

# **QUART&T Kick-Off Meeting**

## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

# **Design and simulation of single and coupled qubits towards tunability**

*Friday, 21 February 2025 10:00 (15 minutes)*

**Presenter:** MORETTI, Roberto (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP2: Design and simulations of planar (2D) devices

Contribution ID: 2

Type: **not specified**

## QUART&T goals and developments

*Friday, 21 February 2025 09:00 (15 minutes)*

**Presenter:** Dr GLACHERO, Andrea (MIB)

**Session Classification:** Introduction

Contribution ID: 3

Type: **not specified**

# **Tunable Couplers and Their Applications in Analog Quantum Simulations**

*Friday, 21 February 2025 10:15 (15 minutes)*

**Presenter:** CATTANEO, Alessandro (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP2: Design and simulations of planar (2D) devices

Contribution ID: 4

Type: **not specified**

# Compact Purcell filter design for superconducting qubit readout

*Friday, 21 February 2025 10:30 (15 minutes)*

**Presenter:** ZACCARIA, Simona (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP2: Design and simulations of planar (2D) devices

Contribution ID: 5

Type: **not specified**

## Introducing Qibo: an open-source quantum operating system

*Friday, 21 February 2025 11:35 (15 minutes)*

**Presenter:** PASQUALE, Andrea (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP5: Control Hardware and Software

Contribution ID: 6

Type: **not specified**

## **Development of a Custom Superconducting Qubit Control and Readout System**

*Friday, 21 February 2025 11:50 (15 minutes)*

**Presenter:** CAROBENE, Rodolfo (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP5: Control Hardware and Software

Contribution ID: 7

Type: **not specified**

# Travelling Wave Photon Energy Lifters for QUART&T

*Friday, 21 February 2025 12:05 (15 minutes)*

**Presenter:** AHRENS, Felix Klaus (Fondazione Bruno Kessler / TIFPA)

**Session Classification:** WP5: Control Hardware and Software

Contribution ID: 8

Type: **not specified**

# Optimal control methods for nuclear physics

*Friday, 21 February 2025 09:30 (15 minutes)*

**Presenter:** PEDERIVA, Francesco (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP1: Theoretical Background

Contribution ID: 9

Type: **not specified**

# Quantum simulation of neutrino flavor oscillations

*Friday, 21 February 2025 09:45 (15 minutes)*

**Presenter:** ROGGERO, Alessandro (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP1: Theoretical Background

Contribution ID: **10**

Type: **not specified**

## **Introduction to QUART&T WP4**

*Friday, 21 February 2025 10:45 (5 minutes)*

**Presenter:** PUGLIA, Claudio (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP4: Microfabrication process for transmon qubits

Contribution ID: **11**

Type: **not specified**

## **Q-bit 3D fabrication @IFN**

*Friday, 21 February 2025 10:50 (10 minutes)*

**Presenter:** MATTIOLI, Francesco (IFN - CNR)

**Session Classification:** WP4: Microfabrication process for transmon qubits

Contribution ID: 12

Type: **not specified**

## **Microfabrication platforms at TIFPA: overlap Josephson junctions and high kinetic inductance circuits**

*Friday, 21 February 2025 11:00 (10 minutes)*

**Presenters:** IRACE, Alessandro (FBK/TIFPA); BOGONI, Enrico (FBK/TIFPA)

**Session Classification:** WP4: Microfabrication process for transmon qubits

Contribution ID: 13

Type: **not specified**

## **3D superconducting resonator production @LNL**

*Friday, 21 February 2025 11:10 (10 minutes)*

**Presenter:** Dr CHYHYRYNETS, Eduard (LNL)

**Session Classification:** WP4: Microfabrication process for transmon qubits

Contribution ID: 14

Type: **not specified**

## **Design, fabrication and operation of Josephson parametric amplifiers**

*Friday, 21 February 2025 15:00 (15 minutes)*

**Presenter:** CRESCINI, Nicolo'

**Session Classification:** WP6: Quantum Limited Amplifiers

Contribution ID: 15

Type: **not specified**

## Design and modelling of practical JTWPA

*Friday, 21 February 2025 14:45 (15 minutes)*

**Presenter:** Prof. PAGANO, Sergio (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP6: Quantum Limited Amplifiers

Contribution ID: **16**

Type: **not specified**

## **Introduction to QUART&T WP1**

*Friday, 21 February 2025 09:20 (10 minutes)*

**Presenter:** ROGGERO, Alessandro (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP1: Theoretical Background

Contribution ID: 17

Type: **not specified**

## Introduction to QUART&T WP8

*Friday, 21 February 2025 12:20 (10 minutes)*

**Presenters:** GATTI, Claudio (Istituto Nazionale di Fisica Nucleare); BANCHI, Leonardo (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP8: Application for Quantum Sensing and Machine Learning

Contribution ID: **18**

Type: **not specified**

## **Coherent states detection for light dark matter searches using multi-qubit sensor**

*Friday, 21 February 2025 12:30 (15 minutes)*

**Presenter:** GOBBO, Marco (University of Milano-Bicocca | INFN MiB)

**Session Classification:** WP8: Application for Quantum Sensing and Machine Learning

Contribution ID: **19**

Type: **not specified**

# Characterization of Planar Transmon Qubits

*Friday, 21 February 2025 15:15 (15 minutes)*

**Presenter:** LABRANCA, Danilo (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP7: Characterization, Measurement and Demonstration

Contribution ID: 20

Type: **not specified**

## Characterization of transmon qubits in 3D cavities

*Friday, 21 February 2025 15:30 (15 minutes)*

**Presenter:** Dr RETTAROLI, Alessio (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP7: Characterization, Measurement and Demonstration

Contribution ID: 21

Type: **not specified**

## Measurement Facilities in the QUART&T Project

*Friday, 21 February 2025 15:45 (15 minutes)*

**Presenters:** Dr RETTAROLI, Alessio (Istituto Nazionale di Fisica Nucleare); FAVERZANI, Marco (Università & INFN Milano - Bicocca)

**Session Classification:** WP7: Characterization, Measurement and Demonstration

Contribution ID: 22

Type: **not specified**

## Toward 3D Analog quantum system

*Friday, 21 February 2025 14:00 (15 minutes)*

**Presenter:** D'ELIA, Alessandro (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP3: Design and simulations of three-dimensional (3D) devices

Contribution ID: 23

Type: **not specified**

## **"Design and simulations of qubits in 3D cavities using Ansys and pyEPR**

*Friday, 21 February 2025 14:15 (15 minutes)*

**Presenter:** PIEDJOU KOMNANG, Alex Stephane (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** WP3: Design and simulations of three-dimensional (3D) devices

Contribution ID: 24

Type: **not specified**

## **High-Q cavity coupled to a high permittivity dielectric resonator for sensing applications**

*Friday, 21 February 2025 14:30 (15 minutes)*

**Presenter:** Prof. CASSINESE, Antonio (Università di Napoli Federico II)

**Session Classification:** WP3: Design and simulations of three-dimensional (3D) devices