every day. The second Winter Institute also provided an opportunity for the participants to honour Professor Shasanka Mohan Roy, the founder-convener of the Winter Institute, on his completing 60 years.

The second Winter Institute would not of course have taken shape without the active support and guidance of the members of the Scientific Organizing Committee. The members of the Local Organizing Committee and the staff of the S.N. Bose Centre provided the necessary infrastructure and ensured smooth running of the Winter Institute. Financial support came from the S.N. Bose Centre, the Department of Science and Technology, the BRNS of the Department of Atomic Energy, and the Council of Scientific and Industrial Research, India.

The Editorial Board of *Pramana* – Journal of Physics, published by the Indian Academy of Sciences, Bangalore, agreed to publish the Proceedings of the second Winter Institute as a special issue of *Pramana*. This volume of the Proceedings in its limited space hopes to capture the essence of the deliberations in the Winter Institute. There are 34 papers in this volume including short contributions and regular papers reporting results of recent research and a few review articles. The authors are to be congratulated for getting the manuscripts ready in the electronic form by the deadline. The members of staff of *Pramana* deserve special thanks for the timely publication of this volume.

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