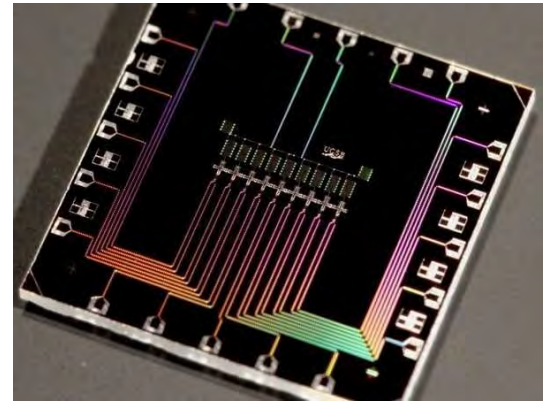
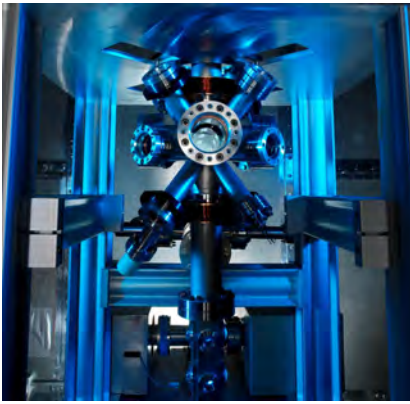


# Physics 406 Quantum Physics of Information Technologies

11:00-12:15 Tu,Th / Spring 2018



This course will explore applications of quantum mechanics to storage, processing & transmission of information.

In the first half we will learn about quantum information processing including:

- computational complexity theory
- qubits, quantum gates
- state preparation, measurements
- entanglement, dense coding, teleportation, Bell's theorem
- quantum algorithms, tomography, randomized benchmarking
- quantum error correction
- adiabatic quantum computing

In the second half we will study experimental quantum devices for metrology, communication and computation including:

- atomic clocks
- optical transmission of data
- photonic quantum computing
- trapped ion & neutral atom quantum computing
- superconducting quantum computing
- semiconductor quantum computing

**Prerequisite** quantum mechanics at the level of Ph 241 or consent of instructor. Concurrent enrollment in Ph 448, 449 sequence or Ph 531 recommended.

**Textbook** Recommended: Introduction to Quantum Computing by Kaye, Laflamme, Mosca supplemented by course notes.

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