

## PREFACE

The 18-th Marian Smoluchowski Symposium on Statistical Physics took place on September 3-6, 2005, in Zakopane, Poland. It was the extraordinary and exceptional meeting because of several reasons: First, it took place in 2005, *i. e.* in the World Year of Physics proclaimed by the United Nations. Moreover, it happened a hundred years after Albert Einstein published in the *Annalen der Physik* the pivotal paper on Brownian motion, which turned out to be a cornerstone work of the modern theory of stochastic processes and non-equilibrium statistical physics. And finally, during the Symposium, we celebrated the 60th birthday of our colleague and friend — Prof. Dr. Peter Talkner.

With this special issue of *Acta Physica Polonica B* we would like to honor Peter Talkner's sixtieth birthday, his life and his scientific activity and creativity. It gave the occasion for the guest editors of this issue to invite renowned scientists and collaborators of Peter Talkner to contribute original papers to a collection of works presented at the Symposium.

During the past decades, Peter Talkner worked in several areas of statistical physics that partly were initiated by Albert Einstein and Marian Smoluchowski a century ago. He published a series of excellent papers on Markovian and non-Markovian stochastic processes, classical and quantum dissipative phenomena, diffusion and fluctuations, activated rate processes and on various aspects of nonlinear dynamics. He wrote together with Peter Hänggi and Michael Borkovec the paper entitled 'Reaction-rate theory: fifty years after Kramers', which was published in the *Reviews of Modern Physics* **62**, 251 (1990). This comprehensive review paper constitutes the "benchmark" in the field of reaction rate theory and is very well known to everybody who deals with the statistical physics involving metastable states. By now this "bible" is in fact cited over 1850 times!. However, his scientific interests are even broader than the above mentioned subjects. It is much less known that Peter Talkner wrote many papers on such exotic (for 'orthodox' physicists) themes as climate processes in the Alpine region or on the statistical dynamics of financial (foreign exchange) markets (the paper has been published in *Nature*, **381**, 767 (1996)). He has also contributed to the notoriously difficult and still not fully solved problem of classical physics, namely turbulence. Recently, he enthusiastically has engaged into challenges that deal with the physics occurring in microfluids.

Many of the authors who have contributed to this issue, and the guest editors in particular, have benefited a lot from discussions with Peter Talkner; discussions not only on science and physics but also on art, life and culture. His broad knowledge, his open friendliness, together with his personal and scientific modesty, allow us to formulate the statement that he is one of few humanists among physicists and a special case of a physicist among humanists.

We want to thank you, Peter, for many common experiences, the many stimulating, often never-ending discussions, profitable collaborations and sincere friendship lasting over centuries: from the former 20th to the present 21st century. We all warmly wish you another 60 years of healthy and fruitful activities of doing science!

On behalf of organizers of the Symposium, we would like also to express our gratitude to all colleagues who have helped in the editorial process making speedy appearance of this issue. Special thanks are directed to Bartek Dybiec and all members of *Acta Physica Polonica B* Editorial Office for their constant assistance in preparation of this volume.

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