

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

**DOTTORATO DI RICERCA / PhD PROGRAM IN  
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING**

## **Seminar announcement**

**Tuesday 24th June 2025, Time: 11:00 - 12:00**

**Meeting Room, Floor 1, Building 3, DIETI - Via Claudio, 21 - NAPOLI**



### **Dr. Silvia Zorzetti**

Fermilab, Batavia, IL , USA,

Superconducting Quantum Materials and Systems Center

<https://sqmscenter.fnal.gov/profile/silvia-zorzetti/> Email: [zorzetti@fnal.gov](mailto:zorzetti@fnal.gov)

# **Superconducting Radio Frequency Cavities for Quantum Computing and Communication**

**Abstract:** The next groundbreaking frontier in Quantum Information Science (QIS) involves establishing low-noise interconnections between quantum processing units (QPUs) and quantum sensors. A pivotal enabler of distributed quantum networks is high-efficiency microwave-optical transduction, a technology with broad applications. Our research at the DOE Fermi National Laboratory and the SQMS Quantum Research Center focuses on advancing transformational technologies in quantum computing and

sensing, leveraging superconducting devices with long coherence times. This talk will present a comprehensive analysis and experimental results in quantum transduction by coupling superconducting cavities to electro-optic optical cavities to achieve high conversion efficiency between microwave and optical photons. We will also explore potential implementations in quantum sensor and distributed quantum networks, enabling QPU interconnects and entanglement distribution.

**Lecturer short bio:** *Dr. Silvia Zorzetti is a Principal Engineer and head of Fermilab's Quantum Computing Co-Design and Communication Department. She is also the QIS Ecosystem Thrust Leader within the Superconducting Quantum Materials and Systems (SQMS) Research Center, one of five DOE National Quantum Information Science Research Centers. Her research interests include superconducting quantum computing and sensing technologies, quantum transduction, and workforce development. Zorzetti was based at CERN during her doctoral studies as a Marie Skłodowska-Curie Fellow. After earning her PhD, she joined Fermilab in 2017 as a Bardeen Fellow. In 2023, she received the DOE Early Career Award. Zorzetti actively mentors several students and interns at SQMS and holds an adjunct professorship at Northwestern University.*

For information: Prof. Edo Giusto (DIETI, UniNA) – [edoardo.giusto@unina.it](mailto:edoardo.giusto@unina.it) (organizer)