

FEDERICA MANTEGAZZINI

Head of Research Unit
SQD - Superconducting Quantum Devices

Fondazione Bruno Kessler (FBK)

RESEARCH INTERESTS

- Superconducting quantum devices
- Quantum sensing
- Cryogenic detectors
- circuit QED

EXPERTISE

Technical skills: Design, Microfabrication, Cryogenic measurements, Data analysis
Coordination: Group leader, PI & Coordinator of scientific projects

EDUCATION

- 10/2016 - 7/2021 **PhD in Physics** **Heidelberg University, Germany**
Doctoral dissertation: *Development and characterisation of high-resolution metallic magnetic calorimeter arrays for the ECHo neutrino mass experiment.*
Final grade: Summa cum laude (with highest distinction)
- 10/2016 - 7/2021 **PhD Scholarship & Fellowship** **Heidelberg University, Germany**
HighRR - *High Resolution and High Rate Detectors in Nuclear and Particle Physics*
Research Training Group
- 10/2009 - 11/2015 **Bachelor & Master Degree in Physics** **University of Milano-Bicocca, Italy**
Final grade: 110/110 cum laude

RESEARCH POSITIONS

- 5/2025 - now **Head of Research Unit** **Fondazione Bruno Kessler, Trento, Italy**
 - Head of the SQD - Superconducting Quantum Devices Research Unit
 - Responsible of cryogenic laboratory
 - Management and coordination of research projects
- 4/2024 - 4/2025 **Research Scientist & Team Leader** **Fondazione Bruno Kessler, Trento, Italy**
 - Coordinator of research team for the development of superconducting devices, e.g. parametric amplifiers, qubits, superconducting detectors
 - Responsible of FBK Cryogenic Laboratory
 - Management and coordination of research projects
- 3/2022 - now **INFN Associated Researcher** **INFN TIFPA, Trento, Italy**
 - Member and Local Responsible of several INFN experiments
 - Coordination of microfabrication and cryogenic measurements of superconducting devices
- 3/2022 - 4/2024 **Tenure Track Researcher** **Fondazione Bruno Kessler, Trento, Italy**
 - Development of superconducting devices (parametric amplifiers, qubits, cryogenic detectors)
 - Scientific and technical activities: design, microfabrication, cryogenic measurements
 - Management and coordination of research projects
- 7/2021 - 3/2022 **Postdoctoral Researcher** **Heidelberg University, Germany**
 - Coordination of cryogenic measurements for the ECHo experiment
 - Supervision of PhD and Master students
- 10/2016 - 7/2021 **Doctoral Researcher** **Heidelberg University, Germany**
 - Development of microcalorimeter arrays for neutrino mass measurements (ECHo experiment):
 - Design and microfabrication
 - Cryogenic measurements, characterisation and data analysis
- 4/2016 - 10/2016 **Research Intern** **Heidelberg University, Germany**
 - Internship topic: Cryogenic testing of SQUID devices

COORDINATION & MANAGEMENT RESPONSIBILITIES

International Projects & Consortia

2023 – now	PI & Coordinator of the MiSS project (Horizon Europe) MiSS - <i>Microwave Squeezing with Superconducting (meta)materials</i> , Horizon-RIA project. Consortium: 7 partners (4 countries). Total budget: 2.6 M€.	FBK, Trento
2022 – now	Task leader & Local responsible for Qu-Pilot project (Horizon Europe) Qu-Pilot - Superconducting platform. Consortium: 21 partners (9 countries). Total budget: 19 M€.	FBK, Trento

National Projects & Consortia (selection)

2022 – now	Contact Person for PNRR NQSTI (National Quantum Science and Technology Institute) Italian National Initiative on Quantum Technologies. Consortium: 20 national partners. Total budget: 117 M€.	FBK, Trento
2025 – now	Local responsible for the QUARTET experiment QUARTET - <i>QUantum Architectures for Theory & Technology</i> (INFN CSN5 experiment). Collaboration: 12 national partners. Total budget: 500 M€.	TIFPA, Trento
2025 – now	Local responsible for the Holmes+ experiment HOLMES+ - <i>Neutrino Mass Experiment</i> (INFN CSN2 experiment). Collaboration: 3 national partners. Total budget: 450 M€.	TIFPA, Trento
2023 – 2024	Local responsible for the DARTWARS experiment DARTWARS - <i>Detector Array Readout with Traveling Wave Amplifiers</i> (INFN CSN5 experiment). Collaboration: 7 national partners. Total budget: 1 M€.	FBK, Trento

REVIEWING ACTIVITIES

2023 – now	Reviewer for scientific journals Springer, IOP, and others. IOP Certified Trusted Reviewer	
2023 – now	External reviewer of Doctoral Thesis & Member of Grading Committees Chalmers University, University of Milano-Bicocca	
2022 – now	Scientific Referee for INFN Reviewer and referee of national scientific project within INFN Commission V	
2021	Scientific Reviewer for Q@Tn - Quantum Science and Technology in Trento Selection and review of projects	

ORGANISATION OF SCIENTIFIC MEETINGS

10/2025	Workshop: Superconducting Devices for Quantum Optics and Quantum Simulations Role: Organiser	Trento, Italy
05/2025	Workshop: Quantum Science Generation Role: Member of Organisational Committee	Trento, Italy
2/2024	INFN Scientific Meeting: Quantum Architectures for Analogues and Theory Applications Role: Member of Scientific Committee	Trento, Italy
9/2023	Workshop: Quantum Technologies for Fundamental Physics Role: Chairman	Erice, Italy
6/2023	Workshop: Quantum Technologies Role: Member of Scientific Committee	Torino, Italy
10/2022	Workshop: cQED@Tn <i>Circuit QED: From Quantum Devices to Analogues on Superconducting Circuits</i> , Role: Member of Scientific Committee	Trento, Italy

TEACHING ACTIVITIES

2025	Lectures - Master Degree, Physics Superconducting Quantum Devices	University of Trento, Italy
2023	Course at Doctoral School PQIP2023 Superconducting single photon detectors	Monte Bondone, Italy
2016-2019	Laboratory course Cryogenic measurements and techniques	Heidelberg University, Germany

SUPERVISION OF STUDENTS

2023 – now	Supervision of 2 PhD students	Fondazione Bruno Kessler, Trento, Italy
2023 – now	Supervision of 1 Master student, 2 interns	Fondazione Bruno Kessler, Trento, Italy
2018 – 2022	Supervision of 5 Master, 4 Bachelor students	Heidelberg University, Germany

INVITED TALKS (SELECTION)

Scientific talks, seminars, lectures

4/3/2025	Invited seminar <i>Non-linear superconducting circuits: a Swiss Army knife for quantum applications</i>	Chalmers University, Gothenburg, Sweden
5/2/2025	Invited Plenary Talk Second NQSTI - National Quantum Science and Technology Institute - Congress, Plenary Talk: <i>Spoke 6-7: From Integration to Complete Quantum Systems - Activities on the Superconducting Platform</i>	NQSTI Congresso, Rome, Italy
21/11/2024	Invited seminar <i>Superconducting circuits: how to make them and what to do with them</i>	BEC Centre, University of Trento, Italy
12/09/2024	Invited lecture <i>Superconducting quantum devices at FBK: From single circuit components to the first qubit made in Italy</i>	NanoInnovation Conference, Roma, Italy
2/2/2024	Invited talk <i>Development of superconducting circuits in Italy</i>	DESY (COST Action CA21106), Hamburg, Germany
24/11/2023	Invited seminar <i>Development and microfabrication of superconducting quantum devices at FBK</i>	CNR-SPIN, Naples, Italy
6/7/2023	Invited talk International workshop COLMO (Quantum Collapse Models investigated with Particle, Nuclear, Atomic and Macro systems), Invited talk: <i>Superconducting devices for quantum sensing</i>	ECT*, Trento, Italy
8/6/2022	Invited talk International workshop NuMass, Invited talk: <i>Optimisation of the high-resolution metallic magnetic calorimeters with embedded Ho-163 for the ECHO-100k experiment</i>	University of Milano-Bicocca, Italy
1/10/2019	Invited talk International workshop Vistas on Detector Physics, Heidelberg, 2019, Invited talk: <i>The ECHO experiment</i>	Heidelberg University, Germany

Outreach activities (selection)

19/5/2025	Invited talk - Pint of Science Festival <i>Tecnologie quantistiche: Roba da fantascienza?</i>	Trento, Italy
24/11/2024	Invited talk - DEVO Lab Annual Event <i>Quantum computing e tecnologie quantistiche: una rivoluzione?</i>	Bocconi University - SDA, Milano, Italy
29/9/2024	Invited speaker - WIRED Next Fest <i>Quanto manca al quantum</i>	Rovereto, Italy

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2023 – now	DRD5 Protocollaboration Quantum Technologies for Future Colliders	CERN, Switzerland
2022 – now	Q@TN (Quantum Science and Technology in Trento) Joint quantum laboratory in Trento	Trento, Italy
2022 – now	INFN Associate Researcher INFN Commission V, TIFPA	Trento, Italy
2016 – 2021	DPG Associated Researcher Deutsche Physikalische Gesellschaft - German Physical Society	Heidelberg, Germany

LANGUAGES

English - Professional proficiency, **Italian** - native, **German** - basic