PREFACE

We have the pleasure to present under the covers of this special issue of «Particles and Nuclei, Letters» the most part of the contributions to the International Conference «Mathematical Modeling and Computational Physics» (MMCP 2006). Devoted to the 50th anniversary of the Joint Institute for Nuclear Research, the Conference was held in the High Tatras Mountains, Slovakia, on August 28 – September 1, 2006. The Conference was organized by the JINR Laboratory of Information Technologies, the Institute of Experimental Physics of the Slovak Academy of Sciences (Košice), and the Technical University in Košice. The Conference was the fourth one organized by LIT under this name. On the initiative of the Slovak colleagues, it was for the first time organized outside JINR.

Chairmen of the Conference were LIT Director Professor V. V. Ivanov and Rector of the Technical University in Košice Professor J. Sinay. Honorary Chairman was Professor E. P. Zhidkov, who celebrated his eightieth anniversary during the days of the MMCP 2006. The Program Committee was headed by Professors I. V. Puzynin and M. Pavluš; and the Organizing Committee, by Professors Gh. Adam and M. Hnatič. Pro-rector of the Technical University Professor A. Čižmár, Dean of the Faculty of Electrical Engineering and Informatics Professor D. Kocur, and Director of the Institute of Experimental Physics of SAS Professor P. Kopčanský welcomed the Conference attendees.

The Conference was attended by participants from Austria, Armenia, Belgium, Belarus, Finland, France, Germany, Great Britain, Italy, Japan, Poland, Romania, Russia, Slovakia, Spain, Taiwan, Ukraine, USA, and Vietnam. A number of 20 plenary and invited papers were delivered by reputed specialists in the field of mathematical simulation and computational physics, together with over 40 contributed talks, covering a broad range of hot computing topics.

Numerical studies on the properties of organic compounds were reported by V. D. Lakhno (DNA conductivity), U. H. E. Hansmann (folding of small proteins), M. Bachmann (adsorption of polymers and peptides to substrates), Ch.-K. Hu (simulation of protein folding), G. R. Kneller (scaling laws and memory effects in proteins), M. S. Li (pathways of oligomerization of short peptides).

New progress in understanding various aspects of turbulence was reported by several speakers (G. Boffetta, M. Martins Afonso, A. Mazzino, M. Jurčišin).

Perspective applications of the computer algebra to quantum computing and to the derivation of discretizations preserving the conservation laws were reported by S. Fritzsche and V. P. Gerdt.

The use of Grid tools in solving large-scale problems was reported in a lecture by N. S. Scott, as well as in several contributed talks (M. Babik, B. Pastirčak, R. Vodička).

V. V. Ivanov discussed the control over the information traffic in Grid networks. Yu. M. Pis'mak presented scaling laws in the evolution of large computing programs.

Methods of experimental data processing were presented by N. D. Dikoussar (four-point transform), as well as in some contributed talks (T. H. Miyazaki, W. Gille, M. Buczkowski).

Results of fruitful international cooperation involving scientists from LIT and Slovakia were delivered by O. Streltsova (Yang–Mills–Dilaton evolution), J. Buša (parallel computing algorithms), M. Pavluš (moisture transfer), B. F. Kostenko (track formation in irradiated cuprates), N. D. Dikoussar (autotracked cubic splines), Ch.-K. Hu (simulation of small peptides).

New results and methods in constructing reliable algorithms for numerical integration were discussed by P. Zinterhof (high-dimensional Monte Carlo) and Gh. Adam (boundary layer problem in Bayesian integration).

Participation of young specialists from Armenia, Russia, Slovakia, and Ukraine who delivered interesting reports should be especially noted.

The Conference highlighted the role of the mathematical modeling and computing methods as an integrating factor in the present-day scientific research in various fields of knowledge: particle physics, physics of solids, hydrodynamics, biology, biochemistry, material studies, quantum computations, economy, computer science, etc.

The Conference received financial support by a special grant afforded by the Plenipotentiary Representative of the Government of the Slovak Republic to JINR. Sponsors were such companies as Cryosoft s.r.o., Linde Technicke Plyny Slovensko k.s., Siemens Program and System Engineering s.r.o. Elsevier generously offered to each participant two free of charge code copies from the CPC Program Library.

Group visits to some beautiful places of High Tatras and an interesting social programme completed the rich scientific programme of MMCP 2006. The Conference attendees are unanimous in their gratitude to the Slovak colleagues, especially to M. Hnatič and J. Buša, for faultless local organization of the Conference, warm hospitality, and good care.

V. V. Ivanov