Preface

At the XVII Brazilian School of Probability (EBP) held in early August 2013, in Mambucaba, Rio de Janeiro, Brazil, we celebrated a long-standing friendship and scientific interaction between the group of mathematical physics and probability of Roma and L'Aquila and our probability group in Brazil. Since the beginning, a central role in this interaction has been played by Errico Presutti, whose leadership, vision, and generosity in sharing ideas and promoting the discussion of different topics have been crucial for the scientific lives of many of us and for the development of these groups. To tell the truth, that celebration was the closest we could get to organize a meeting to celebrate Errico's work. Indeed, few years back, when some of us thought of organizing a meeting in his honor, it became clear that he would not accept it. Thus, some change was needed...

Errico Presutti is currently Professor at the Gran Sasso Science Institute, in L'Aquila, after many years as Professor at the Mathematics Department at Università di Roma Tor Vergata, where he is now Professor Emeritus. Errico has made extremely deep and key contributions to fundamental problems in mathematical physics, dealing with equilibrium and non-equilibrium rigorous statistical mechanics. Among these, we mention the approach to phase transitions in the continuum, in collaboration with J. L. Lebowitz and A. E. Mazel, and, more generally, the study of collective behaviour in many component systems, emergence of microstructures, the role of mesoscopic scales, a whole theory for Kac type interactions. His book *Scaling Limits in Statistical Mechanics and Microstructures in Continuum Mechanics* is a key reference for this subject, and a must to all those who want to learn more on this, building in a didactic way bridges between continuum mechanics and PDEs and statistical mechanics.

At the XVII EBP we had the priviledge of two minicourses: Martin Hairer lectured on *Renormalisation Theory and Stochastic PDEs*. Errico's course was titled *From equilibrium to non equilibrium statistical mechanics. Phase transitions and the Fourier law*. We deeply thank both of them for coming to the school, and for their inspiring and iluminating lectures.

It is for us reason of big joy and happiness that Errico has accepted to have this Festschrift, that we now present with great pleasure. It includes the lecture notes of both courses and twelve articles from different areas of Probability and Statistical Mechanics. Several of these contributions have been part of—or are strongly related to—the scientific program of the school and some of their authors have a long-standing scientific relationship with Errico.

We wish to take this opportunity to thank all of the authors for their valuable contributions.

The papers have been peer-reviewed, and we are thankful to all the colleagues who generously worked as referees.

Since this volume partially grew out of the XVII EBP, we also take the occasion to acknowledge the financial support given to the school by various agencies:

Capes, CNPq, ESF, Faperj, and Fapesp. The school was organized by IMPA and IM-UFRJ as an activity of INCTMat. It was also sponsored by the Bernoulli Society in the context of their International Year of Probability and Statistics—2013. Our special thanks to the members of the scientific and organizing committees, and to the staff of IMPA for their help in the organization.

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