

Workshop on**Modelling and Simulation of Multi-Physics Multi-Scale Systems**<http://carol.science.uva.nl/~valeria/multi-physics2004/>**Introduction**

A great number of real-life systems, important for industrial applications and academic research, involve interactions amongst a **range of physical phenomena** (e.g. viscous, turbulent, thermal, chemical, mechanical, electromagnetic or plasma processes). In some systems the **time and length scales** of processes studied differ by orders of magnitude. Numerical simulation of these multi-physics and multi-scale problems requires the development of sophisticated models and methods for their integration, as well as efficient numerical algorithms and advanced computational techniques based on appropriate software/hardware technologies.

Because of the heavy computational demands of such simulations one needs proficient utilization of high-performance parallel distributed systems, such as efficient resource management. The complexity of modelling and data description, the large number and wide range of parameters under investigation, as well as the necessity to control and steer the simulation processes, motivate the development of problem solving environments, user interfaces and code integration schemas.

The workshop aims to bring together computational physicists, numerical specialists and computational scientists to push forward this challenging multi-disciplinary research field.

Topics**Specific topics may include (but are not limited to):**

- Modelling of multi-physics and/or multi-scale 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;
- Novel approaches to combine different models and scales in one problem solution;
- Large-scale industrial and academical applications (e.g. time-dependent, 3D systems, multi-phase flows, fluid-structure interactions, chemical engineering, plasma physics, material science, bio-physics, automotive industry);
- Advanced numerical methods for solving multi-physics problems;
- Algorithms for parallel and distributed computing;
- Software integration;
- Problem solving environments; user interfaces; interactive software for modelling multi-physics problems;
- Performance analysis of multi-physics simulation systems;
- Special hardware for multi-physics simulation (e.g. Field Programmable Gate Arrays)

Papers

We cordially invite you to submit a paper presenting the results of original research or innovative practical applications in the area of the multi-physics and multi-scale system modelling and simulation.

Papers should be of **6 to 10 single-spaced pages** (we recommend to stay within 8 pages) written in English, and must comply with the Springer-Verlag format described at www.springer.de/comp/lncs/authors.html. Papers should be submitted in **pdf** or **ps** file format, electronically to the e-mail address: multi-physics-ws-iccs@science.uva.nl. **Please do not upload your workshop papers to the general ICCS submission engine!**

All papers will be peer reviewed. Accepted papers will be published by *Springer-Verlag* 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 at the conference site <http://www.cyfronet.krakow.pl/iccs2004/registration.html> 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* (<http://www.begellhouse.com/journals/61fd1b191cf7e96f.html>)

Important dates

Extended abstract (4-5 pages):	December 10, 2003 - Extended!
Full papers submission:	January 1, 2004
Notification of acceptance:	February 1, 2004
Camera-ready papers:	February 14, 2004

Other information

For information on [conference venue](#) and [how to get there](#), [registration and fee](#), [paper formatting](#), etc. please refer to the conference site <http://www.cyfronet.krakow.pl/iccs2004>

Workshop Organizers

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