

Introduction to Quantum Computing

Lecturer: Xiaodi Wu

Reading Assignment: Course Website; KLM Chap 1 and 2.

Welcome to CMSC/PHYS 457
Introduction to Quantum Computing

Teaching Team

Instructor

- ▶ Instructor: Prof. Xiaodi Wu
- ▶ Contact: xwu@cs.umd.edu
- ▶ Research: Quantum Information and Computation
- ▶ Joint Center for Quantum Information and Computer Science (QuICS)

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TA

- ▶ Ethan Hickman, Email: ethanh@umd.edu

Why Quantum Computing? or Why are you here?

- ▶ One sentence about who you are (e.g., name, major, graduate/undergraduate).
- ▶ One sentence about why you are here.

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- ▶ Please feel free to share your interests or so at piazza.
- ▶ Also please finish assignment 0 so that we can understand your need better.

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- ▶ coding experience of quantum clouds – *a more substantial component this year!*
- ▶ selective quantum research frontiers: **error mitigation schemes.**

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- ▶ **A lot of effort expected!**

CMSC/PHYS 457: Common Questions

There is NO required textbook. We will mainly refer to lecture notes (available online or our own) and the following textbooks.

- KLM** An Introduction to Quantum Computing, Oxford University Press (2007).
- KSV** Classical and Quantum Computation (Graduate Studies in Mathematics), AMS, 2002.
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Interested in working with QuICS?

- ▶ Do well! Discuss project topics with QuICS people!

More logistics

Office Hours

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- ▶ Hickman: Wednesday 10 am - 12 am, Thursday 2 pm - 4 pm
- ▶ In general, please send your questions/requests to Piazza or set up appointments via emails with the instructor and the TA. We will act as soon as possible to reply to your requests.

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Please let us know ASAP if

- ▶ you cannot submit assignments electronically.
- ▶ time conflicts of exams.
- ▶ concerns about the difficulty of the course.
- ▶ anything that you wanted to discuss

You might be interested in knowing

Some ongoing projects inside QuICS: (incomplete list)

- ▶ Circuit Compilation and Optimization.
- ▶ Quantum Programming Languages.
- ▶ Quantum Algorithms for Optimization.
- ▶ Quantum Computing meets Machine Learning.
- ▶ Quantum Hamiltonian Simulation.
- ▶ Quantum Cryptography.
- ▶ (check more at our website)

Reading Assignments on Linear Algebra

Linear algebra with Dirac notations

- ▶ KLM 2.1-2.6.
- ▶ A cheatsheet on our website.