SIMAC3

NUMERICAL ALGORITHMS FOR EXTREME COMPUTING ARCHITECTURES

http://blogs.bu.edu/simac3

The third workshop for a Software Institute for Methodologies and Abstractions for Codes (SIMAC)

November 4-5, 2013 at Boston University
3 Cummington Mall, PRB (Physics Research Building) Room 595.

This third SIMAC workshop will focus on the design of Numerical Algorithms and Software Frameworks to accommodate the increasingly complex environment of multiscale physics and complex heterogeneous HPC architectures. Algorithmic examples include Multigrid (MG), Domain Decomposition (DD) solvers and Adaptive Mesh Refinement (AMR). Hardware examples include GPU and PHI heterogeneous architectures. The goal is to explore existing collaborative teams and frameworks that seek to respond to this disruptive technological landscape and suggest new or improved methods required to keep pace with the evolution of Extreme scale computing.

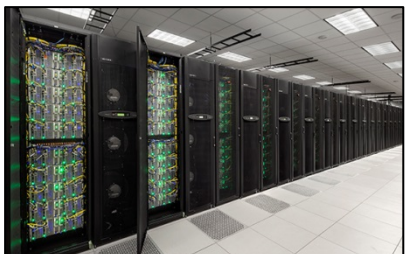
Free registration is now open but **please register**. Travel/lodging suggestions and the agenda are posted at http://blogs.bu.edu/simac3

Yours,
Rich Brower (brower@bu.edu)

Sponsored by:
Center for Computation & Technology — LSU
Center of Computational Science — BU
Hariri Institute for Computing and Computational Science & Engineering — BU

SIMAC Organizers:

Steven R. Brandt (LSU), Richard Brower (BU), Anshu Dubey (LBL), Paul Hovland (ANL), Don Lamb (U. Chicago), Frank Loffler (LSU), Merle E. Giles (U. Illinois), Boyana Norris (ANL), Brian O'Shea (MSU), Claudio Rebbi (BU), Marc Snir (ANL), Rajeev Thakur (ANL).



Speakers and Schedule

Talks will take place the Center for Computational Sciences, Boston University, 3 Cummington Mall, PRB (Physics Research Building) Room 595. The plan is to have **short presentations** to raise questions and provide **ample time for discussion** by all participants.

Tentative Schedule of Speakers & Panelists

Nov. 4, 2013

8:30 AM Coffee et al
9:00 AM Start of Morning Session

- Mike Clark (NVIDIA) *Scaling Massively Parallel Code on Hybrid GPU Architecture*
- Joe Eaton (NVIDIA) *NVIDIA MPI-enabled Iterative Solvers for Large Scale Problems*
- Frank Winter (Jefferson Laboratory): *Accelerating Lattice QCD Calculations on GPU-Enabled Systems*
- Andrew Pochinsky (MIT) *Qlua: Scripting a DSL*

Open Discussion:

- *How do we accelerate the transition to Heterogeneous Architectures with Accelerators?*

12:30 PM Lunch
1:30 PM Start of Afternoon Session

- James Brannick (Penn State) *AMG at the Exascale*
- J. (Ram) Ramanujam (LSU) *Software for High Level Optimizing of PDE*
- Anshu Dubey (LBL) *Array Construction in various Languages: Matrices and Meshes*

Open Discussion:

- *What can languages do to help*? (lead by tbd)
- *Array Construction in various Languages: Matrices Vs. Meshes* (summary Anshu)
- *AMR implementations in different packages* (summary Petros)

5:00 PM Panel Discussion: *Professional Development and maximizing the impact of a SIMAC Institute.*

- Hans Johansen (LBL) Chair
- Lori Diachin (LNLL)
- Roscoe Giles (BU)
- Claudio Rebbi (BU)

6:00 PM Reception and Buffet Dinner at Hariri Institute for Computing and Computational Science & Engineering

Nov 5, 2013

9:00 AM Start of Morning Session

- Chris Hill (MIT) *Multi-scale Fluids and co-processor Hardware*
- Lorena Barba (George Washington) *Fast Multipole Methods for Fluids and Biomolecules*
- Erik Schnetter (Perimeter Institute) *Adaptive Mesh Refinement: Current state in Cactus, and future possibilities*
- Bryce Lelbach & Dominic Marcello (LSU) *Message-driven AMR Techniques for Binary Star Simulations.*

12:30 PM Panel Discussion: Industrial Collaborations

- Don Lamb (U of Chicago) Chair
- Andrew Jones (NAG)
- Jonathan Cohen (NVIDIA)
- James F Wiedenhoefer (GE Global Research) et al

1:00 PM Lunch