



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II

itee^{PhD}
information technology
electrical engineering



DIPARTIMENTO 2018
DI ECCELLENZA 2022



Daide Cuneo

PNRR IRIS (Innovative Research Infrastructure on applied Superconductivity)

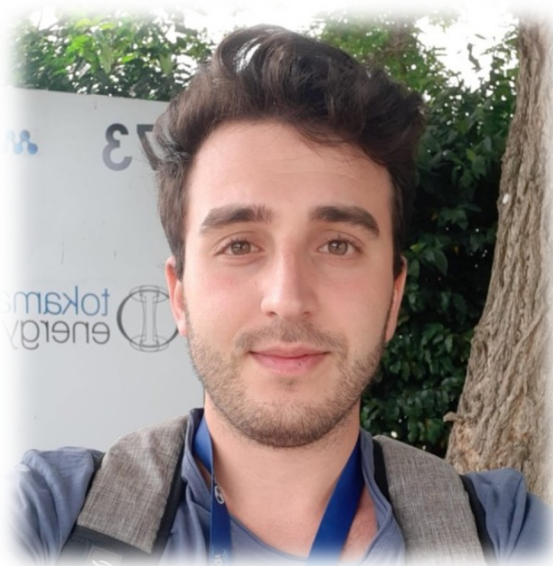
Tutor: Prof. Pasquale Arpaia

Cycle: XXXVIII

Year: 2024

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My background



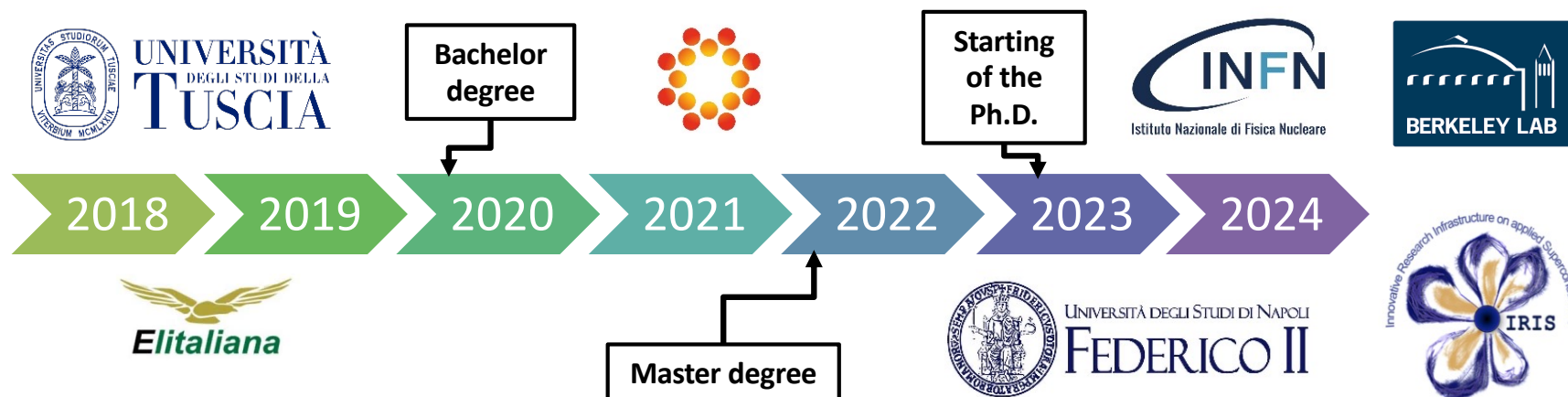
Davide Cuneo

16-09-1998, Grosseto (GR), Italy.

Email: davide.cuneo@unina.it

DIETI department, University of Naples Federico II, IMPALab.

- ❑ **Ph.D. student** in «Information Technology and Electrical Engineering (ITEE)» at University of Naples Federico II (2023 - on going).
- ❑ Supervisor: **Prof. P. Arpaia, PNRR fellowship.**
- ❑ **Ph.D. Start Date: January 2023**
- ❑ **Period Abroad: Lawrence Berkeley National Laboratory (2024)**



Research field of interest

- **IRIS (Innovative Research Infrastructure on applied Superconductivity:**
Instrumentation and measurement for High-Temperature Superconductors (HTS) cables and magnets.



Summary of study activities

❑ Ad hoc PhD courses / schools:

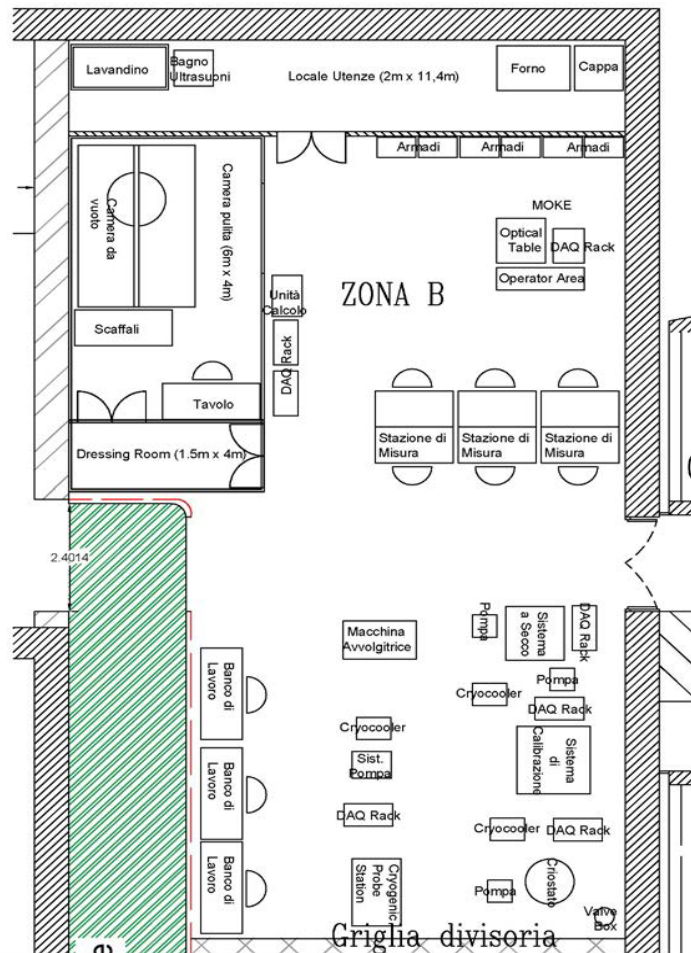
- ✓ Modelli numerici per I campi, Prof. Massimiliano D'Aquino;
- ✓ U.S. Particle Accelerator School 2024 (USPAS2024): “Magnetic Systems for Accelerators, Detectors and Insertion Device’s”, Rohnert Park, California, 22-26 July, 2024;
- ✓ U.S. Particle Accelerator School 2025 (USPAS2025): Superconducting Accelerator magnets/Machine Learning for particle Accelerators, Knoxville, Tennessee, 27, January – 7, February: **scholarship awarded**;

❑ Conferences / events attended:

- ✓ **Conference:** Applied Superconductivity conference 2024 (ASC2024), Salt Lake City, Utah, 1-6 September, 2024.

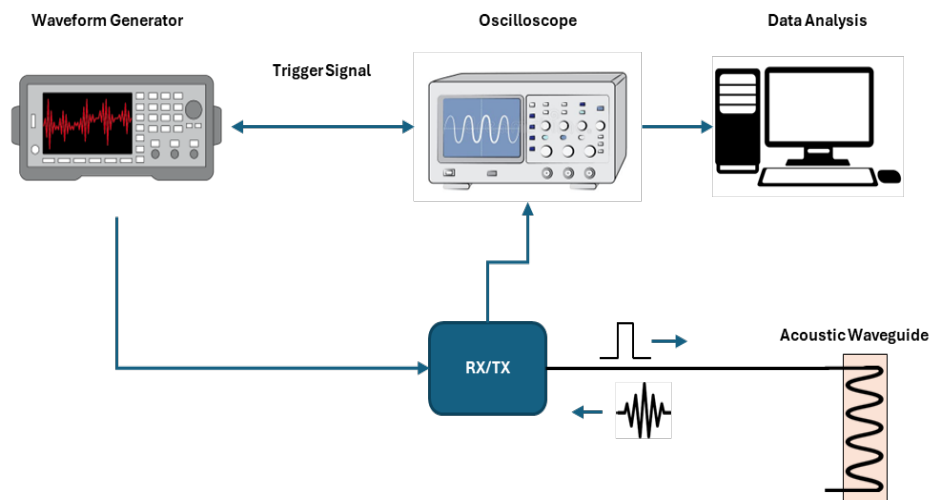
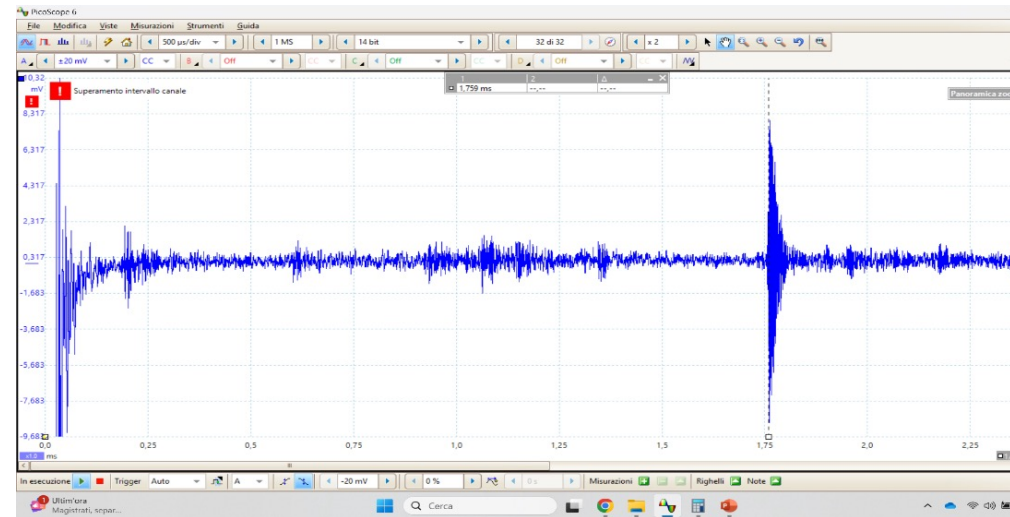
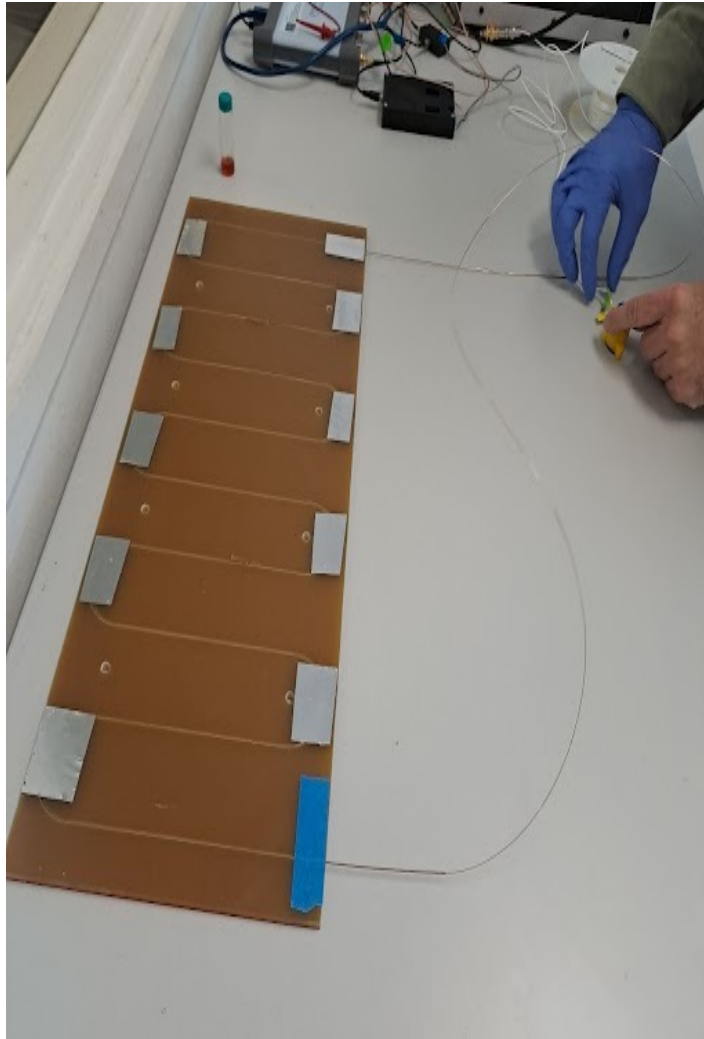
Research area(s)

- ❑ An advanced instrumentation lab for superconducting cables and magnets



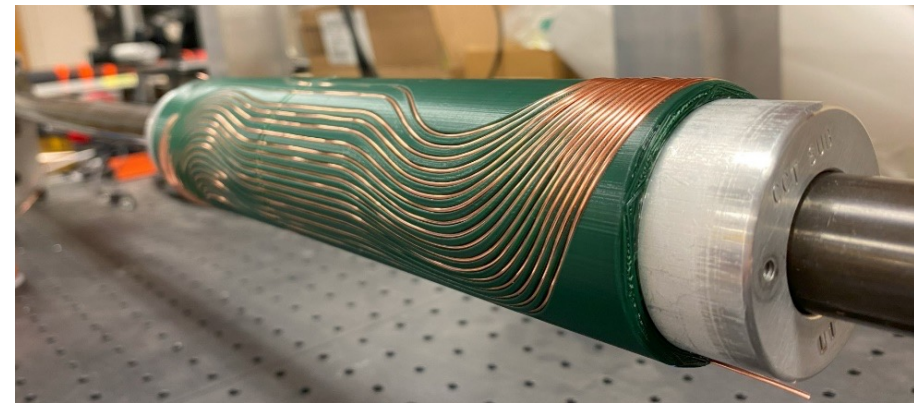
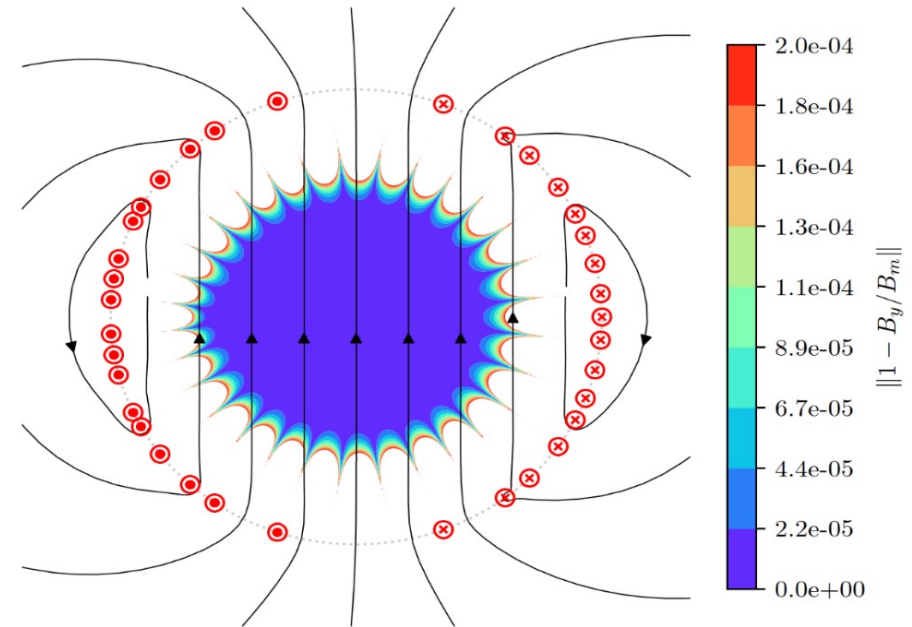
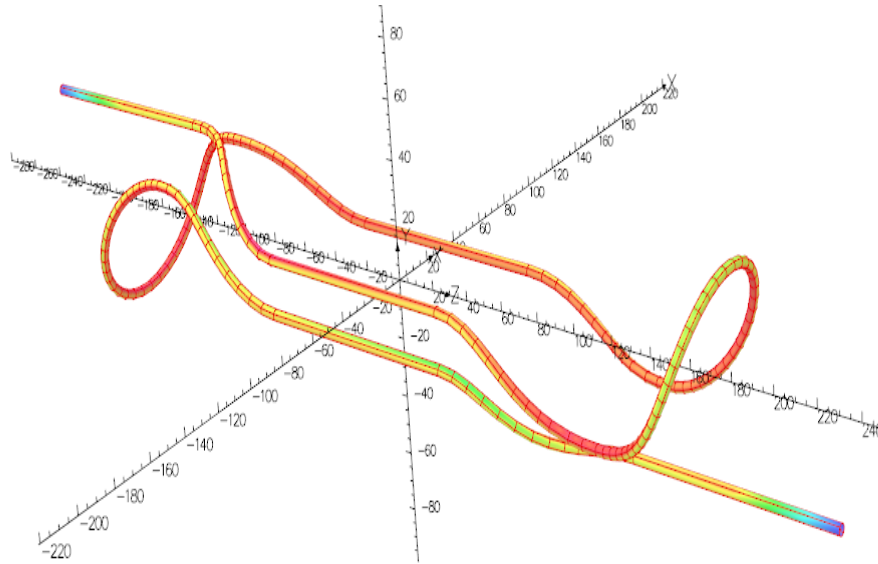
Research area(s)

❑ Development of an acoustic waveguide sensor for quench detection on HTS magnets

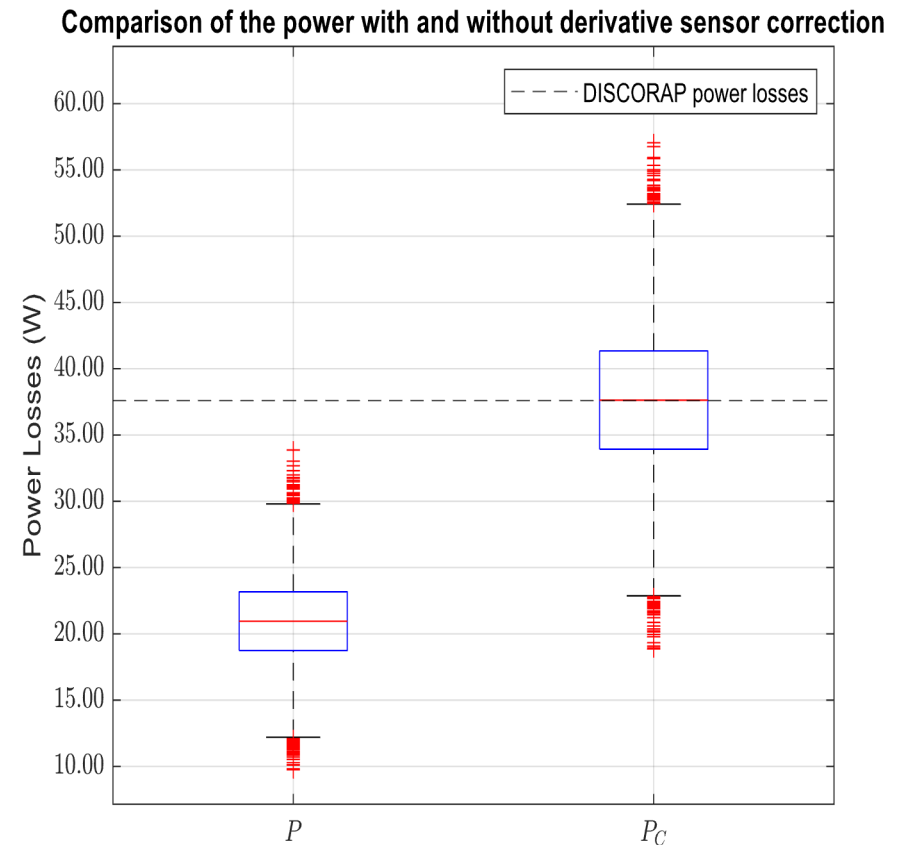
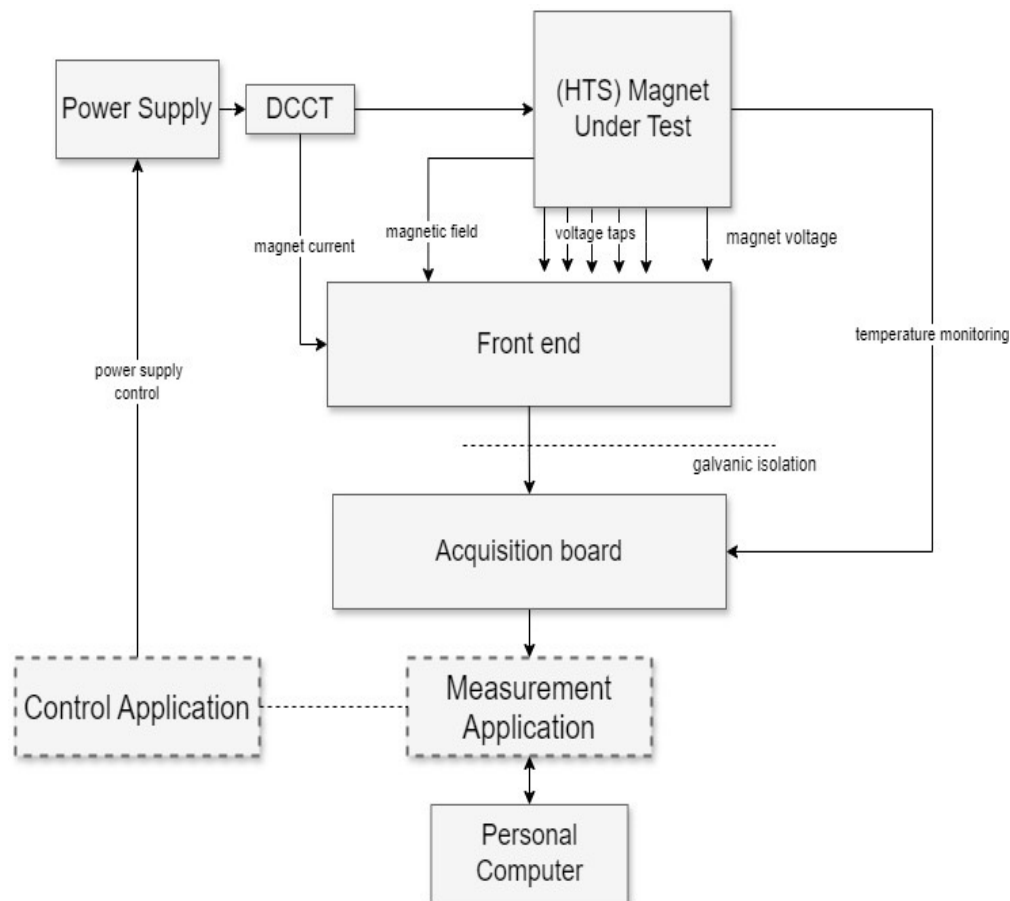


Research area(s)

- Design and development of a 3-turn HTS Conductor on Round core (CORC)-based Uni-Layer Magnet Prototype



❑ Design of an AC Losses measurement system for superconducting magnets.



Research results

❑ *Research and development results*

- Acoustic waveguide sensor developed and ready to be installed in the final magnet;
- Development of the mandrel geometry for the 3-turn CORC based Uni-Layer magnet prototype achieved;
- Experimental campaigns conducted on a copper mock-up magnet both at room and 77 K;
- Experimental campaign on the conductor to determine the critical current conducted and ready to install the conductor on the mandrel designed;
- Design of the AC Losses test bench and Monte Carlo simulations performed
- Scientific contribution on MDPI Instruments ready to be submitted on the design of the measurement system for AC Losses

❑ *Next year planned activities*

- Machine Learning on data acquired from particle accelerator magnets;
- Reproduction of the acoustic sensor in the new IRIS Laboratory
- Writing of scientific contributions (3 planned)
- Writing of the Ph.D. thesis

Research products

[P1]	Pasquale Arpaia, Davide Cuneo, Antonio Esposito, Antonio Gilardi, and Pedro M. Ramos, <i>An Overview on Quench Detection Techniques for High-Temperature Superconducting Cables and Magnets</i> , IEEE Instrumentation & Measurement Magazine , 2024
[P2]	Pasquale Arpaia, Davide Cuneo, Ernesto De Matteis, Antonio Esposito and Pedro Ramos, <i>Physical design and uncertainty analysis of a measuring system for AC power losses in superconducting magnets</i> , MDPI Instruments 2025
[P3]	Awarded with a prestigious scholarship for the next U.S. Particle Accelerator School in Knoxville, Tennessee for the period January 27 - February 7, 2025.



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