

# Condensed Matter Theory Center Seminar



Wednesday, April 15  
11:00 am – 12:00 pm  
2205 Toll Physics Building

## Carlo Beenakker

Leiden University

### “Quench dynamics of fermion-parity switches in a Josephson junction”

We have investigated the phase-coherent, deterministic counterpart of incoherent, stochastic quasiparticle poisoning: A fermion-parity switch in a Josephson junction transfers a single quasiparticle into a metal contact, on demand and in a pure state. The quasiparticle is a coherent superposition of electron and hole, with a charge expectation value that can be adjusted between 0 and  $e$ . A charge-neutral quasiparticle is produced in the quenched limit of a fast parity switch, if the metal couples predominantly to a single Majorana operator in the Josephson junction. This level of control over Bogoliubov quasiparticles could be an asset for quantum information processing with superconducting electronics.

Host: Jay Sau

Web: <http://www.physics.umd.edu/cmtc/seminars.html>

