



Preface

This colorful meeting at the shore of the Brazilian coast not far from Rio de Janeiro in a setting that is impossible to forget honoured the 60th birthday of Constantino Tsallis who is one of the outstanding personalities today in Statistical Physics and an extraordinary example of how top science can be made in a developing country. In 1974 Constantino had a permanent position in Paris where he worked on Statistical Physics when he decided to leave this comfortable situation and become a professor in Brazil. After having spent 2 years in Brasilia, he became a permanent member of one of the most prestigious Brazilian physics research institution, namely the Centro Brasileiro de Pesquisas Físicas (CBPF) in Rio de Janeiro where he is still today. Being in Brazil he focused his area of research on critical phenomena and related matters. He made an impressive number of original contributions, widely spread over various areas. For instance he invented an original real space renormalization-group technique of very general applicability which surprisingly gave exact results for several cases. He also proposed a model to explain the origin of life via the growth of polymers in the “primordial soup” and, as another example, he proposed an alternative to the Feigenbaum mapping (having a jump at the apex of the parabola), giving different critical exponents. These and many other contributions gave each of them an important impetus to the development of the field at that time. In Brazil he attracted numerous students of whom most are now professors and who made their Masters or Doctor thesis under his supervision. He also attracted the first European post-docs and Guggenheim fellows that went to Brazil. He created one of the strongest scientific activities in physics in the entire country and rose to the most visible figure to the outside world. So he was asked by the scientific community to organize in 1989 STATPHYS in Rio de Janeiro for the first time outside the developed world the most important international conference in statistical physics. His influence on science in Brazil is enormous and his ideas and fields of interests have found roots in all continents and nearly all universities of Brazil. In 1988 Constantino surprised the scientific community with a proposal of generalizing the classical Boltzmann-Gibbs Statistical Mechanics. This was an extremely bold step since at first sight it seemed to violate some of the basic principles of thermodynamics and was rejected in the early stages by many traditional scientists. This generalization has become in the meantime one of the most, if not the most important contribution to Statistical Physics in the last decades. It turned out over the years that the novel approach proposed by Constantino has a very broad range of applications, ranging from astrophysics to turbulence, from biological systems to Levy-flights. In many cases it is able to give a framework to yet unexplained data and to handle contradictions of thermodynamics (for instance the non-extensivity due to long ranged potentials). In the

last 5 years alone over 700 publications have been written by more than 480 scientists coming from 38 different countries on this extended thermodynamics. In the last 3 years five conferences have been held on the subject and four books have been published. In the centre of this evolution, Constantino is still the main actor in feeding relentlessly this fast growing field with many original ideas and always deepening insight. His name appears nearly every week in the titles of papers as “Tsallis-statistics” or “Tsallis-entropy” (including many Physical Review Letters) and has by now become a concept in Statistical Physics. Constantino has also won many honours and distinctions in his career, is Chief Co-editor of Physica A, and member of several editorial boards.

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