

# ECR presentation & summary previous INFN ECR event

**2nd ECFA-INFN Early Career Researchers**

30 September 2024 to 1 October 2024

Laboratori Nazionali di Frascati (Rome), Italy

Nicolò Jacazio (Bologna University and INFN)

# European Committee for Future Accelerators

ECFA main goal is to **promote and support** the development of **high-energy particle accelerators in Europe**

- Established by CERN in 1963
- Members are elected by each country and CERN

Composition

- Chair + Secretary (Prof. Paris Sphicas, Prof. Patricia Conde Muino)
- General assembly (**Plenary ECFA**)
- Executive board (**Restricted EFCA**)

**Panels:** groups tasked with evaluating and providing recommendation on a specific aspect of the accelerator physics (e.g. Detector R&D, Training, ECR)

– see <https://ecfa.web.cern.ch/panels>

# Plenary ECFA (PECFA)

Plenary ECFA decides on all ECFA activities, appoints the Chair and Secretary, approves the final reports of the working groups and terminates their activities, decides on admission of new observers, and makes recommendations to outside organizations. Plenary ECFA appoints members for a total maximum period of six years after nomination by their country. [...] Plenary ECFA normally holds two meetings per year. Meetings are public unless otherwise decided.

— from <https://ecfa.web.cern.ch/plenary-ecfa>

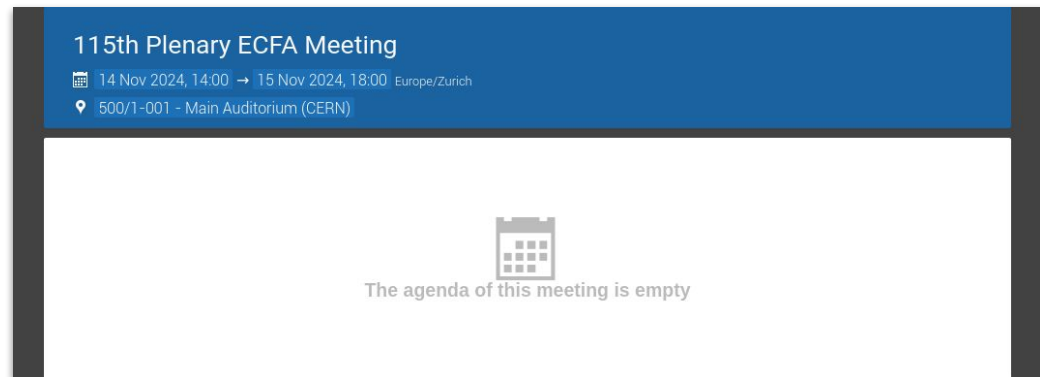
## Composition

(<https://ecfa.web.cern.ch/plenary-ecfa-composition>)

- Chair + secretary
- Representatives nominated per each country (and CERN), appointed by PECFA
- Observers

# Plenary ECFA sessions

Next open session 14-15 November 2024 at CERN: <https://indico.cern.ch/event/1361604/>



115th Plenary ECFA Meeting

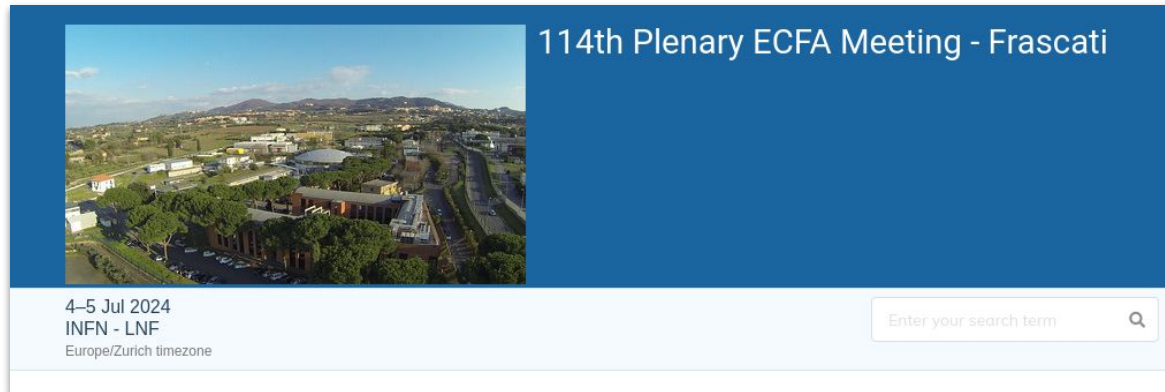
14 Nov 2024, 14:00 → 15 Nov 2024, 18:00 Europe/Zurich

500/1-001 - Main Auditorium (CERN)

The agenda of this meeting is empty

Previous edition in Frascati 4–5 Julu 2024

<https://indico.cern.ch/event/1361605/timetable/#20240704.detailed>



114th Plenary ECFA Meeting - Frascati

4-5 Jul 2024  
INFN - LNF  
Europe/Zurich timezone

Enter your search term

# Restricted ECFA (RECFA)

Restricted ECFA is composed of one member per country, appointed for at most two three-year periods. Restricted ECFA assists and advises the Chair and the Secretary in the current running of ECFA, and acts as the communication channel to each participating country, its physics community and national institutes and authorities.

— from <https://ecfa.web.cern.ch/restricted-ecfa>

Composition (<https://ecfa.web.cern.ch/restricted-ecfa-composition>)

- Chair + secretary
- 1 representative per country, appointed by PECFA
- Observers

# Italian members

## PECFA members

Italy

Dr Roberta Arnaldi

Appointed Jan. 2024

Dr Paolo Azzurri

Appointed Jan. 2024

Dr Diego Bettoni

Appointed Jan. 2021

Dr Marco Ciuchini

Appointed Jan. 2024

Dr Pierluigi Campana

Appointed Jan. 2021

Prof. Marina Cobal

Appointed Jan. 2021

Dr Gabriella Gaudio

Appointed Jan. 2024

Dr Sandra Malvezzi

Appointed Jan. 2024

RECFA member



# ECFA ECR - Early Career Research Panel

The objective of the ECFA Early-Career Researchers (ECR) Panel is for its members to discuss all aspects that contribute in a broad sense to the future of the research field of particle physics.

— from <https://ecfa.web.cern.ch/ecfa-early-career-researcher-panel>

- Members are **PhD students and postdocs**, either with a non-permanent contract or with **up to 8 years** after obtaining the PhD
- Up to **three members per country** and each major laboratory represented in ECFA, for 2 + 2 years
- Activities organized in smaller groups (working groups)
- Mandate available <https://ecfa.web.cern.ch/mandate-ecfa-early-career-researcher-panel>
- Full overview <https://arxiv.org/abs/2212.11238>

# ECR ECFA delegates

Observers	PECFA observers
President of Council Chair of the SPC Chair of the FC Chair of NuPPEC Chair of EPS-HEPP Chair of ApPEC	Prof. Eliezer Rabinovici Dr Hugh Montgomery Dr Laurent Salzarulo Prof. Marek Lewitowicz Prof. Fabio Maltoni Dr Andreas Haungs
U.S.A. EPS ESF	Prof. Kim Young-Kee Prof. Luc Bergé Dr Hans U. Karow
Early Career Researchers	Andrea Garcia Alonso Lydia Brenner Patrick Dougan Armin Ilg Holly Pacey

Observers	RECFA observers
EPS-HEPP Board Chair	Prof. Fabio Maltoni
ApPEC Chair	Dr Andreas Haungs
NuPECC Chair	Prof. Marek Lewitowicz
Early Career Researchers (ECR)	Lydia Brenner



# ECR ECFA italian members

<b>ITALY</b>	Cecilia Marco Elisabetta	BORCA GIACALONE SPADARO NORELLA	PhD student Postdoc Postdoc	CMS ALICE LHCb	01.2023 - 12.2024 01.2024 - 12.2025 01.2023 - 12.2024
<b>ITALY/INFN-LNGS</b>	Miriam	OLMI	Junior Staff	Neutrino / Computing	01.2024 - 12.2025
<b>ITALY/INFN-LNF</b>	Matteo	GIOVANNETTI	Postdoc	LHCb	01.2024 - 12.2025

# Previous ECFA-INFN ECR event



## First ECFA-INFN Early Career Researchers Meeting

3 July 2024  
Europe/Rome timezone

Enter your search term

<https://agenda.infn.it/event/42205/>

### ECFA

European Committee for Future Accelerators

A one-day event, by and for young researchers, organized by the Italian representatives of the [ECFA Early Career Researcher \(ECR\) panel](#), aimed at bringing together for the first time the ECR Italian community on the occasion of the [ECFA Plenary](#) at LNF. The aim is to start a discussion about the future of our discipline, in the context of future accelerators and beyond, focusing on career paths and physics perspectives.

Part of the event will be dedicated to building an Italian ECR network with the goal of informing, sparking discussion, and promoting constructive intergenerational dialogue ahead of the European Strategy. The organisation of a follow-up community event, planned for October, will also be discussed.

Due to logistical considerations, only a few representatives per section have been invited, but the event is open to anyone who wishes to participate. Please register if you plan to attend online or in person.

In the afternoon session, participants who wish to do so will be invited to present the activities of their laboratories in 2-3 slides that might be of interest for this meeting. The aim is to foster networking and awareness regarding the work of various groups, ideally having one representative per section. The idea is to have a series of flash presentations rather than a long list of contributions that would take up the entire day. Slides should be uploaded to the [shared cernbox](#) before Wednesday morning.

- Overview
- Timetable
- Contribution List
- Registration
- Participant List
- Internet access
- Privacy Policy
- Safety Rules
- Venue

#### Support

- ✉ [matteo.giovanetti@inf.infn.it](mailto:matteo.giovanetti@inf.infn.it)
- ✉ [debora.bifaretti@inf.infn.it](mailto:debora.bifaretti@inf.infn.it)
- ✉ [sara.arnone@inf.infn.it](mailto:sara.arnone@inf.infn.it)
- ✉ [cecilia.borca@cern.ch](mailto:cecilia.borca@cern.ch)

# Agenda of last event

## Timetable

Wed 03/07

Print PDF Full screen Detailed view Filter Session legend

Contributions from INFN sections Guided tour to SPARC Open discussion Plenary talks

10:00	<b>Introduction from the Italian ECR Panel members</b> <i>Cecilia Borca et al.</i>	10:00 - 10:08
	<i>Auditorium B. Touschek</i>	
	<b>Summary of ECFA-wide event, and of the previous activity of the ECFA ECR Panel</b> <i>Emanuele Angelo Bagnaschi</i>	10:08 - 10:15
	<i>Auditorium B. Touschek</i>	
	<b>ECR involvement in the INFN strategy effort</b> <i>Aleandro Nisati</i>	10:15 - 10:20
	<i>Auditorium B. Touschek</i>	
	<b>The FCC project</b> <i>Andrea Ciarna</i>	10:20 - 10:55
	<i>Auditorium B. Touschek</i>	
11:00	<b>The EuPRAXIA project</b> <i>Livio Verra</i>	10:55 - 11:30
	<i>Auditorium B. Touschek</i>	
	<b>Group Picture</b> <i>Auditorium B. Touschek</i>	11:30 - 11:40
	<b>Coffee break</b> <i>Auditorium B. Touschek</i>	11:40 - 11:50
12:00	<b>The EIC project</b> <i>Annalisa D'Angelo</i>	11:50 - 12:25
	<i>Auditorium B. Touschek</i>	
	<b>The physics landscape of future colliders</b> <i>Roberto Franceschini</i>	12:25 - 13:15
13:00	<i>Auditorium B. Touschek</i>	

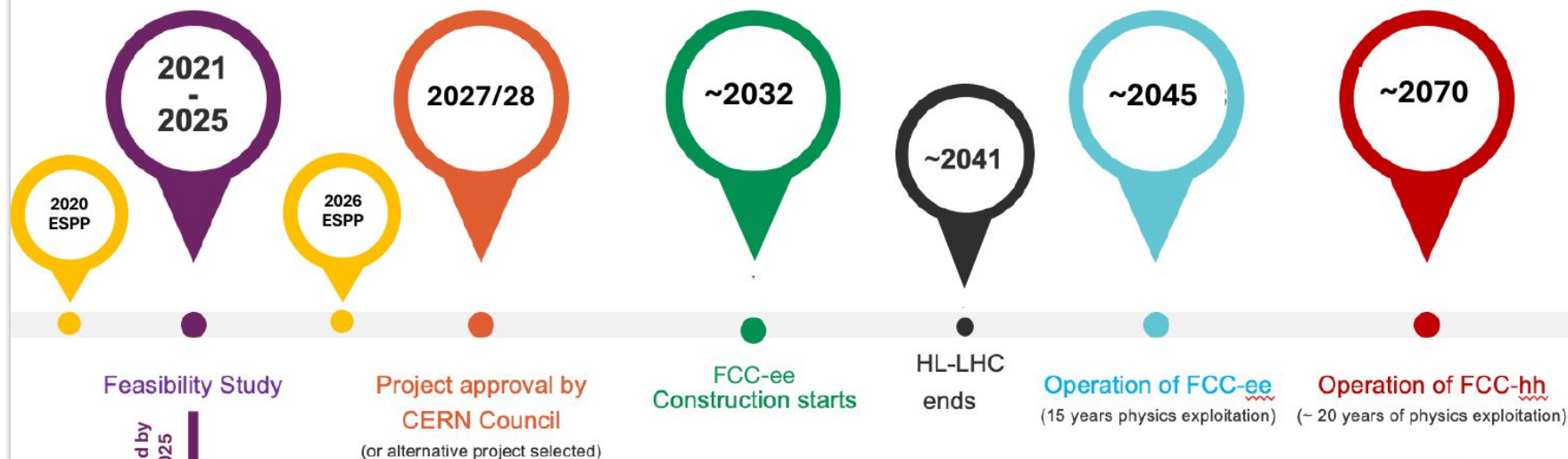
Condensed in a 1 day event

	<b>Guided tour to SPARC</b> <i>Livio Verra</i>	14:30 - 15:00
	<i>Auditorium B. Touschek</i>	
15:00	<b>The MuCol project</b> <i>Davide Zullani</i>	15:00 - 15:35
	<i>Auditorium B. Touschek</i>	
	<b>Contributions from INFN sections</b>	
16:00	<i>Auditorium B. Touschek</i>	15:35 - 16:35
	<b>Coffee break</b> <i>Auditorium B. Touschek</i>	16:35 - 17:00
17:00	<b>Open discussion</b>	17:00 - 18:00
	<i>Auditorium B. Touschek</i>	

# Highlights

## The FCC Integrated Program - Timeline

M. Benedikt – FCCWeek24



Completed by  
March 2025



- **geological, technical, environmental and administrative** (with Host States) feasibility of the tunnel
- surface areas and optimisation of **tunnel placement**
- **cost estimate** and **funding models** for technical design completion, implementation and operation
- identification of **external resources** for first stage (tunnel + FCC-ee)
- **collider design optimisation**, injector chains, R&D to develop needed key technologies
- consolidation of the **physics case** and **detector concepts** for both colliders

[Slides](#)

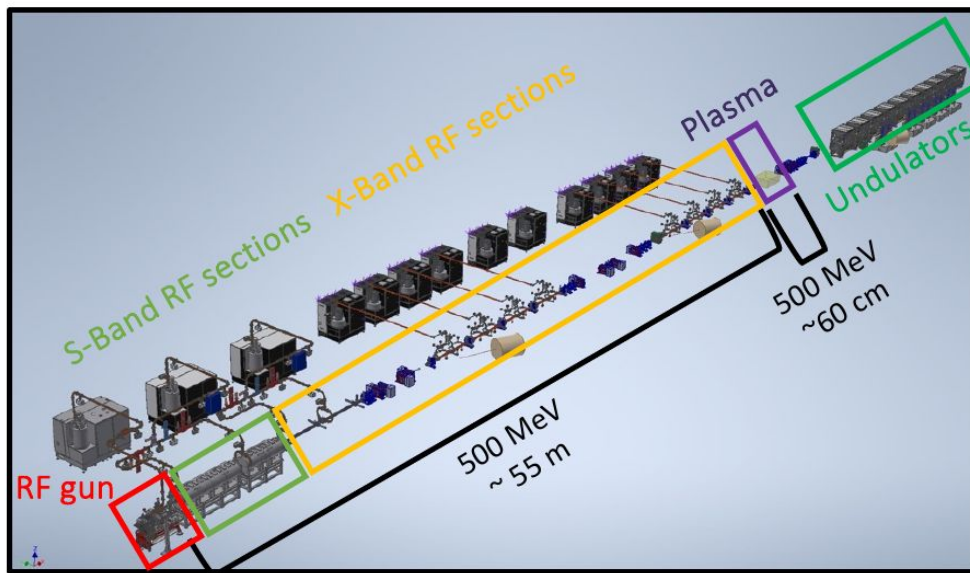
# Highlights

- Soft X-ray (2-4 nm) FEL based on Plasma Wakefield Acceleration (PWFA) at Frascati
- 500 MeV, 30 pC electron bunch boosted to 1 GeV in 60-cm-long plasma

### Key ingredients:

→ Free-electrons lasers

→ PWFA



## The Path to the EIC project



2010 “Gluons and the quark sea at high energies: distributions, polarization, tomography”,  
INT - Seattle, Sept 13 - Nov 19 2010, [arXiv:1108.1713](https://arxiv.org/abs/1108.1713)

2012 - White Paper

Electron Ion Collider: the Next QCD Frontier”, E.P.J. A52 (16) 268,  
[arXiv:1212.1701](https://arxiv.org/abs/1212.1701) - 1200 citations on Inspire

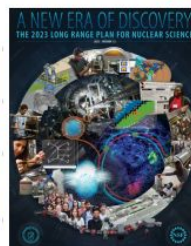
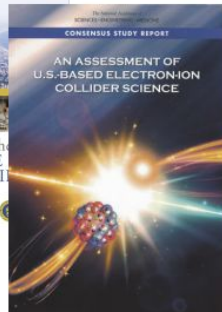
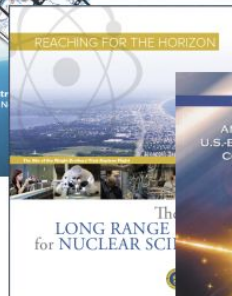
2015 Long Range Plan recommendations

2018 Assessment by the US National Academy of Science  
“The Committee finds that the science that can be  
addressed by an EIC is **compelling, fundamental and  
timely**”

2022 Yellow Report [Nucl. Phys. A 1026 \(2022\) 122447](https://arxiv.org/abs/2103.05419)

2023 NSAC - Long Range Plan

We recommend the  
expeditious completion of the  
EIC as the **highest priority** for  
facility construction



# Highlights

## Open Questions on the “big picture” on fundamental physics circa 2020

- what is the dark matter in the Universe?
- why QCD does not violate CP?
- how have baryons originated in the early Universe?
- what originates flavor mixing and fermions masses?
- what gives mass to neutrinos?
- why gravity and weak interactions are so different?
- what fixes the cosmological constant?

*EFT*

*EFT*

EACH of these issues one day will teach us a lesson

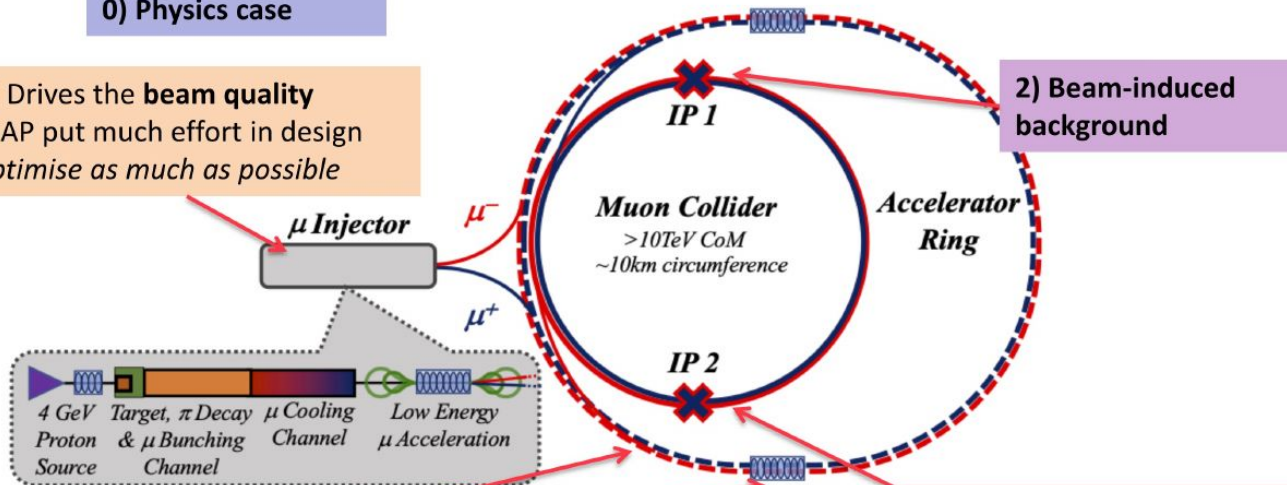
Slides

## The Muon Collider machine

### The “Dream Machine”

0) Physics case

4) Drives the **beam quality**  
MAP put much effort in design  
*optimise as much as possible*



2) Beam-induced background

1) Dense neutrino flux  
mitigated by mover system  
and site selection

3) **Cost** and **power** consumption limit energy reach  
e.g. 35 km accelerator for 10 TeV, 10 km collider ring  
Also impacts **beam quality**



# Highlights

## Session



### Contributions from INFN sections

🕒 3 Jul 2024, 15:35

📍 Auditorium B. Touschek

## Description

In the afternoon session, participants who wish to do so will be invited to present the activities of their laboratories in 2-3 slides that might be of interest for this meeting. The aim is to foster networking and awareness regarding the work of various groups, ideally having one representative per section. The idea is to have a series of flash presentations rather than a long list of contributions that would take up the entire day. Slides should be uploaded to the shared cernbox before Wednesday morning.

## 📎 Presentation materials

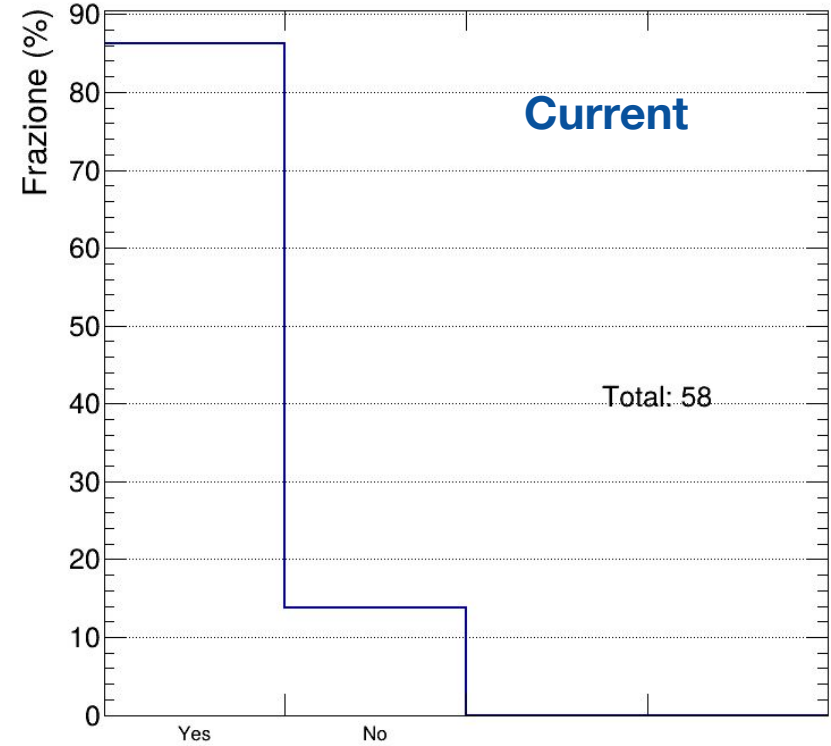
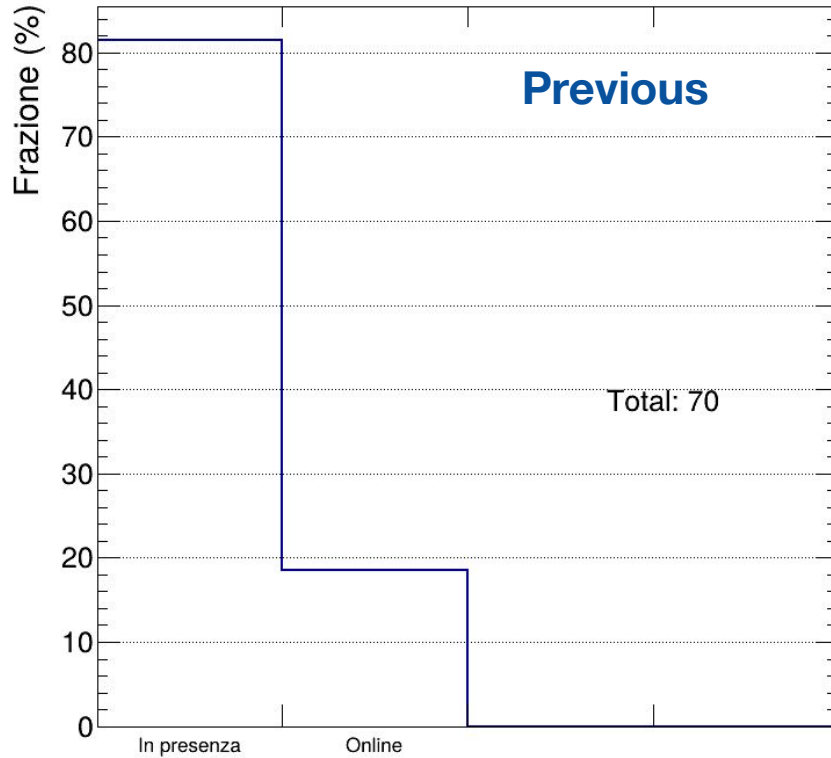


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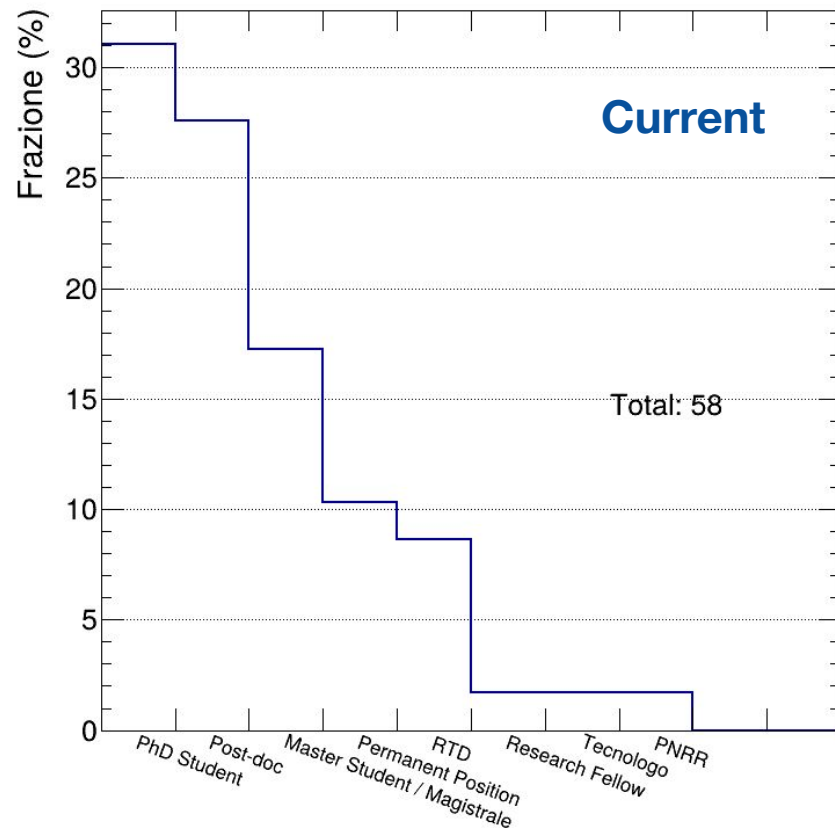
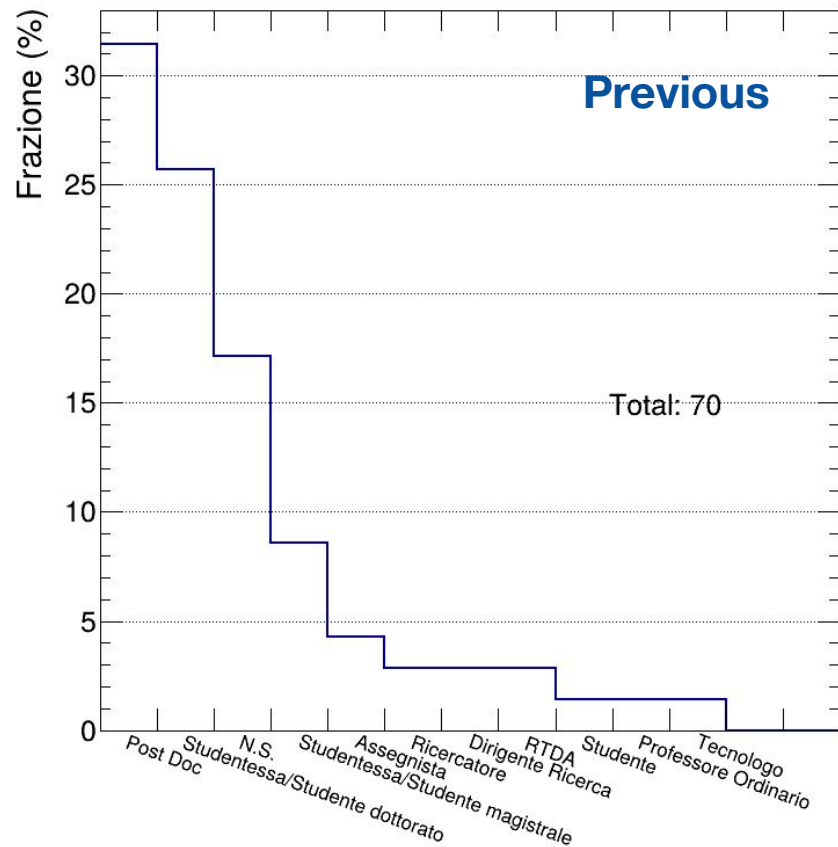
## Slides

🕒 Timetable

# Attendance statistics

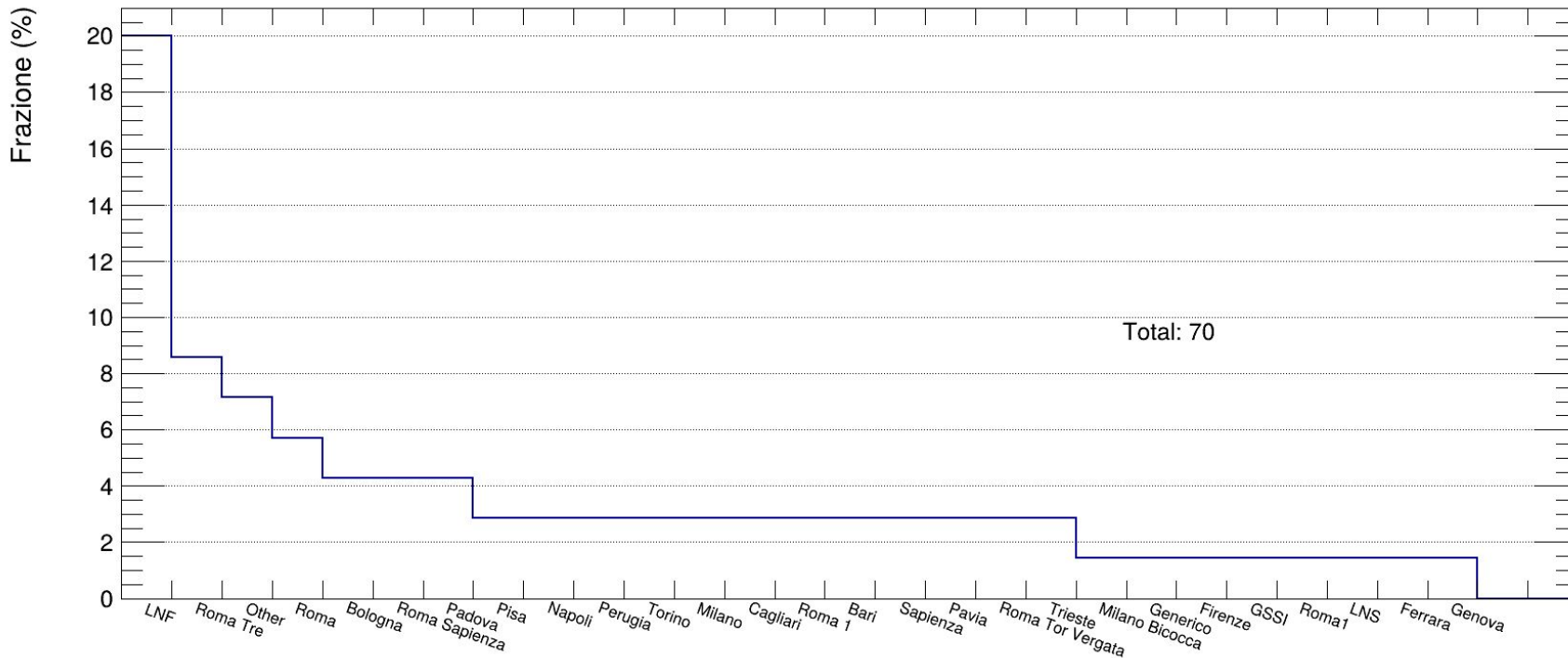


# Position statistics

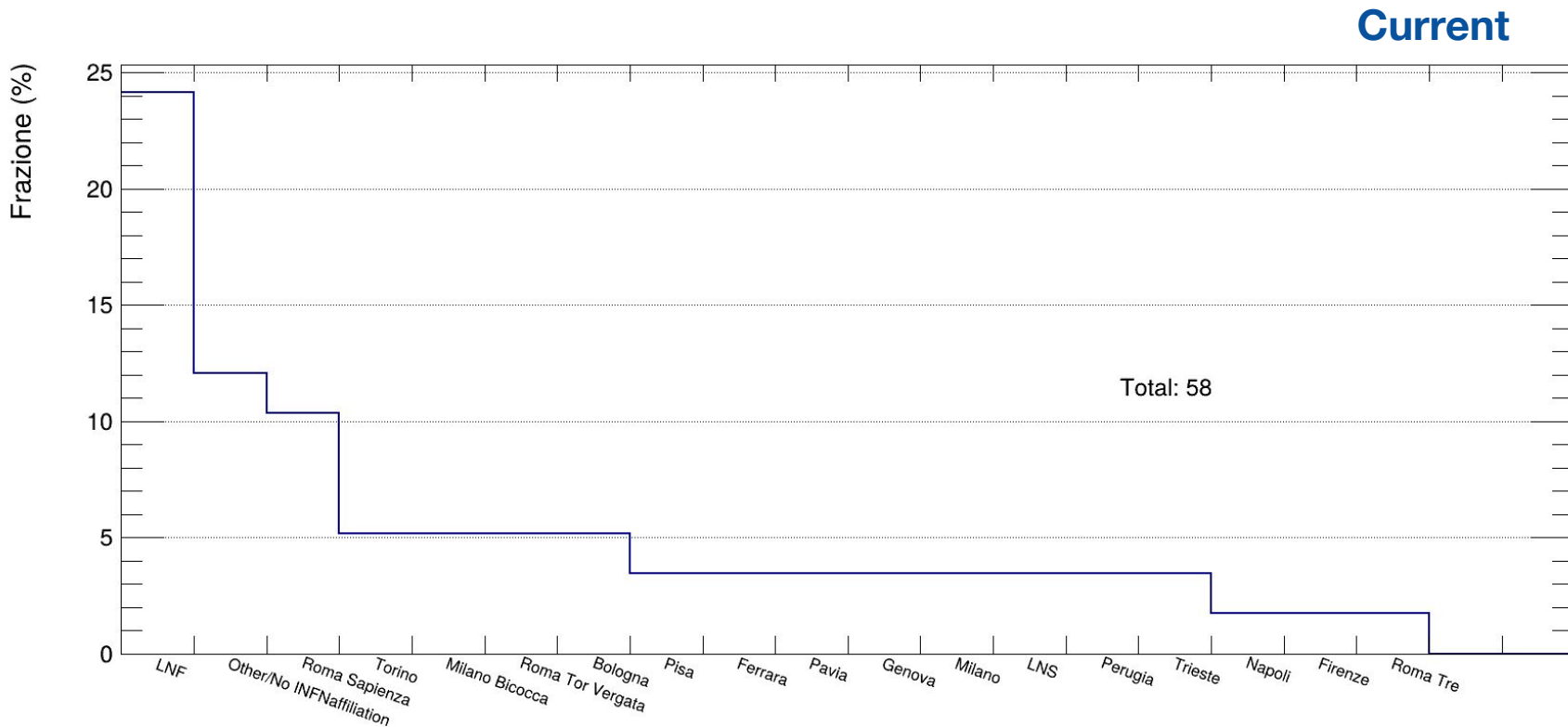


# Attendance per section

Previous



# Attendance per section



**Thanks for participating!**