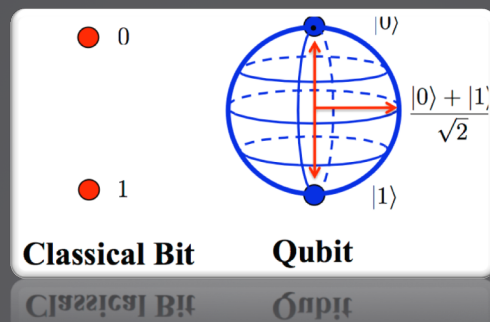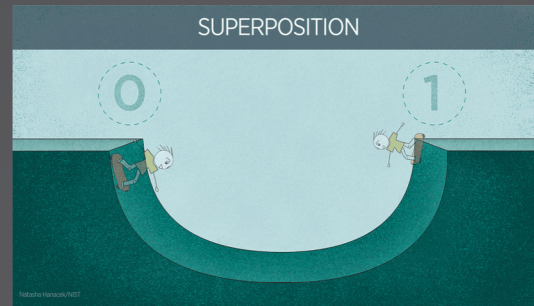# Quantum Computing

Daniel Arlt

Qubits

- Classic bit – 0 or 1
- Qubits – 0 or 1 or neither or both
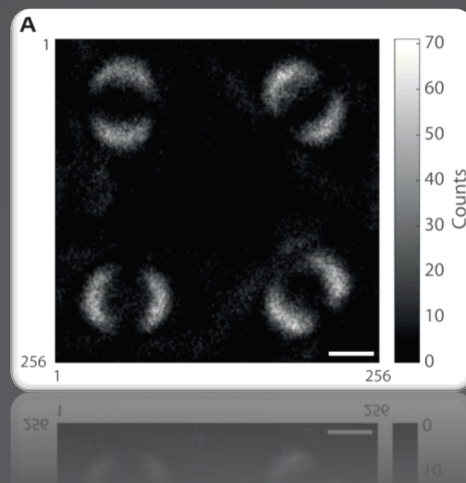- Controlled by special algorithms

Superposition

- Schrödinger's cat
- Simultaneous states
- Observation is key

Entanglement

- Particles link
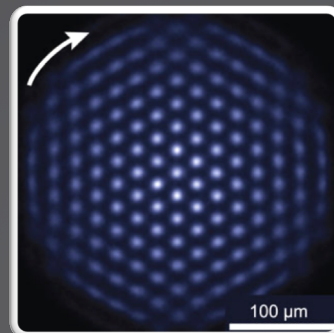- Acting on one affects the other
- Different states

Uses – Encryption

- Current standards rely on large integer factorization
- Peter Shor
- RIP internet
- Quantum cryptography
- Non-quantum solutions

Uses – Quantum Simulation

- Very hard to model on classic computers
- Trivial with a quantum computer
- Physics and chemistry applications

100 μm

Uses – Large Amounts of Data

- Quantum computers are parallel in operation

- Perfect for large amounts of data

- Currently it's time consuming

Sources

- https://poetryinphysics.wordpress.com/2017/03/08/what-is-a-qubit/

- https://www.nist.gov/image/superpositiongif

- https://www.sciencealert.com/scientists-just-unveiled-the-first-ever-photo-of-quantum-entanglement

- https://www.pngfind.com/mpng/hbTxio_excel-logo-png-microsoft-excel-logo-transparent-png/

- https://en.wikipedia.org/wiki/Quantum_simulator#/media/File:Quantum_Simulator_Crystal.jpg

Questions?