



# The Italian Summer Students Program at the Fermi National Accelerator Laboratory

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**New Perspectives in Science Education**  
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# Outline

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- ❖ Fermi National Accelerator Laboratory
- ❖ Fermilab Summer School
  - ❖ Historical background
  - ❖ Sponsors
  - ❖ Recruitment
  - ❖ Activity
  - ❖ Logistics
- ❖ Conclusions and future plans



# Fermi National Accelerator Laboratory

- ❖ Founded in 1967 as the **National Accelerator Laboratory**
- ❖ Renamed in honor of Enrico Fermi in 1974
- ❖ 1750 employees (scientists, engineers, technicians)
- ❖ > 3500 scientists and 1000 students from 50 countries
- ❖ > 15000 K-12 students on educational programs every year



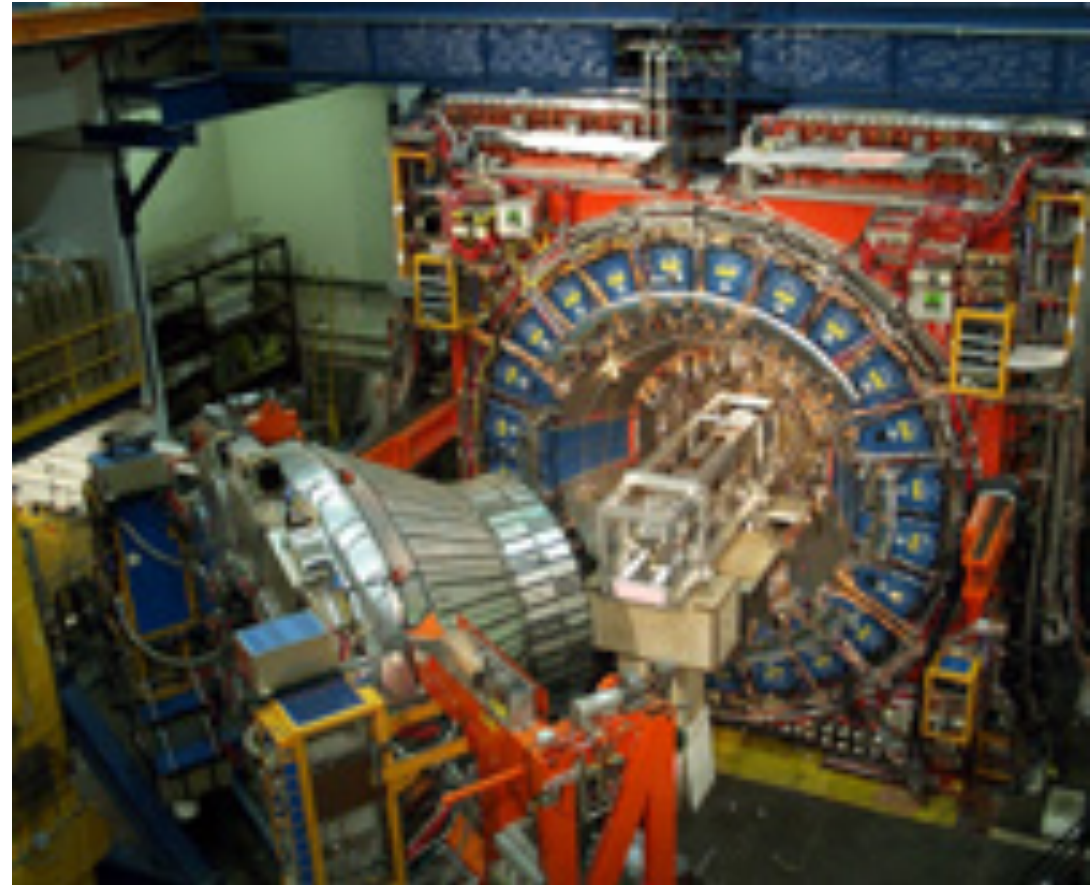


# Discoveries at Fermilab

- ❖ 1977  
**bottom quark**
- ❖ 1995  
**top quark, CDF and D0 experiments**
- ❖ 2000  
**tau neutrino, DONUT experiment**

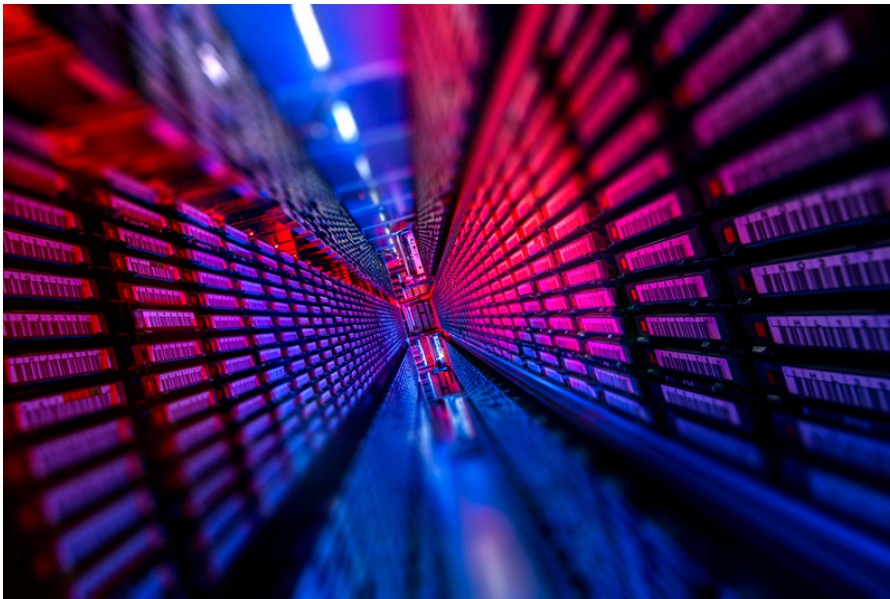
## **CDF**

**Collider Detector at Fermilab**  
Fundamental contributions  
from Italy and Pisa



# Fermilab Today

- ❖ ACCELERATOR DIVISION
- ❖ TECHNICAL DIVISION
- ❖ COMPUTING DIVISION



Feynman Computer Center



# Fermilab Summer School: History

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1984: INFN started an internship program for Italian physics students

2004:  for Italian/US students exchange

2007:  **Sant'Anna** /Fermilab agreement for 50% support of engineering students  
Scuola Universitaria Superiore Pisa

2009:   started additional fund raising  
The Italian Scientists and Scholars of North America Foundation

As of Today: on average 25 Italian students/year at Fermilab



# Fermilab Summer School: Sponsorships

- ❖ 0 (“zero”) cost for the student
- ❖ ~9,000 \$/student for the sponsor
- ❖ Department Of Energy at Fermilab
- ❖ Italian National Institute of Nuclear Physics
- ❖ Sant’Anna School of Advanced Studies (Pisa)
- ❖ ASI (also INAF in 2010-2011): internships in US Space Science Laboratories
- ❖ University of Pisa

# Fermilab Summer School: Recruitment

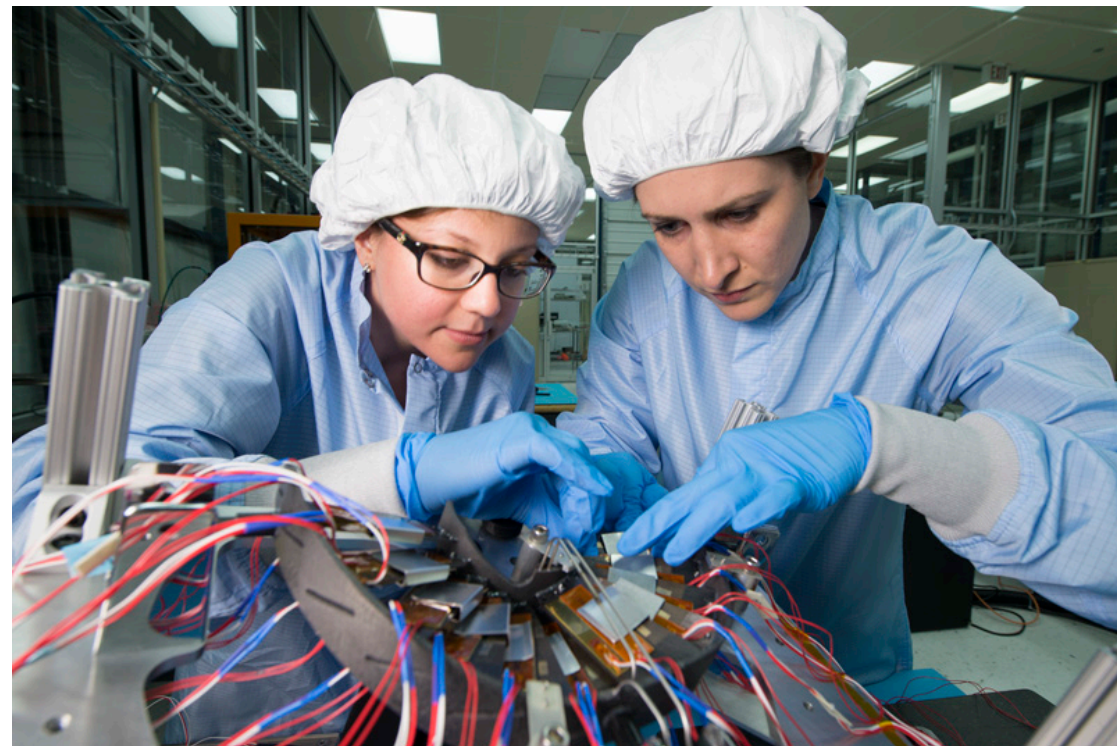
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## INTERNATIONAL PROGRAM – MASTER STUDENTS

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

## ADMISSION

- ❖ Curriculum Vitae
- ❖ Recommendation Letters
- ❖ Interview
- ❖ Good knowledge of English





# Fermilab Summer School: Activity

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❖ 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 (since Summer School creation in 2015)

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

# Deadlines for 2018 Edition

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March 15<sup>th</sup>, end of term for student applications to the School

*March 15<sup>th</sup>, end of term for training programs to be sent by supervisors to the School*

March 31<sup>st</sup>, end of student interviews in Italy and creation of list of qualified candidates

*March 31<sup>st</sup>, profiles of qualified candidates made available by the School to supervisors*

*April 20<sup>th</sup>, candidates of choice indicated by supervisors (in priority order) to the School*

May 20<sup>th</sup>, selections of winners by the School and assignments of students to programs.

# Fermilab Summer School: Students

## What does Fermilab provide?

- ✓ Weekly salary: ~400 \$
- ✓ Free housing in Dorm
- ✓ Shared rental car

## What does not Fermilab provide?

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

## Student to-do list

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





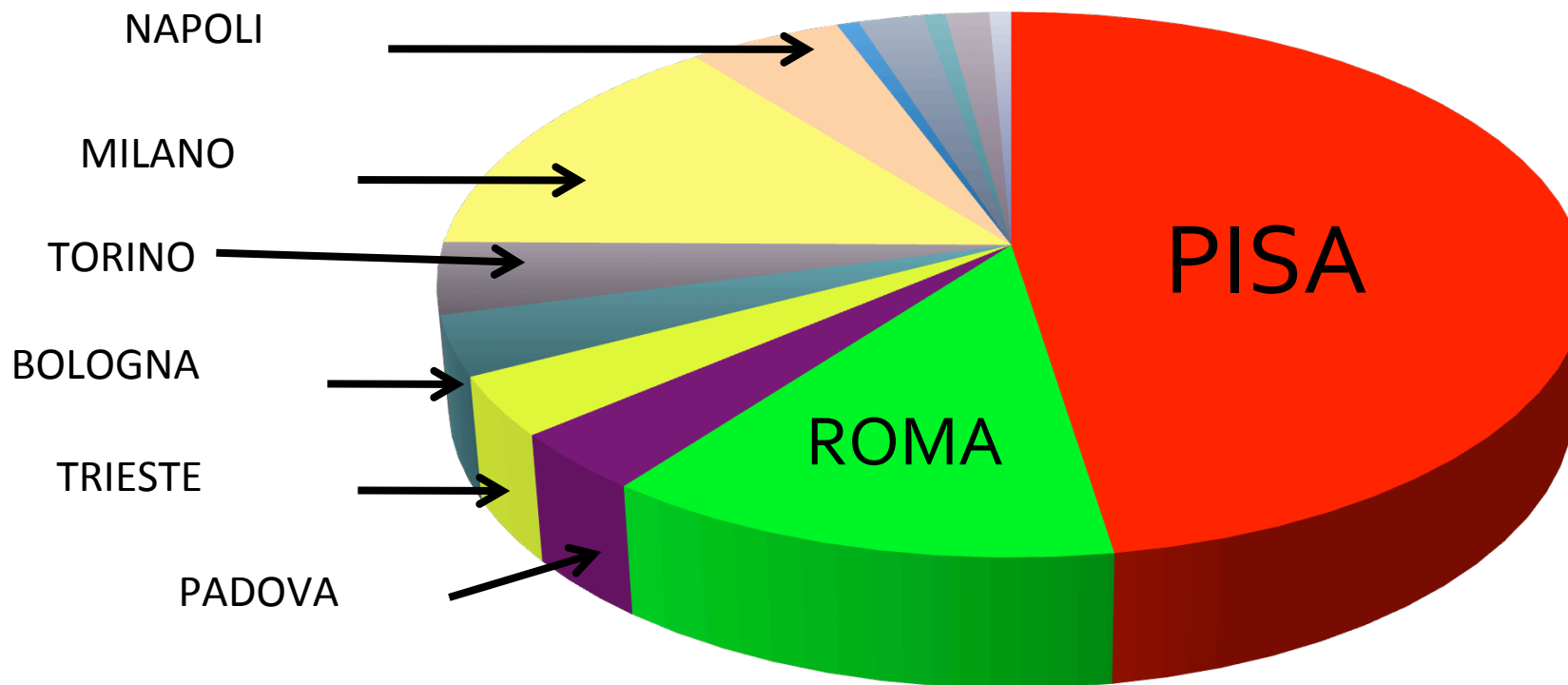
# Fermilab Summer School: Logistics

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- ❖ July 27-28, 2018: students fly to Fermilab
- ❖ July 30, 2018: Orientation Session, Training Session, students are introduced to their supervisors
- ❖ August 27-31, 2018: Mid-term Review, ~20 slides
- ❖ Labor Day
- ❖ September 24-28, 2018: Final Review, ~20 slides
- ❖ Summary for FNAL and UNIFI, 20 pages
- ❖ Pisa: 6 CFU exam with UNIFI board

# Fermilab Summer School: Statistics

- MORE THAN 500 STUDENTS SINCE 1984



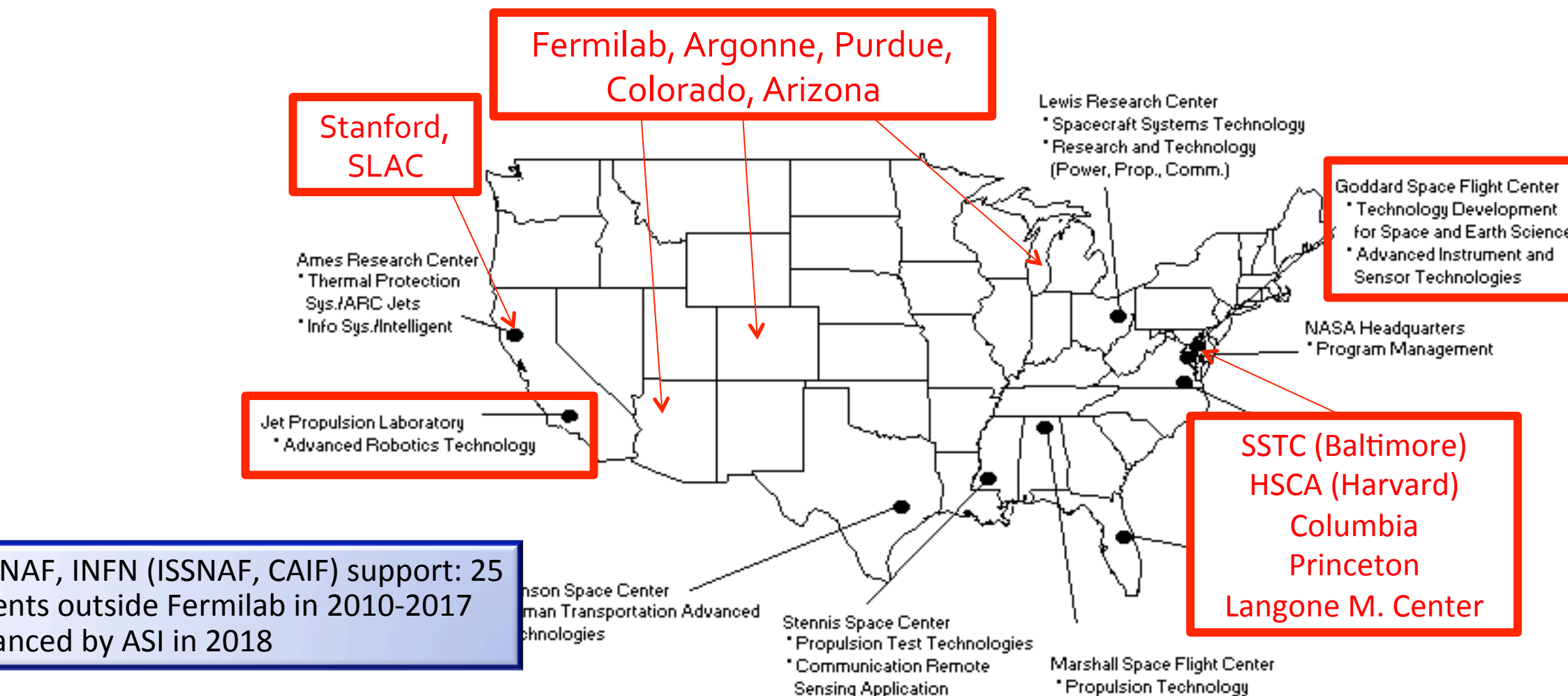
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## Fermilab Summer School: the last 10 years

Year	Accepted	INFN & FNAL groups	SSSA	ASI	INAF	CNI	No. Physicists	No. Engineers
2008	20	14	6				12	8
2009	22	18	4				9	13
2010	24	18	2	2	2		16	8
2011	23	17	4		2		16	7
2012	21	14	5	2			10	11
2013	23	16	4	2		1	11	12
2014	25	15	4	2		4	9	16
2015	35	28	3	3		1	17	18
2016	40	33	4	3			21	19
2017	30	24	3	3			15	15



# Internships at other US Laboratories



# Conclusions

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- ❖ The UNIFI Summer School at Fermilab is a multi-disciplinary program for Physics and Engineering students
  - ❖ Students get a hands-on training and contribute to Fermilab high-tech research
  - ❖ More than 500 Italian students have taken part in the program since 1984 (~50 % were from UNIFI)
  - ❖ Lots of opportunities to continue collaboration for a Master Thesis and a PhD
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- ❖ **DEADLINE FOR APPLICATION EXPIRED ON MARCH 15, 2018**
  - ❖ **WE HAVE STARTED THE STUDENTS' SELECTION PROCESS**