



The Italian Summer Students Program at Fermilab

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In partnership with:



UNIVERSITÀ DI PISA



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Outline

FERMI NATIONAL ACCELERATOR LABORATORY

- Italy @Fermilab (since early 80's)

THE ITALIAN SUMMER STUDENTS PROGRAM AT FERMILAB

- Students' Recruitment
- Training Programs
- Costs, Sponsorships, Students' Benefits
- Statistics (1983–2023)
 - 2020 and 2021 Programs (sadly) cancelled
 - **2022 Back To Work (21 Summer Students at Fermilab)**
 - **2023 Progressing at full steam (27 Summer Students at Fermilab)**
- Internships at US Space Science Labs

CONCLUSIONS

Fermilab S&T Directorates and Centers

PARTICLE PHYSICS & NEUTRINO

- Design Lab's particle physics & neutrino experiments

ACCELERATOR

- Develop new accelerator techniques
- Provide beams for Lab's experiments

EMERGING TECHNOLOGIES

- Push boundaries in Quantum, AI, microelectronics

APPLIED PHYSICS AND SUPERCONDUCTING TECHNOLOGY

- Develop technologies for particle experiments

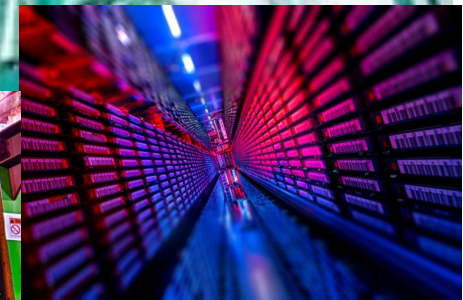
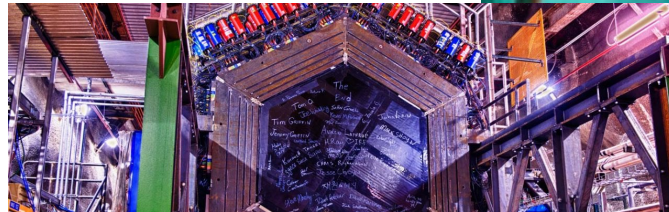
COMPUTATIONAL SCIENCE / AI

- Provide infrastructures for data handling/analysis

Superconducting Quantum Materials and Systems (SQMS)

- A DOE National Quantum Information Science Research Center

**~1800 EMPLOYEES +
THOUSANDS OF VISITORS**



Italy @Fermilab, some history

COLLIDER DETECTOR AT FERMILAB (CDF), SINCE EARLY 80's

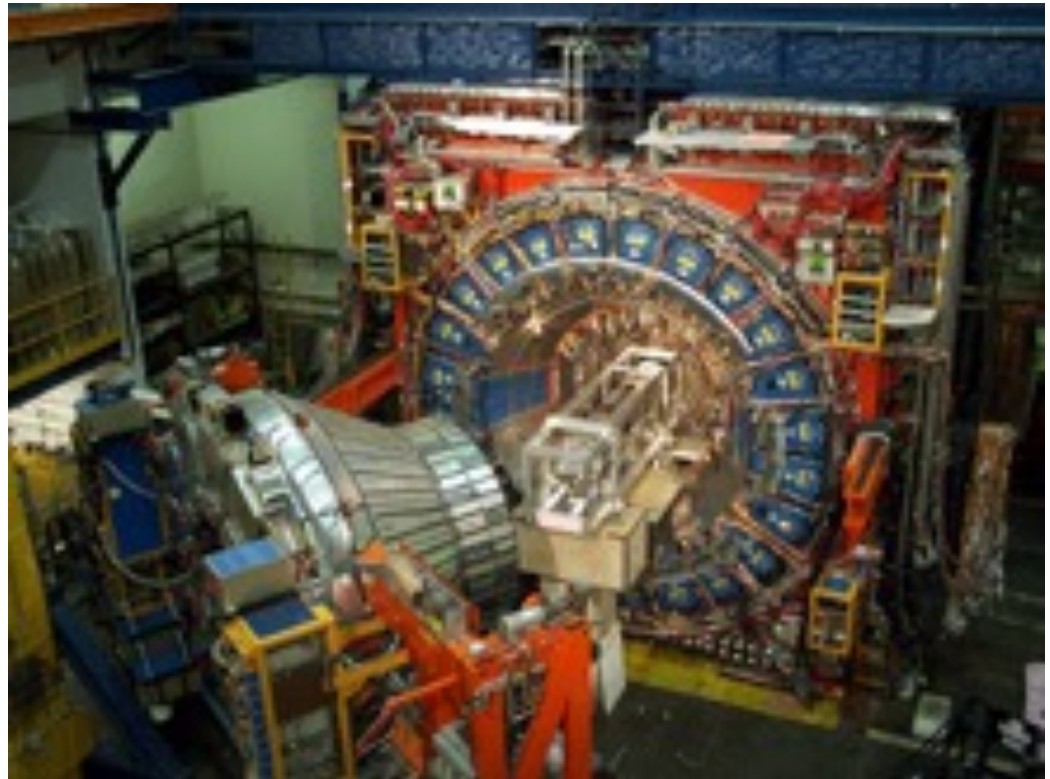
- ~100/600 Italian scientists in the years 2000-2010

BOLOGNA, FRASCATI, PADOVA, PAVIA, PISA, ROMA, SIENA, TRENTO, TRIESTE, UDINE (INFN DEPARTMENTS and UNIVERSITIES)

- 5 Co-Spokesperson from Pisa

~100 MASTER + 35 PhD THESES

**The 2019 HEP prize of the EPS
was awarded to the CDF and D0
Collaborations for the discovery
of the top quark (1995)**

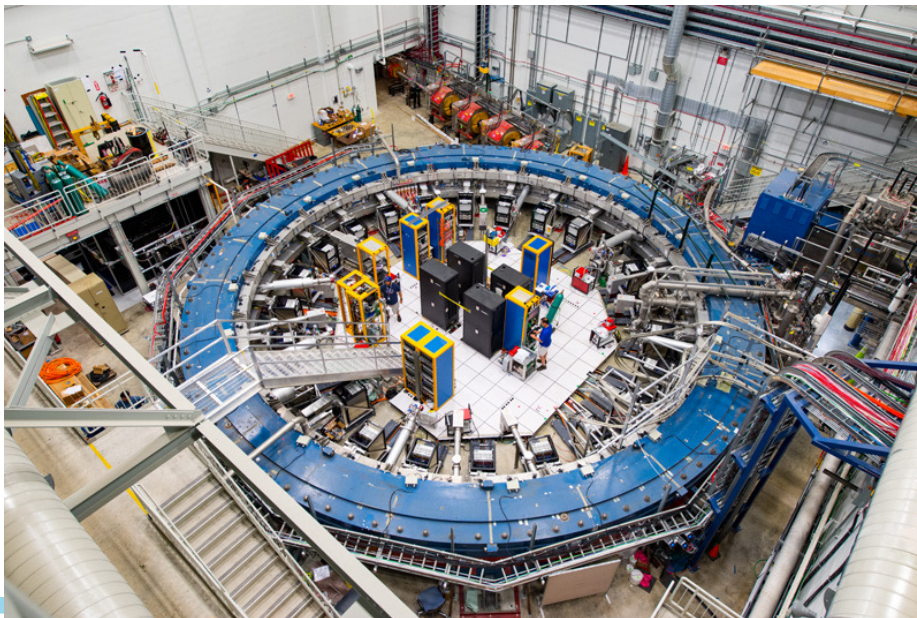


Italy @Fermilab, as of today

NEW LAB's ENDEAVOURS

- **Muon (g-2)**: Measurement of the anomalous muon magnetic moment
- **Mu2e**: Muon to electron conversion experiment
- **Icarus, SBN, DUNE**: Short/Long-baseline neutrino experiments
- ~150 Italian scientists (Muon g-2, Mu2e, Icarus, DUNE Co-Spokesperson)

BOLOGNA, CATANIA, FERRARA, FRASCATI, GENOVA, GRAN SASSO, LECCE, MILANO, NAPOLI, PAVIA, PADOVA, PISA, ROMA, TRIESTE, UDINE (INFN DEPARTMENTS and UNIVERSITIES)



Students' Recruitment

INTERNATIONAL PROGRAM

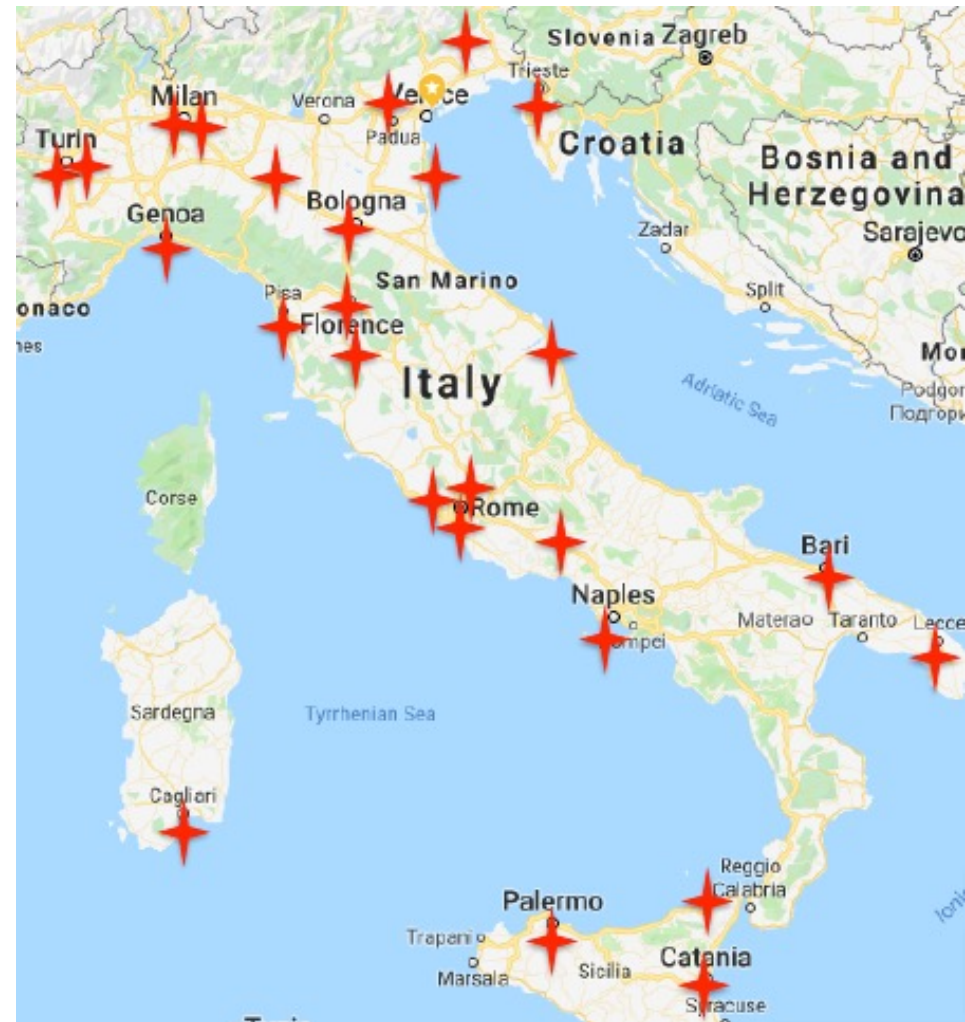
- Applications from most Italian and some European Universities

MASTER STUDENTS

- Physics/Applied Physics
- Engineering, Materials Science
- Computer Science

ADMISSION

- Curriculum Vitae
- Recommendation Letters
- Motivation Letter
- Interview
- Good knowledge of English



Training Programs

AUGUST – SEPTEMBER (9 WEEKS)

PROGRAMS FOR PHYSICISTS

- Design, construction, commissioning of particle detectors/accelerators
- Simulation of particle detectors/accelerators and particle physics experiments
- Analysis of data collected by particle physics experiments

PROGRAMS FOR ENGINEERS

- Design/Test of particle detectors/accelerator components
- Design/Test of superconducting materials and magnets for particle accelerators
- Development of fast electronics components/high precision mechanics
- Development of advanced computing infrastructures

UNIVERSITY CREDITS (acknowledged by the UNIPI Summer School)

- 6 ECTS credits (ECTS, European Credit Transfer and Accumulation System)

Sponsorships

0\$ COST FOR THE STUDENT, ~9,000\$ FOR THE SPONSOR

- U.S. Department of Energy at Fermilab
- INFN - Italian National Institute of Nuclear Physics
- Sant'Anna School of Advanced Studies (Pisa)
- ASI - Italian Space Agency (for internships at US Space Science Labs)
- University of Pisa

Applicants Benefits

WHAT FERMILAB PROVIDES

- Weekly stipend: ~600 \$
- Free housing in Fermilab Dorms
- Free shared rental car
- Total cost ~9000 \$/student

WHAT FERMILAB DOES NOT PROVIDE

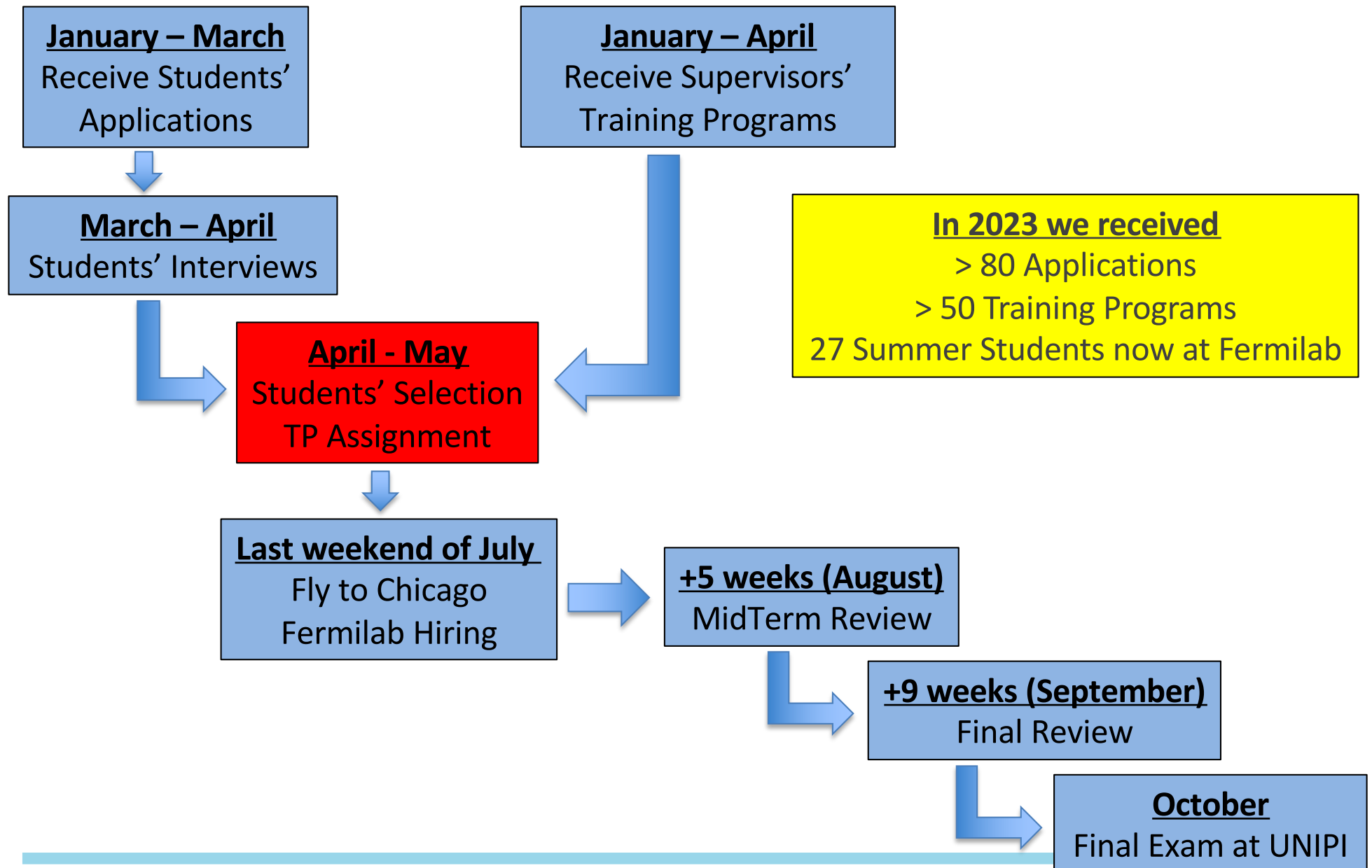
- Round-trip journey from Italy to Chicago
- Health insurance: mandatory

STUDENTS' TO-DO LIST

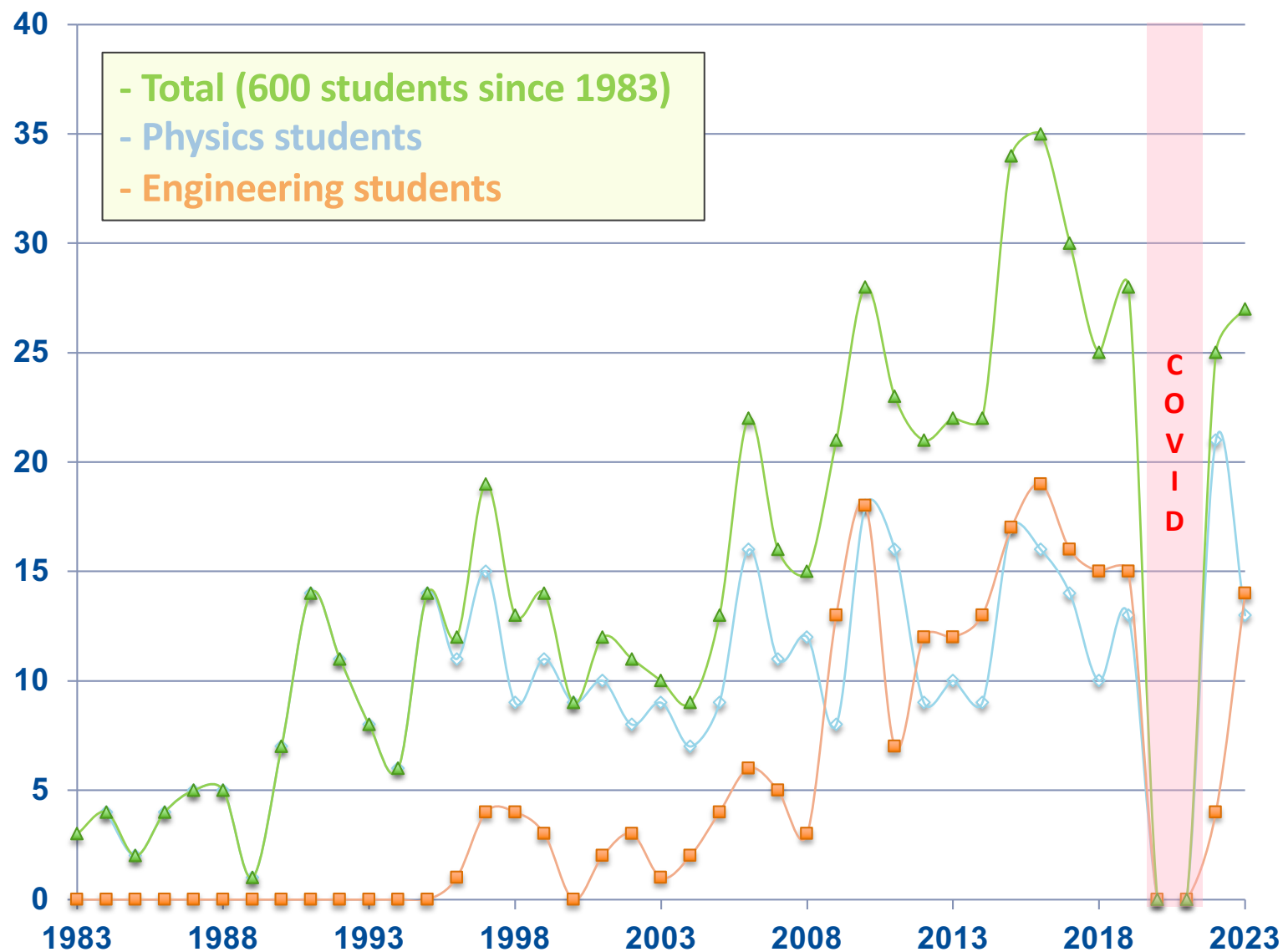
- Valid passport
- Employment and J1 Visa bureaucracy with the help of Fermilab's administrative offices



Important Actions/Dates



Summer Students Statistics (1983 – 2023)



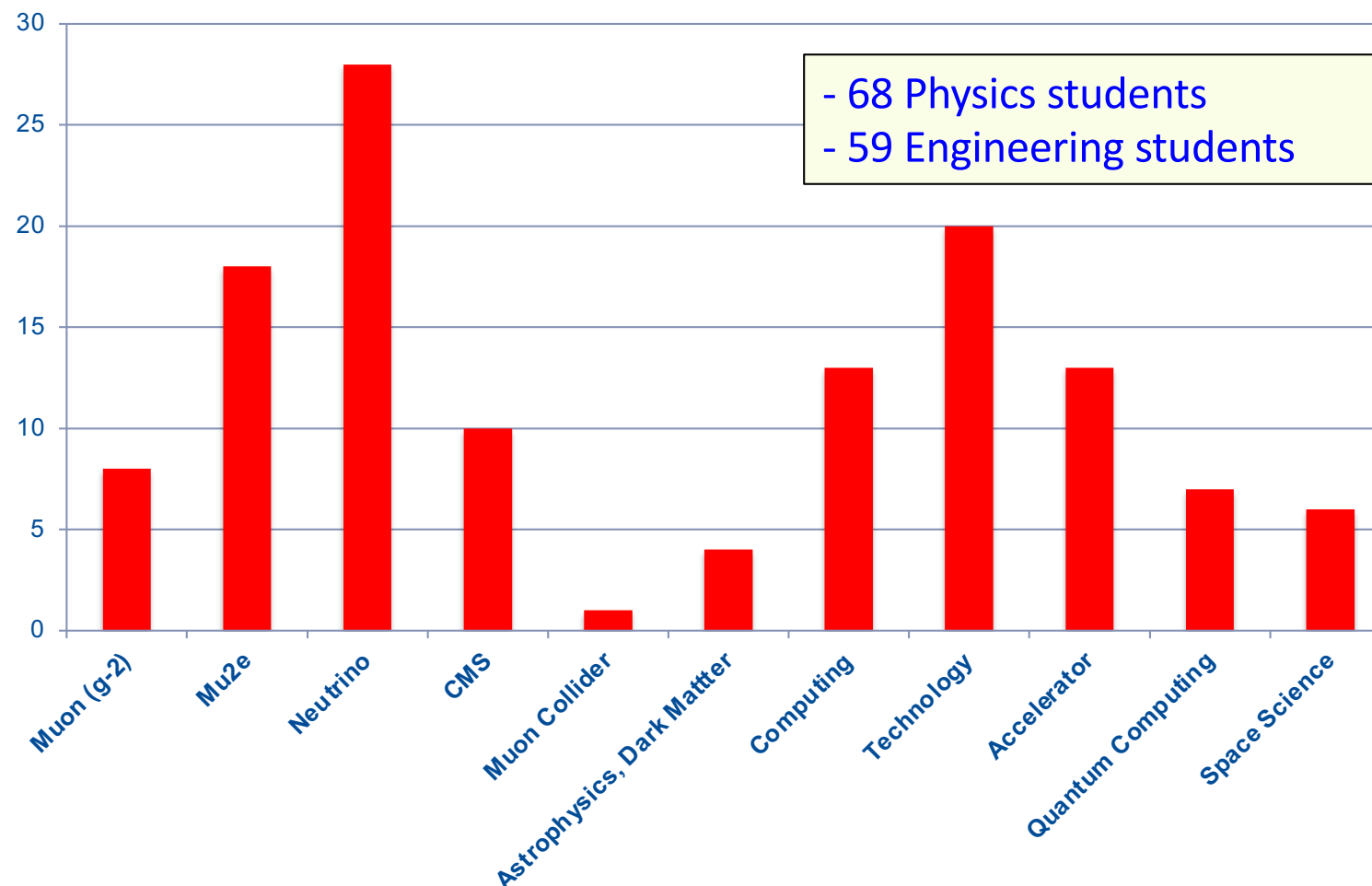
Summer Students Statistics (1983 – 2023)

Involved Universities (1983-2023)	600 students
Pisa	52%
Roma	10%
Padova	8%
Milano	8%
Bologna	7%
Torino	2%
Trieste	2%
Napoli	2%
Ferrara	1%
Cassino	<1%
Udine	<1%
Siena	<1%
Firenze	<1%
Parma	<1%
Palermo	<1%
Messina	<1%
Lecce	<1%
L'Aquila	<1%
Ancona	<1%
Bari	<1%
International	1%

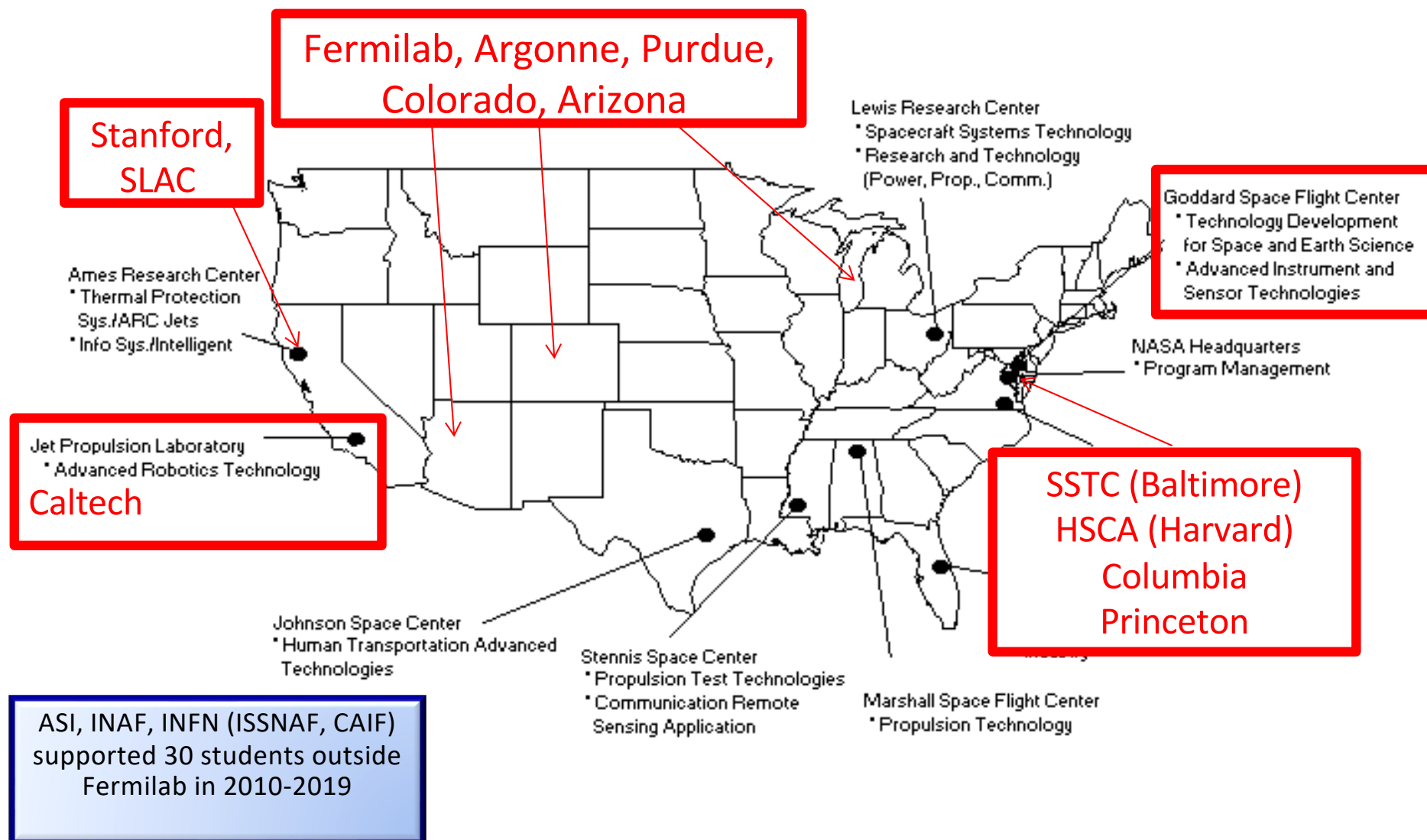


Training Programs (2008-2023)	320 students
Particle Physics & Neutrino	62%
Technology	20%
Accelerator	10%
Computational Science/AI	8%

Training Programs (2017-2023, last 5 “years”)



Internships at Space Science Labs



Conclusions

THE ITALIAN SUMMER STUDENTS PROGRAM AT FERMILAB

- A multi-disciplinary 9-week internship for Physics and Engineering students
- Hands-on training on Fermilab high-tech research
- 2023 program under way (27 Summer Students now at Fermilab)

~600 SUMMER STUDENTS IN THE PROGRAM SINCE 1983

- Many former Summer Students have developed their career at Fermilab with a Master Thesis and a PhD

