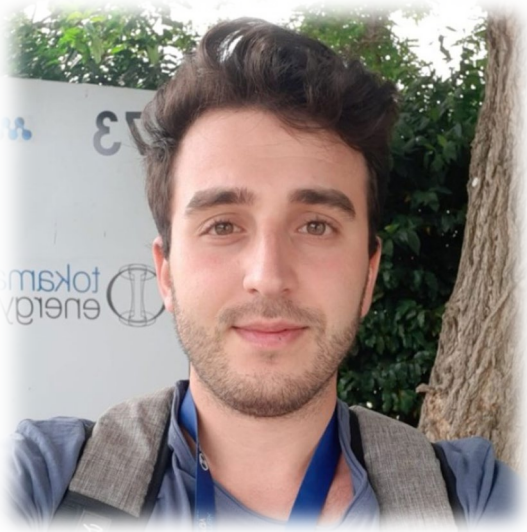
Davide Cuneo

PNRR **IRIS** (**I**nnovative **R**esearch **I**nfrastructure on applied **S**uperconductivity)

Tutor: Prof. Pasquale Arpaia

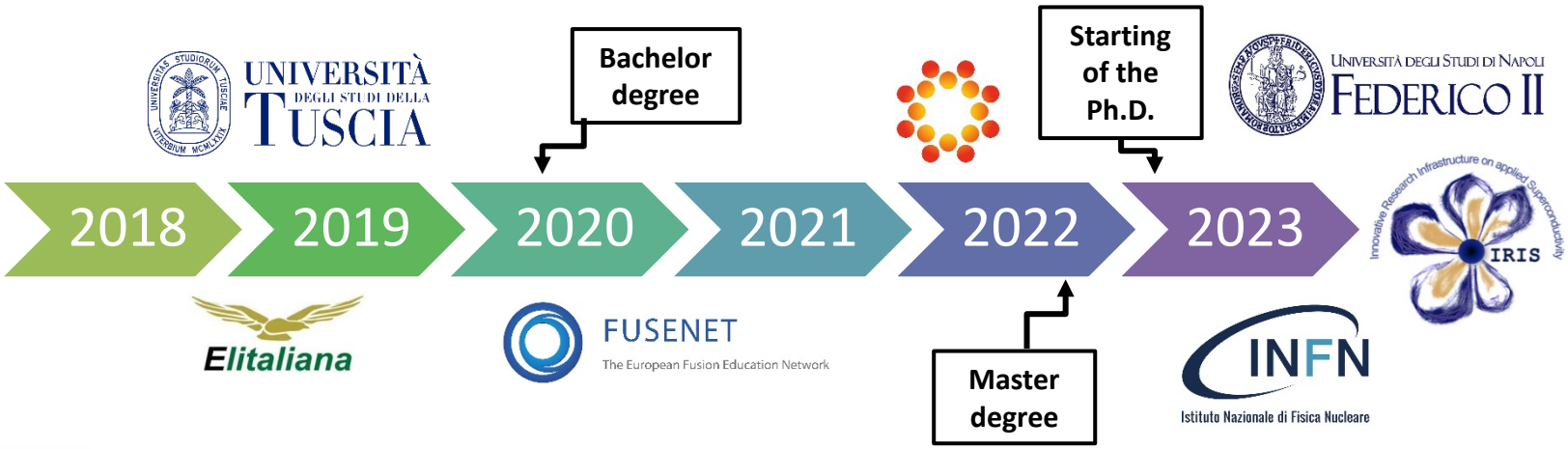
Cycle: XXXVIII Year: 2023

My background



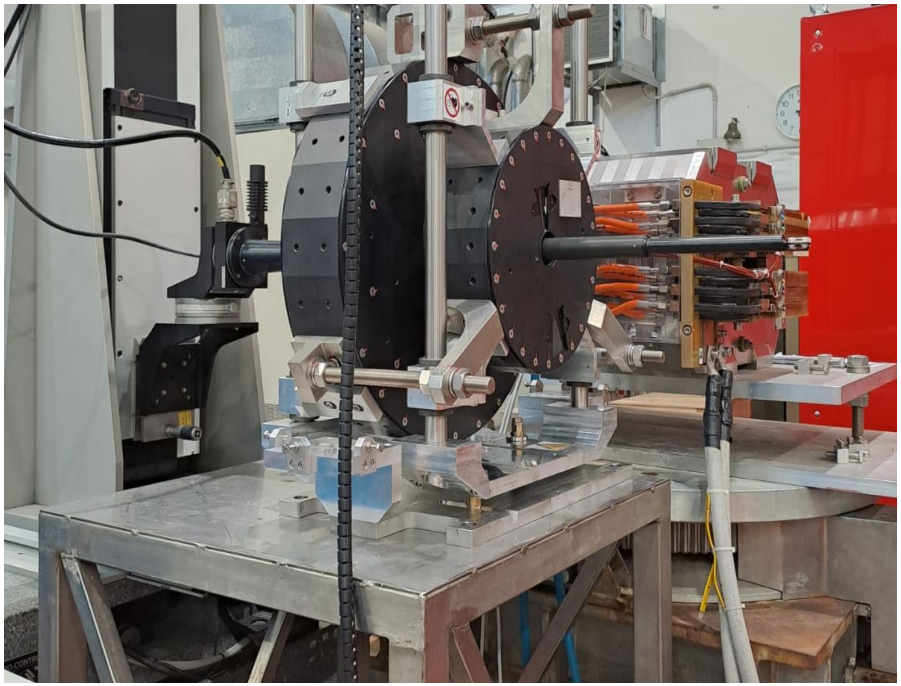
Davide Cuneo
16-09-1998, Grosseto (GR), Italy.
Email: davide.cuneo@unina.it
DIETI department, University of Naples Federico II, IMPALab.

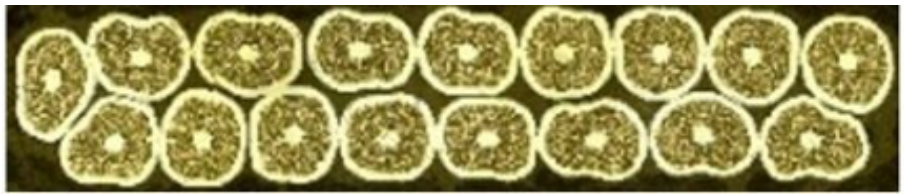
- **Ph.D. student** in «Information Technology and Electrical Engineering (ITEE)» at University of Naples Federico II (2023 - on going).
- Supervisor: **Prof. P. Arpaia, PNRR fellowship.**
- **MSc degree:** Mechanical Engineering at University of Tuscia (2022)

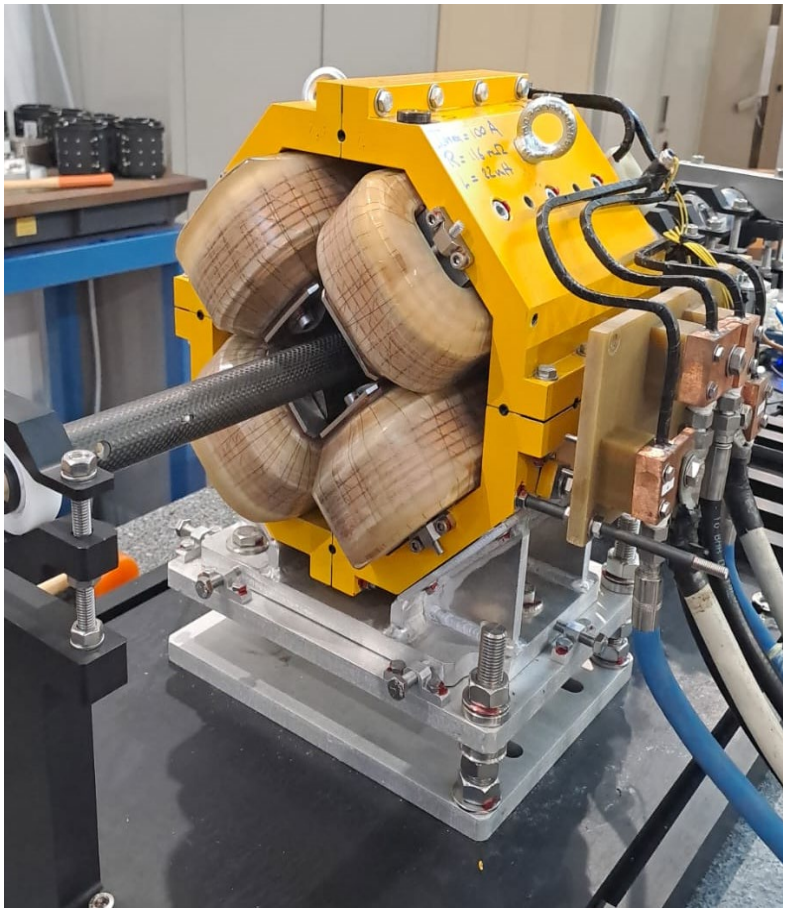


Research field of interest

- **Instrumentation and measurement for High-Temperature Superconductors (HTS) cables and magnets.**







Summary of study activities

- **Ad hoc PhD courses / schools**:
  - ✓ Statistical Data analysis for Science and Engineering Research;
  - ✓ Introduction to Computational Fluid Dynamics (SSM);
  - ✓ Ph.D. School Italo Gorini on: "Instrumentation and measurement for improving quality, reliability and safety; sustainable development goals for UN Agenda 2030";
  - ✓ Lectures for Superconducting Magnet Test stands, Magnet Protection and Diagnostics;
  - ✓ CERN Accelerator School (CAS): Course on "Normal- and Superconducting Magnets".
- **Courses borrowed from MSc curricula**:
  - ✓ Data Uncertainty;
  - ✓ Modelli numerici per i campi (on going).
- **Conferences / events attended**:
  - ✓ **Workshop**: 2nd Instrumentation and diagnostic for superconducting magnets (2nd IDSM), Paestum (NA).
  - ✓ **Seminar**: "Towards teleporting quantum images", SSM;
  - ✓ **Seminar**: "NIST on a chip: bringing precision metrology out of the lab and into the field", INRiM;
  - ✓ **Seminar**: "Multi-robot Control of Heterogeneous Herds", SSM;
  - ✓ **Seminar**: "Discrete De Giorgi Theory: Analysis and Applications", SSM;
  - ✓ **Seminar**: "Printable Thermoelectric Devices", INRiM;
  - ✓ **Seminar**: "Nuove frontiere dell'esplorazione lunare e delle comunicazioni quantistiche via satellite", INRiM;
  - ✓ **Seminar**: "Phenomenology of Planck scale Physics", SSM;
  - ✓ **Seminar**: "How to publish under the CARE-CRUI agreement", UniNa;
  - ✓ **Seminar**: "Grad-Shafranov equations", University of Tuscia.

Research activity: Overview

- ***Problem*: IRIS** (**I**nnovative **R**esearch **I**nfrastructure on applied **S**uperconductivity): a national project leaded by INFN-LASA with the aim of creating a national infrastructure of laboratories working on different aspects of superconductive magnets and cables for high energy physics**.**
- ***Objective***: Establishment of an Advanced Instrumentation Laboratory (AIL) for HTS cables and magnets measurement.
- ***Methodology***:
  - Purchasing, design, prototyping and testing of innovative monitoring diagnostic systems for both magnetic measurements and quench detection/protection.
  - The requirements of the instrumentations are dictated by the technical parameters of the two main experiments proposed:
    - Green Superconducting Line (GSL, WP8 - LASA)
    - Energy Savings HTS Magnets for sustainable Accelerators (ESMA, WP9 - LASA)

Next Year activities

- R&D for the new Advanced Instrumentation Laboratory;
- It is foreseen a period abroad for deepen my knowledge in HTS magnet measurements.
- Scientific publications regarding:
  - Quench detection techniques (to be submitted on I&M Magazine, Journal);
  - Results of magnetic measurements on Halbach-type permanent quadrupoles (IPAC24) in collaboration with INFN-LNF;
  - …