

# Welcome to the XSEDE MPI Workshop

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# Who are we?

*Your hosts:*

Pittsburgh Supercomputing Center

*Our satellite sites:*

Tufts University

University of Utah

Purdue University

Howard University

National University

University of Arizona

University of Delaware

Stony Brook University

Georgia State University

Old Dominion University

Ohio Supercomputer Center

Pennsylvania State University

University of Colorado Boulder

University of Nebraska - Omaha

University of Houston - Clear Lake

California State Polytechnic University, Pomona

# XSEDE

Extreme Science and Engineering  
Discovery Environment



# Who am I?

John Urbanic  
Parallel Computing Scientist  
Pittsburgh Supercomputing Center

Parallelize codes with

- MPI
- OpenMP
- OpenACC
- Hybrid and Big Data/Machine Learning mixes of these

Mostly for XSEDE platforms. Mostly to extreme scalability.

**XSEDE**

Extreme Science and Engineering  
Discovery Environment



# XSEDE HPC Monthly Workshop Schedule

- September 7,8 *HPC Monthly Workshop: MPI*
- October 4 *HPC Monthly Workshop: OpenMP*
- November 1 *HPC Monthly Workshop: Big Data*
- December 6 *HPC Monthly Workshop: OpenACC*
- January 16 *HPC Monthly Workshop: OpenMP*
- February 10 *HPC Monthly Workshop: Big Data*
- March 30 *HPC Monthly Workshop: OpenACC*
- **April 18-19** ***HPC Monthly Workshop: MPI***
- May 18-19 *HPC Monthly Workshop: Big Data*
- June 6-9 Summer Boot Camp
- August 15 *HPC Monthly Workshop: OpenMP*
- September 12-13 *HPC Monthly Workshop: Big Data*
- October 3-4 *HPC Monthly Workshop: MPI*
- November 7 *HPC Monthly Workshop: OpenACC*
- December 5-6 *HPC Monthly Workshop: Big Data*

# HPC Monthly Workshop Philosophy

- Workshops as long as they should be.
- You have real lives...
  - in different time zones...
    - that don't come to a halt.
- General Agenda
  - Lightweight first morning to get all the logistical nonsense out of the way so we can focus on...
  - Intense afternoon
  - Second day is advanced and optional topics (to allow you to continue with exercises at your pace)
  - As much hands on as we can fit...
    - but now 2 weeks of follow on accounts
- Learning is a social process
  - This is not a MOOC
  - This is the Wide Area Classroom
    - so raise your expectations

# Agenda

Wednesday, September 10

- 11:00 Welcome
- 11:15 Computing Environment
- 12:00 Intro To Parallel Computing
- 1:00 Lunch Break
- 2:00 Introduction To MPI
- 3:30 Intro Exercises
- 4:10 Intro Exercises Review
- 4:30 Scalable Programming: Laplace Exercise
- 5:00 Adjourn / Laplace Exercises

Thursday, September 11

- 11:00 Advanced MPI
- 12:30 Lunch break
- 1:30 Laplace Solution
- 2:00 Outro To Parallel Computing
- 2:45 Parallel Debugging and Profiling Tools
- 3:00 Exercises
- 4:30 Adjourn

# *Resources*

Your local TAs

Questions from the audience

On-line talks

[bit.ly/XSEDEWorkshop](https://bit.ly/XSEDEWorkshop)

# *Getting Time on XSEDE*

# XSEDE

Extreme Science and Engineering  
Discovery Environment

<https://portal.xsede.org/web/guest/allocations>





## Check your email now for the post-event survey.

Surveys are conducted by an external evaluation team. XSEDE staff will not know who said what. If you have questions regarding the evaluation please contact:  
Lorna Rivera, [lirivera@Illinois.edu](mailto:lirivera@Illinois.edu), or Lizanne DeStefano, [ldestefano6@gatech.edu](mailto:ldestefano6@gatech.edu)