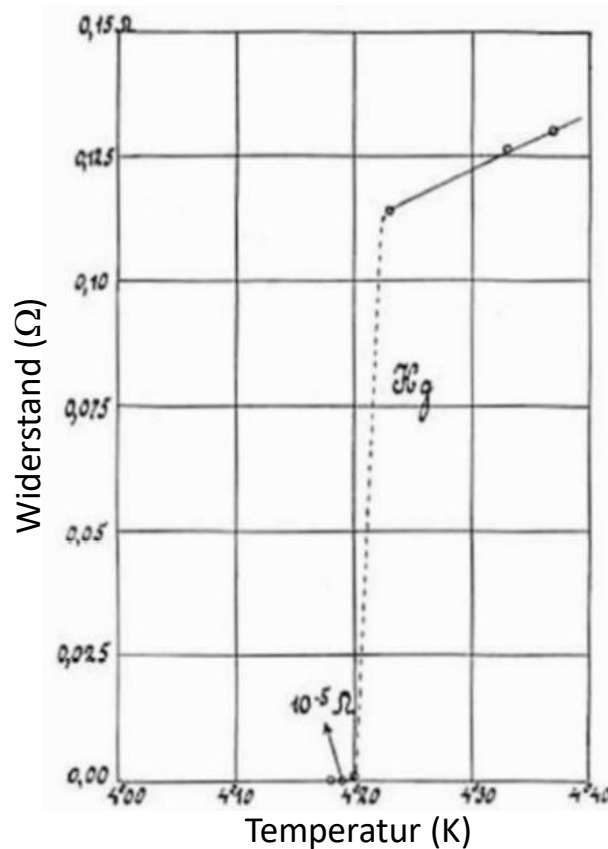


Superconducting Quantum Circuits



Gerhard Kirchmair

15.01.2025

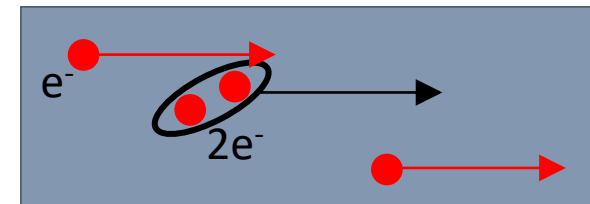


Kammerlingh Onnes, 26 Oktober, 1911

Physics Today, September 2010

Ein über hundert Jahre altes Phänomen

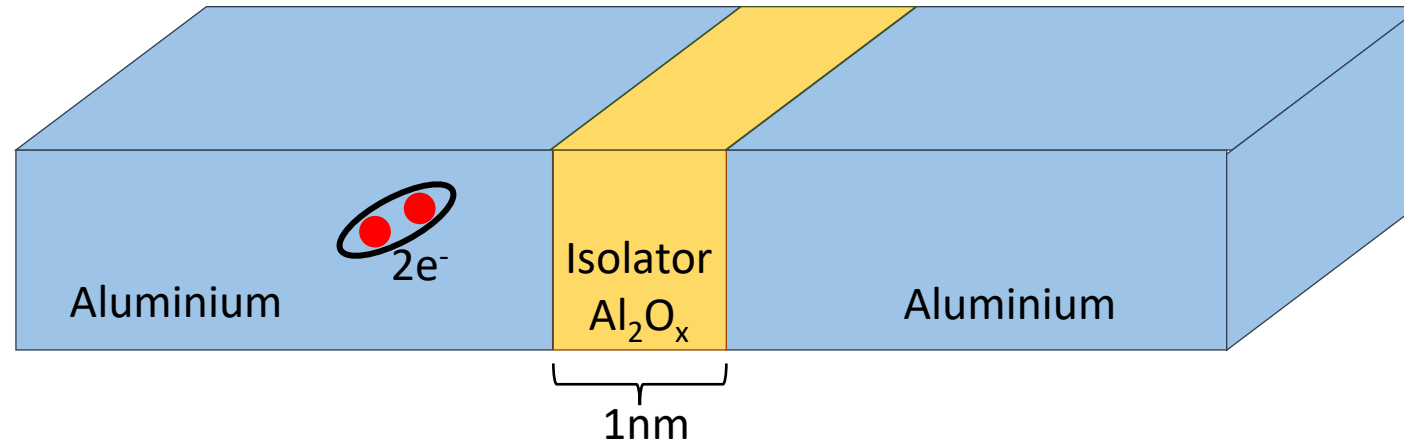
Elektronen bewegen sich paarweise,
verlustfrei in einem Supraleiter
(Cooper Paare)



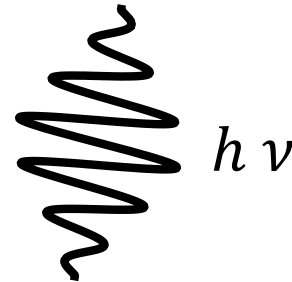
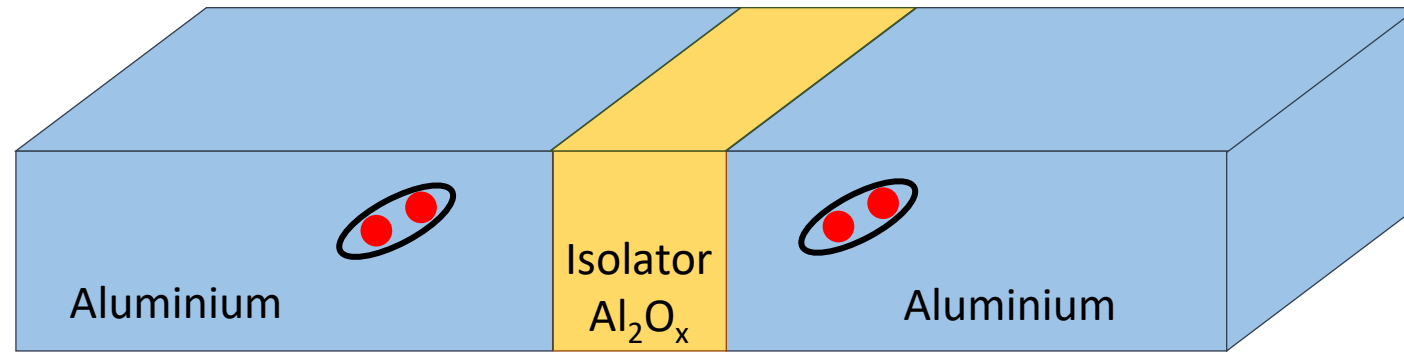
Aluminium, Niob, Quecksilber ...

Temperatur < 1 K

Josephson Kontakt



Josephson Kontakt



Mikrowellen Strahlung

$|0\rangle$ 10000

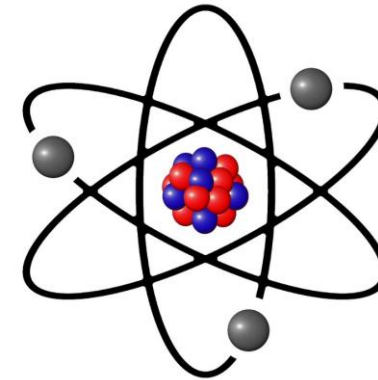
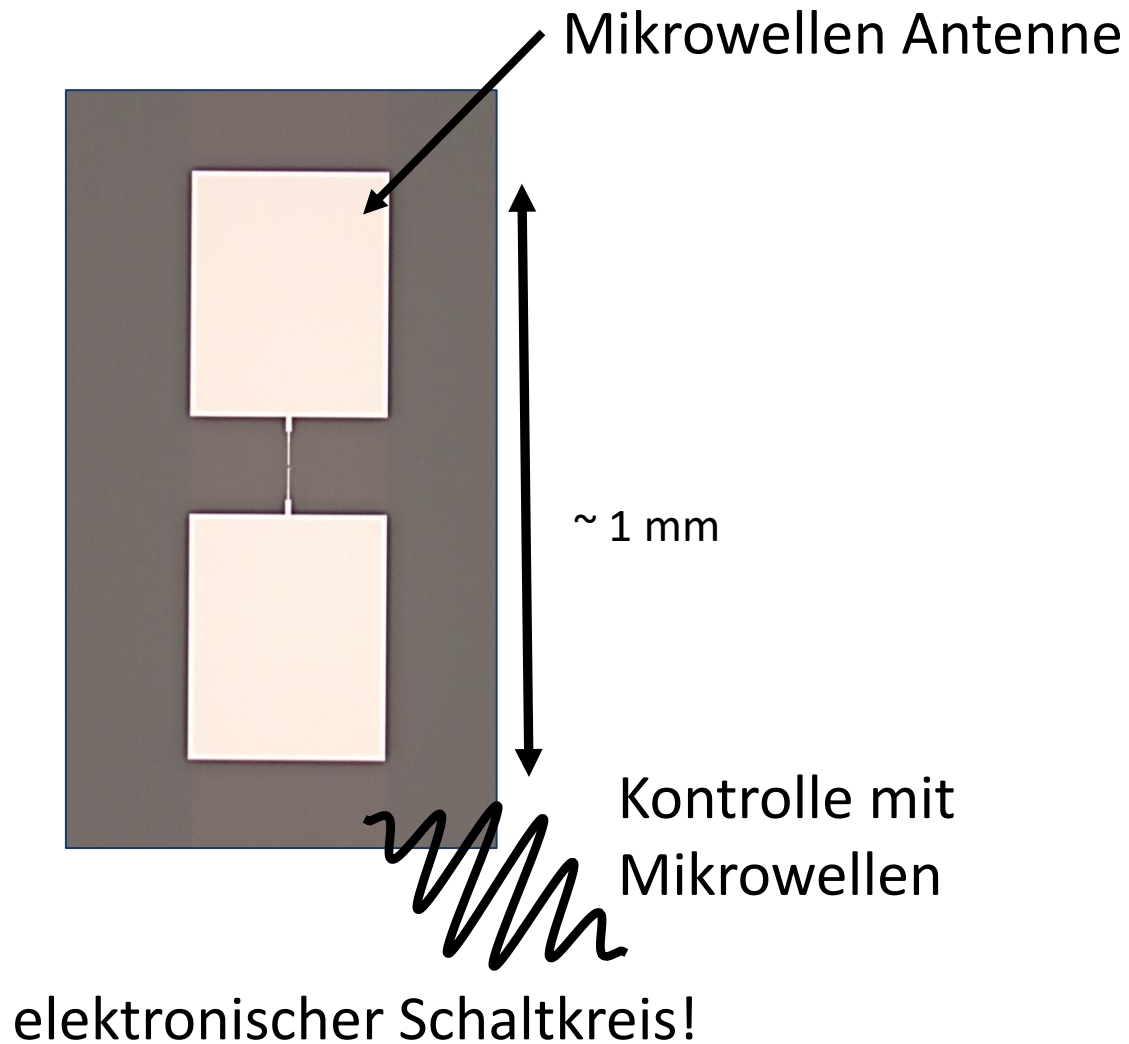
10000

$|1\rangle$ 9999

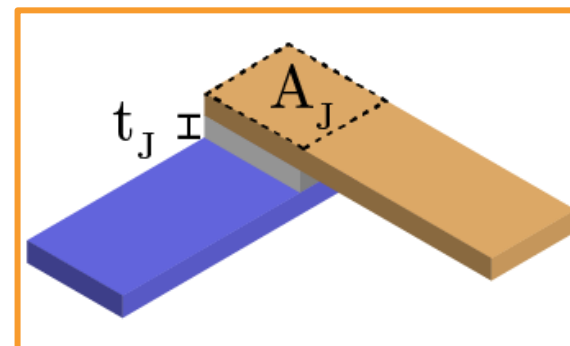
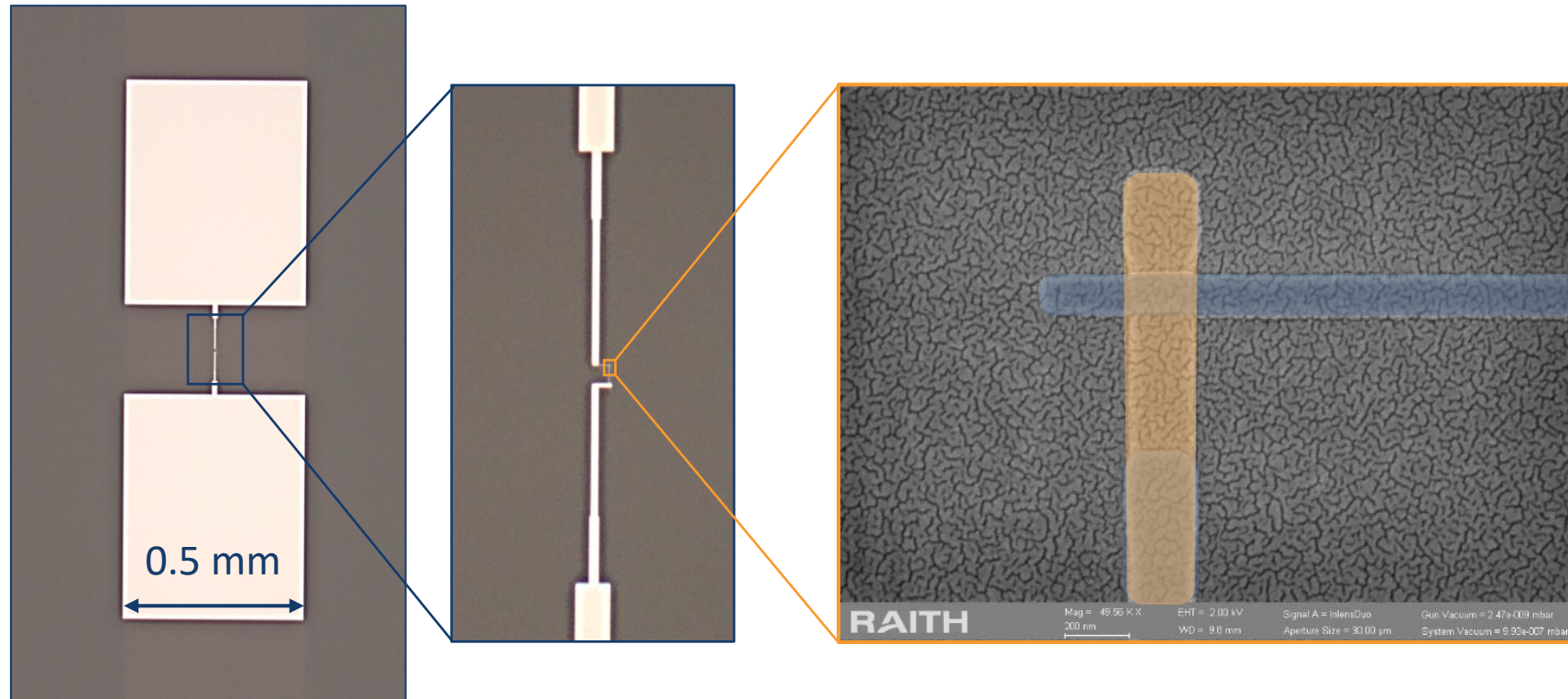
10001

$|0\rangle + |1\rangle$

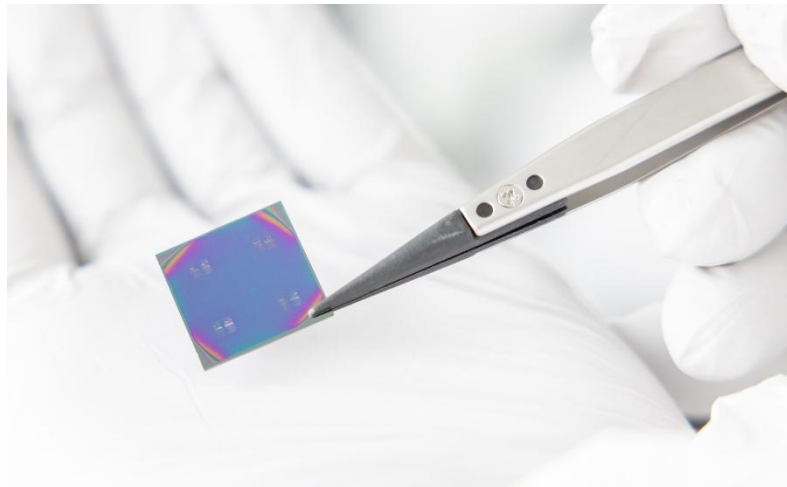
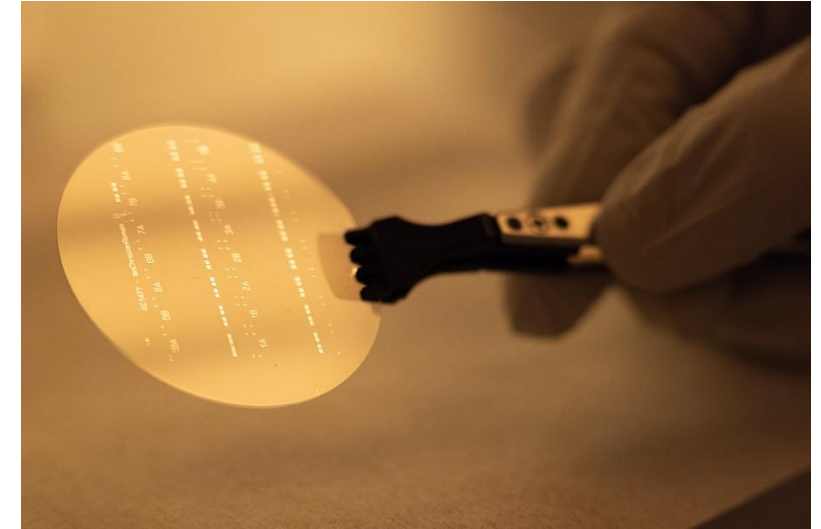
Cooper Paar an zwei Orten gleichzeitig!!

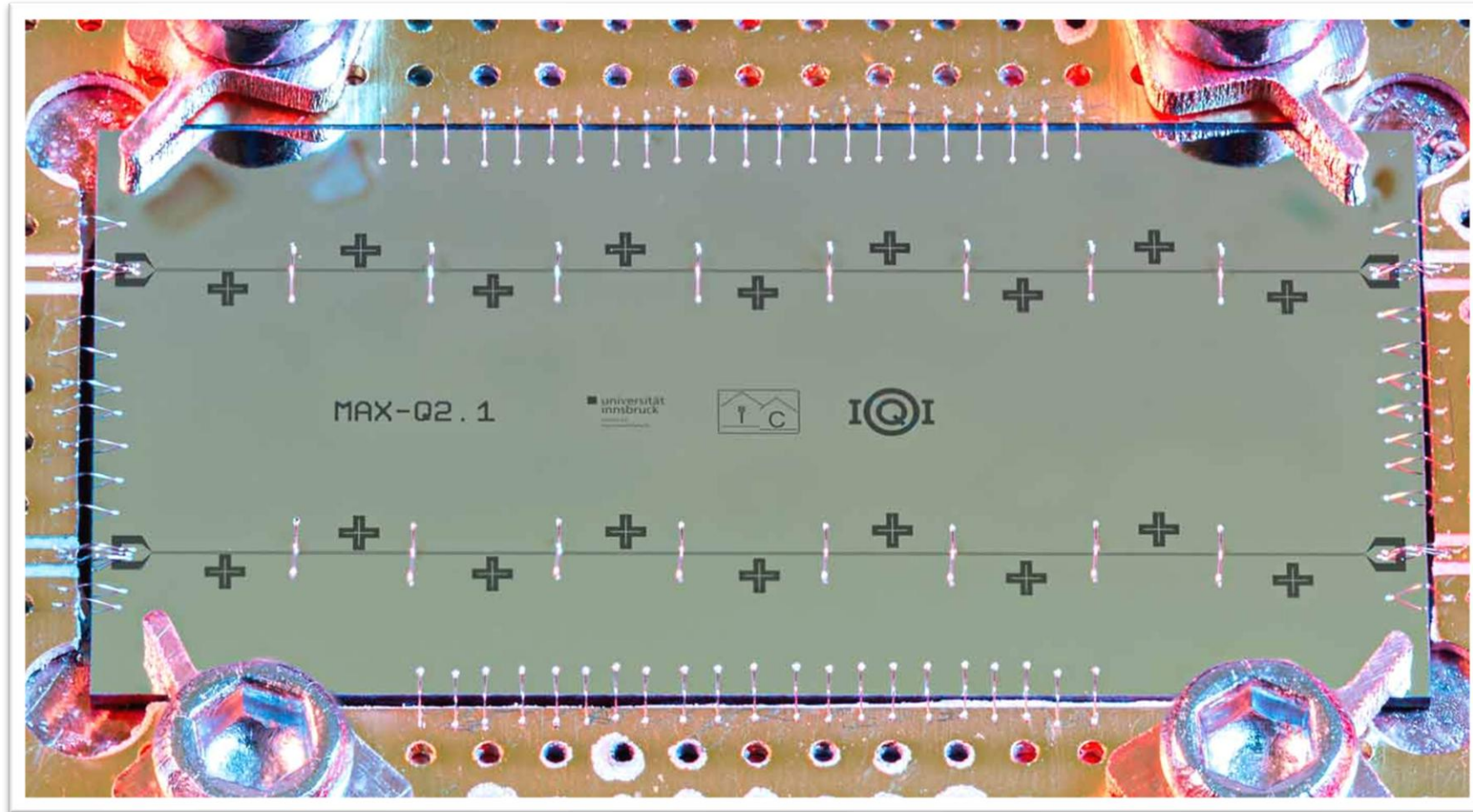


Fertiges Qubit

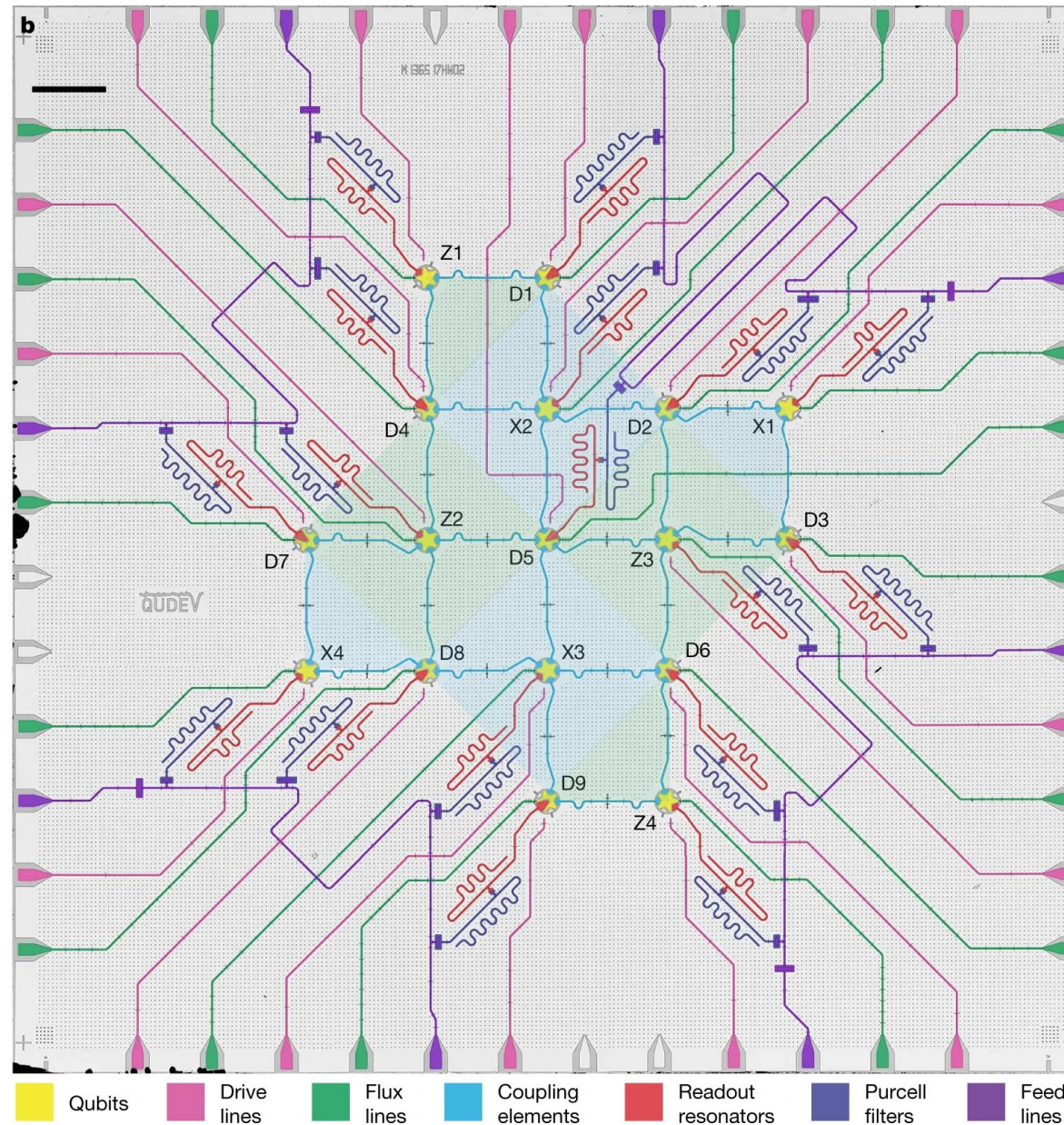


Wie baut man so ein Qubit - Reinraum





Superconducting Qubit Quantum Processor



- **BSc Projekte**

- *Superconducting circuit characterisation and calibration*
 - Anmelden für“Fortgeschrittenes Praktikum B Optik”!
 - Messungen im Labor
- How do superconducting qubits couple to single microwave photons?
 - Literatur Arbeit
- How does a superconducting qubit processor work?
 - Literatur Arbeit

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Superconducting Quantum Circuits

Danke für die Aufmerksamkeit.



Gerhard Kirchmair

15.01.2025