

Preface

The 10th International Conference on Large-Scale Scientific Computations (LSSC 2015) was held in Sozopol, Bulgaria, June 8–12, 2015. The conference was organized by the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences in cooperation with Society for Industrial and Applied Mathematics (SIAM) and Sozopol municipality.

The following plenary invited speakers and lectures were hosted:

- Thierry Coupez, “Implicit Boundary in Multiphase Flows and Anisotropic Adaptive Meshing”
- David Keyes, “Algorithmic Adaptations to Extreme Scale”
- Johannes Kraus, “Combined Strategies in Algebraic Multilevel Preconditioning”
- Siegfried Selberherr, “Spin-Based CMOS-Compatible Devices”
- Ludmil Zikatanov, “Subspace Correction Methods: Theory, Practice, and Robustness”

The success of the conference and the present volume are the outcome of the joint efforts of many partners from various institutions and organizations. First, thanks to all the members of the Scientific Committee for their valuable contribution forming the scientific face of the conference, as well as for their help in reviewing contributed papers. We especially thank the organizers of the special sessions. We are also grateful to the staff involved in the local organization.

Traditionally, the purpose of the conference is to bring together scientists working with large-scale computational models in natural sciences and environmental and industrial applications, and specialists in the field of numerical methods and algorithms for modern high-performance computers. The invited lectures reviewed some of the most advanced achievements in the field of numerical methods and their efficient applications. The conference talks were presented by researchers from academic institutions and practical industry engineers including applied mathematicians, numerical analysts, and computer experts. The general theme of LSSC 2015 was “Large-Scale Scientific Computing” with a particular focus on the organized special sessions.

The special sessions and organizers are as follows:

- “A Posteriori Error Control and Iterative Methods for Maxwell Type Problems” — D. Pauly, J. Kraus
- “Multilevel Methods on Graphs” — P. Vassilevski, L. Zikatanov
- “Mathematical Modeling and Analysis of PDEs Describing Physical Problems” — O. Iliev
- “Numerical Methods for Multiphysics Problems” — J. Adler, X. Hu, R. Lazarov
- “Control and Uncertain Systems” — M. Krastanov, V. Veliov
- “Enabling Exascale Computation” — O. Iliev, D. Keyes

- “Efficient Algorithms for Hybrid HPC Systems” — A. Karaivanova, E. Atanassov, T. Gurov, M. Mascagni
- “Applications of Metaheuristics to Large-Scale Problems” — S. Fidanova, G. Luque
- “Computational Microelectronics — From Monte Carlo to Deterministic Approaches” — I. Dimov, M. Nedjalkov, J. Weinbub
- “Large-Scale Models: Numerical Methods, Parallel Computations and Applications” — K. Georgiev, Z. Zlatev

More than 120 participants from all over the world attended the conference representing some of the strongest research groups in the field of advanced large-scale scientific computing. This volume contains 49 papers by authors from 15 countries.

The next international LSSC conference will be organized in June 2017.

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