



## CiSE Special Issue on SC/HPC Education Call for Papers - Due January 15, 2008

<http://cise.aip.org/>

<http://sc-education.org/cise/>

**Computing in Science and Engineering (CiSE)** is publishing a special issue in 2008 to highlight the role of education in developing a skilled and knowledgeable workforce capable of harnessing the power of tomorrow's high performance computing (HPC) infrastructure to solve global scale, multi-disciplinary problems critical to society and to the world.

### Background

Computational methods have changed the scale and nature of "researchable" problems by allowing more accurate modeling of, and better affect on, the real world. Modeling is opening new areas of inquiry such as proteomics, predictive climate models, and data mining terabytes of raw astronomical data—as well as addressing new problems from humanities, arts and social sciences, including environmental and social issues, health care, and economic competitiveness.

Science and engineering continues to be transformed by extreme advancements in cyberinfrastructure. In 2008, the HPC community will have access to petaflop ( $10^{15}$ ) computing systems, while researchers are already exploring exaflop ( $10^{18}$ ) solutions. This acceleration brings with it the challenge of scaling applications to effectively use these evolving, highly parallel and highly distributed systems that are forming new generations of significantly larger and more complex HPC environments.

Radically new collaboration technologies and virtual organizations are fostering new approaches to learning and working. The demand for a skilled workforce requires a transition in education commensurate with the scale of this new computational infrastructure. Who are these future innovators and leaders? They are today's K-12 students, who must be led by graduate students, post docs, and faculty members applying advanced computing power in addressing urgent real-world problems. What are we doing to provide them with cyber-enabled discovery facilitating the computational thinking and experiences required to solve these problems?

### CiSE Special Issue

The 2008 CiSE special issue on HPC will incorporate successful and innovative strategies from high school through graduate school, from all fields including traditionally under-represented fields of study, and from all institutions. Addressing society's most pressing and complex problems will only be realized with the next generation of scientists, technologists, engineers and mathematicians being well educated and experienced in adapting and using the ever-advancing HPC environments. We are interested in HPC educational problems and solutions facing all people, in particular minorities, women, and people with disabilities.

### Topics of specific interest are:

- Teaching strategies or innovative course content in applying computational science, grid-enhanced technologies, or HPC environments to problem solving.
- The theory, practice, and use of highly parallel methods, high performance networks, and/or high performance file systems in educational environments.
- Pedagogies that use computational science to facilitate learning of modern science topics, such as nanotechnology and data validation.
- Ontologies for the computational science and HPC skills and knowledge students should acquire to be well prepared for their professional careers.
- Synchronous and asynchronous methodologies to address non-traditional teaching and learning styles.
- Advancements in computational science education—curriculum, resource use, applications, and best practices.
- Strategies for engaging and sustaining larger and more diverse communities, including women, minorities, and people with disabilities, in pursuing advanced degrees and becoming full participants in the HPC community.
- Resources and methodologies used for assessment of HPC education.
- HPC-based tools, resources, and methods, including computational modeling and visualization, which successfully improve and advance teaching and learning.
- The broad applicability of managing and analyzing vast data resources across multiple disciplines and/or multiple institutions for teaching and learning.

### Guest Editors

**Scott Lathrop**, Argonne National Laboratory

**Thomas Murphy**, Contra Costa College (California)

### Advisory Panel

**Paul Gray**, University of Northern Iowa

**Rubin Landau**, Oregon State University

**Robert M. Panoff**, Shodor

**Nora Sabelli**, SRI International

**George K. Thiruvathukal**, Loyola University Chicago

### Submission Process

Submissions should be limited to 2,400 to 7,200 words with pictures counting as 250 words. Refer to <http://www.computer.org/portal/pages/cise/content/author.html> for the submission instructions.

**Submission deadline is January 15, 2008.**