Simulation of Multiphysics Multiscale Systems

http://www.science.uva.nl/~valeria/multiphysics2007/

4th International Workshop

in conjunction with the International Conference on Computational Science

May 27-30, 2007

Beijing, China

Introduction

Simulation of multiphysics and multiscale (MPMS) systems poses a grand challenge to computational science. Most of the real-life systems, vital for industrial applications and academic research, involve interactions amongst **a wide range of physical phenomena**. In addition to that, the **time and length scales** of the individual processes involved often differ by orders of magnitude. Numerical simulation of these multiphysics and multiscale problems requires development of sophisticated models and methods for their integration, as well as efficient numerical algorithms and advanced computational techniques.

This workshop, being a follow-up to the highly successful events held at ICCS-2006 in Reading, UK, ICCS-2005 in Atlanta, USA and ICCS-2004 in Krakow, Poland, aims to bring together computational physicists, numerical specialists and computational scientists to push forward this challenging multidisciplinary research field.

Topics

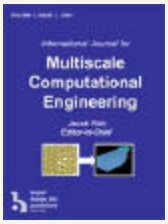
Specific topics include (but are not limited to):

- Modeling of multiphysics and/or multiscale systems. Of particular interest are: Monte Carlo methods, particle-based methods, mesoscopic models such as cellular-automata, lattice gas and lattice-Boltzmann methods, computational fluid dynamics and computational solid mechanics;
- Multiphysics and/or multiscale modeling of biological or biomedical systems. This includes computational models of tissue- and organo-genesis, tumor growth, blood vessels formation and interaction with the hosting tissue, biochemical transport and signaling, biomedical simulations for surgical planning, etc.
- Novel approaches to combine different models and scales in one problem solution;
- Challenging applications in industry and academia, e.g. time-dependent, 3D systems, multiphase flows, fluid-structure interactions, chemical engineering, plasma physics, material science, biophysics, automotive industry, etc.;
- Advanced numerical methods for solving multiphysics multiscale problems;
- New algorithms for parallel distributed computing, specific to the field.

Papers

We cordially invite you to submit a paper presenting the results of original research or innovative practical application in the area of modeling and simulation of multiphysics and multiscale systems. Papers not exceeding **8 pages**, written in English and complying with the LNCS format, should be submitted electronically through the ICCS submission engine.

All papers will be peer reviewed. Accepted papers will be published in the conference proceedings in *Lecture Notes in Computer Science* series. The proceedings will be available at the conference. At least one author of an accepted paper must register and present the paper at the workshop.



A selected number of papers will also be published in the special issue of the *International Journal for Multiscale Computational Engineering* after the conference.

Important dates

Short abstract (1 page):	**December 5, 2006**
Full paper submission:	January 5, 2007
Notification of acceptance:	February 3, 2007
Camera-ready papers:	February 19, 2007

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