

# Superconducting Quantum Computers Study Guide - Jack Crawford

Questions:

What containment system is needed for a superconducting QC (SQC)?

- They have to be as protected as possible from interference of all sorts to lengthen quantum coherence windows.

What is the largest number of qubits that have been assembled in a SQC?

- IBM had 50 Qubits as of 2017

Compared to other forms of QC, is it more or less energy efficient?

- Unclear as of yet.

What are SQC's currently being used for/tested on?

- Chemical bond length calculations and traveling salesman are examples I found on IBM's website

What is the principle language used to develop on SQC's?

- IBM uses Qiskit

Article:

Henderson, Sarah. "Newfound Superconductor Material Could Be the 'Silicon of Quantum Computers'." *NIST*, NIST, 7 Oct. 2019, [www.nist.gov/news-events/news/2019/08/newfound-superconductor-material-could-be-silicon-quantum-computers](http://www.nist.gov/news-events/news/2019/08/newfound-superconductor-material-could-be-silicon-quantum-computers).

Articles linked from that article:

[IBM Raises the Bar with a 50-Qubit Quantum Computer | MIT Technology Review](#)

Notes: There's an exciting new material in the industry, uranium ditelluride, that could solve "the difficulty with making such a computer's memory storage switches, called qubits, function long enough to finish a computation before losing the delicate physical relationship that allows them to operate as a group. This relationship, called quantum coherence, is hard to maintain because of disturbances from the surrounding world" (Henderson).

This quantum coherence is a big deal - that IBM QC only stays coherent for 90 microseconds, and that was the RECORD (2017).