Istituto Nazionale di Fisica Nucleare

INSPYRE
INternational School on modern PhYsics and REsearch

Bringing research, education and outreach into dialogue: the INFN-INSPYRE school case study

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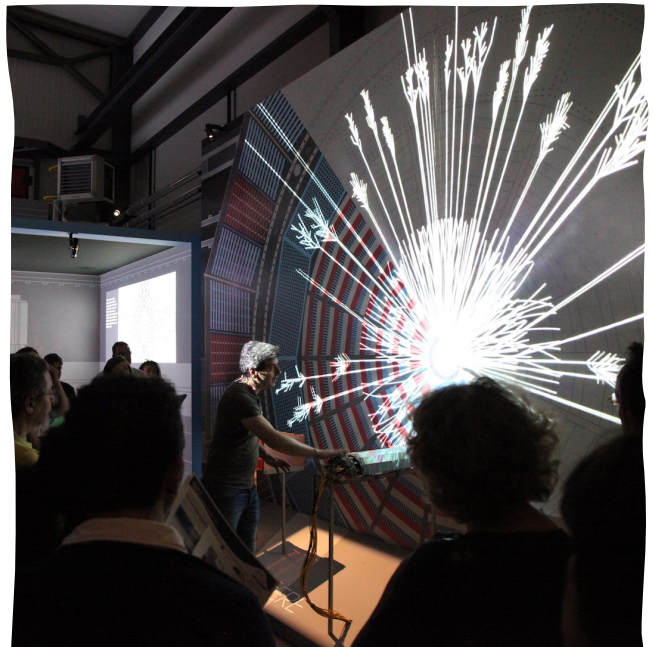
Finanziato dall'Unione europea NextGenerationEU

Ministero dell'Università e della Ricerca

Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA

ROME TECHNOPOLE INNOVATION ECOSYSTEM



INSPYRE

INternational School on modern PhYsics and REsearch

- One-week school organized by INFN and held at INFN Frascati National Laboratory
- Addressed to 30/40 students from all over the world attending the last two years of high school
- Our aim is to bring participants closer to STEM careers by introducing them to INFN and other research institutions and universities

- We present modern physics mainly through experimental and practical activities, but also through lectures and guided tours
- Participants are immersed in the research environments and become protagonists of their own learning while getting to know research facilities and professionals

From 2011, we reached more than 600 students from 18 different countries

INSPYRE 2024: research, education and outreach communities

1. broaden the range of topics covered
2. present the topics in an even more effective and engaging way
3. Introduce tools that would allow us to assess student learning

> Scientific committee

The Scientific Committee

Scientific Committee
Susanna Bertelli (INFN – LNF)
Fabio Bossi (INFN – LNF Director)
Catalina Curceanu (INFN – LNF)
Alessandra Filippi (INFN – Torino)
Tommaso Marchi (INFN – LNL)
Marisa Michelini (GIREP member)
Adriana Postiglione (INFN – LNF)
Sascha Schmeling (CERN Section Leader for Teacher and Student Programmes)

INFN community

International Research Group on Physics Teaching

CERN outreach community

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INFN

INSPYRE

INTERNATIONAL SCHOOL ON MODERN PHYSICS AND RESEARCH

From quantum foundations to artificial intelligence

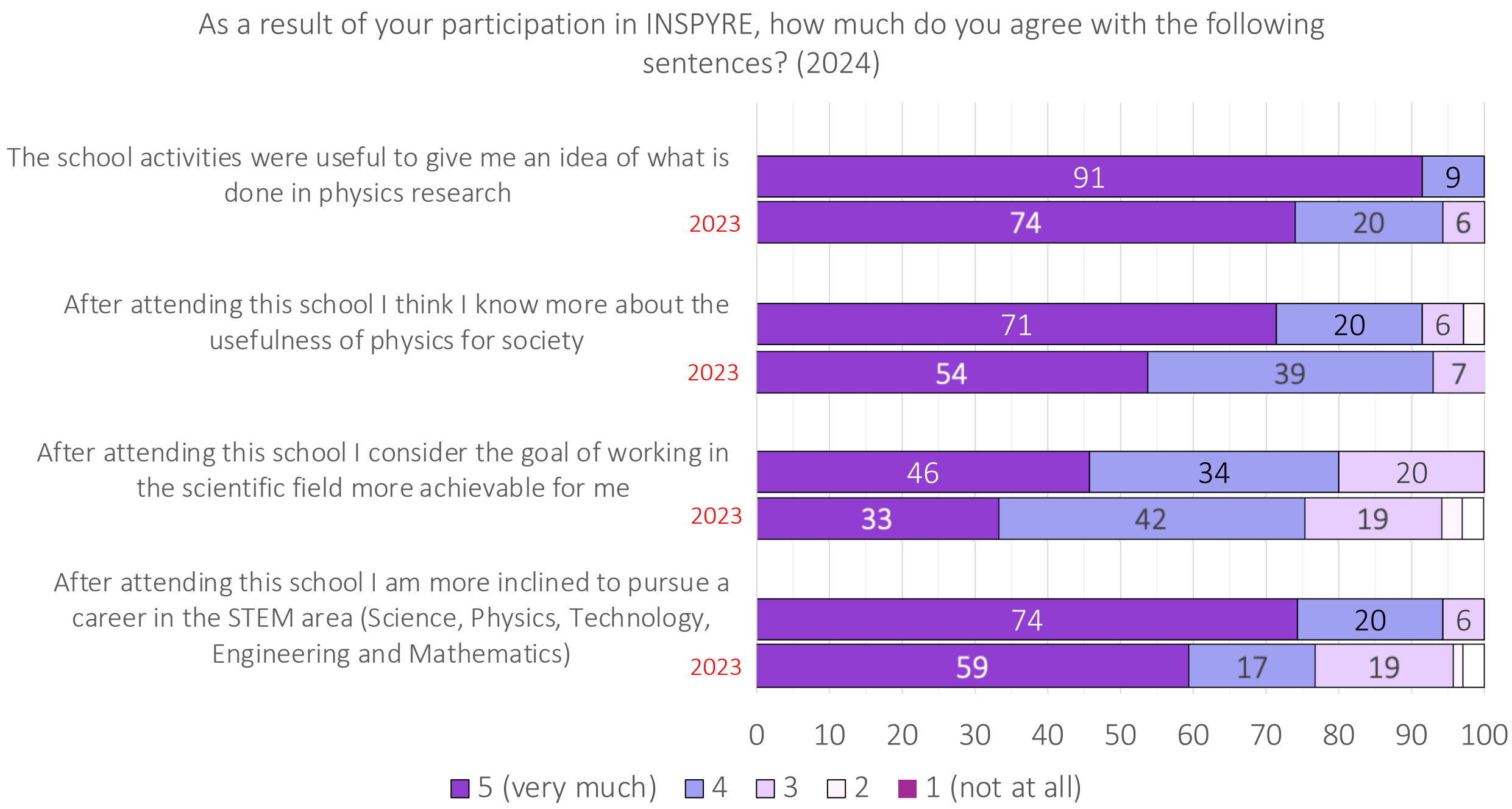
APRIL 8-12, 2024

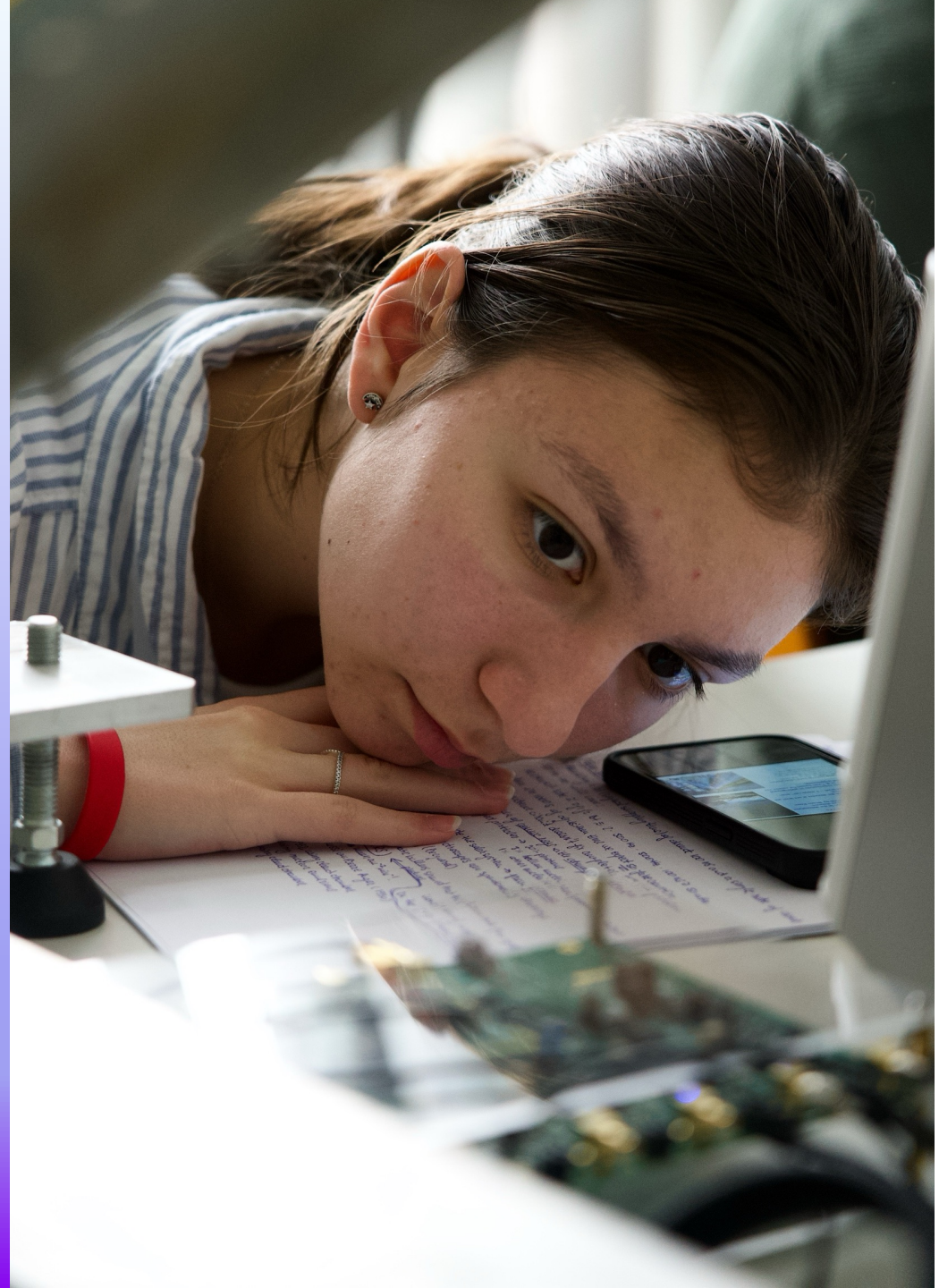
INFN - LABORATORI NAZIONALI DI FRASCATI

1. Approach a topic from multiple perspectives, giving participants the opportunity to interact and share ideas and questions
   > accompany the lectures with debates and experiments
2. In the case of quantum mechanics, propose a real educational path
   > QM and Quantum computing
3. Collect students' opinions through evaluative questionnaires
4. Evaluate their learning

Programme

- **7 lectures** (Accelerators, Particle detectors, Standard Model, Gravity, Artificial Intelligence, Quantum mechanics foundations, Quantum Computing)
- **5 debates** (QM e Quantum Computing, Nuclear physics application, Messengers from space (GW and neutrinos), Artificial Intelligence, What is yet to be discovered in physics)
- **11 experiments** (Particle detectors, Simulation techniques for medical applications, Environmental monitoring, Superconductivity, Diagnostics and preservation of Cultural Heritage, Plasma sources for particle accelerator, Cosmic rays, Gamma spectrometry, Atoms, X-rays and Synchrotron Radiation, Quantum mechanics)
- **Special events** (Art&Science Event, Young People of LNF)


As a result of your participation in INSPYRE, how much do you agree with the following sentences? (2024)
The school activities were useful to give me an idea of what is done in physics research
2023
91
9
74
20
6
After attending this school I think I know more about the usefulness of physics for society
2023
71
20
6
54
39
7
After attending this school I consider the goal of working in the scientific field more achievable for me
2023
46
34
20
33
42
19
After attending this school I am more inclined to pursue a career in the STEM area (Science, Physics, Technology, Engineering and Mathematics)
2023
74
20
6
59
17
19
0
10
20
30
40
50
60
70
80
90
100
5 (very much)
4
3
2
1 (not at all)



What are you going to take with you?

Good memories, new knowledge and new friends

the people I met, the things I learned and the curiosity that has grown all along the week

The hope in physics research

My understanding of who physists are

The inspiration of science

a strong motivation to become a physicist

A lot of material to study, a lot of encouragement to go futher in the topics I enjoyed the most and a lot of ambitions

That I should not ever give up and always pursue my goals and dreams even I am not the best one

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