Seminar/Talk

Progress and challenges in designing a universal Majorana quantum computer

Torsten Karzig
Microsoft Station Q, UCSB

Host:

I will discuss a promising design proposal for a scalable topological quantum computer. The qubits are envisioned to be encoded in aggregates of four or more Majorana zero modes, realized at the ends of topological superconducting wire segments that are assembled into superconducting islands with significant charging energy. Quantum information can be manipulated according to a measurement-only protocol, which is facilitated by tunable couplings between Majorana zero modes and nearby semiconductor quantum dots. The key virtue of the proposed architecture is its modular and scalable design and a natural suppression of quasiparticle poisoning by charge protection.

In the second part of the talk I will comment on the importance of elevating these designs to full quantum universality by so called magic state injection. The latter relies on a high fidelity source of specific quantum states and I will point out some of ideas and challenges for providing them.

Wednesday, February 1, 2017 08:45am - 09:45am
Mondi Seminar Room 3, Central Building

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.