

FOREWORD

In these proceedings of the Fifth Edition of the International School and Workshop on Quantum Field Theory and Hamiltonian Systems, Călimănești-Căciulata, Romania, 20-26 May 2006, contributors describe their research in the basic fields of Theoretical Physics and Dynamical Systems. Individual paper topics are dedicated to the idea that the interplay between Physics and Mathematics yields a better understanding of Nature and creates a fruitful framework for the study of Universe. Organized by the Faculty of Physics from the University of Craiova, in collaboration with the University Lucian Blaga from Sibiu, the West University of Timișoara, and the National Institute for Physics and Nuclear Engineering Horia Hulubei from Bucharest, this edition benefited also from the financial support kindly provided by the Romanian Ministry of Education and Research and the National Council for Academic Scientific Research – Romania.

All invited lessons and workshop talks were intended to a large audience of specialists, but not only. The morning and afternoon sessions were followed by exercise meetings, especially conceived for master and Ph.D. students in Physics and Mathematics. The main subjects approached during the school include special aspects of:

- Quantum Field Theory, Supersymmetry, String Theory, and General Relativity and Gravitation (maximal SUGRA and maximal supersymmetric Yang-Mills theory, finite unified theories, higher spin field theories, scalar resonance in QCD, models for strong decays, quantum strings, cosmological models, superenergy tensors, applications of the BRST method);
- Mathematical Aspects of Dynamical Systems (Ricci flows, causality and noncommutativity, exactly solvable quantum models, non-Hamiltonian systems);
- Non-linear Dynamics (soliton solutions for the nonlinear Schrödinger equation, inverse scattering transform, nonclassical symmetries of 2D-flow models, invariants of zonal-flow models, Lie symmetries for flow equations, differential equations and conservation laws, group analysis and integration methods of ODEs).

Apart from their main scientific preoccupations, the participants had the opportunity to exchange ideas on the future of Physics research, education, and funding. They eventually converge at a unique point: mathematicians and physicists working in the field of Theoretical Physics portray to a great extent the idealistic scientist, designed for the previous century, but creating the next one. Enjoyable moments were spent during the trips organized in the neighborhood region.

Both organizers and editors express their sincere gratitude to all the contributors to these Proceedings for their cooperation in respect of time limitation, and accurate and patient preparation of their manuscripts in electronic form. Special thanks are presented to Dr. Mihail Sandu, professor at the University Lucian Blaga from Sibiu, the main local organizer, whose endeavor and dedication were invaluable to the well-course of this activity. Our acknowledgment is likewise made for the cooperation of several local and national institutions, business and economical organizations and societies as sponsors of the School and Workshop. Since so many people and sponsors helped us in so many ways at the preparation of this School and Workshop, we apologize in advance for possible omissions of names or institutions.

Editors of the 5th International School and Workshop