

The Masterclass of particle physics and scientific careers from the point of view of male and female students

Sandra Leone

INFN Pisa



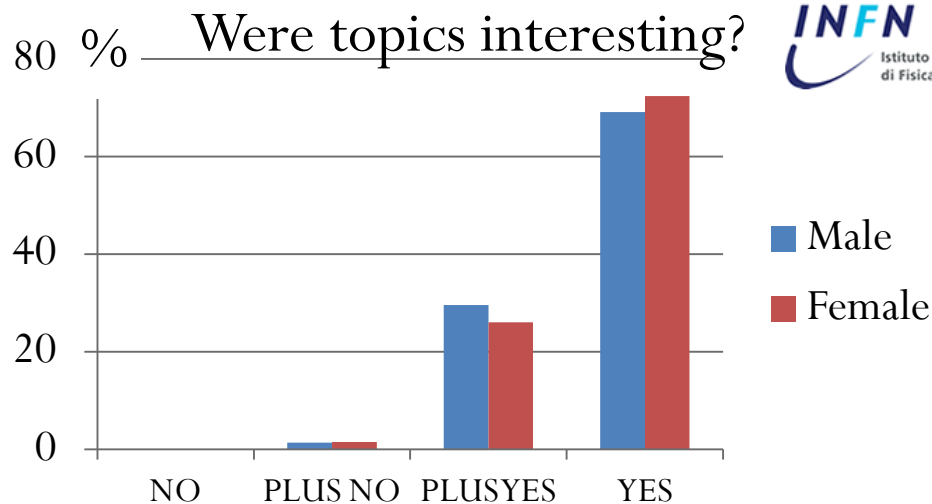
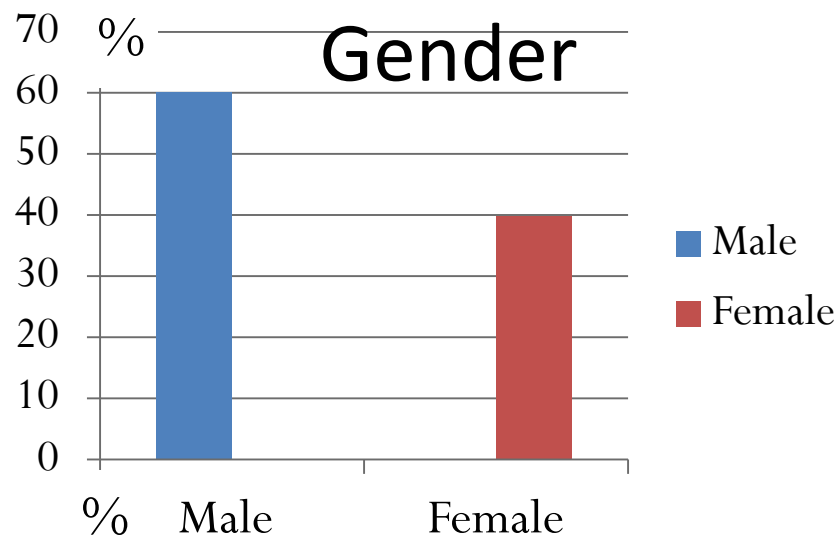
ICHEP 2016 Chicago, August 3-10

What is the particle physics Masterclass?

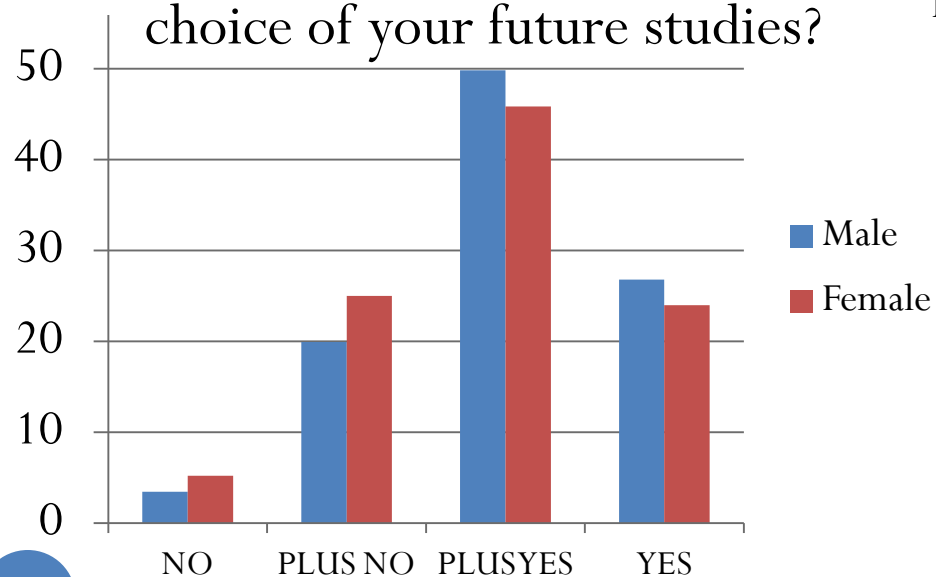
- High school students spend one day in research institutes
- Listen to introductory talks to particle physics
 - standard model, accelerators, detectors
- Work like scientists: they make measurements on real data!!
- At the end of the day 5-6 MC from around Europe/US join in videoconference to discuss/combine their results



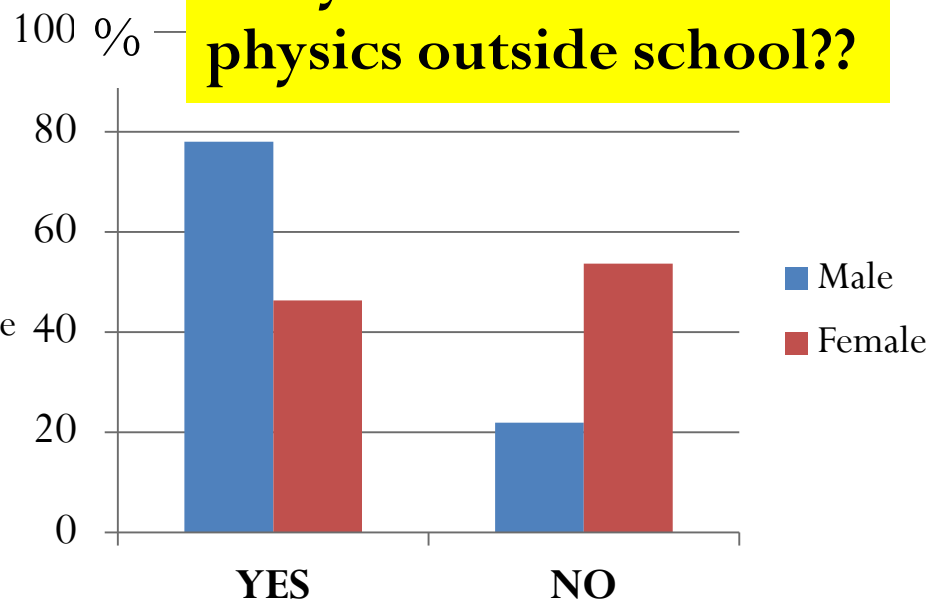
- Pisa INFN (National Institute for Nuclear Physics) joined MC since the first year, in 2005 (World Year of Physics)
- Each year more than a hundred students (18-19 years old, in Italy high school is 5 years) come to our research center: they are selected by their schools, based on previous year grades. Since a few years we ask schools to reflect the “gender” distribution of the school in the list of selected students
- At the end of the day a questionnaire is given to the students to assess if the Masterclass met a positive response
- Together with specific questions about the various activities, we ask them if they would like to become a scientist.
- They are offered about ten possible motivations for a ‘yes’ or a ‘no’ to choose from.
- The data collected since 2010 have been analyzed from a gender perspective: about 500 students answered, 300 male and 200 female
- With this study we aim to assess if male and female students have a different perception of scientific careers.

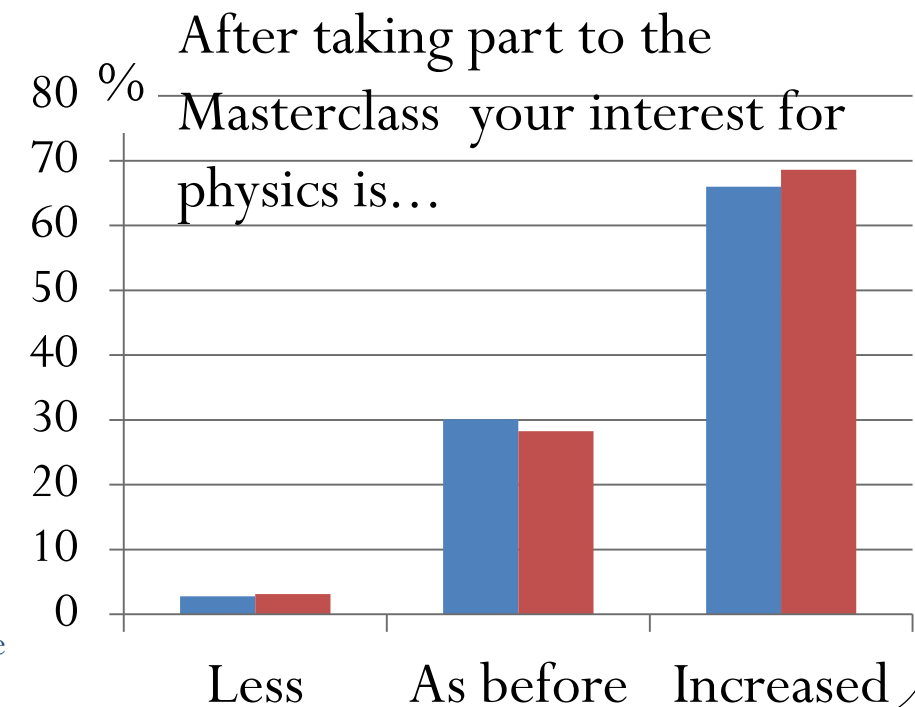
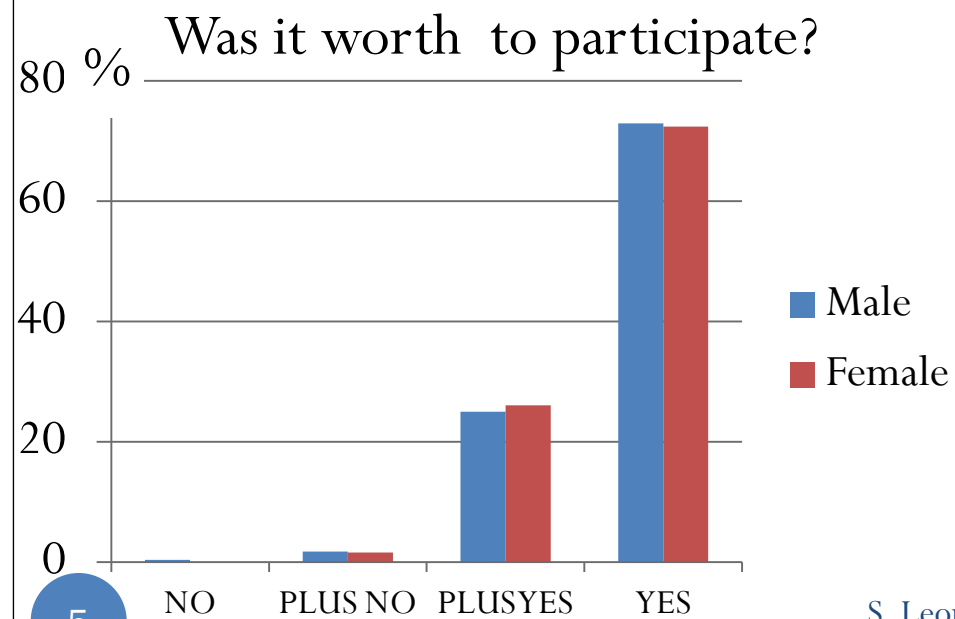
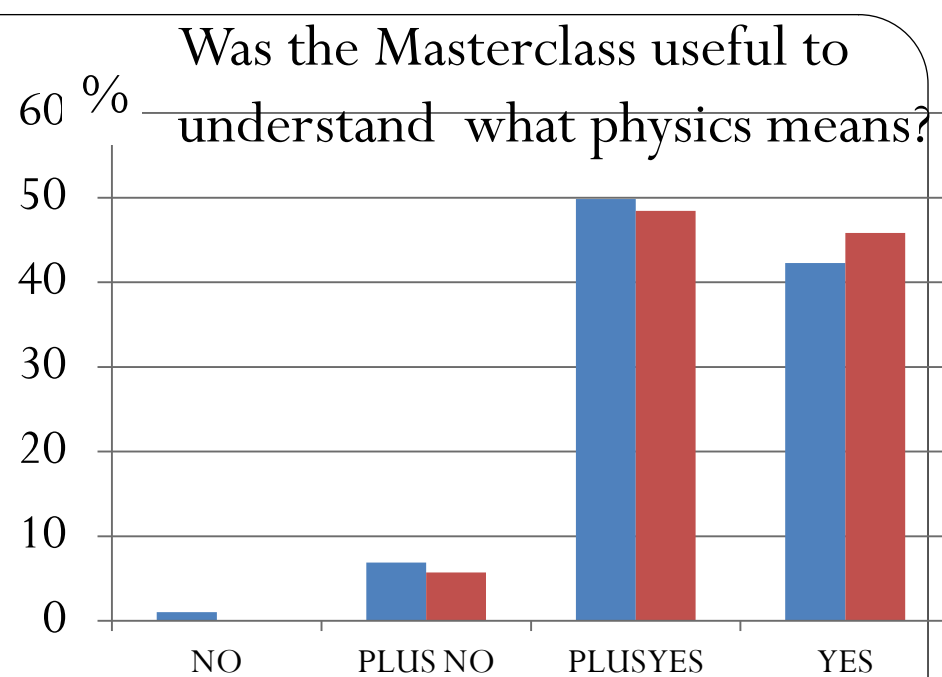
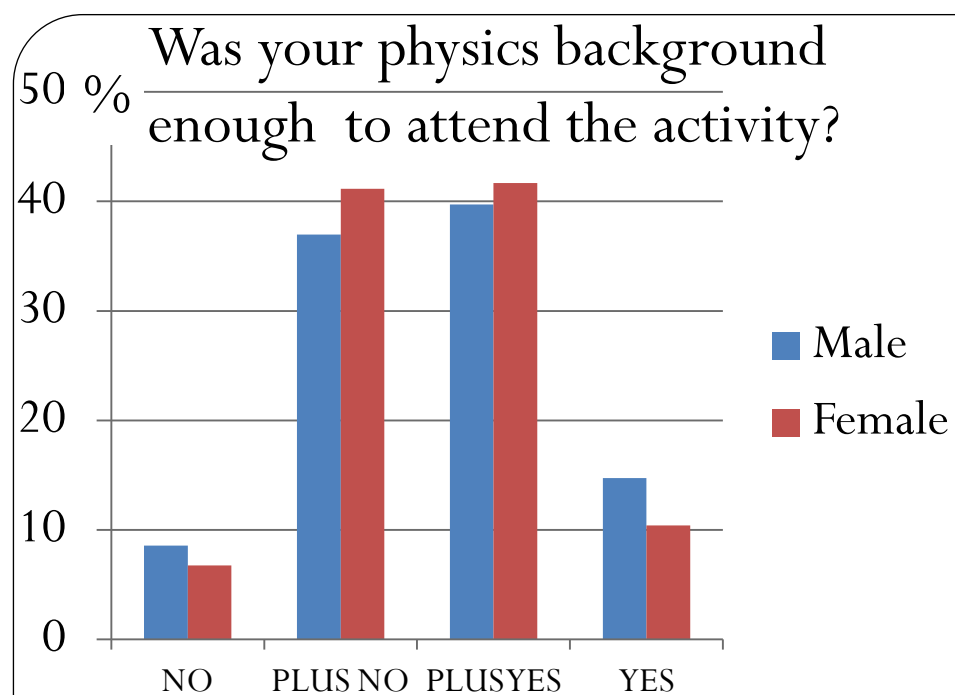


Was the Masterckass helpful for the choice of your future studies?

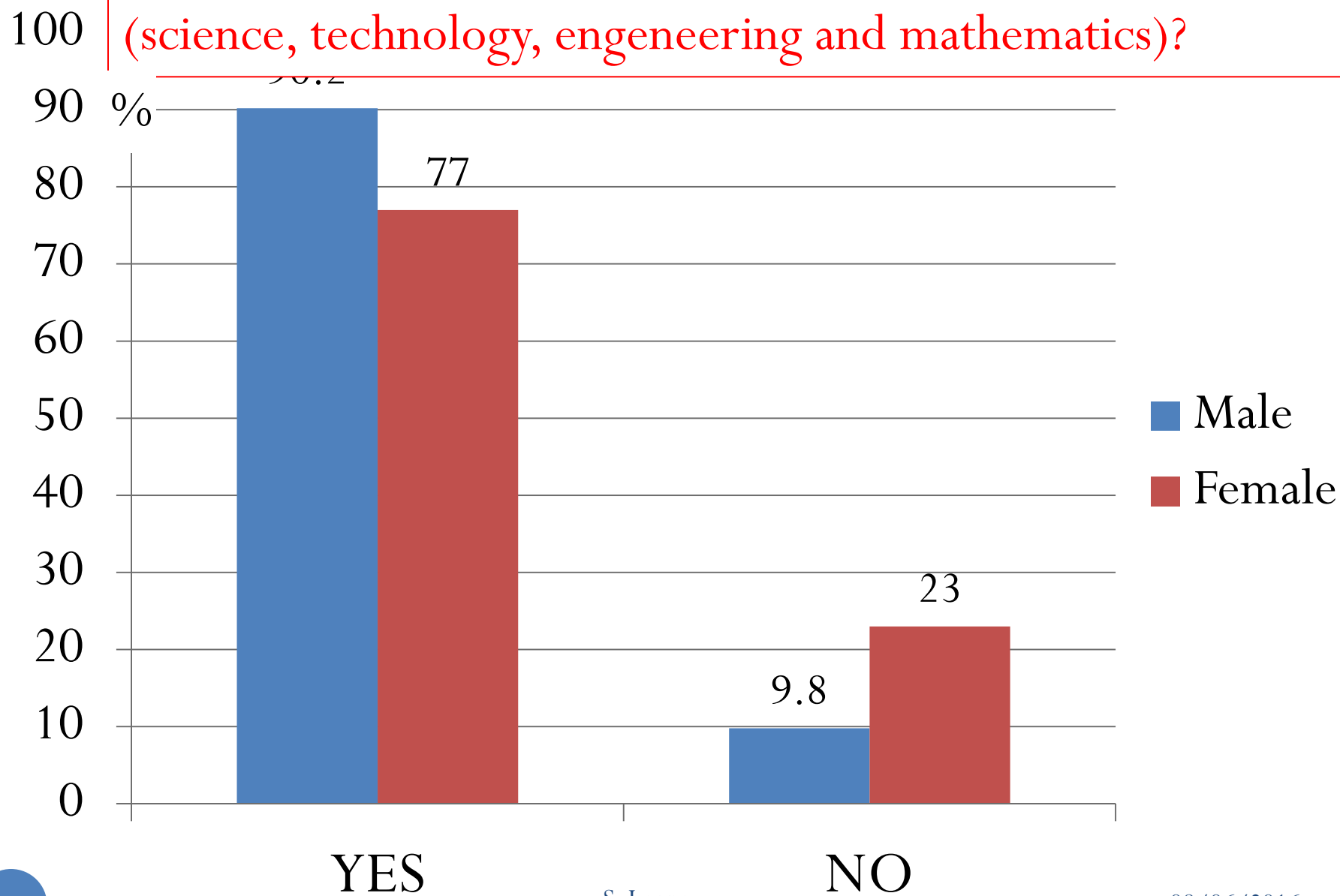


Are you interested in physics outside school??

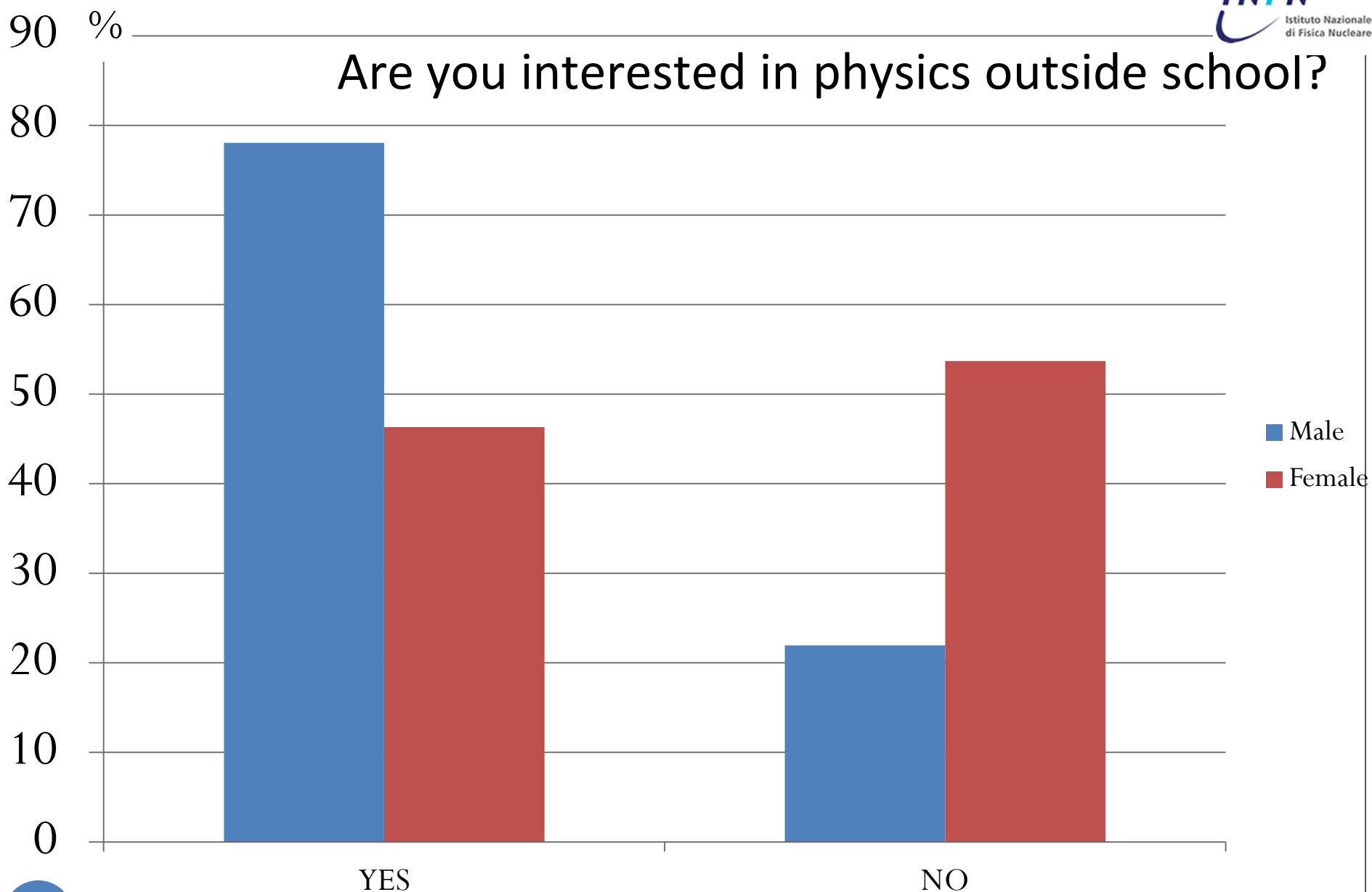


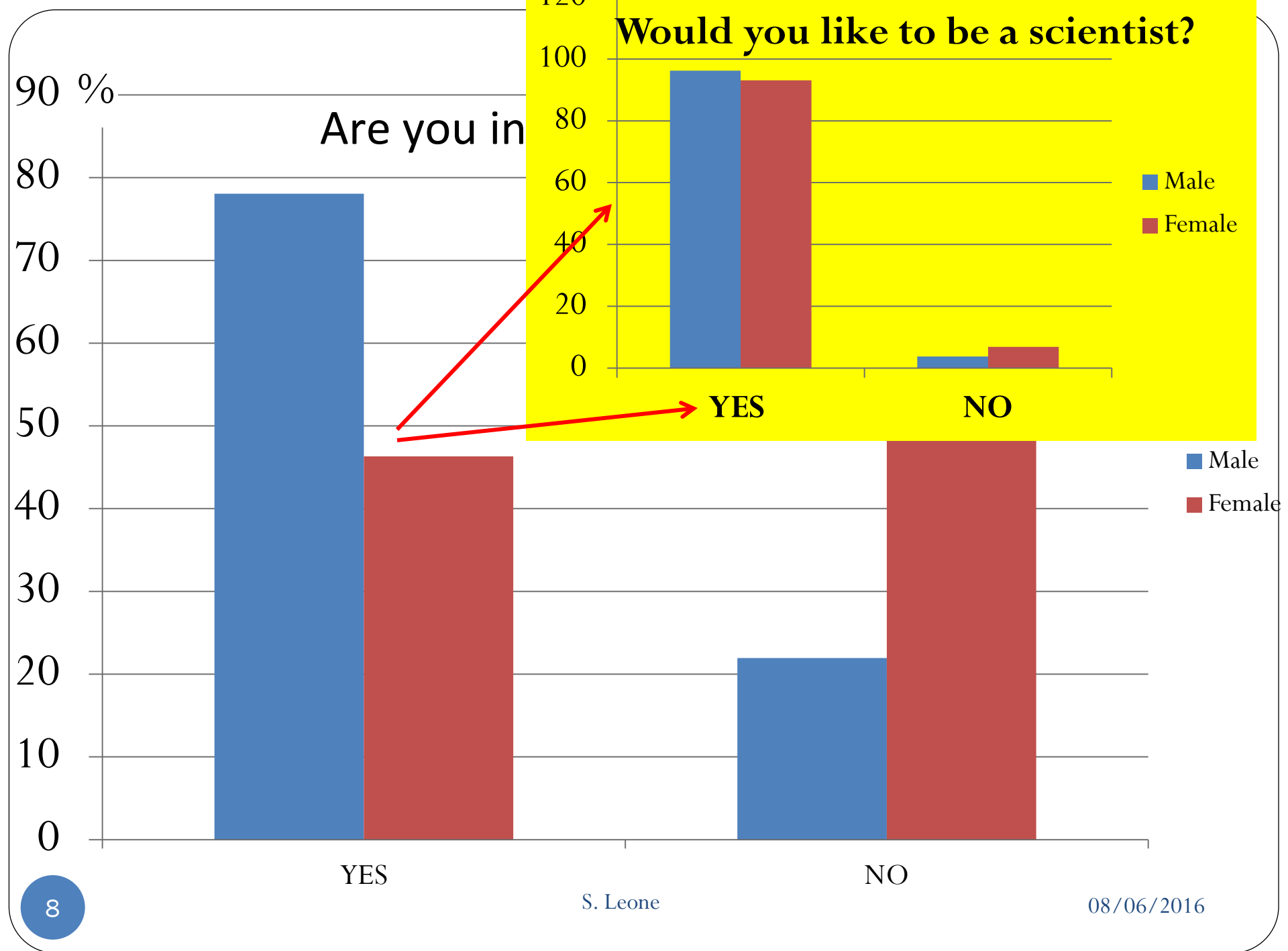


Would you like to work or do research in a STEM discipline (science, technology, engineering and mathematics)?



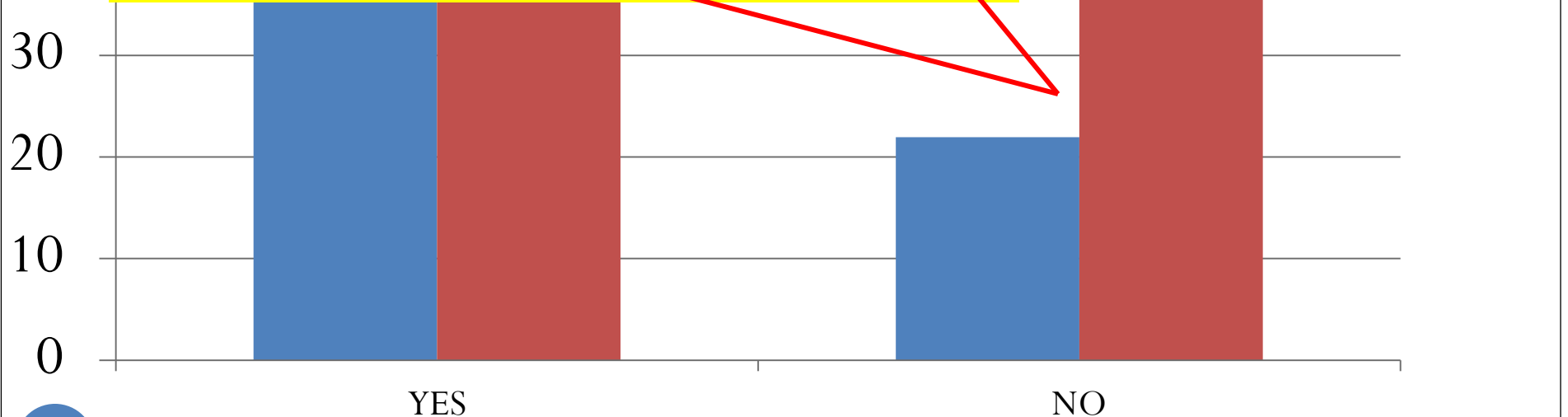
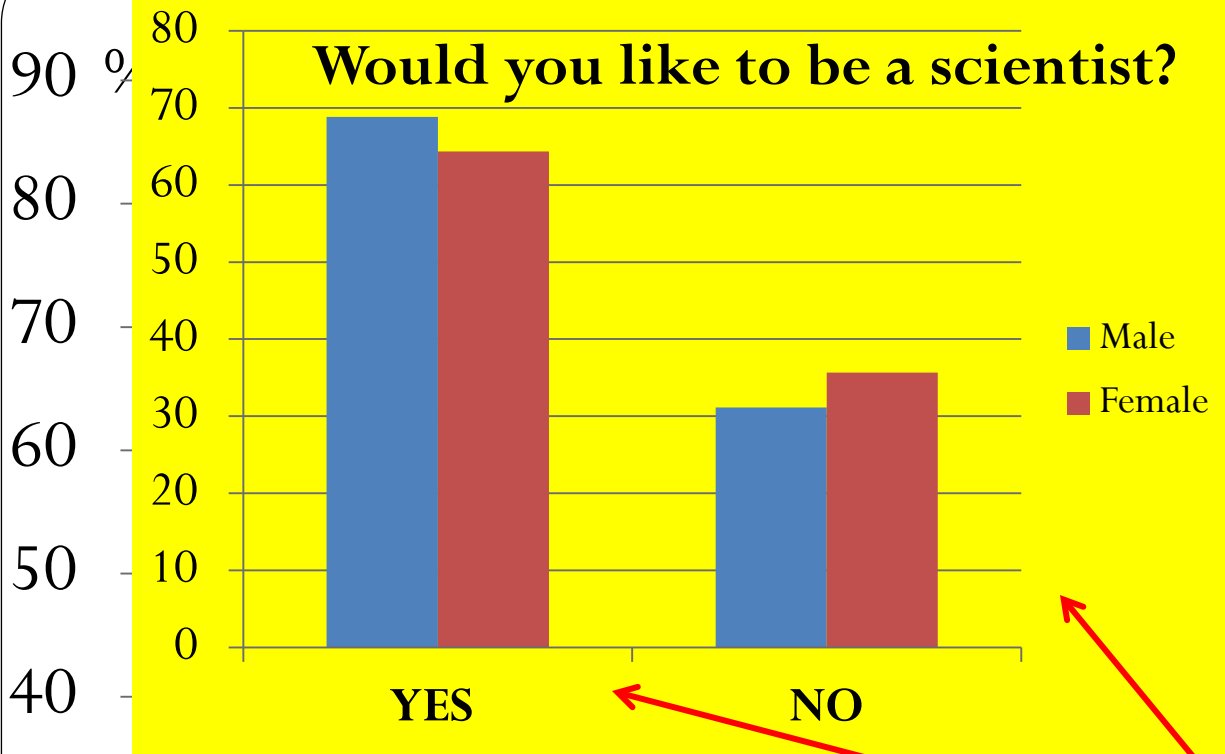
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Would you like to be a scientist?



Would you like to work or do research in a STEM discipline (science, technology, engineering and mathematics)?

- **YES** because....
 - It's easy to find a job
 - I have a talent for science
 - I see myself as a scientist
 - I like science
 - I like to do things that are considered difficult
 - I like to study
 - I like the idea of studying the mysteries of the universe and finding answers to questions
 - I'm not scared by the idea of working without regular meals and hours
 - One can make a lot of money in science
 - One can travel a lot
 - The choice of career has a high priority in my life
 - It would make my life more interesting
 - I'm not scared by the prospects of an all-encompassing job
 - I deeply admire scientists and consider them a role model
 - Pure and applied sciences are well suited for a man/woman
 - My teachers are encouraging me to undertake a scientific career
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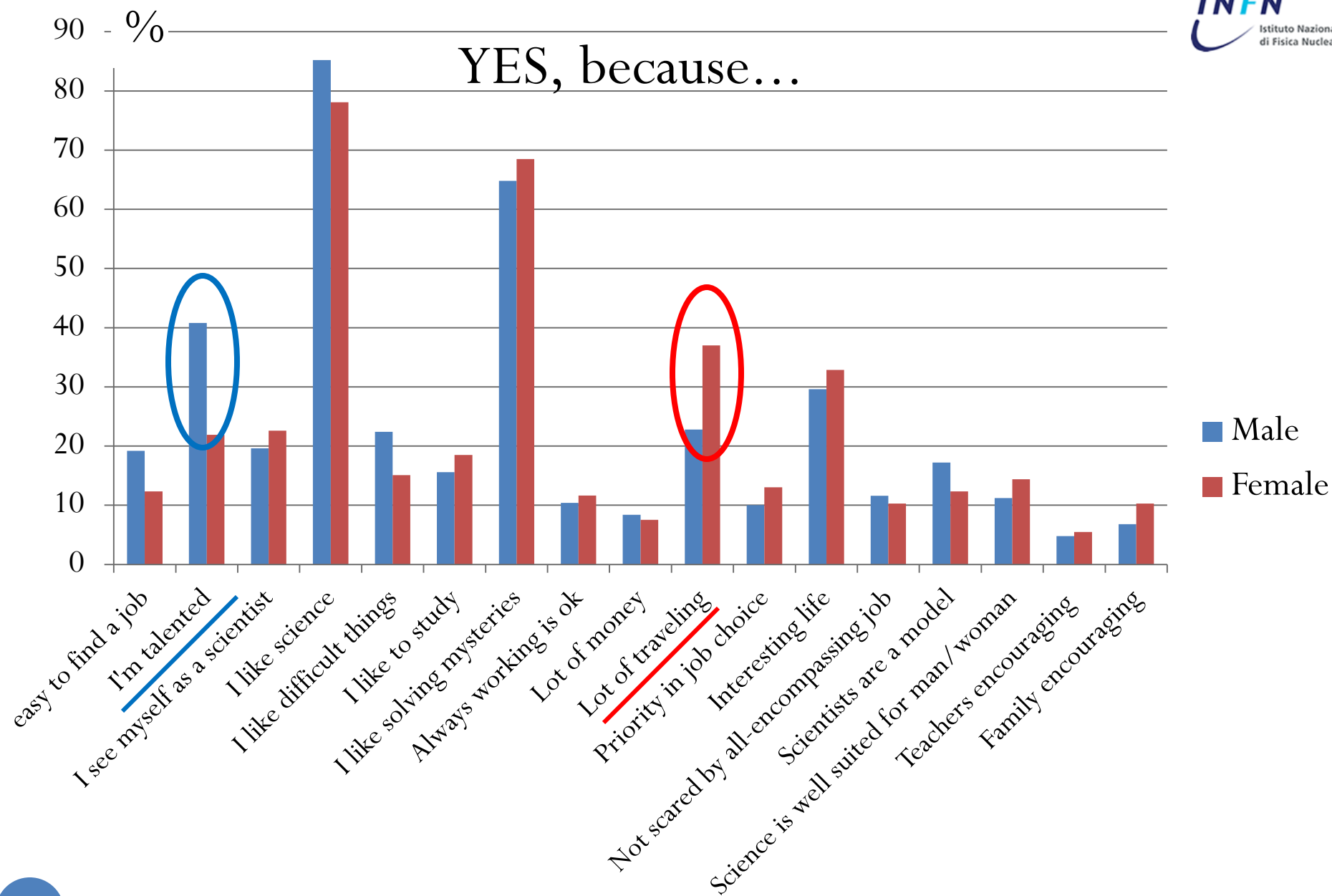
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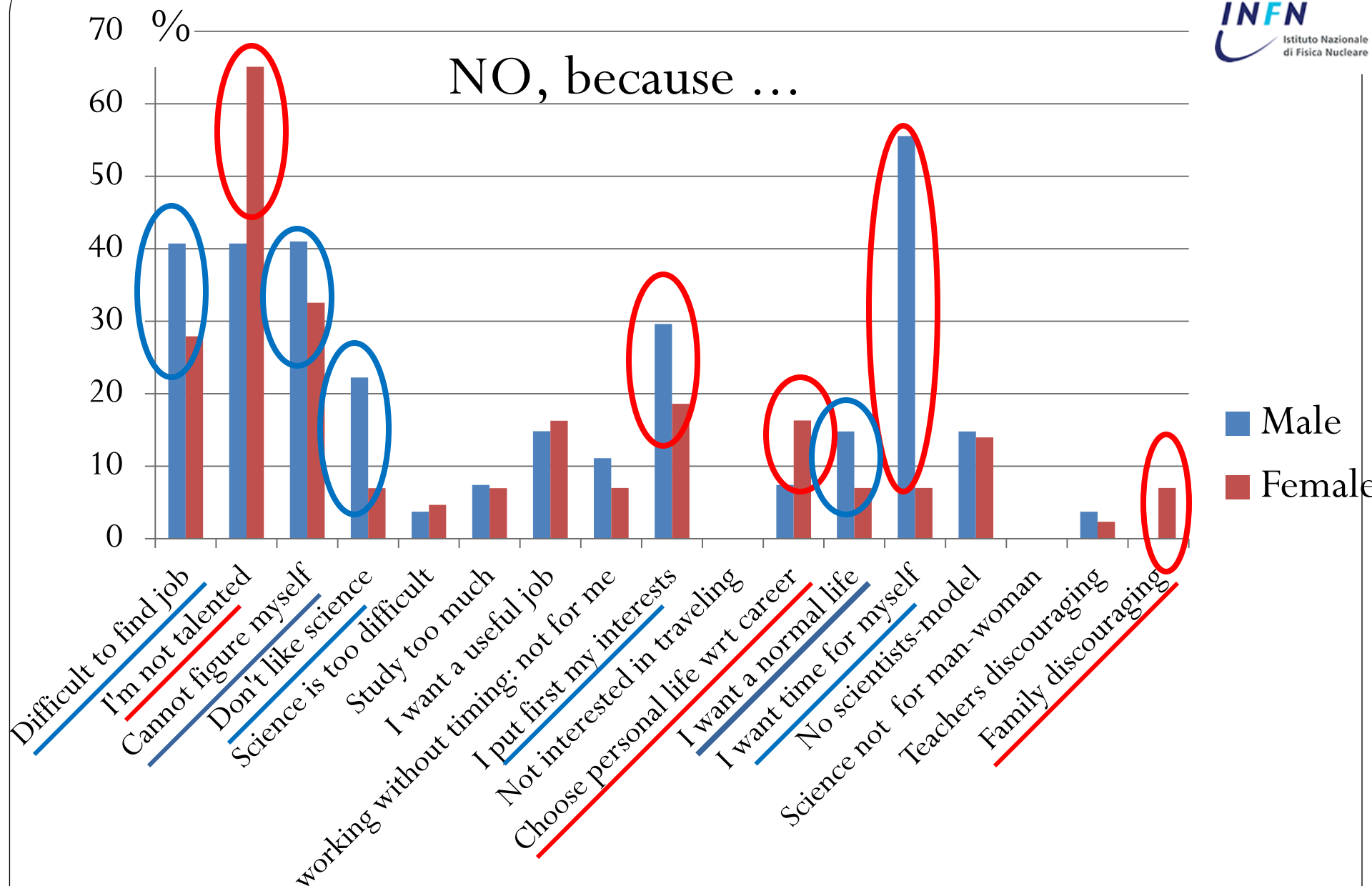
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Would you like to work or do research in a STEM discipline (science, technology, engineering and mathematics)?

- **NO** because....
 - It's difficult to find a job
 - I have no talent for science
 - I cannot see myself as a scientist
 - I don't like science
 - Scientific disciplines are too difficult
 - One has to study too much
 - I would like to do more practical work
 - Working in a lab without regular meals and hours is not for me
 - I put my personal interests first
 - I'm not interested in traveling for work
 - I don't want to sacrifice my personal life for my career
 - I aspire to a normal life
 - I'm scared by the prospects of an all-encompassing job: I want to have time for myself
 - There aren't scientists who I consider as a model for my future life
 - Pure and applied sciences are not well suited for men/women
 - My teachers are discouraging me
 - My family is discouraging me



Conclusions

- Only 46% of female students declare to be interested in physics outside school, compared to 78% of male students.
- This is reflected into the willingness to become a STEM scientist (77% of female compared to 90% of male students)
 - Reasons are not univocal:
 - ⇒ feel they are not talented enough?
 - ⇒ lack of encouragement?
 - ⇒ dichotomy between personal dimension and working dimension of life?
- Open question:
 - What can we do to engage girls to physics/hard sciences?