

Vorlesung Quantum Transport – Superconductivity (2)

1. Superconducting tunnel junctions
 - NIS
 - SIS
2. SQUID
3. Cooper pair box
4. Real world Josephson junction (RCSJ model)
5. Quantum effects in Josephson junctions
6. Superconducting Qubits
 - Charge Qubit
 - Flux Qubit
 - Phase Qubit

Literature

T. Heikkilä: The Physics of Nanoelectronics

M. Tinkham: Superconductivity

Y. Nazarov, Y. Blanter: Quantum transport



Universität
Basel

Swiss Nanoscience Institute



SNI Lecture

Exploring Complex Chemical Systems

Prof. Lee Cronin
University of Glasgow, UK

How do high nuclearity inorganic and supramolecular assemblies form? Can understanding the minimal information content of the structures help us understand their assembly? Is there a general route to explore the mechanism and how can one given compound dominate from a combinatorial explosion of possibilities?

Get the answers during the next SNI Lecture!

When: 12th May, 2015, 17.15 h

Where: Small lecture hall, Organic Chemistry (St. Johans-Ring 19).

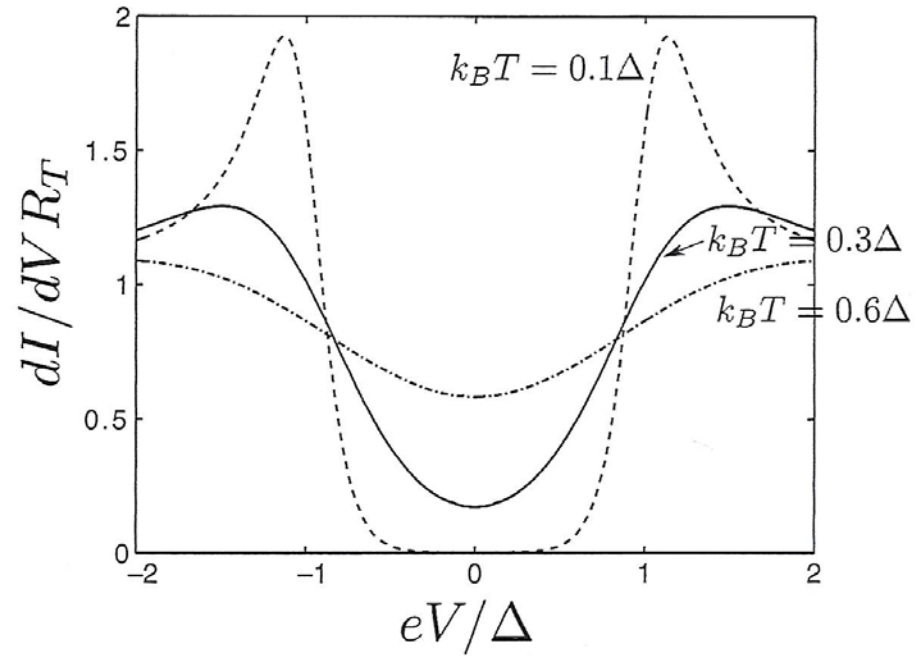
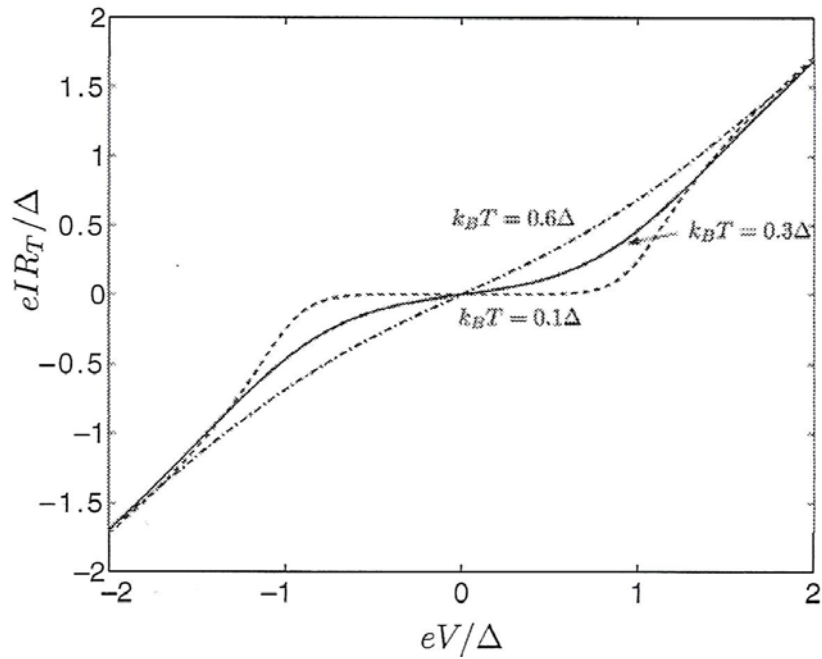
The talk will be followed by an apéro.

Announcement

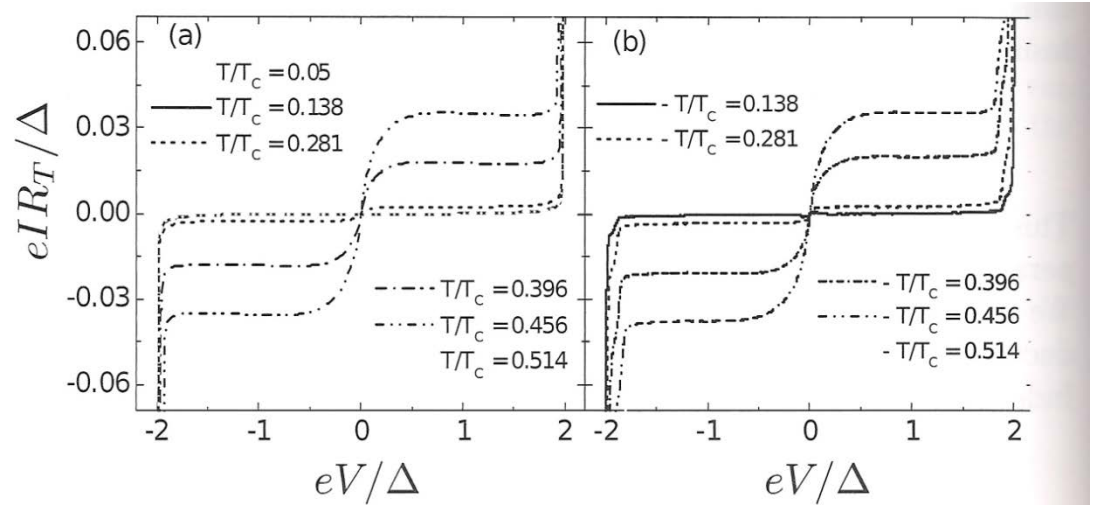
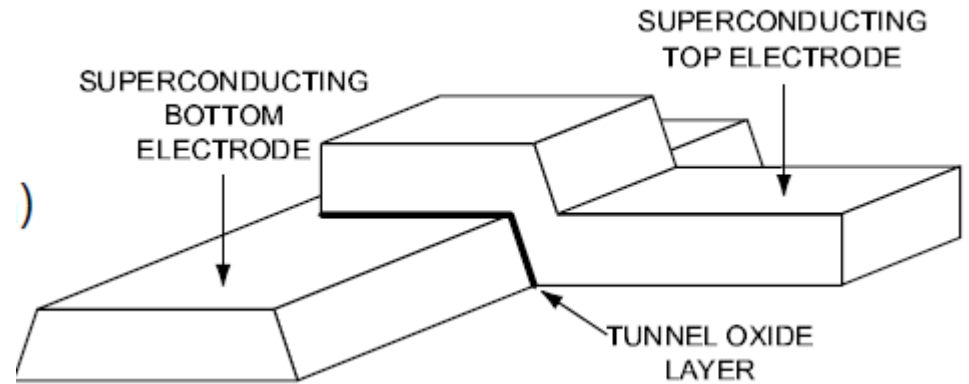
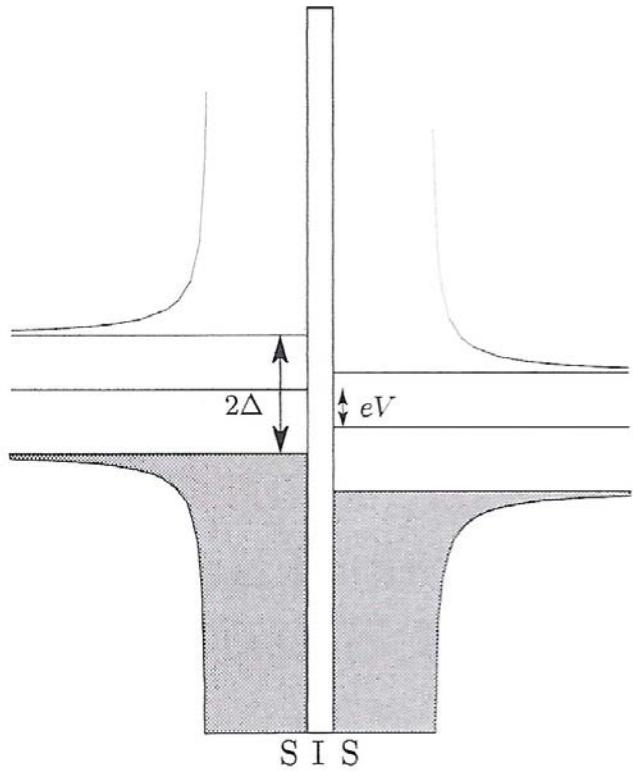
Next week's lecture:

Tuesday, 12.5.2015, 15:00-17:00

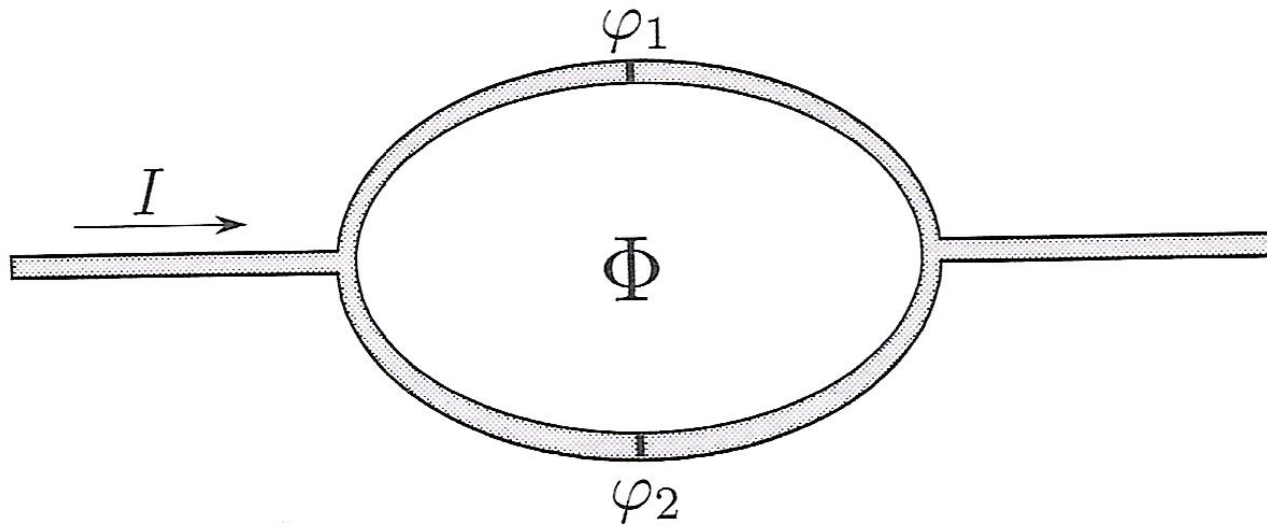
NIS junctions



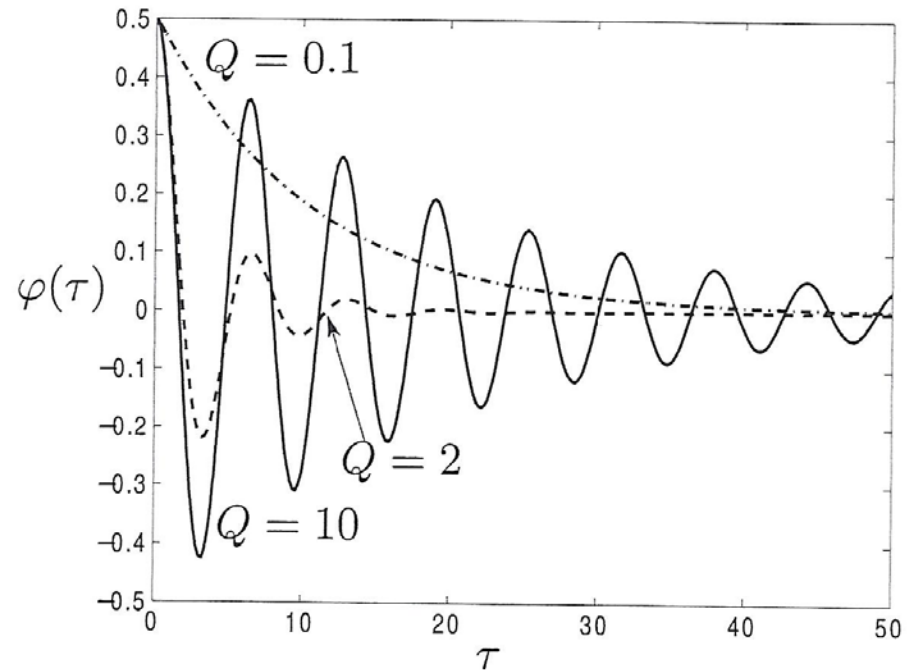
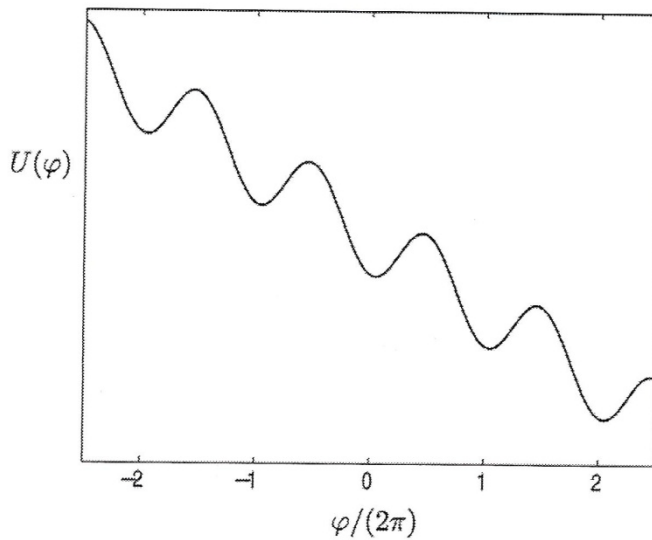
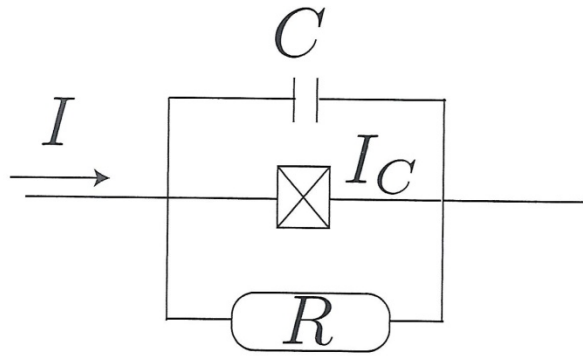
SIS junctions



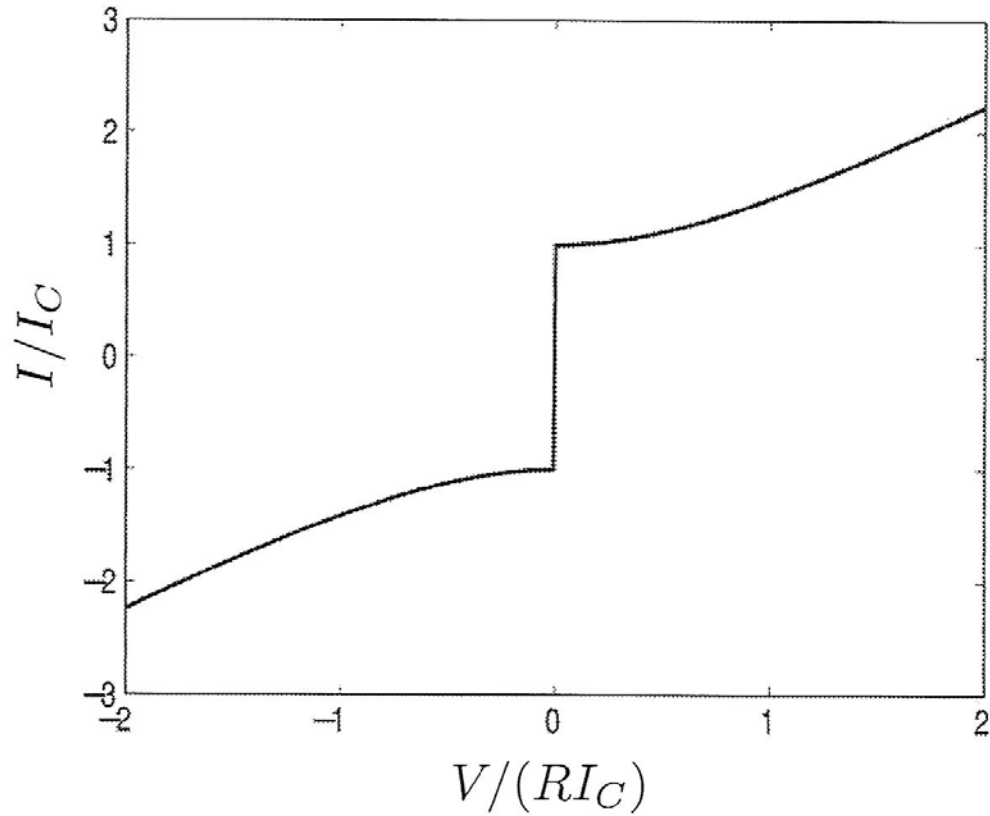
SQUID



Real world superconducting junctions: RCSJ model

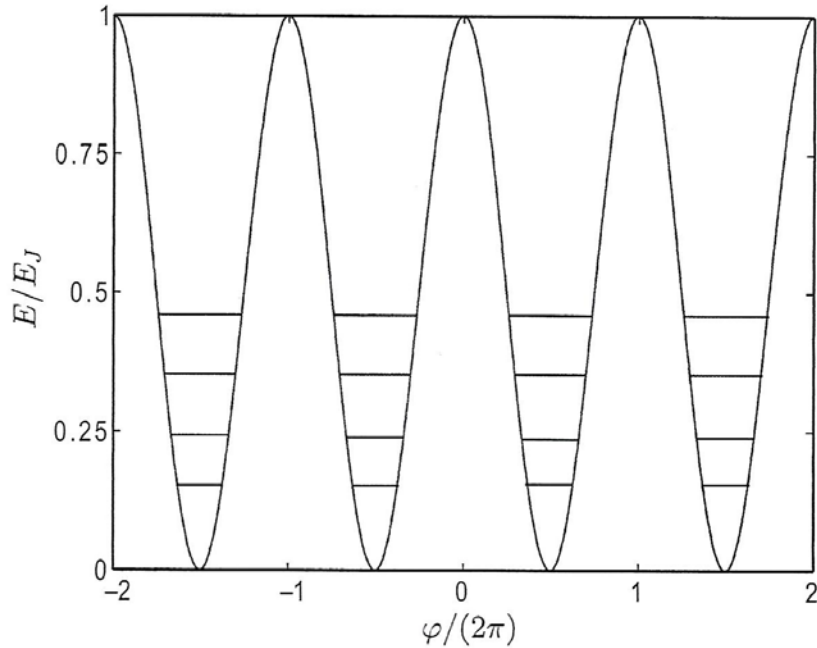


Overdamped junction

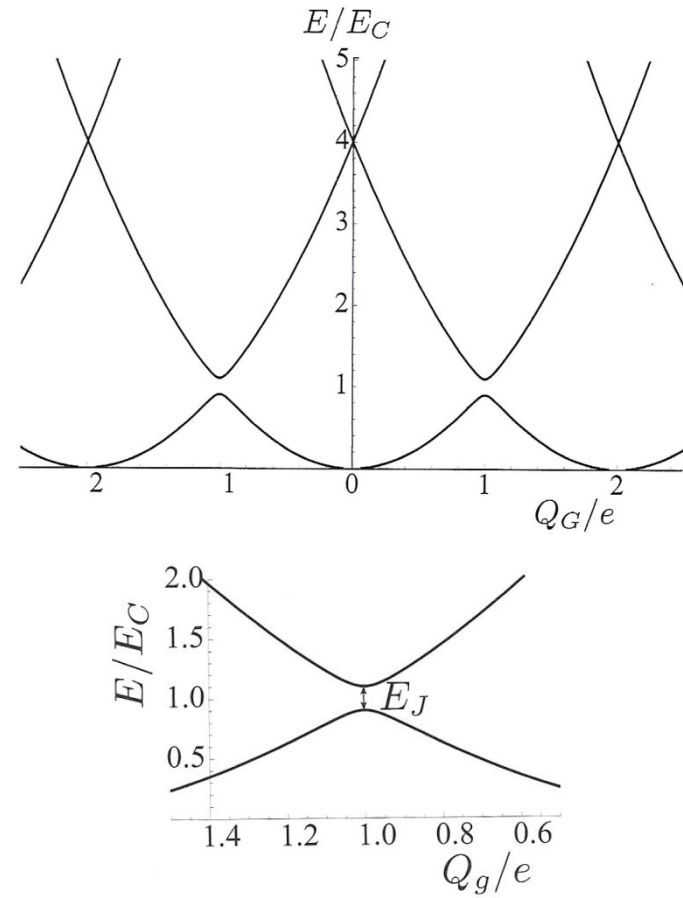


Quantum effects

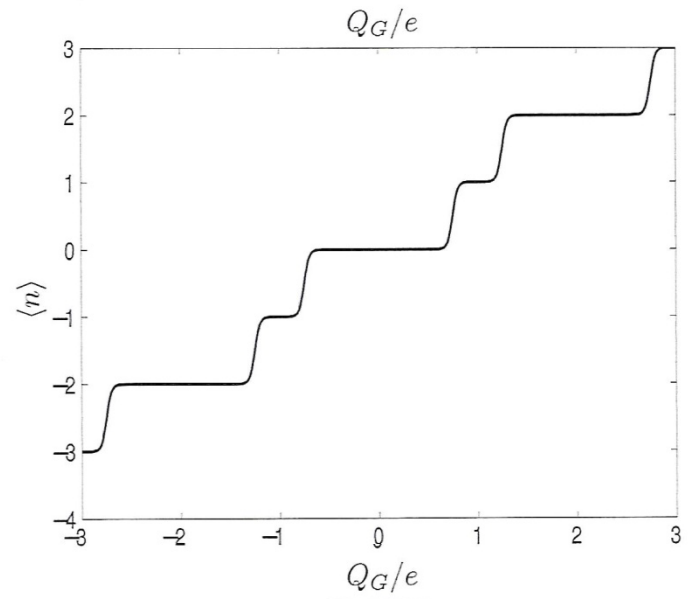
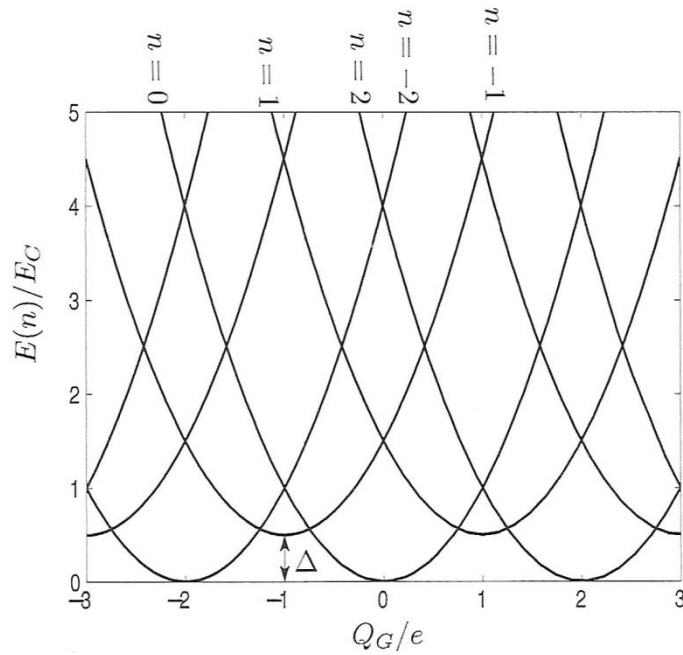
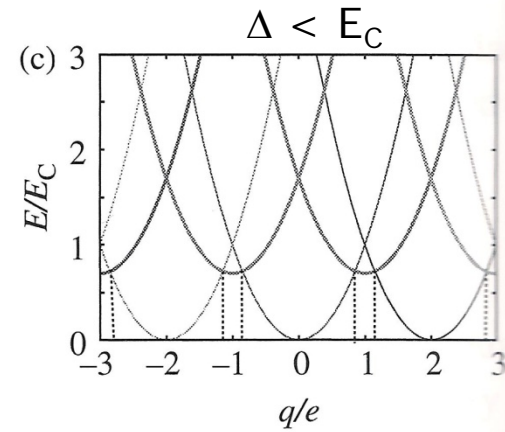
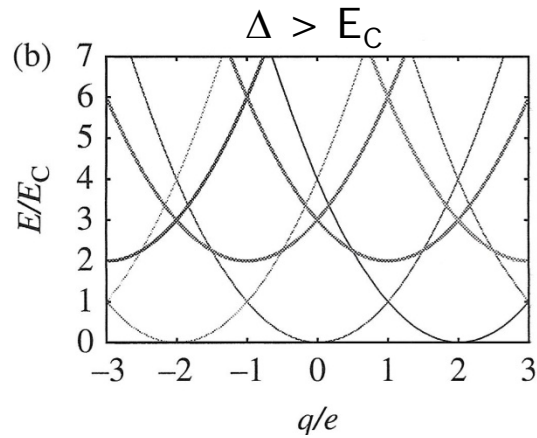
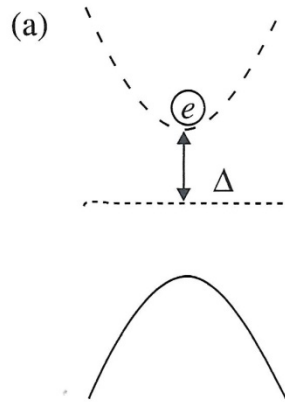
tight binding



free electron limit

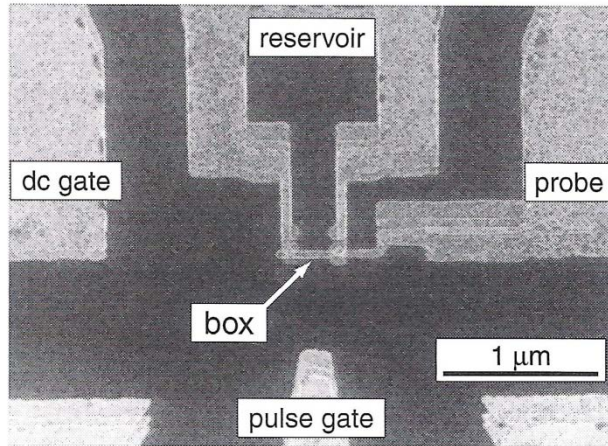


parity effects

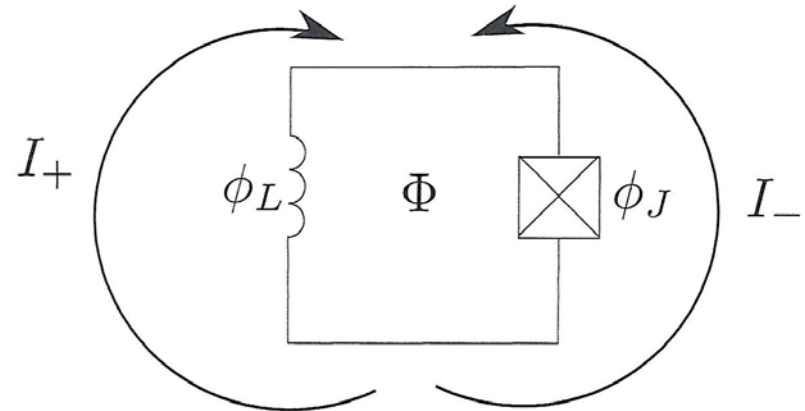


Superconducting Qubits

charge qubit



flux qubit



Nakamura et al., Nature 398, 786 (1999)

transmon

