

# Preface

The present volume contains expanded and substantially reworked records of invited lectures delivered during the 38th Karpacz Winter School of Theoretical Physics on “Dynamical Semigroups: Dissipation, Chaos, Quanta”, which took place in Łądek Zdrój, (Poland) in the period 6–15 February 2002.

The main purpose of the school was to create a platform for the confrontation of viewpoints and research methodologies represented by two groups of experts actually working in the *very same* area of theoretical physics. This situation is quite distinct in non-equilibrium statistical physics of open systems, where classical and quantum aspects are addressed separately by means of very different and even incompatible formal tools.

The school topics selection by the Lecturers reads: dissipative dynamics and chaotic behaviour, models of environment–system coupling and models of thermostats; non-equilibrium statistical mechanics and far from equilibrium phenomena; quantum open systems, decoherence and links to quantum chaos; quantum and classical applications of Markov semigroups and the validity of Markovian approximations.

The organizing principle for the whole endeavour was the issue of the *dynamics of open systems* and more specifically – the *dynamics of dissipation*. Since this research area is extremely broad and varied, no single book can cover all important developments. Therefore, links with dynamical chaos were chosen to represent a supplementary constraint.

The programme of the school and its final outcome in the form of the present volume has been shaped with the help of the scientific committee comprising: R. Alicki, Ph. Blanchard, J. R. Dorfman, G. Gallavotti, P. Gaspard, I. Guarneri, F. Haake, M. Kuś, A. Lasota, B. Zegarliński and K. Życzkowski. Some of the committee members took charge of lecturing too. We convey our thanks to all of them.

We would like to express words of gratitude to members of the local organizing committee, W. Cegła and P. Ługiewicz, for their help. Special thanks must be extended to Mrs Anna Jadczyk for her help at various stages of the school organization and the competent editorial assistance.

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