Thank you

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and

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Great Lakes Consortium for Petascale Computing
Outline

- Welcome and Introductions
- Aims of this Summer School
- Comments
- Getting Online
Welcome and Introductions

• Students from a wide range of departments:
  Biochemistry
  Biomedical Engineering
  Chemistry
  Chemical and Biochemical Engineering
  Economics
  Electrical and Computer Engineering
  Geography
  Hydroscience and Engineering
  Industrial Engineering
  Institute for Clinical and Translational Science
  Management Sciences
  Mechanical Engineering
  Physics and Astronomy
  Statistics and Actuarial Science

• Please Introduce yourselves:
  - Name
  - Department
  - Academic Status and Year (ex. graduate student, 3rd year)
  - High Performance Computing Experience
  - Research Topic
Aims of this Summer School

To enable you to apply parallel computing to your own research

General Comments:
• Much of this material may be familiar to you

• I plan to explain things from a very basic level to make sure this group from such diverse backgrounds can follow
A few comments before we get started are in order:

1) **Terminology**: Terminology in this field is *not* standardized.
   - This field is new and evolves rapidly.

2) **HPC is valuable to a wide range of fields:**
   - Many examples I use will come from the field of physics.
   - I will try to present the specific problems in a relatively abstract way so that you can consider them simply mathematical problems to be solved.

3) **Software (programming) vs. Hardware (computers):**
   - I am not going to talk a lot about different hardware options, but will focus on the software side, specifically how to design and implement parallel algorithms.
4) **Common approaches vs. Exhaustive coverage:**
- This will not be an exhaustive review of all possible HPC approaches
- I will focus on the most important and widely used approaches
- In particular, we will talk a lot about MPI and some about OpenMP

5) **Specificity vs. Generality:**
- I will try to strike a balance between specific examples, which are often most illuminating, vs. general considerations which may apply to a more wide variety of HPC applications
Getting Online

Each participant has accounts set up on several computers:

University of Iowa, Research Services:

• Research Clusters
  
  rs-001.its.uiowa.edu (32 bit, 44 cores)
  rs-003.its.uiowa.edu (64 bit, 64 cores)

Rosen Center for Advanced Computing, Purdue University:

• Moffet: SiCortex 5832
  
  756 compute nodes (4536 cores)
  moffett.rcac.purdue.edu

• Detailed information for running on Moffett is available at
  http://www.rcac.purdue.edu/userinfo/resources/moffett/newuser.cfm

• See handout for information on getting online and submitting both interactive and batch jobs