Preface

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Preface

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In 2010 ICCS celebrated its 10th anniversary in Amsterdam. For this great event we invited world leading keynote speakers to give their vision on Computational Science now and in the future.

- Stephen Wolfram, Wolfram Research
- Seth Lloyd, MIT MechE
- Anton Zeilinger, Quantum Optics, Quantum Nanophysics, Quantum Information, Universiät Wien
- Peter Hunter, Auckland Bioengineering Institute
- László Barabási, Northeastern University, Center for Complex Network Research
- Ed Seidel, National Science Foundation

The International Conference on Computational Science 2010 (ICCS 2010) aims to bring together 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.

Besides our excellent keynote speakers, out of the submitted papers to main track and workshops, we selected about 300 high-quality papers for presentation at the conference and publication in the proceedings, published by Elsevier in their new Procedia Computer Science series.

ICCS 2010 is the tenth in the series of highly successful conferences; for the previous nine very successful meetings see: http://www.iccs-meeting.org/iccs2010/previous-iccs.html

Since its beginnings in 2001, ICCS has attracted increasingly higher quality and numbers of attendees and papers. Average attendance each year is about 400 participants. The proceedings series have become a major intellectual resource for computational science researchers and serve to both define and advance the state of the field.

The theme for ICCS 2010 in Amsterdam is "Advancing Computational Thinking", to mark several decades of progress in computational science theory and practice, leading to greatly improved applications in science. This conference was 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 ICCS 2010 papers were submitted from over 60 countries; the list of accepted papers includes authors from over 40. ICCS 2010 had 38\% of the submitted papers accepted for its Main Track.

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Workshops rely on direct invitation of topic specific authors, therefore in this case there is already a pre-selection of potential authors, resulting in a much higher acceptance rate. For ICCS 2010 this was: 55%.

We are proud to note that ICCS is an ERA 2010 A-ranked conference series.

ICCS relies strongly on the vital contributions of our workshop organizers to attract high quality papers in many subject areas. The program committees for the main track and the workshops help ensure a high standard for the accepted papers. Financially, the conference is made possible by the support of our sponsors.

May 2010, The ICCS 2010 Organizers, Peter M.A. Sloot G. Dick van Albada Jack Dongarra

Local Organizing Committee

G.D. van Albada
E.E. ten Broeke
B. van Ulzen
P.M.A. Sloot

Sponsors

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| NWO, the Netherlands Organization for Scientific Research |
| KNAW, the Royal Netherlands Academy of Arts and Sciences |
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Workshop organizers

Simulation of Multiphysics Multiscale Systems, 7th International Workshop
V.V. Krzhizhanovskaya, University of Amsterdam and A.G. Hoekstra, University of Amsterdam

Fourth Workshop on Teaching Computational Science (WTCS 2010)
A.B. Shiflet, Wofford College and A. Tirado-Ramos, Emory University, Atlanta, Georgia, USA

Third Workshop on Biomedical and Bioinformatics Challenges to Computer Science
M. Cannataro, University Magna Græcia of Catanzaro, R. Weber dos Santos, Federal University of Juiz de Fora, Brazil and J. Sundnes, Simula Research Laboratory, Norway
Second Workshop on Emerging Parallel Architectures
B. Schmidt and D.L. Maskell, Nanyang Technological University, Singapore

Workshop on Computational Chemistry and Its Applications (5th CCA)
P. Ramasami, University of Mauritius and H.F. Schaefer, University of Georgia, USA

Dynamic Data Driven Application Systems - DDDAS 2010
C.C. Douglas, University of Wyoming and F. Darema, Air Force Office of Scientific Research, USA

Computational Optimization, Modelling and Simulation (COMS 2010)
X.S. Yang, National Physical Laboratory, UK and S. Koziel, Engineering Optimization and Modeling Center, Israel

3rd International Workshop on Software Engineering for Computational Science and Engineering
J.C. Carver, University of Alabama

International Workshop on Computational Stochastics
W. Sandmann, Clausthal University of Technology, Germany

DYNANETS: Workshop on Dynamic Networks and Network Dynamics
G. Kampis, Collegium Budapest, L. Gulyas  Collegium Budapest, Hungary and V. Colizza, ISI Foundation, Turin, Italy

Visualization in Computational Science
R.G. Belleman, University of Amsterdam

Automated Program Generation for Computational Science
C. Bischof, RWTH Aachen University and W. Gropp, University of Illinois Urbana-Champaign, USA

P.-H. Maire, UMR CELIA Université Bordeaux I, France, R. Loubère, IMT Université de Toulouse, France and M. Shashkov, Los Alamos National Laboratory, USA

Agent-Based Computing, Adaptive Algorithms and Bio Computing
M. Paszynski, K. Cetnarowicz, both Department of Computer Science, AGH University of Science and Technology, Krakow, Poland, D. Pardo, Basque Center for Applied Mathematics, Bilbao, Spain, T. Bosse, Department of Artificial Intelligence, Vrije Universiteit Amsterdam and J.A. La Poutré, CWI, Centrum Wiskunde & Informatica, Amsterdam

Practical Aspects of High-level Parallel Programming (PAPP 2010)
A. Benoit, LIP, ENS Lyon, France and F. Gava, LACL, University Paris 12, France

Tools for Program Development and Analysis in Computational Science
C. Klausecker, LMU Munich

Cognitive Agents: Theory & Applications
A.T. Lawniczak, Department of Mathematics & Statistics - University of Guelph - Guelph, Ontario Canada and B.N. Di Stefano, Nuptek Systems Ltd. - Toronto, Ontario, Canada

Frontiers in the computational modeling of disease spreading
V. Colizza, ISI Foundation, Turin, Italy and A. Vespignani, Indiana University, Bloomington, IN, USA

Knowledge Representation and Applied Decision Making (KREAM)
D. Rodriguez, The University of Alcala, J.C. Riquelme, the University of Seville, Spain, M.A. Sicilia, The University of Alcala, Spain and R. Ruiz, Pablo de Olavide University, Spain

Engineered & Social Networks: Theory and Applications
A.T. Lawniczak, Department of Mathematics & Statistics - University of Guelph, Guelph, Ontario, Canada and B.N. Di Stefano, Nuptek Systems Ltd. - Toronto, Ontario, Canada

2010 Workshop on Computational Finance and Business Intelligence
Y. Shi, Graduate University of the Chinese Academy of Sciences and University of Nebraska at Omaha

Video Intelligence (VI-2010)
Y. Cai, Carnegie Mellon University, USA