New Frontiers Panel: Community & Collaboration

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My very abridged story

- 2007: Me + 19 faculty & students that used computational resources
- 2008: Formed state-wide collaboration (OneOCII) and joined the Campus Champions
- 2010: Over 150 faculty & students
- 2011: NSF MRI grant (got second staff member)
- 2012-2014: Explosive growth, Research cloud deployed, 2 more staff, volunteer member of Champion leadership
- 2015: NSF MRI award + bioinformatics hire
- 2016: Began staff leadership position of Champions
- 2018: Over 1100 users, 5 staff, aspiring to sustain to the Champions.
OneOklahoma CI Initiative

- **Reach** institutions outside the mainstream of advanced computing.
- **Serve** every higher education institution in Oklahoma that has relevant curricula.
- **Educate** Oklahomans about advanced computing.
- **Attract** underrepresented populations and institution types into advanced computing.
OneOCII Outcomes: Research

• External research funding to OK institutions facilitated by OneOCII (Fall 2001- Spring 2018): $200M+
• Funded projects facilitated: 300+
• Specifically needed OneOCII just to be funded: ~$44M
• NSF Major Research Instrumentation for CI: OU, OSU, Langston Univ., Univ. of Central OK, TU
• NSF Networking Grant Collaborations: OU, OSU, TU, Langston Univ., SRNF, Onenet, Univ. of Central OK, SWOSU, SE, NSU, RSU (OFFN & MoREOFFN)
• Publications facilitated: over 2000
Campus Champions: Research Computing Community of Practice

Celebrating 10 years of supporting research computing professionals

470+ people at 250 Institutions

Including 46 Minority Serving Institutions
What Champions talked about in 2017
XSEDE Broadening Participation

Expand awareness of XSEDE

• Campus Visits
• Conference Exhibiting
• Papers
• News

Identify programs and researchers who can benefit from XSEDE services

• Conference Exhibiting
• Campus Visits
• Training Events
• Consulting

Enable institutions and faculty to use advanced computing to increase their research productivity

• Build and Maintain a Thriving Peer Support Community
• Deliver training mapped to needs
• Connect researchers with XSEDE services and expertise

Create scalable and sustainable models and best practices

• Enhance curriculum
• Foster productive campus champions
• Create connections to the CI Ecosystem
XSEDE Education

Curriculum and Educator Programs

XSEDE pursues innovation and collaboration in computational science education.

Campus Visits

XSEDE campus visits emphasize the need for computational science education and offer guidance concerning course content. Campus visits bring together faculty, students, and administrators to discuss the importance of having a workforce that is ready to use XSEDE computational resources.

Participating in Collaborative Online Courses

The XSEDE courses consist of recorded lectures that can be watched by students independently or in their own local classrooms. Each lecture comes with built-in quizzes that are used as part of the grading for the course. In addition, several computer exercises are typically available that students can run on XSEDE computational resources to gain practical experience and have credit for the work recorded in their class grade.

The capstone assignment for a course often is a final project supervised by the local faculty members.

The first of these courses is Applications of Parallel Computers, taught by Jim Demmel at the University of California, Berkeley. View the course content.

How Faculty Can Participate

If you are a faculty member interested in collaborating with XSEDE in this program, you will need to create a course in your own academic schedule that your local students can register for and receive credit. You and your students will then use the online materials and XSEDE resources to complete the course.

Local faculty who participate in the program meet periodically with the XSEDE instructors and staff to discuss schedules, suggestions for course improvement, and any questions related to operations. The local faculties are responsible for assigning final grades to all of their own students.
Example: SC16 Advanced Computing for Social Change Challenge

- Data-driven discussion to confirm/debunk perceptions/misperceptions on Black Lives Matter
- Worked in four teams
  - Identified their audience
  - Identified their argument
  - Team presentations using evidence-based analysis and visualization
- 60% Female Participants, 40% African American, 58% First Generation College Students
- External Evaluators did focus groups
- Students Rated Challenge Experience 4.5/5.0
Summary

• We’re in this together!
• Collaborate
  – within campus (Library, IT, Education and Research, formal and informal gatherings)
  – and externally (Champions, XSEDE Broadening Participation, etc)
• Contribute your ideas and challenges.

Thanks to the National Science Foundation and XSEDE for supporting this work. Various slides from Kelly Gaither, Linda Akli, & Susan Mehringer.
Extra slides
Motivating Statistics

• According to the 2014 United States (U.S.) Census Bureau, there were more than 20 million children under 5 years old living in the U.S., and 50.2 percent of them were minorities.
• U.S. is projected to become a majority minority population by 2040.
• U.S. Bureau of labor statistics projects 1.4 million computer-science related jobs available by 2020
• 400,000 graduate students qualified to fill these positions.
• **Deficit of 1 million unmet high-tech jobs in the U.S. alone.**
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• 400,000 graduate students qualified to fill these positions.
• Deficit of 1 million unmet high-tech jobs in the U.S. alone.
Women’s representation in STEM occupations has increased since the 1970s, but declined since the 1990s.

Men are employed in STEM occupations at twice the rate of women: 31 percent vs 15 percent. Nearly 1 in 5 female STEM graduates leave the labor force, compared with less than 1 in 10 male STEM graduates.

In 2011, 6 percent of STEM workers were Black (up from 2 percent in 1970).

Hispanics were only 7 percent of the STEM workforce in 2011.

Native Americans, Pacific islanders and Indigenous Peoples have been historically low in STEM employment, registering consistently in the low single digits.
5 Years of Broadening Participation

![Bar Chart]

- **PY1**: 201 New URM, Women, or MSI PIs, 334 New URM, Women, or MSI Users
- **PY2**: 603 New URM, Women, or MSI PIs, 993 New URM, Women, or MSI Users
- **PY3**: 851 New URM, Women, or MSI PIs, 1,356 New URM, Women, or MSI Users
- **PY4**: 1,113 New URM, Women, or MSI PIs, 1,675 New URM, Women, or MSI Users
- **PY5**: 1,329 New URM, Women, or MSI PIs, 1,993 New URM, Women, or MSI Users
XSEDE Training

Training is available in a variety of formats, including multicast, webinars, online training, and in person workshops. Suggestions for new topics are encouraged via the feedback form. For more information, see:

- XSEDE Training Overview for a summary guide of materials available
- XSEDE Training Course Catalog including listings across formats and sites
- Course Calendar with registration for upcoming training courses
- Online Training on materials relevant to XSEDE users
- Badges are available
- Roadmaps are in development

Training materials focus on systems and software supported by the XSEDE Service Providers, covering programming principles and techniques for using resources and services. Training classes are offered in high performance computing, visualization, data management, distributed and grid computing, science gateways, and more.
Champion list CY 2017

• Email list:
  – Distinct contributors: 274
  – NEW contributors: 128
  – # messages: 1409
  – # threads: 601

• Slack
  – 14,425 total messages
  – 11,752 direct messages
  – 1,525 in public channels
Synchronous Champions

• 1st Tuesday -- Leadership team
• 2nd Tuesday -- Community Chats
• 3rd Tuesday -- The All Champions Call: Guest speakers + community updates
• 4th Tuesday -- Sustainability working group
• Ad hoc special topics calls
• Face-to-face meetings at regional and national conferences
Chamlsit pion Subject of longest threads for 2017

1. Data Management Initiatives on YOUR Campus - TGR/TGW?
2. Adjusted Peak Performance for HPC clusters
3. OS flavors in HPC
4. HPC systems login access only with VPN -- good idea?
5. AMD EPYC and Intel Skylake Pricing Extremes
6. Theoretical Peak Performance
7. Champions-style job board?
8. CephFS for HPC?
9. Successful Scheduling
10. Xeon Phi on Motherboard
11. cgroups Memory Leak in RHEL 6/7.x
12. Advice needed -- Gaussian software on an HPC
13. sysadmin internships for undergrads?
Champion list Subject of longest threads for 2017

15. Cluster Environment Monitoring
16. Service ticketing/tracking software
17. HPC Steering Committee
18. If you had $50K...
19. University risk due to using external computing resources
20. Cloud Costing for NSF
21. High School Student Looking for HPC
22. cloud vs local cluster stats
23. Memory leak in VASP (GPU)?
25. New Campus Champion
26. Onboarding of HPC users & its challenges
27. **How to submit an extension via XRAS**
Hello From the Other Side: Uniting Communities & Law Enforcement with Understanding and Empathy

- Improve public trust with transparency and accountability
- Community policing
- De-escalation training
Awareness for the Unification of Races

- Target audience: people who do not think BLM is important
- Discussed racial divide, what factors contributed to it, and why it is important to all of us
SC17: Exploring Immigration Through Big Data Lens

- Advanced Computing for Social Change Challenge (Second Year) at SC17
- Nine students from local area
- Four mentors brought back from SC16 challenge
Computing4Change