

C²QA QIS 102-F: Applied Quantum Computing Summer School

Academic Invitation: Faculty Will Be Taught the Skills & Knowledge Needed to Design a University-led QIS Course

Program Date | June 10 – 28, 2024, offered virtually through Zoom

*“There is a distinct need to teach students core scientific computing,
and then stitch quantum computing concepts to enhance intuition and skills.”*

David Biersach, Senior Technology Architect
Brookhaven National Laboratory

For over three years the Co-design Center for Quantum Advantage (C²QA), at Brookhaven National Laboratory (BNL), has offered a virtual course to introduce participants to the exciting world of quantum computing. This summer 2024, we will host our first ever faculty cohort as we endeavor to teach the quantum information science (QIS) knowledge and skills needed to transfer this learning into their classrooms (Train the Trainer).

Faculty and their associated postdocs or graduate students are invited to take part in this exciting opportunity to participate in the summer 2024 program which will provide the framework to aid academics in bringing a 3.0 credit quantum computing course to their university!

C²QA is committed to supporting faculty as they are instructed on the skills and knowledge needed to design and implement a QIS course at their institution. C²QA instructors will provide resources, such as syllabus design support, and instructional labs that can be customized to their university specifications. Participation in this year’s program may also provide faculty with the opportunity to lead the summer 2025 QIS 102: Applied Quantum Computing course at BNL. These elements will support learning and give participants the tools, knowledge and support to champion QIS programmatic development within their institutions.

QIS 102 will be led by **Dr. David Biersach**. Through a series of demonstrations and hands-on programming labs, participants will:

- learn how quantum algorithms, when applied to specific problem domains, can outperform classical computers.
- learn IBM Qiskit, a world-class software package for working with quantum computers at the level of pulses, circuits, and application modules. (Instructions on downloading and installing the 100% open-source courseware and development tools on their personal computers will be provided).
- receive a weekly stipend.
- receive a certificate from Brookhaven National Laboratory attesting to their skills in Applied Quantum Computing (upon successful completion).

It is **highly recommended** that a “university team” (ex. faculty + postdoc or grad student) participate together in the program.

- If attending as a university team, one or both participant(s) must have all the computer programming, math, and physics skills noted below.

- If attending as a university stand-alone participant, participant must have all the computer programming, math, and physics skills noted below.

PROGRAM DATE: The workshop will run each day, Monday – Friday, for three weeks from June 10 – 28, 2024 from 10:00 AM – 6:00 PM ET (two 1-hour breaks) and be conducted entirely via Zoom web conferencing.

DAILY SCHEDULE: Monday – Friday, from Jun 10 – 28, 2024.

Zoom Session #1: 10:00 am to 12:00 pm (EDT)
 Zoom Session #2: 1:00 pm to 3:00 pm (EDT)
 Zoom Session #3: 4:00 pm to 6:00 pm (EDT)

Attendance in the three sessions each day for the entire two hours is required, and attendees should anticipate two hours of homework each day.

ELIGIBILITY: Minimum 18 years of age. Must be a U.S. citizen or Legal Permanent Resident. Must successfully complete the Brookhaven National Laboratory Guest Registration process.

PREREQUISITES: Individual academics or academic teams must have competency in all (6) courses listed below. It is suggested that two academics from the university participate in the program, but that is completely at the discretion of the participating university.

- **Computer Programming:** Introduction to Programming and Data Structure & Algorithms.
- **Math:** Linear Algebra with Vectors & Matrices and Differential Equations.
- **Physics:** Physics Using Calculus including Classical Mechanics & Electromagnetism and Thermodynamics or Mathematical Methods in Physics.

STIPEND: Faculty \$1,500 per week. Postdocs \$1,000. Graduate Students \$750 per week.

COMMITMENT: Participants must complete the entire program, including attending all classes, and completing all laboratory and homework assignments.

KEY PROGRAM DATES:

April 8, 2024	Application Opens at 9:00am ET
April 24, 2024	Application Closes at 6:00pm ET
Apr 28-30, 2024	Applicant Decisions Communicated
May 3, 2024	Applicant Decision Deadline
May 6, 2024	Attendee Onboarding Begins
June 10, 2024	Program Commences
June 28, 2024	Program Concludes

LEARN MORE!



APPLY AT <https://bit.ly/QIS102F> | VISIT https://bit.ly/QIS102F_Info FOR MORE INFORMATION