International Conference on Computational Science, ICCS 2012

Empowering Science through Computing, preface for ICCS 2012

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Welcome to the 12th Annual International conference on Computational Science, to be held in Omaha, USA. This year's conference will take place in Omaha, the heart of USA, at the Embassy suites – Downtown/Old Market. ICCS 2012 is organized by the University of Nebraska at Omaha, Universiteit van Amsterdam, the University of Tennessee, Nanyang Technological University, and Chinese Academy of Sciences Research Center on Fictitious Economy and Data Science.

The International Conference on Computational Science aims to bring together annually researchers and scientists from mathematics and computer science as basic computing disciplines, researchers from various application areas who are pioneering advanced application of computational methods to sciences such as physics, chemistry, life sciences, and engineering, arts and humanitarian fields, along with software developers and vendors, to discuss problems and solutions in the area, to identify new issues, and to shape future directions for research, as well as to help industrial users apply various advanced computational techniques.

ICCS 2012 will be the twelfth in this series of highly successful conferences. For details of the previous eleven very successful meetings see: http://www.iccs-meeting.org/iccs2012/previous-iccs.html

The theme for ICCS 2012 is "Empowering Science through Computing", to mark the ever-increasing importance of and progress in computational science theory and practice. The conference will be a unique event focusing on recent developments in methods and modeling of complex systems for diverse areas of science, scalable scientific algorithms, advanced software tools, computational grids, advanced numerical methods, and novel application areas where the above novel models, algorithms and tools can be efficiently applied such as physical systems, computational and systems biology, environmental systems, finance, and others.

For this great event, we have invited the following world leading keynote speakers to give their current and future vision of Computational Science:

- Dirk Helbing, ETH Zürich, Switzerland
- Frederica Darema, Air Force Office of Scientific Research, USA
- Michael L. Norman, San Diego Supercomputer Center, USA
- Philip S. Yu, University of Illinois at Chicago, USA
- Nin Zhong, Maebashi Institute of Technology, Japan

Besides our excellent keynote speakers, out of the submitted papers to main track and workshops, we selected 235 high-quality papers for presentation at the conference and publication in the proceedings, published by Elsevier in their Procedia Computer Science series. These papers are collated into a single main track and nineteen workshops. The accepted papers are contributed by scholars and practitioners from many different countries across the globe. In addition to the keynote talks and presentations of

the contributors, we have also invited four well-known scholars and experts to share their valuable experience at the tutorial sessions.

ICCS relies strongly on the vital contributions of our workshop organizers to attract high quality papers in many subject areas. We would like to thank all committee members and reviewers for the main track and the workshops for their contribution to ensure a high standard for the accepted papers. We would like to express our gratitude to the local organizing committee for their enthusiastic work towards the success of ICCS 2012. We owe special thanks to our sponsors: Elsevier B.V., College of Information Science and Technology, University of Nebraska at Omaha, The Gallup Organization, Union Pacific Railroad and Interpublic Group of Companies for their generous support.

We are proud to note that ICCS is an ERA 2010 A-ranked conference series. We wish you a successful and enjoyable conference in Omaha!

June 2012, Omaha   The ICCS 2012 Organizers,
                                                    Hesham Ali
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Workshops and Organizers

Simulation of Multiphysics Multiscale Systems, 9th International Workshop
V.V. Krzhizhanovskaya, University of Amsterdam, The Netherlands

3rd Workshop on Computational Optimization, Modelling and Simulation (COMS 2012)
X.S. Yang, National Physical Lab, UK; S. Koziel, Rekjavik University, Iceland; L. Leifsson, Rekjavik University, Iceland

9th International Workshop on Practical Aspects of High-Level Parallel Programming (PAPP 2012)
Frederic Loulergue, (LIFO, University of Orleans, France)

Tools for Program Development and Analysis in Computational Science
A. Knüpfer, Technische Universität Dresden; J. Tao, Karlsruhe Institute of Technology; Sascha Hunold Heidelberg University; Karl Fuerlinger LMU Munich; Bettina Krammer University of Versailles; Kathryn Mohror CASC, LLNL; Josef Weidendorfer TU Munich; D. Kranzlmüller, Ludwig-Maximilians-Universität München; R. Wismüller, University of Siegen

Fourth Workshop on Emerging Parallel Architectures (WEPA)
B. Schmidt, Johannes Gutenberg University Mainz

Agent-Based Simulations, Adaptive Algorithms and Solvers
M. Paszynski, R. Schaefer, K. Cetnarowicz, Department of Computer Science, AGH University of Science and Technology, Krakow, Poland; D. Pardo IKERBASQUE, Basque Foundation of Science, Bilbao, Spain; V. Calo, King Abdullah University of Science and Technology KAUST, Thuwal, Saudi Arabia.

Knowledge representation and applied models and metadata in computational science
M.-A. Sicilia, D. Rodríguez-García, Computer Science Department, University of Alcalá; N. Manouselis, Greek Research and Technology Network – GRNET; P. Karampiperis, National Center of Scientific Research, DEMOKRITOS

International Workshop on Flow and Transport: Computational Challenges
S. Sun, King Abdullah University of Science and Technology; J. Liu, Colorado State University

Dynamic Data Driven Application Systems - DDDAS 2012
C.C. Douglas, University of Wyoming; A. Patra, University of Buffalo

Computational Approaches to Social Modeling (ChASM)
Bruno Gonçalves, Nicola Perra, Notheastern University

Social Computing and Web Service
G.M. Huang Guilin University of Electronic Technology, China; Y.C. Zhang, Victoria University, Australia

9th Workshop on Computational Finance and Business Intelligence
Y. Shi, Graduate University of the Chinese Academy of Sciences and University of Nebraska at Omaha; S.Y. Wang, Academy of Mathematical and System Sciences, Chinese Academy of Sciences; Y. Tian, Graduate University of the Chinese Academy of Sciences

Sixth Workshop on Teaching Computational Science (WTCS 2012)
A.B. Shiflet, Wofford College, USA; A. Tirado-Ramos, Emory University

Advances in Kepler Scientific Workflow System and Its Applications
I.A. Altintas, San Diego Supercomputer Center, UCSD; B.L. Ludaescher, UC Davis; M.J. Jones, UC Santa Barbara

Third Workshop on Data Mining in Earth System Science (DMESS 2012)
F.M. Hoffman, R.T. Mills, J Kumar, J.W Larson, Oak Ridge National Laboratory, USA; M.D. Mahecha, Max Planck Institute for Biogeochemistry

Second International Workshop on Advances in High-Performance Computational Earth Sciences: Applications and Frameworks (IHPCES)
H.M. Tufo, National Center for Atmospheric Research; Y. Cui San Diego Supercomputer Center

Workshop on Urgent Computing
M. Bubak, AGH Krakow and University of Amsterdam; A. Boukhanovsky, St.Petersburg NRU ITMO; P.V. Coneney, UCL London, UK

Atmospheric and Oceanic Computational Science
A. Sandu, Virginia Tech, USA

1st International Workshop on Advances in Computational Social Science
S.A. Cheong, Nanyang Technological University, Singapore; P. Torrens, University of Maryland, College Park; T. Bosse, Vrije Universiteit Amsterdam; A. Crooks, George Mason University

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