

FEDERICA MANTEGAZZINI

Research scientist

Fondazione Bruno Kessler

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📍 FBK, Via Sommarive 18, Trento, Italy

RESEARCH AREAS

- Superconducting quantum devices
- Cryogenic detectors
- Low temperature physics

EXPERTISE

Technical skills: Microfabrication, Cryogenic measurements, Data analysis
Coordination: Team 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
- 10/2009 - 11/2015 **Bachelor & Master Degree in Physics** University of Milano-Bicocca, Italy
Final grade: 110/110 cum laude

FELLOWSHIPS

- 4/2016 - 7/2021 **PhD Scholarship** Heidelberg University, Germany
HighRR Research Training Group - High Resolution and High Rate Detectors in Nuclear and Particle Physics

RESEARCH POSITIONS

- 3/2022 - now **Research scientist** Fondazione Bruno Kessler, Trento, Italy
 - Coordinator of research team:
Development of superconducting devices (parametric amplifiers, qubits, superconducting detectors)
 - Responsible of cryogenic laboratory (under construction)
 - Management and coordination of research projects
- 3/2022 - now **Associated Researcher** INFN TIFPA, Trento, Italy
 - Member of INFN experiments (DARTWARS, Qub-IT)
 - Responsible for microfabrication of superconducting devices in Trento
- 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
 - Design and microfabrication of microcalorimeter arrays for neutrino mass measurements (ECHo experiment)
 - Cryogenic measurements, characterisation and data analysis
- 4/2016 - 10/2016 **Research internship** Heidelberg University, Germany
 - Cryogenic testing of SQUID devices

COORDINATION & MANAGEMENT RESPONSIBILITIES

- 2023 - now **PI & Coordinator of the MiSS project (Horizon Europe)** FBK, Trento
MiSS - *Microwave Squeezing with Superconducting (meta)materials*, Horizon-RIA project.
Consortium: 7 partners (4 countries). Total budget: 2.6 M€, managing a budget of 600 k€
- 2023 - now **Local responsible for the DARTWARS experiment** FBK, Trento
DARTWARS - *Detector Array Readout with Traveling Wave Amplifiers* (INFN CSN5 experiment).
Collaboration: 7 national partners. Total budget: 1 M€, managing a budget of 50 k€
- 2022 - now **Task leader & Local responsible for Qu-Pilot project (Horizon Europe)** FBK, Trento
Qu-Pilot - Superconducting platform.
Consortium: 21 partners (9 countries). Total budget: 19 M€, managing a budget of 370 k€

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€, managing a budget of 800 k€	FBK, Trento
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REVIEWING ACTIVITIES

2023 – now	Reviewer for scientific journals Journals: Superconducting Science and Technology (IOP), European Physical Journal C (Springer), Low Temperature Physics (AIP), and others. IOP Certified Trusted Reviewer	
10/2025	Workshop: Superconducting Devices for Quantum Optics and Quantum Simulations Role: Organiser	Trento, Italy
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 (SELECTION)

2023 – now	Recurring scientific meetings "Theory+Experiments" Role: Organiser	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

currently planned	Master course on Superconducting Quantum Devices	University of Trento, Italy
2023	Course at the Doctoral School PQIP2023	Trento, Italy
2016-2019	Laboratory course for cryogenic measurements	Heidelberg University, Germany

SUPERVISION OF STUDENTS

2022 – now	Supervision of 3 PhD students	Heidelberg University, Germany & University of Milano-Bicocca, Italy
2022 – now	Supervision of 5 Master, 4 Bachelor students	Heidelberg University, Germany & University of Milano-Bicocca, Italy

PUBLICATIONS (SELECTION)

- F. Ahrens, E. Ferri et al, *Development of KI-TWPAs for the DARTWARS Project*, IEEE Trans Appl Superc, 34 3, 1-5, 2024, 1700605, doi:10.1109/TASC.2024.3350602
- F. Mantegazzini et al, *High kinetic inductance NbTiN films for quantum limited travelling wave parametric amplifiers*, Phys. Scr. 98 125921, 2023, doi.org/ 10.1088/1402-4896/ad070d
- M. Borghesi et al, *Progress in the development of a KITWPA for the DARTWARS project*, NIM A 1047, 2023, 167745, doi:10.1016/j.nima.2022.167745
- F. Mantegazzini et al, *Development and characterisation of high-resolution microcalorimeter detectors for the ECHO-100k experiment*, NIM A 1055, 2023, 168564, doi:10.1016/j.nima.2023.168564
- F. Mantegazzini et al, *Metallic magnetic calorimeter arrays for the first phase of the ECHO experiment*, NIM A 1030, 2022, 166406, doi:10.1016/j.nima.2022.166406

- M. Griedel, F. Mantegazzini (corresponding authors) et al, From ECHo-1k to ECHo-100k: *Optimization of High-Resolution Metallic Magnetic Calorimeters with Embedded ^{163}Ho for Neutrino Mass Determination*, J Low Temp Phys 209, 779–787, 2022, doi.org/10.1007/s10909-022-02732-w
- F. Mantegazzini, *Development and characterisation of high-resolution metallic magnetic calorimeter arrays for the ECHo neutrino mass experiment*, 2021, doi:10.11588/heidok.00030250
- F. Mantegazzini et al, *Multichannel read-out for arrays of metallic magnetic calorimeters*, 2021 JINST 16 P08003, doi:10.1088/1748-0221/16/08/P08003

INVITED PRESENTATIONS (SELECTION)

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 ^{163}Ho 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

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