



Be better connected.

Quantum Program Workshop (QPW)

Teaching Quantum Technologies

Roundtable

GPN/SURF July 2026





Be better connected.

Why Quantum now?

- *With AI taking up all the oxygen in the room, should we look further down the road?*
- *Technology Leadership as a core value*
- *Quantum seems really close – and getting closer*
- *Dangers of Q-Day (or Y2Q, as it were)*
- *Quantum Leap – enabling breakthrough science*



Missouri Quantum Pipeline K12 to R1 PhDs

- *Generate interest in all aspects of Quantum in younger students*
- *As quantum computing approaches mainstream, ensure tech schools and the trades are ready to support unique requirements of quantum hardware – cryo cooling, ultra stable power, fiber installation, electro magnetic and radiation shielding*
- *Prepare k12 instructors to teach quantum principles, physics, and quantum computing using simulators*
- *Prepare K12 students with a background of quantum mathematics, physics, and computing for quantum-related undergraduate degrees*

Missouri Quantum Pipeline K12 to R1 PhDs

What we reported to our Board of Curators:

- “Partnering with Sandia National Labs, MOREnet is beginning to build a Missouri pipeline for quantum workforce development. Starting with K-12 STEM teachers in an immersive summer camp, MOREnet is preparing instructors to teach quantum concepts and quantum computer programming to K12 students. The goal is to position MOREnet and the University to quickly develop a quantum-ready workforce, students prepared for higher education quantum degrees and quantum research, and provide a shared testbed for quantum networking research and to fully participate in the anticipated national quantum research network.”

Qcamp for Missouri – Sandia National Labs

From the Sandia National Labs:

“What is QCaMP?”

- The strangeness of quantum physics is being harnessed to revolutionize computing as we know it. At QCaMP, you will get a primer on the fundamentals of computing, learn hands-on the often times perplexing phenomena of quantum physics, and apply those phenomena to solve computing problems in new ways.
- Participants will gain experience creating circuits on a real-world quantum computer and gain access to resources to bring quantum concepts into the classroom. The only prerequisites for this camp are basic algebra and an interest in learning more! ”
- <https://www.sandia.gov/quantum/qcamp/>

Qcamp for Missouri – Sandia National Labs

Bringing the Sandia QCaMP model to Missouri

- Focus is on K12 teachers (2026) and students (2027)
- We sent two instructors to Sandia Labs' Educator Summer Camp: June 16-20, 2025 to bring back their experiences and **QCaMP** resources to launch the Missouri **QCaMP** experience for Missouri students
- Use DOE/Sandia Labs established curriculum, exercises, and challenging visits by quantum scientists
- QCaMP starts with hands-on student experience as opposed to grounding undergraduates in theoretical maths, physics, and computer science before they can move to hands on experience
- QCaMP students only need basic algebra knowledge, eventually Linear Algebra will be the key

Qcamp for Missouri – Sandia National Labs

Bringing the Sandia Qcamp model to Missouri

- **Held our FIRST QCaMP!**
- **7+ modules including slides, recordings, activities, and worksheets**
- **Modules can be incorporated into classroom settings and linked with existing Next Generation Science Standards (NGSS) K-12 framework**
- **Teacher program includes pedagogical discussions, feedback, and resource sharing**
- **Student program includes career talks and lots of Q&A**

Competition! Quantum Challenge

We've run a Cybersecurity Challenge for high school teams for several years

- **Lots of simulators**
- **Most of the competitions I found were higher ed and industry teams focused on proving improving specific algorithms**
- **Issue: rightsizing the competition complexity**
- **Issue: comfort zone of high school teachers with quantum and coaching, Is there a dual credit solution here?**
- **Share/co-develop curriculum, resources across institutions**
- **Quantum guest speakers (Quest speakers?)**
- **Potential partnership with University of Missouri QIC**

Move up the stack – Community Colleges and PUIs

BRICCs and shared resources, shared interests

- **Building Research Innovation at Community Colleges**
- **REU**
- **ShowMeCI**
- **Issue: no time to develop new areas**
- **Build constituency groups across institutions**
- **Share/co-develop curriculum, resources across institutions**
- **Potential partnership with University of Missouri QIC**

Other resources

Lots of great resources from Arkansas's Quantum conference

They invited Mary Bell and I

Need permission to share some of the great work and resources from their undergraduate seminars



Stay tuned! Questions? Contact:

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