Joint Laboratory for PetaScale Computing
Ceremonial Opening

- Michel Cosnard, INRIA President and CEO
- Thom Dunning, NCSA & IACAT Director, UIUC representative
- Michel Israel, Counselor of the Office of Science and Technology at Embassy of France
- Marc Snir, co-director of the Joint Laboratory, Faiman/Muroga Professor of Computer Science, University of Illinois at Urbana-Champaign
- Franck Cappello, co-director of the Joint Laboratory, Senior Researcher at INRIA
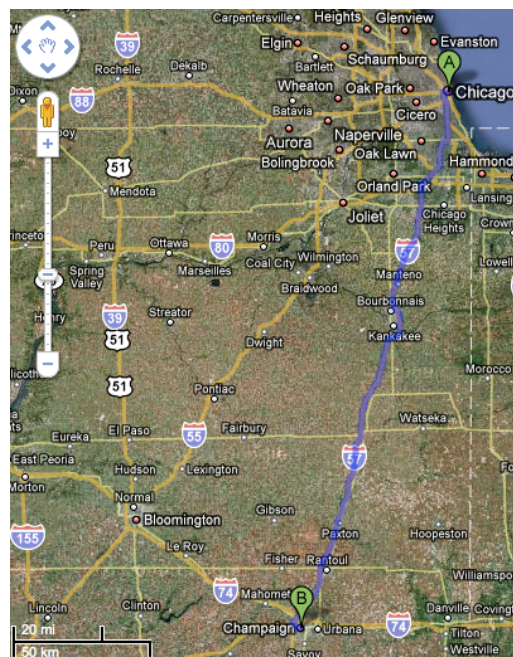
Joint-Lab Objectives and Organization

Franck Cappello

INRIA & UIUC

Co-director of the Joint-Lab

Joint-Lab Organization

- Joint-laboratory for PetaScale Computing
- Between INRIA and U. of Illinois-NCSA
- Located on the University Campus (NCSA)
- From Chicago:
  - 45 minutes (Plane)
  - 2h30 (car, bus)

NCSA

Siebel center

Joint-Lab Objectives

• Initiating and sustaining collaborative and applied research for the **Blue Waters** System, which is anticipated to be installed at NCSA in 2011, by contributing to research on and development of algorithms and software for the Blue Waters System.

• Establishing a research bridge between INRIA and the Center for Extreme-Scale Computation at IACAT in the field of petascale computing, through the pursuit of joint research projects on topics in petascale computing.

• Providing opportunities for INRIA researchers to participate in and influence the development of software for the Blue Waters System.

Joint-Lab Areas of Cooperation

- *Algorithms* (numerical methods);

- *Applications* (numerical libraries);

- *Tools* (compilers, debuggers, performance understanding tools);

- *Programming environments* (communication libraries, workflow environments, parallel languages); and

- *Operating systems* (deployment tools, monitoring, scheduler, multi-threading related issues).

Joint-Lab initial Collaboration topics

1) Numerical Libraries. Understanding, through modeling, and optimizing the performance of numerical libraries, taking into account the computing, memory and communication (data, block transfers) hierarchy.

2) Fault Tolerance. Comparing and understanding the performance of various fault tolerant protocols. Evaluating existing solutions and potential development of novel methods for the reduction of the checkpointing size.

3) Hierarchical Programming. Comparing and understanding the performance of flat and hybrid programming models (MPI, OpenMP, Threading Building Blocks, PGAS languages, Workflow).

Joint-Lab Activities

1) Collaborative research and development activities conducted jointly by ILLINOIS personnel and INRIA personnel;

2) Periodic workshops: researchers will present their current work, with the objective of identifying potential new collaborative projects of mutual interest. Existing collaborative research teams will present the results of their investigations and development activities.

3) The hosting of INRIA personnel on site at ILLINOIS facilities for varying periods of time to engage in collaborative research with ILLINOIS personnel

4) The hosting of ILLINOIS personnel on site at INRIA facilities for varying periods of time to engage in collaborative research with INRIA personnel.

Joint-Lab Governance

1) **Steering Committee:**
   - Thom Dunning,   Michel Cosnard
   - Williman Gropp,   Malik Ghallab
   - William Kramer,   Claude Puech

2) **Scientific Committee** (note yet named)
   - Well qualified external researchers

3) **2 Co-Executive Directors** (alphabetical order):
   - Franck Cappello, INRIA
   - Marc Snir, UIUC-NCSA

Joint-Lab Evaluation

1) Once every year by:
   - Scientific Committee
     (Well qualified external researchers)

Joint-Lab Web Site

- http://jointlab.ncsa.uiuc.edu/

Joint-Lab WIKI

- https://wiki.ncsa.uiuc.edu/display/jointlab/Home
- The central place to find key details about the joint-lab
  - Joint-Lab news
  - Research topics
  - Research teams
  - Calls for proposals
  - Permanent researchers / Student visits
  - Joint publications
  - Preparation of the next workshop
  - Preparation of the evaluation
  - Joint-Lab related events (seminar, workshops, conferences, etc.)
  - Logistic information

Workshop Objectives and Arrangement

Workshop Objectives

- Gather Illinois and INRIA researchers involved in the topics of the joint-laboratory
  - Parallel programming models and environments
  - Numerical algorithms and libraries
  - Fault Tolerance (Resilience)
- Initiate discussions between French and US researchers
- Identify commonalities in research problems
- Start discussing about collaboration topics
- Identify visitors for 2009
- Explore novel opportunities of collaboration (open topics)

Workshop Program

- **Session 1 on programming models and environments**
  (shared memory, hybrid programming models, distributed objects, etc.)

- **Session 2 on Numerical Algorithms and Libraries**
  (optimizations for multi-core, reduction of communications, hybrid approaches, solvers, etc.)

- **Session 3 on Fault Tolerance (Resilience)**
  (cover a large spectrum of issues)

- **Session 4 on "Open topics"**
  (GPGPUs, Compilers for multi and many cores, communication libraries)

Workshop Discussions

Discussions during the session and informal discussions (breaks, lunches, Banquet, etc.)

For every session we shall identify:

- Common topics of interests
- Common research problems
- Article + documentations sharing
- Experimental tools sharing
- Software of mutual interest
- etc.
- A first ultimate outcome of the discussion would be a set or joint research topics.
- A second ultimate outcome is the identification of researchers (permanent or student) who will visit the joint lab before the next workshop in November-December 2009.

Workshop Logistics 1/2

- All sessions will take place in this room
- All lunches will take place in the restaurant upstairs
- Some breaks will take place in the Patio, upstairs
- The Banquet will be at the "Bouillon Racine"
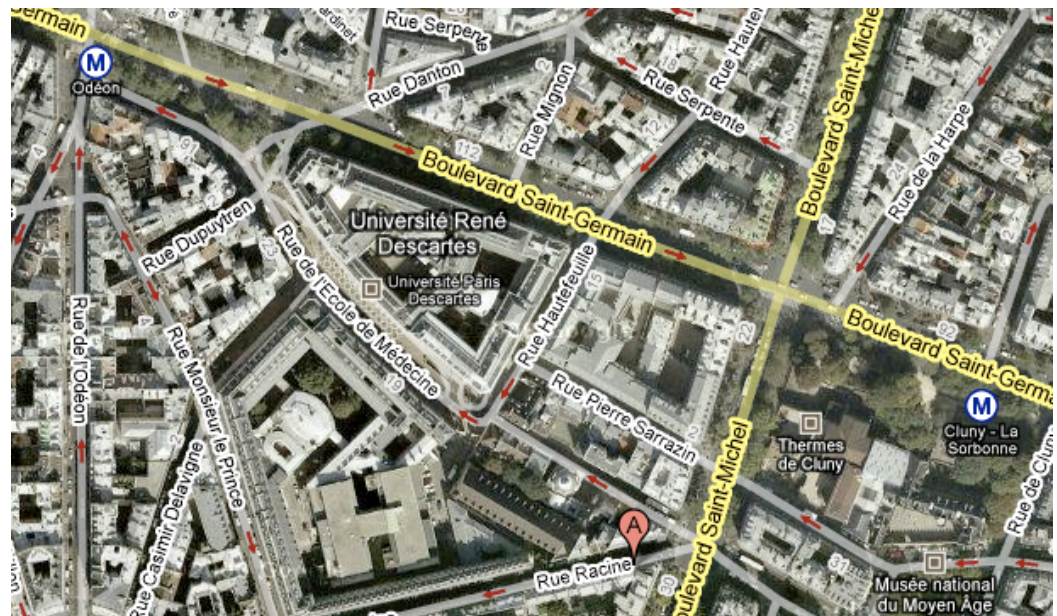
Workshop Logistics 2/2

- We collect ALL presentations
- Presentations will be stored on the join-lab web site.
- Please put you presentation on the ORANGE USB key, right after your talk.

Questions about the Joint-Lab or/and the Workshop?

Enjoy the Workshop!

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