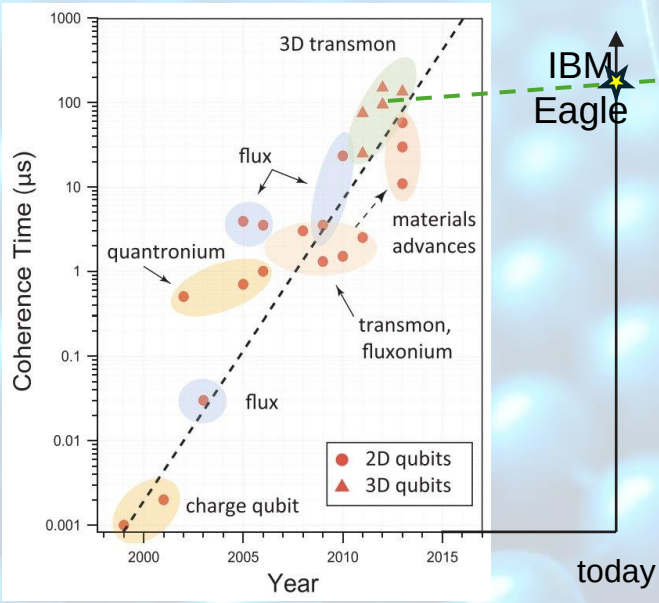
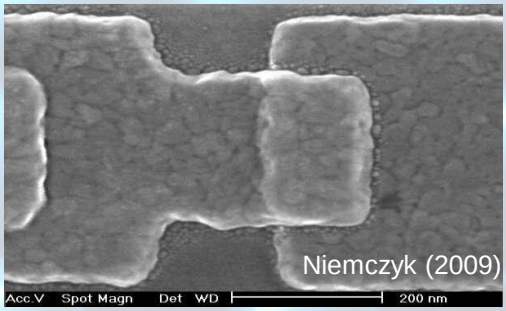
Growth of Niobium Thin Films on Ag(111) for Atomic-Scale Josephson Junctions

One key application of superconductivity is the development of superconducting qubits, the building blocks of quantum computers. A major challenge for these qubits is their limited coherence time. Decoherence occurs when qubits interact with their environment, leading to loss of quantum information and computational errors.

In this project, you will work on growing thin films of niobium (Nb) on silver (Ag(111)) surfaces, an essential step toward building Josephson junctions (JJs) using scanning tunneling microscopy (STM). The aim is to optimize the growth parameters to obtain Nb films suitable for forming qubits. These structures will later enable studies on how material properties affect qubit coherence times—a key factor in advancing quantum technologies.



Ref: William D. Oliver, MIT



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