

Foreword

Special issue – EBME2004

Brazilian School on Statistical Mechanics 2004 **Escola Brasileira de Mecânica Estatística 2004**

The 2004 version of the Brazilian School on Statistical Mechanics (Escola Brasileira de Mecânica Estatística, EBME) took place from 9 to 20 February, 2004, at the Instituto de Física de São Carlos, University of São Paulo, in the city of São Carlos, about 250 km from São Paulo. We are now publishing the lecture notes of four short courses, which were attended by about 70 graduate students and research associates.

The first week of the school was devoted to the study of “complex systems.” In the short courses of this week there was a review of recent applications of ideas and techniques of statistical mechanics, including numerical analysis and stochastic simulations. The article by Giovani Vasconcelos, from Recife, Pernambuco, *A Guided Walk Down Wall Street: An Introduction to Econophysics*, is very representative of the new directions in this area. The other short courses of this week were organized by the group of Niterói, with emphasis on numerical simulations of simple model systems. In this special issue, we are publishing articles by Suzana Moss de Oliveira (*Evolution, Ageing and Speciation: Monte Carlo Simulations of Biological Systems*), and by Jorge S. Sá Martins and Paulo Murilo C. Oliveira (*Computer Simulations of Statistical Models and Dynamic Complex Systems*).

The second week was devoted to the old phenomenon of Bose-Einstein condensation, which has been duly revived by the spectacular experimental realizations in atomic physics, and to recent investigations of charged fluids and related polyelectrolytes. The article by Antonio F. R. Toledo Piza, from São Paulo, *Bose-Einstein Condensation in Dilute Atomic Gases*, is a detailed and comprehensive review of the recent work on this topic. Finally, the work on charged fluids is reviewed by Yan Levin, from Porto Alegre (*Introduction to Statistical Mechanics of Charged Systems*).

We hope that these review articles will give an overview of new trends and directions in statistical mechanics.

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