# QIS 101: Foundations of Quantum Information Science

## 2025 Virtual Summer School
## June 9-July 18, 2025

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

**David Biersach**
**Program Founder & Instructor** and
**Senior Technology Architect**
**Brookhaven National Laboratory**

The Co-design Center for Quantum Advantage (C$^2$QA), led by Brookhaven National Laboratory, offers a six-week virtual workshop to introduce undergraduate and graduate students to the exciting world of quantum information science (QIS). During QIS 101, led by David Biersach, students will learn how quantum algorithms, when applied to specific problems, can outperform classical computers. Through a series of demonstrations and hands-on programming labs, students will learn how to use IBM Qiskit, a world-class software package for working with quantum computers. Students will also take guided virtual tours of Brookhaven Lab's world-renowned facilities and hear from guest speakers, including Brookhaven researchers and C$^2$QA leadership.

The program will be conducted via Zoom web videoconferencing. To participate in QIS 101, students must have access to a computer and be able to install 100% open-source courseware and development tools on that device.

C$^2$QA
Co-design Center for
Quantum Advantage

# PROGRAM SCHEDULE

The summer school runs each weekday from June 9 to July 18. There will be three two-hour sessions each day, and attendance at all three sessions **is required**. Students should anticipate **two additional hours of homework each day**. All assignments are mandatory.

| Monday - Friday | | |
|---|---|---|
| **Session #1** | **Session #2** | **Session #3** |
| **10 – 12 p.m. ET** | **1 – 3 p.m. ET** | **4 – 6 p.m. ET** |

**Classes will not be held on**
Wednesday, June 19
Thursday, July 3 or Friday, July 4

# ELIGIBILITY

Application is open to undergraduate and graduate students, recent college graduates, and educators. Applicants enrolled in courses for the spring 2025 semester must complete that semester by June 9. Applicants must be at least 18 years of age by Jun 9, be a U.S. citizen or legal permanent resident, and successfully complete the Brookhaven National Laboratory guest registration process by May 23.

# KEY PROGRAM DATES

| | | | |
|---|---|---|---|
| **Feb 18** | Application period commences | **May 23** | Student onboarding concludes |
| **Mar 31** | Application period concludes | **Jun 9** | Program commences |
| **Apr 7 – 11** | Application decisions communicated | **Jun 19** | NO CLASS |
| **Apr 18** | Student decision deadline | **Jul 3 – 4** | NO CLASS |
| **Apr 23** | Student onboarding commences | **Jul 18** | Program concludes |
| | | **Aug 31** | Certificates conferred |

# STIPEND

Students will receive a weekly stipend of $500 for each week of successful participation.

# CERTIFICATE

Upon successful completion of the program, students will receive a certificate from Brookhaven National Laboratory attesting to their skills in Foundations of Quantum Information Science.

# FEES and CONTINUING PROFESSIONAL EDUCATION CREDIT

No fee to apply or attend. Continuing Professional Education credit is not available.

# QUESTIONS

Reach out to C2QA-Info@BNL.gov