

TECH-FPA PhD Retreat 2025

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Summary

- Introduction to the Retreat
- Presentation of students and supervisor

The national Doctoral programs

- **National PhD programs** (or programs of national interests) **have been recently introduced** by the Italian Ministry of University and Research (2021)
- rather than being run by a single University, they are based on an **aggregation of expertise** that benefits from **critical mass and national coordination, sharing resources and infrastructure among Universities, Research Institutions and Industry.**
- the objective is the creation of **networks of young researchers**, selected according to high standards and **trained on homogeneous and interdisciplinary research topics**, fostering the **bridge between academic and industrial research**, reducing fragmentation, contributing to make our University and Research system, and therefore our country, more competitive internationally
- up to 2023, **27 national PhD programs had been approved**, involving more than 1000 researchers of 77 Universities and 28 Research Institutions

The other key players

- **the Italian National Institute for Nuclear Physics (INFN)**
 - founded in 1951 to promote, coordinate, and conduct research in nuclear and particle physics in Italy, with strong interactions with the Italian Universities
 - INFN's research focuses on understanding the fundamental particles of the universe and their interactions, contributing significantly to the field of high-energy physics.
- the **National Institute for Astrophysics (INAF)**
 - established in 1999, INAF coordinates and conducts research in various areas of space science, from planetary studies to cosmology.
 - The institute focuses on advancing knowledge about the universe, studying celestial phenomena, and developing cutting-edge astronomical instruments and technologies.

The agenda today

- The agenda today is dedicated **to the students of the 40th cycle**, who had already a first opportunity to meet online on October 29, 2024
- Given the **exceptional ensemble of speakers** who will take turns on stage today, we thought it appropriate to open up participation to researchers and technologists from local research institutes to whom we also extend a warm welcome
- There will be three set of talks today, addressing, for both fundamental physics and astrophysics:
 - **What questions do we want to answer** with our research?
 - **What experimental and observational approaches, instruments and technologies do we use** ?
 - **How are the research activity organised** and how do we operate within the institutions that support research in physics and astrophysics?
- Finally, tonight, we will have a dinner together with also the students of the 39th cycle in L' Aquila

14:00	Introducing the PhD Retreat and the participants <i>Room "E. Majorana", LNGS</i>
15:00	INAF's and INFN's scientific mission: key questions being addressed <i>Room "E. Majorana", LNGS</i>
16:00	INAF's and INFN's experimental activities: ingenuity and passion at work <i>Room "E. Majorana", LNGS</i>
	Coffee break
17:00	INAF's and INFN's experimental activities: ingenuity and passion at work <i>Room "E. Majorana", LNGS</i>
18:00	INFN and INAF: structure and operation <i>Room "E. Majorana", LNGS</i>

Tuesday - morning

- Tomorrow in the morning:
 - we will get to know **our host laboratory** and the scientific and technological activities that take place here
 - then we will take a first journey in the world of the **cutting-edge technological developments** that have been instrumental in extending the discovery potential of our research:
 - **superconductors** capable of operating in high magnetic fields
 - **adaptive optics**
 - We will return to matters related to the national doctoral programme with a **description of the curricula** on which it is organised and the related **course offerings** available to students.

09:00	Introduction to the Gran Sasso Laboratories <i>Room "E. Majorana", LNGS</i>
10:00	Cutting-edge technological developments in INFN and INAF <i>Room "E. Majorana", LNGS</i>
11:00	Coffee break The curricula and course offerings for the academic year 2024-2025 <i>Room "E. Majorana", LNGS</i>
12:00	Safety video instructions ahead of the Underground visit <i>Room "E. Majorana", LNGS</i>
13:00	Lunch break
14:00	

Tuesday - afternoon

- in the afternoon we will split in **four parallel sessions**, one per each curriculum to:
 - create a more effective opportunity **to foster the interactions**, the **exchange of experiences**, the **collaborations** among students and supervisors within the same curriculum
 - explore and discuss in more detail some **interesting examples of current technological developments**
- and finally we will meet again all together for the **poster session**
 - with refreshments of some tasty food and drink, there will be an opportunity to discover the activities in which the 39th grade students are engaged, ask them questions and discuss their achievements

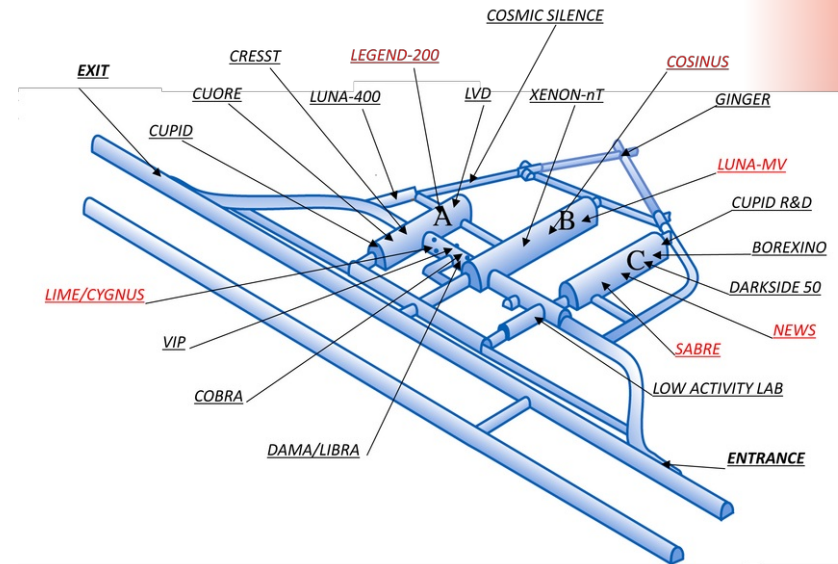
15:00	Mechanics <i>Marco Riva</i>	Detectors, lasers and optics <i>Salvatore My</i>	Computing <i>Stefano Giagu</i>	Electronics <i>Angelo Rivetti, Mauro Migliorati</i>
16:00	Room "B. Pontecorvo", LNGS 15:00 - 17:00	Room "E. Majorana", LNGS 15:00 - 17:00	Room "B. Rossi", LNGS 15:00 - 17:00	Room "G. Occhialini", LNGS 15:00 - 17:00
17:00	Coffee break 17:00 - 17:30			
18:00	Mechanics	Detectors, lasers and optics	Computing	Electronics
19:00	Room "B. Pontecorvo", LNGS 17:30 - 19:00	Room "E. Majorana", LNGS 17:30 - 19:00	Room "B. Rossi", LNGS 17:30 - 19:00	Room "G. Occhialini", LNGS 17:30 - 19:00
19:00	Poster session			

Wednesday - afternoon

- **a bit of a break**, halfway through the retreat, dedicated to exploring the area:
 - with an **initial virtual visit to one of the local companies** that are operating in a high-tech sector, i.e. Thales
- then with an in-person visit to the centre of the host city, **L' Aquila**
- and finally concluding with an exploration of what the territory has to offer from a gastronomic point of view, during the social dinner.

Thursday

- We will divide into two groups that will take turns in visiting the Gran Sasso Laboratories; this will include
 - a visit to the **underground experimental halls**
 - a visit to the **technological facilities inside LNGS**
- while one group will be engaged in the visits...
 - the other group will be involved in a course aimed at **improving soft skills**, in particular the ability to make **an effective impact in teamwork**



Friday morning

- The last half day will have three sessions:
 - the first will be devoted to examining some important aspects of the **interaction between society and the world of research**:
 - the need to give due consideration to aspects of **sustainability** and, in particular environmental impact, in the development of research technologies
 - the potential that research offers to create **innovation**, not only in the field of research, but also in the **industrial context**, in particular with the **creation of spin-offs**
 - the second dedicated to illustrate the next big scientific infrastructure that is now being designed: the **Einstein Telescope**
 - the third one will be dedicated to report the outcome of a questionnaire that students will be asked to fill and will trigger **an open discussion** aimed at extracting elements that will be useful for the organization of future events
 - finally we will draw the final conclusions that will include a look to what is coming next for our PhD program

09:00

Technology, society, industry

10:00

Room "E. Majorana", LNGS

11:00

Coffee break

12:00

Outlook and closout

13:00

Room "E. Majorana", LNGS

Lunch

Final comment

- We hope **you are going to enjoy** these week at the LNGS
- The spirit in which we would like to conduct this event is to encourage **maximum interaction between us all**
- so please do not hesitate to **come forward with your questions and comments** and also after each presentation and during the coffee-breaks and the other social events