What is XSEDE?

• Foundation for a national CI ecosystem
  – comprehensive suite of advanced digital services will federate with other high-end facilities and campus-based resources

• Unprecedented integration of diverse digital resources
  – innovative, open architecture making possible the continuous addition of new technology capabilities and services
XSEDE’s Distinguishing Characteristics

• Coordinated national program with greater scope and scale
  – increased diversity of topics, modes of delivery, and reach to new communities and audiences
  – broaden participation among under-represented communities

• Campus bridging for effective use of CI resources
  – more tightly integrate with campuses through expanded Champions program and additional bridging activities

• Establish certificate and degree programs
  – institutional incorporation of CS&E curricula; professional development certificate
  – prepare undergraduates, graduates and future K-12 teachers
Governance

• World-class leadership from CI centers with deep experience: partnership led by NCSA, NICS, PSC, TACC and SDSC
  – PI: John Towns, NCSA/Univ of Illinois
  – Co-PIs: Jay Boisseau, TACC/Univ of Texas Austin
    Patricia Kovatch, NICS/Univ of Tenn-Knoxville
    Ralph Roskies, PSC/CMU
    Nancy Wilkins-Diehr, SDSC/UC-San Diego

• Partners who strongly complement these CI centers with expertise in science, engineering, technology and education
  – Univ of Virginia Ohio Supercomputer Center
    SURA Cornell
    Indiana Univ Purdue
    Univ of Chicago Rice
    Berkeley NCAR
    Shodor Jülich Supercomputing Centre
Why would you use XSEDE?

- Access to live and online training materials
- Access to science gateways connected with databases and large-scale computational resources
- Access to software and computer hardware for large scale computations
- Assistance with educational materials and program implementation
The XSEDE Portal

• Single sign-on for access to everything

• http://www.xsede.org
  – News and announcements
  – Upcoming events
  – Links to other resources
Training

• Free training for students and faculty
  – Online self-paced tutorials on selected topics
    • Focus on parallel computing, programming, and skills related to high performance computing tools
    • Number of topics expected to grow over time
  – Live webcast training on related topics
    • Can see the schedule online and sign up for courses
    • Webcast live or in person at one of the centers
XSEDE offers training classes to teach users how to maximize their productivity and impact in using the XSEDE services. The training classes focus on systems and software supported by the XSEDE Service Providers, covering programming principles and techniques for using resources and services effectively. Training classes are offered in high performance computing, visualization, data management, distributed and grid computing, science gateways, and more.

Current and potential XSEDE users should review the Course Calendar for a list of upcoming training courses at XSEDE Sites. The calendar provides link to the course descriptions and for requesting to be enrolled in the classes. Requests for new or additional training class offerings may be submitted via this user portal.

XSEDE also maintains a list Online Training materials of relevance to XSEDE users. The list of online training materials will be expanded as new materials are developed; suggestions for additions can also be submitted via the feedback form.
# Training Calendar

## All Upcoming training classes

<table>
<thead>
<tr>
<th>CLASS NAME</th>
<th>DATE</th>
<th>REGISTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSEDE Nashville Regional Workshop</td>
<td>05/07/2012 12:00 - 05/08/2012 15:30 CDT</td>
<td><a href="#">REGISTER</a></td>
</tr>
<tr>
<td>XSEDE Workshop @ NCCU</td>
<td>05/14/2012 12:00 - 05/14/2012 17:30 EDT</td>
<td><a href="#">REGISTER</a></td>
</tr>
<tr>
<td>Parallel Computing on Ranger and Longhorn</td>
<td>05/16/2012 09:00 - 05/17/2012 17:00 EDT</td>
<td>This class is full. Registration has closed.</td>
</tr>
<tr>
<td>Gordon 101: An Introduction to using SDSC’s Appro Gordon Compute Cluster</td>
<td>05/17/2012 09:00 - 05/17/2012 12:00 PDT</td>
<td></td>
</tr>
<tr>
<td>1st Temple-XSEDE High-Performance Code-a-thon (</td>
<td>06/04/2012 08:00 - 06/08/2012 12:00 EDT</td>
<td></td>
</tr>
<tr>
<td>Extreme Science, Data &amp; Cheesesteaks )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I2PC Summer School on Multicore Programming</td>
<td>07/09/2012 09:00 - 07/13/2012 17:00 CDT</td>
<td></td>
</tr>
</tbody>
</table>
## Past training classes

<table>
<thead>
<tr>
<th>CLASS NAME</th>
<th>DATE</th>
<th>COMPLETED</th>
</tr>
</thead>
<tbody>
<tr>
<td>XSEDE Training: HPC Python Tutorial</td>
<td>04/23/2012 09:00 - 04/23/2012 16:00 CDT</td>
<td></td>
</tr>
<tr>
<td>XSEDE New User Training</td>
<td>04/19/2012 14:00 - 04/19/2012 16:00 CDT</td>
<td></td>
</tr>
<tr>
<td>Accelerating Applications with OpenACC</td>
<td>04/18/2012 09:00 - 04/19/2012 17:00 EDT</td>
<td></td>
</tr>
<tr>
<td>Introduction to Scientific Visualization @ CAU</td>
<td>04/09/2012 09:00 - 04/09/2012 16:00 EDT</td>
<td></td>
</tr>
<tr>
<td>Introduction to Scientific Visualization @ FAMU</td>
<td>03/30/2012 09:00 - 03/30/2012 04:00 CDT</td>
<td></td>
</tr>
<tr>
<td><strong>TACC Training: Writing a Data Management Plan : A Guide for the Perplexed</strong></td>
<td>03/29/2012 13:00 - 03/29/2012 15:00 CDT</td>
<td></td>
</tr>
<tr>
<td>C++ Programming Basics</td>
<td>03/26/2012 09:00 - 03/26/2012 16:00 CDT</td>
<td></td>
</tr>
</tbody>
</table>
Online Training

• Currently hosted on two platforms
  – CITUTOR at NCSA in Illinois
    • Create a free account and start
  – Cornell Virtual Workshop
    • Go to the site and take the course as a guest
### PROGRAMMING

- **Introduction to Linux (Cornell Virtual Workshop)**
- **An Introduction to C Programming (Cornell Virtual Workshop)**
- **An Introduction to Fortran Programming (Cornell Virtual Workshop)**
- **MATLAB Programming (Cornell Virtual Workshop)**

### SCRIPTING TOPICS

- **Python (Cornell Virtual Workshop)**
- **Balancing Scripts and Compiled Code in Scientific Applications (Cornell Virtual Workshop)**

### PARALLEL PROGRAMMING CONCEPTS

- **Parallel Computing Explained (CI-Tutor)**
- **Parallel Programming Concepts and High-Performance Computing (Cornell Virtual Workshop)**
- **Multilevel Parallel Programming (CI-Tutor)**
Science Gateways

• Access to special programs through a web portal or light weight client
  – Each portal has its own rules and procedures
  – Many offer free resources but may restrict the size or number of jobs
  – Excellent way to introduce some topics to students
  – Gateway listing - https://www.xsede.org/gateways-listing
Getting an Account

• Beyond gateways, need an allocation of time to use XSEDE computational resources for education or research

• Application process required

• Read Getting Started Guide
  – Get a portal account (free)
  – Learn about allocation requests
  – Review sample allocation requests
Types of Allocations

• Start up account and education account
  – Reviewed quickly
  – Requires minimal information
  – Use it to determine what resources you need

• Larger allocation
  – Requires detailed proposal (see samples)
  – Reviewed quarterly
Outreach Services

GOAL: Recruit a large and diverse scientific, academic, and industrial workforce capable of advancing scientific discovery using XSEDE services.

• **Student Engagement**
  – Provide meaningful experiences for undergraduate and graduate students to become engaged in Extreme Digital environments

• **Underrepresented Engagement**
  – Bring XSEDE to new faculty, and students, providing dedicated training and support

• **Campus Champions**
  – Build broader and deeper programs based on TeraGrid foundation

• **Speakers’ Bureau**
  – Raise awareness of Extreme Digital environments among new communities of potential users
Student Engagement

Components
• Students
  – Undergraduate and graduate
  – Drawn from contacts within and outside of XSEDE
  – 3-12 month appointments
• Projects
  – Provided and supervised by XSEDE researchers and staff

Outcomes
• Student presentations (papers, posters, etc)
• Case studies of successful and unsuccessful experiences
• More experienced practitioners entering STEM workforce

Process:
• Students and projects recruited and paired throughout the year.
• Researcher/staff supervises student work to complete project.
• Student develops and submits presentation material to relevant venue(s).
# Underrepresented Engagement

## Minority Institutions

**SURA**
- Identify established and emerging programs and researchers
- Expand awareness of XSEDE via campus visits, professional conferences
- Build a community promoting collaboration and peer support
- Target deep engagement that connect researchers with XSEDE expertise

## Minority Students at Research Institutions

**Rice University/Empowering Leadership Alliance (ELA)**
- Increase awareness and knowledge among underrepresented communities
- Identify and recruit minority students and mentors, leveraging ELA
- Provide education and professional development to participants
- Create support community, paring students with mentors
- Establish XSEDE Faculty Council for ongoing state-of-the-practice focus

## SDSC

Work with SURA and Rice/ELA to implement their plans nationally, esp. in the southwest US and among Hispanic and Tribal communities
XSEDE and Campuses

• **Campus Bridging**
  – Pilot

• **Campus Champions: expansion on TeraGrid Campus Champions Program**
  – campus representatives as a local source of knowledge
  – source of information regarding XSEDE resources and services that will benefit research and education
  – source of start-up accounts to quickly get researchers and educators using XSEDE resources
  – conduit for the campus needs, requirements and challenges, with direct access to XSEDE staff
  – over 100 campuses participating today

• **Campus Champions Fellowship Program**
  – fellowship/internship program for campus champions
  – provides stipend and support for spending dedicated time with XSEDE AUSS staff on a project as a learning experience
Summary

• All XSEDE Services are User-Centric
• Improved Integration
  – Across national resources
  – Partnership with OSG
  – Focus on Campus bridging
• Robust project management
• More rigorous evaluation of impact
Questions? Or Feedback

- XSEDE User Portal – [www.xsede.org](http://www.xsede.org)
- Help – [https://portal.xsede.org/overview1](https://portal.xsede.org/overview1)
- Feedback - [https://portal.xsede.org/feedback](https://portal.xsede.org/feedback)
Our reach will forever exceed our grasp, but, in stretching our horizon, we forever improve our world.