

# Simulation of Multiphysics Multiscale Systems

<http://www.science.uva.nl/~valeria/SMMS/>

7<sup>th</sup> International Workshop

in conjunction with the International Conference on Computational Science

**iccs**

May 31 - June 2, 2010

Amsterdam

The Netherlands

## Introduction

Simulation of multiphysics and multiscale systems poses a grand challenge to computational science, with vast applications in chemical engineering, plasma physics, material science, biophysics, aerospace and automotive sectors. Most of the real-life systems 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 aims to bring together computational physicists, numerical specialists and computational scientists to push forward this challenging multidisciplinary research field, and to foster cross-fertilization between all fields of applications.

## 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 interaction, etc.;
- Advanced numerical methods for solving multiphysics multiscale problems;
- Problem solving environments for simulation of multiphysics multiscale systems.

## 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 of up to **10 pages**, written in English and complying with the Proceadia format ([LaTeX](#) or [MS Word](#)), should be submitted electronically through the [ICCS submission engine](#).



All papers will be peer reviewed. Accepted papers will be published by [Elsevier](#) in the open-access [Proceadia 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 (extended) papers will be invited to the special issue of the [International Journal for Multiscale Computational Engineering](#) after the conference.



## Important dates

Conference: May 31 - June 2, 2010

## Program Committee

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## Workshop Organizers

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