

# Student's point of view

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rECFA meeting – LNF

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# About me

- I chose particle physics because I was very fascinated by this subject: my physics teacher at the high school was a very good one
- I've been working on experimental flavor physics since my first level degree (2003) and I'm part of the BaBar and SuperB collaborations
- I got my second level degree in 2005 and my PhD degree in 2008. Since then I'm a PostDoc in Perugia, mostly financed by INFN
- I've participated to INFN selections for
  - non-permanent researcher positions (2009)
  - permanent researcher positions (2010)like many of my colleagues, I've entered the "short-lists" but the list of positions was even shorter

# The “long and winding road” to a permanent position

# Education in Italy (I)

- University:
  - 3 years: First Level degree
  - +2 years: Second level degree
- One has to defend a thesis both for the first and the second level degree: one may come in touch with experimental collaborations already during the first level degree thesis
- In my experience, the quality of the teachers you meet during classes really matters on the choice of a given field (particle physics, theoretical physics,...)

# Education in Italy (II)

- PhD in Italy:
  - 3 year program (in some Universities it may take a little longer, i.e. 3+1/2 year)
  - classes and exams (+ some research) during the first year
  - research activities and thesis writing during 2<sup>nd</sup> and 3<sup>rd</sup> year
- During Phd one really gets in touch with international collaborations and experiments
  - chances to be responsible of tasks inside the experiment
  - possibility of participating and contributing to conferences
  - possibility of periods spent in international laboratories (if the experiment is in data-taking or construction phase)

all this is really stimulating, challenging, and illuminating!

# Post-PhD positions

After the PhD one can:

- look for a position outside the research field (i.e. industry)
  - not so easy in most parts of Italy at the moment
- search for a position in the research field:
  - in Italy, mainly supported by University and/or INFN
  - abroad, i.e. Universities or big international laboratories

Staying in Italy to make research:

- first step: “Assegno di ricerca” (= PostDoc position)
  - within INFN: monthly salary ~1.4K€, 4 years maximum, 34 years old max to participate in the selection
- next step: non-permanent research position
  - within INFN: monthly salary ~ 1.9K€, 5 years maximum
  - the upgrade from PostDoc to this position is not straightforward

# From non-permanent to permanent

- Permanent positions available (in principle) both with University and INFN (more research-oriented)
- In the past decades, after a few years of PostDoc/Non-perm. researcher there was a quite high probability of getting a permanent position in Italy
- This is not true anymore:
  - one can spend several years in Italy...
  - one can go abroad with the hope of being back...  
..and never have a permanent position.
- In most of the cases, at this point one is not so young and is also over-qualified for a “real” job
- Also, recruitment procedures and budget change very often and it's hard to make a reliable plan

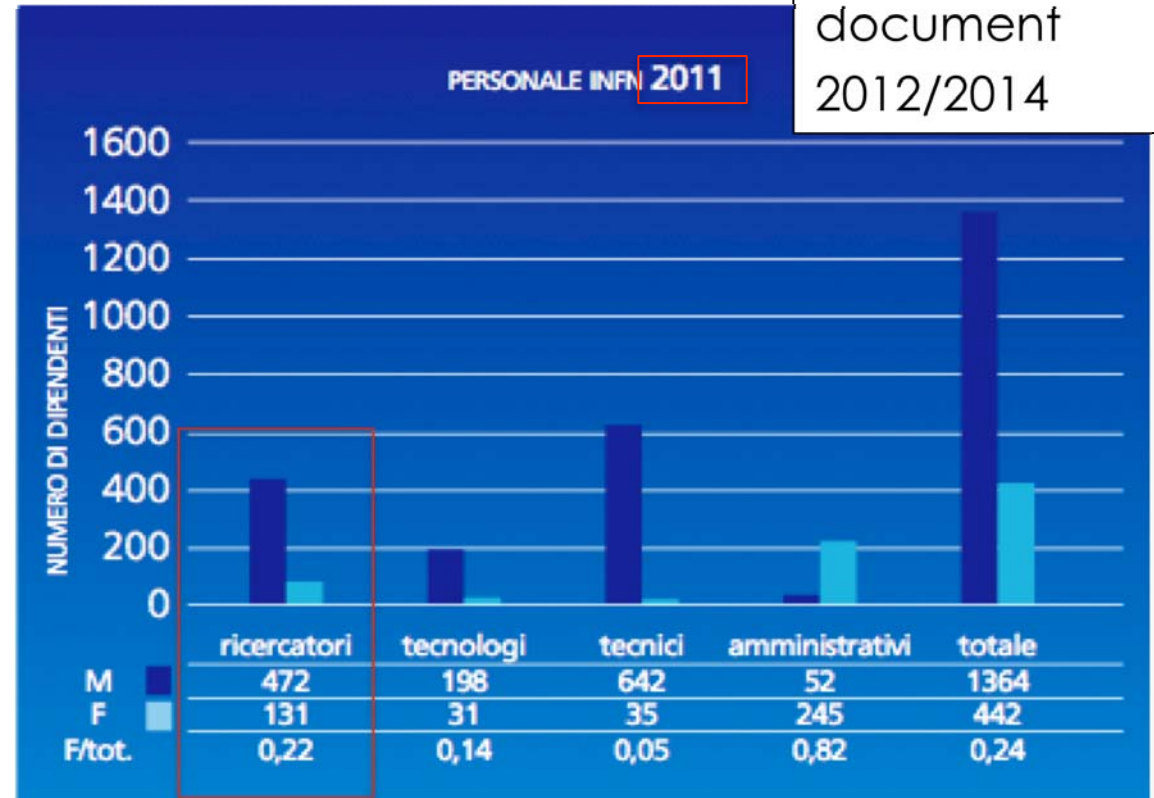
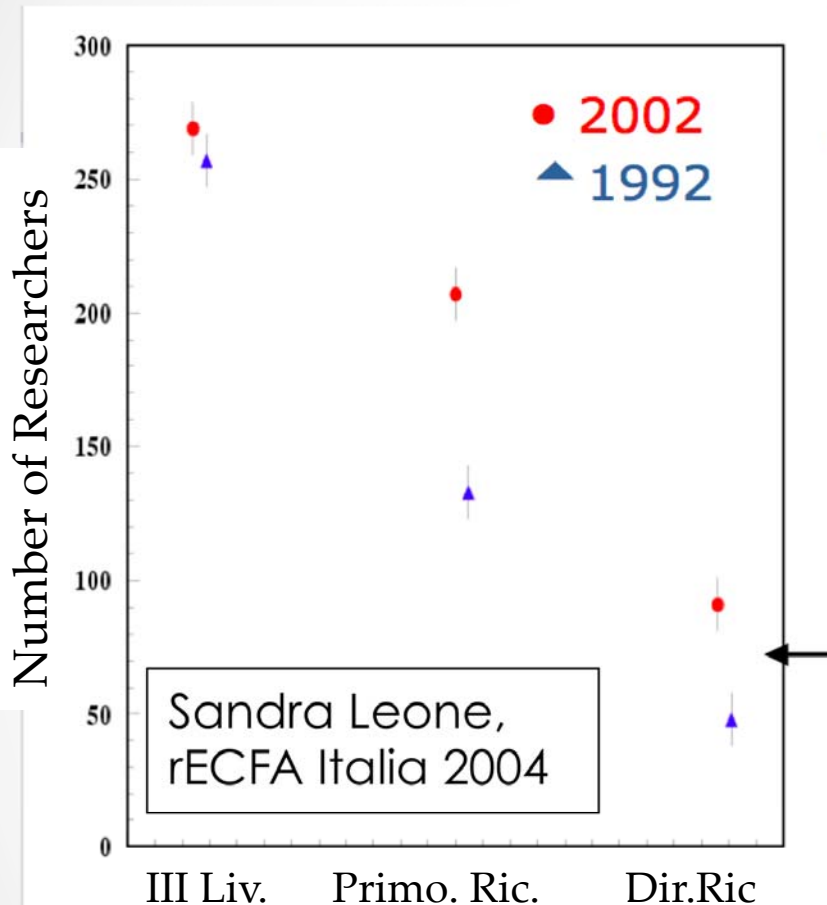
# On INFN personnel

[Thanks to Dott. Iaia Masullo, for the material and the useful discussions]



# INFN Personnel

INFN 3-year plan document 2012/2014



Total number of INFN researchers:

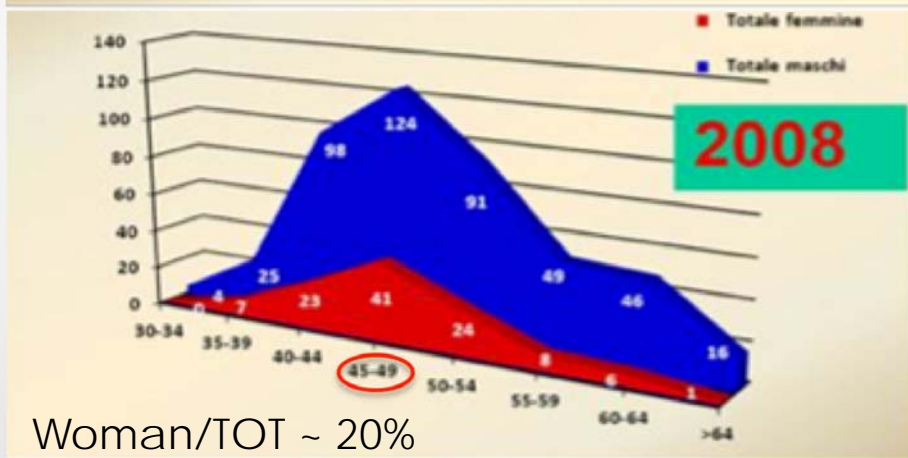
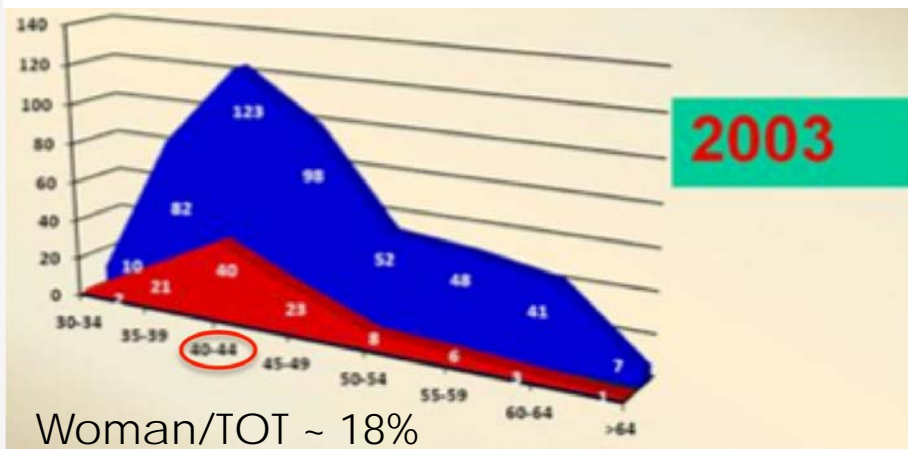
- 1992: ~ 425
- 2002: ~ 570
- 2011: ~ 603

In 2011:

- Total Number of INFN employee with permanent positions: 1806
- % of researchers: ~ 33%
- % of female researchers: ~ 7%

# INFN Personnel “aging”

Age of researchers, for men (blue) and women (red)

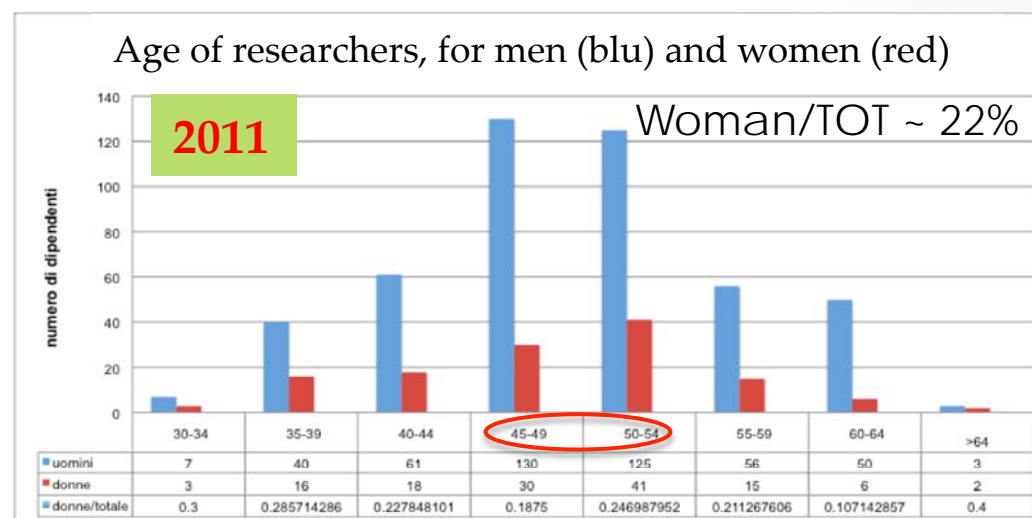


Similar age distributions in 2003 and 2008, in 2008 the peak is shifted in the slice 45-49 (with only 36 people less than 40 years old). This trend is reflected also in the 2011 distribution.

The lower hiring power in the last ten years is the consequence of:

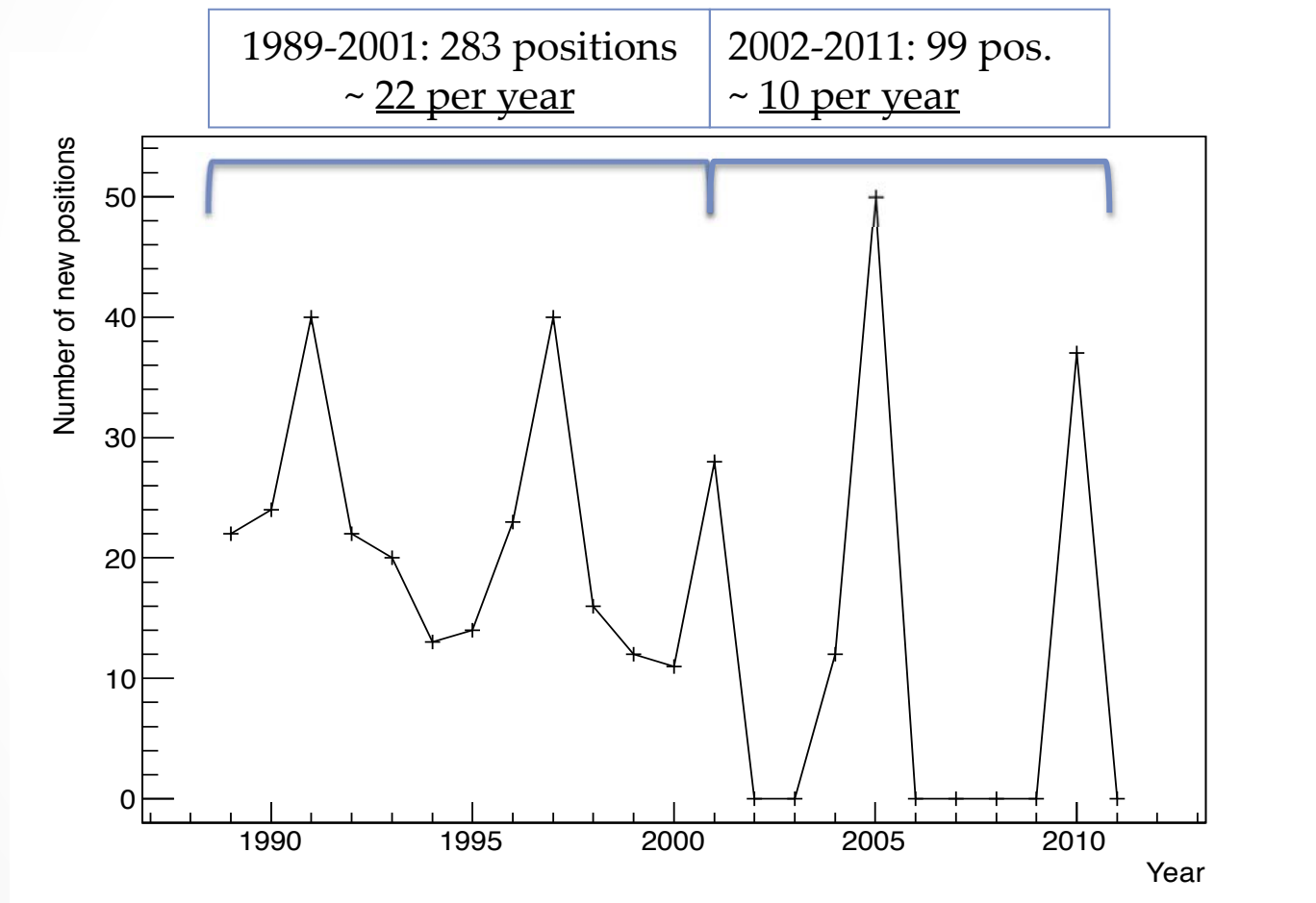
- freeze from mid 2001 to mid 2004
- governmental policies that currently limit the number of recruitments to a fraction of the retirements.

Age of researchers, for men (blu) and women (red)



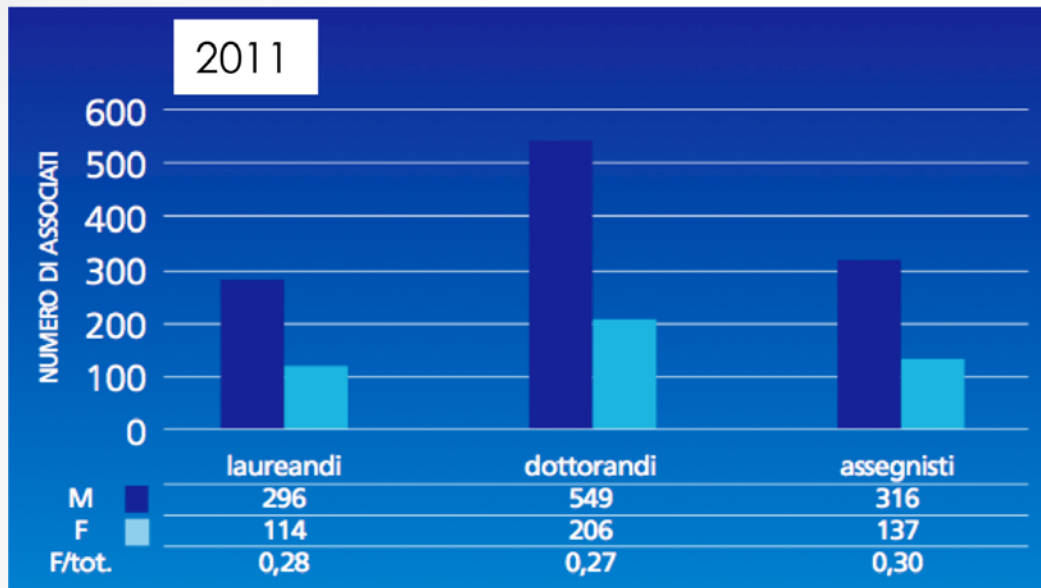
# History of new INFN researcher positions

- From 1989 to 2011



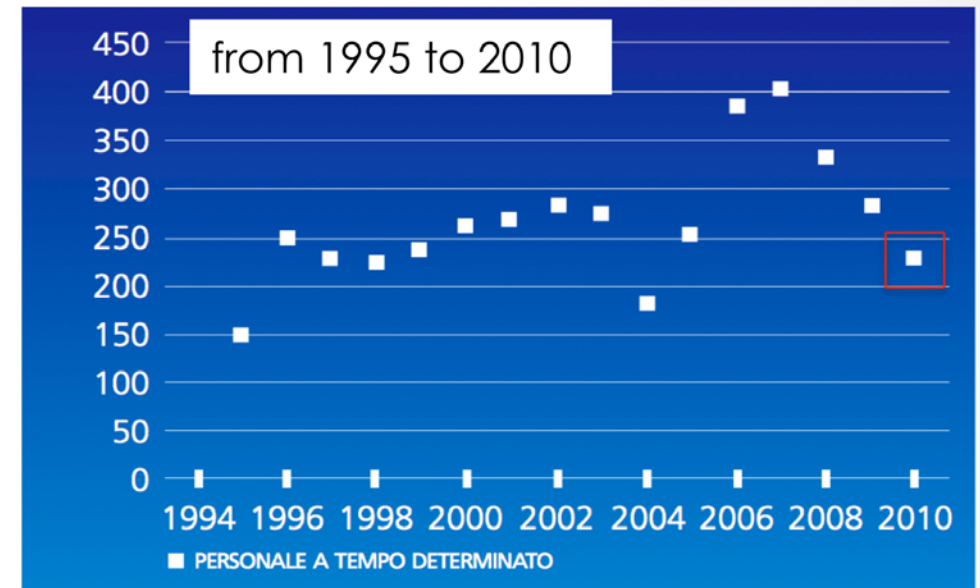
[ N.B. : 50 Non-permanent positions in 2005, turned into permanent between 2005 and 2010 ]

# Non-permanent personnel et al.



students      PhD      PostDoc

total 1618



History of non-permanent positions  
(researchers, technicians,  
administrative employees)

- within the 240 non permanent positions, ~ 50 are researchers
- in international collaboration a large amount of work is done by PhDs, PostDocs, and Non-perm. researchers
- What if 50 new researchers are hired AND PhDs and PostDocs stop their activities ?

# Young researchers<sup>(\*)</sup>' point of view

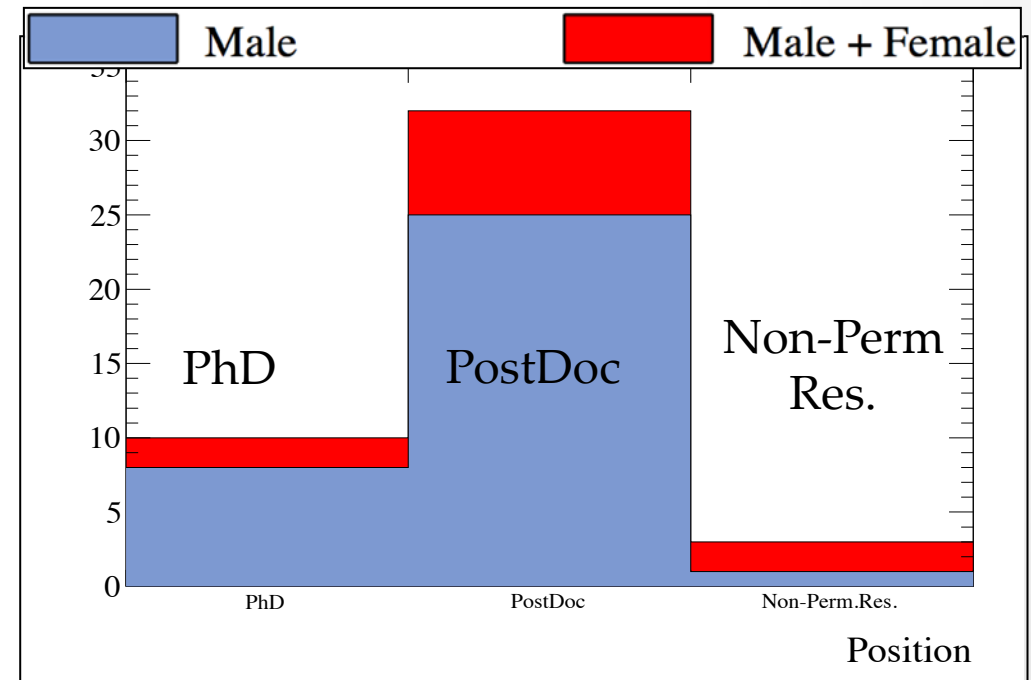
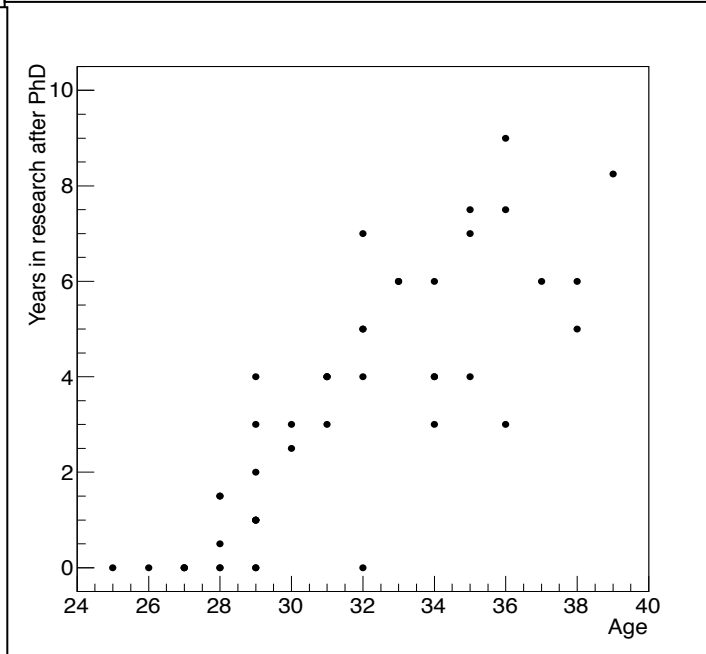
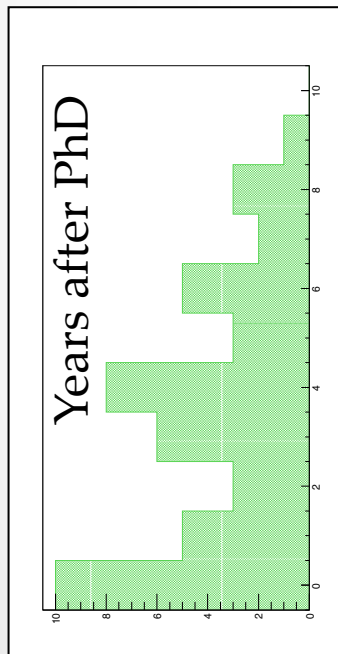
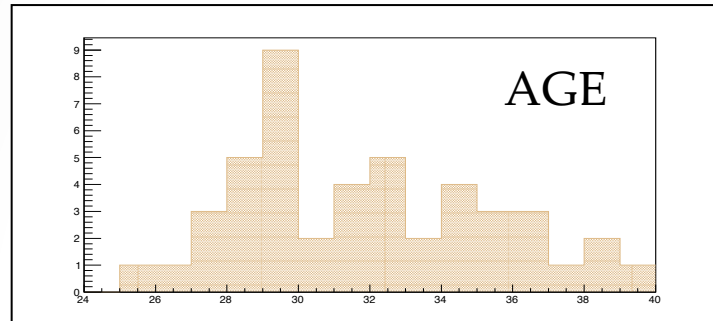
[Thanks to Dott. Lucio De Donno and his collaborators, for helping me in collecting my colleagues' opinion]

**(\*) Young researchers == PhD + PosDocs + Non-permanent researchers**

# Questionnaire

- After the summer, a questionnaire has been sent to young researchers working with INFN in the particle and astroparticle fields
- ~30 INFN PhDs+PostDocs (+ few non-permanent researchers) have sent feedbacks
- other italian PostDocs outside Italy have been reached by colleagues (~15 have answered)
- [ Few feedbacks received:
  - People too busy after vacation?
  - People feel that their contribution may be useless? ]
- Even if this is a small sample, their experience is certainly more interesting than my single opinion

# My sample: Age and Position



# Why high energy physics

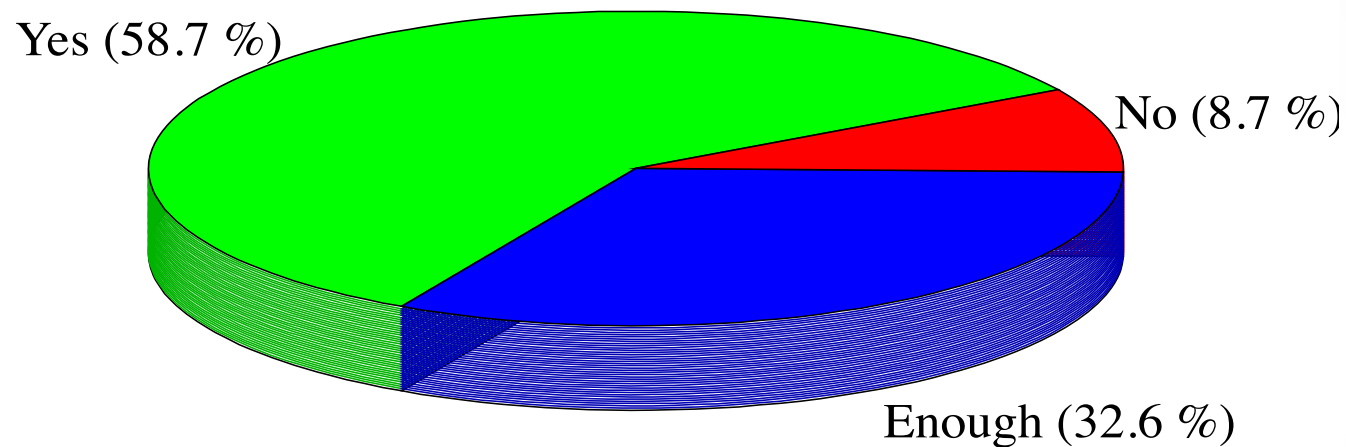
Most frequent answers:

- Interest on HEP developed during degree course
  - high level technology and particle detectors
  - specific physics subjects (Higgs physics, LHC experiments..)
- Interest on physics since high school
  - good physics teacher
  - passion and curiosity for the subject
- Visit to HEP Labs (mainly CERN) at high school or during the degree course



# Working in collaborations (I)

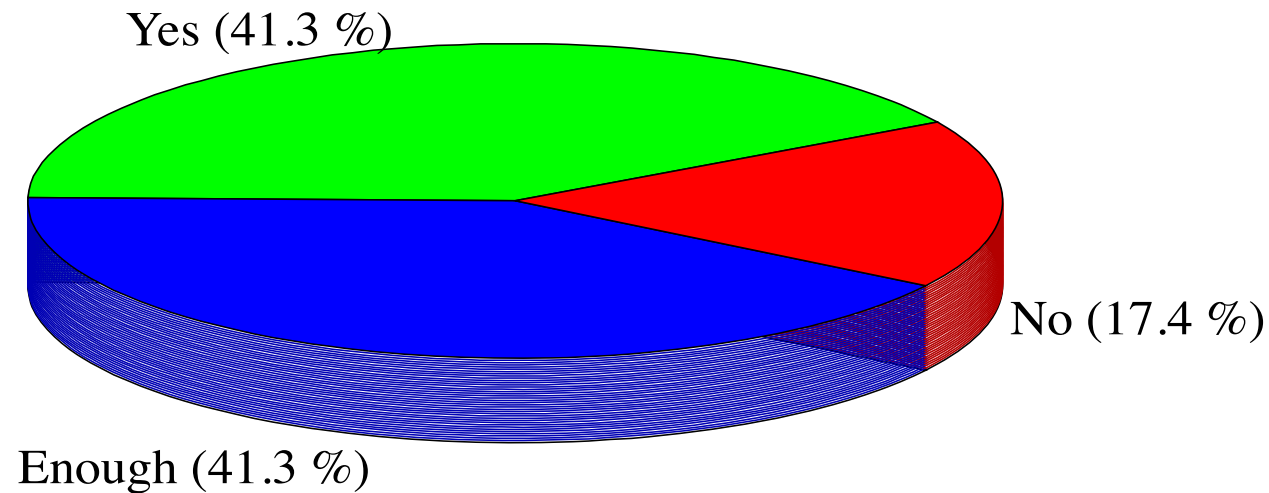
- Is the collaboration with other young researchers satisfactory?



- Comments:
  - fundings to join collaborators in other university/labs are sometimes scarce
  - the number of young researchers and HEP students is decreasing

# Working in collaborations (II)

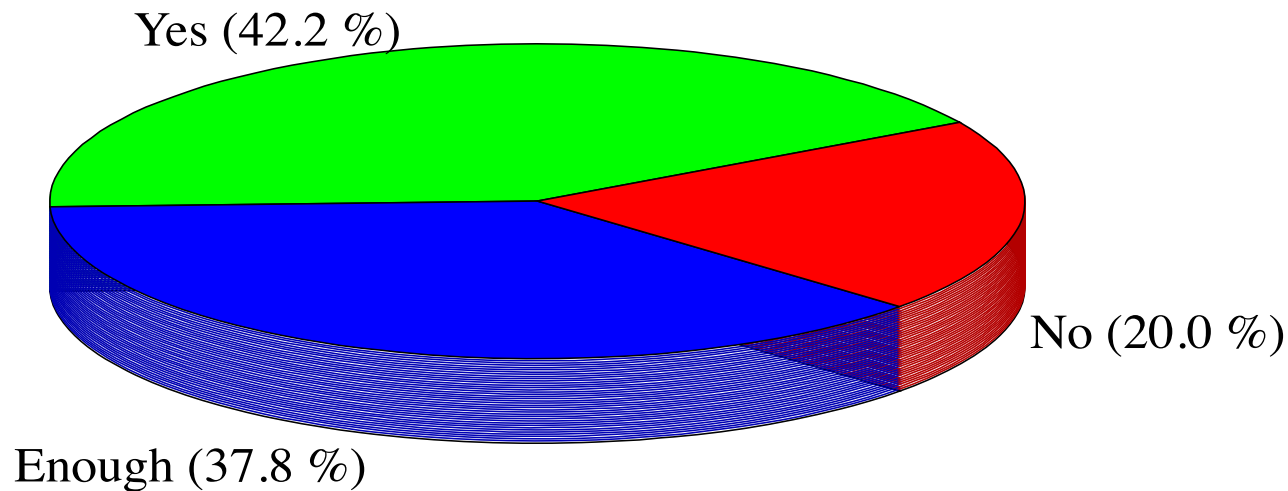
- Is the collaboration with staff personnel satisfactory?



- Comments:
  - the bigger the experiment, the harder the collaboration between staff and non-staff
  - staff personnel needs usually to take care of non-research activities which prevent them to be 100% available for research

# Working in collaborations (III)

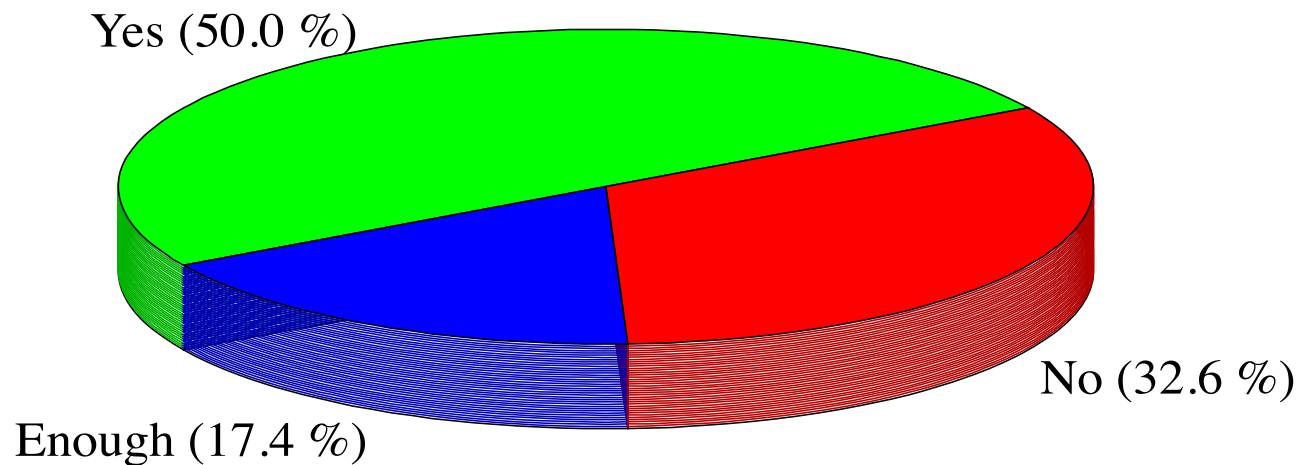
- Is the opinion of young researcher taken into account properly by groups or collaborations?



- Comment:
  - it depends from the collaboration and the group
  - most of the work is carried out by young researchers, but sometime their opinion doesn't receive the proper attention

# Working in collaborations (IV)

- Do you think being a young researcher prevents you from having responsibilities within your group or collaboration?



- Comment:
  - a young researcher can not guarantee continuity on long term tasks

# Being an Italian young researcher.. (I)

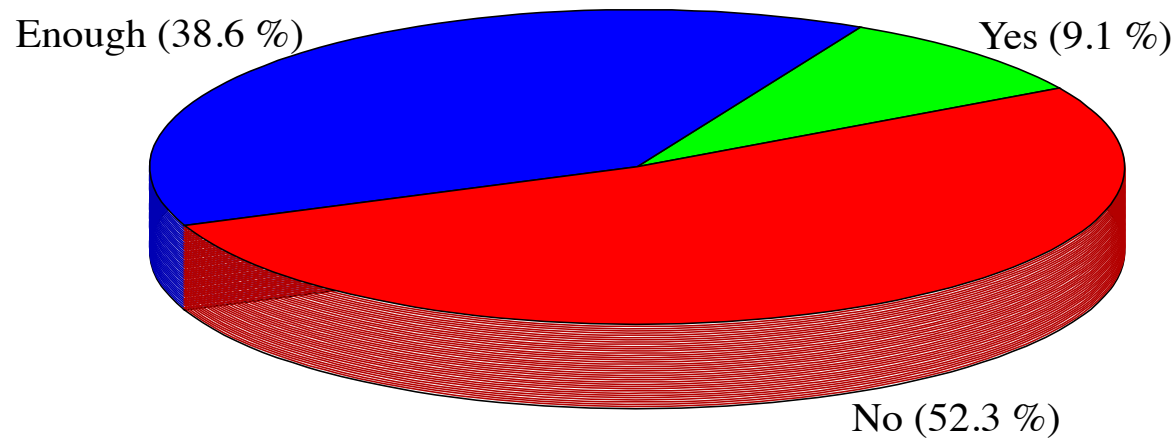
- Disadvantages wrt colleagues from other countries
  - economic conditions (i.e. some very good researchers leave the field for this reason)
  - longer period of temporary employment before having a permanent position wrt some other countries
  - difficulties on planning research activities and career steps, which translate in difficulties on having responsibility duties wrt same-age foreign colleagues
  - insufficient fundings to spend periods in labs and to participate to conferences
  - scarce synergy between University/INFN and industry
  - knowledge of other languages

# Being an Italian young researcher.. (II)

- Advantages wrt colleagues from other countries (in order of popularity)
  - college-preparation
  - none
  - devotion to research activities
  - working in group

# Scientific freedom

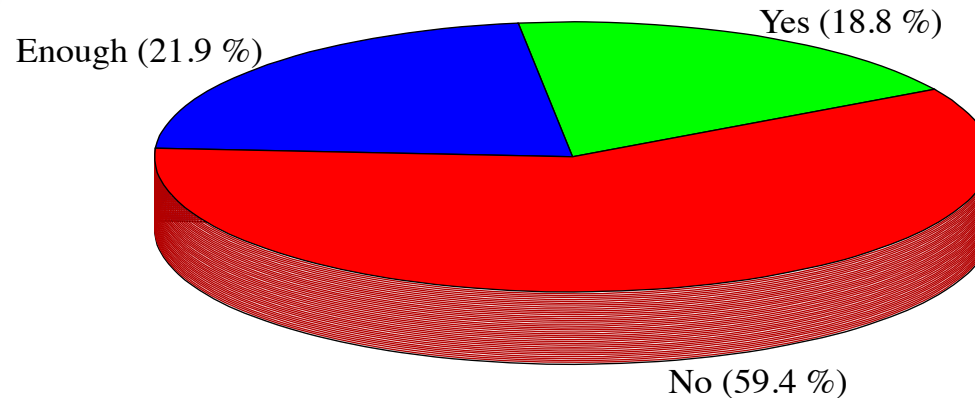
- Do you think that young researcher have scientific freedom?



- Comments
  - it depends on the attitude of the supervisor
  - the choice of the scientific activities is often driven by: the possibility of having a contract, the chance of having visibility within a group or a collaboration which may give the opportunity of a new position

# Salary

- Do you think your salary is adequate?



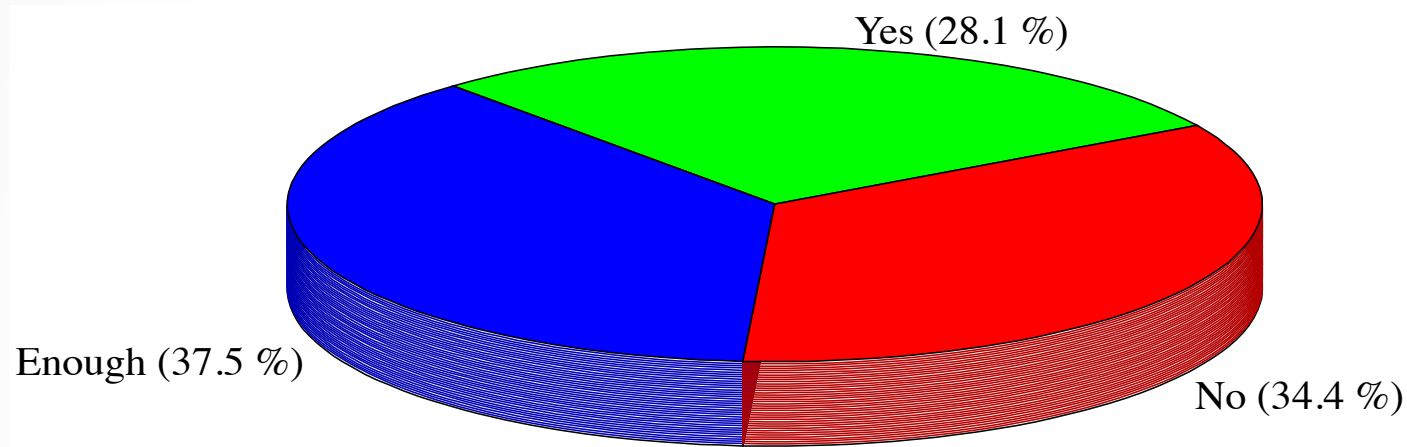
(Answers from colleagues working in Italy only)

- Comments:
  - for PhD and PostDocs, previdential care is not foreseen in a proper way
  - salary is often low if compared to the cost of living: family help is sometimes needed, hard to make plans for your own family, a house,..
  - Such a salary would be ok for a permanent position with real previdential care, stable working position, career upgrades
  - often, the amount of money compared to the amount of work is not enough
  - in Italy, the employment contract of a young researcher is often not even considered as a real contract (i.e. no chance of having a loan from a bank)



# Travel fundings

- Do you think travel fundings (conferences, meeting, period in labs) are enough ?



(Answers from colleagues working in Italy only)

- Comments:
  - almost all travel expenses are covered by INFN (both for University and INFN PhD, PostDocs,..)
  - there has been a significant reduction of such fundings in the last few years
  - reimbursement may take a long time (from 1/2 months to 1 year!!)
  - with recent reimbursement rules, not all the expenses are covered

# Physicists outside the research field

- In which fields, other than research, do you think you can find an employment?
  - information technology and programming
  - medical physics
  - finance
  - industry (activities related to solid state physics)
  - teaching
  - renewable energy field
- In Italy now is really hard for a HEP young researcher (for everybody actually..)to find a position in the aforementioned fields and just non-permanent position are offered at best
- More opportunities may be found abroad

# Future perspectives

- What would you like to do in the future?

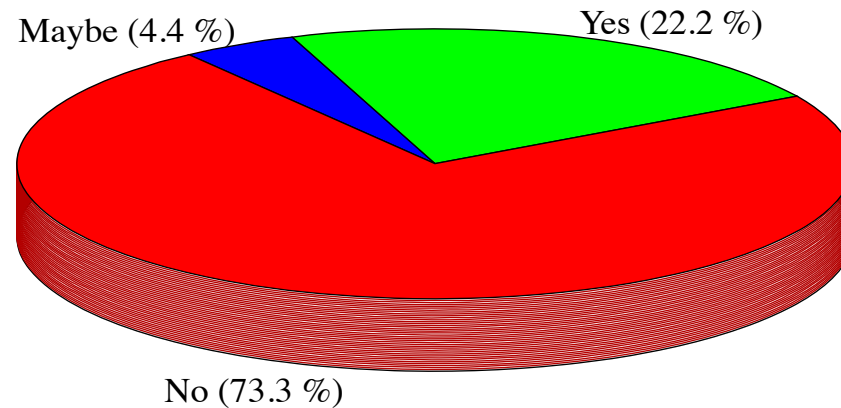
As expected, almost everybody has answered:

**HAVE A PERMANENT POSITION AS A RESEARCHER**

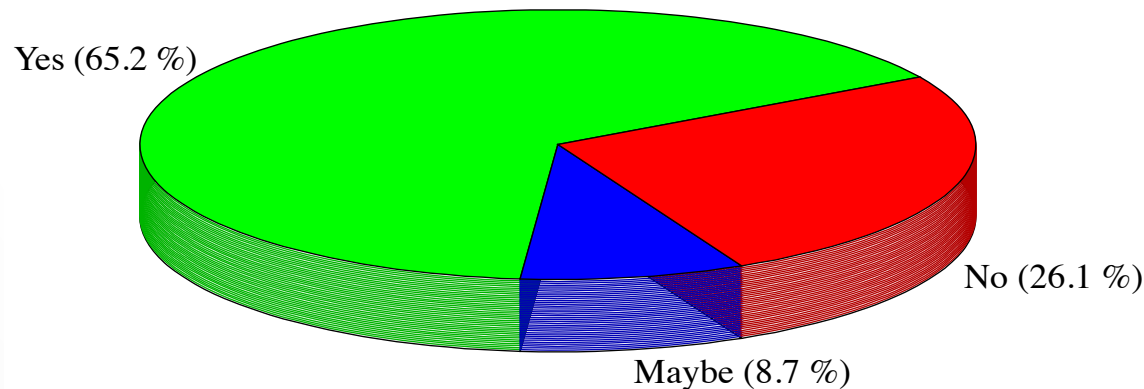
- Along with this my colleagues would like to:
  - Reach economic and geographical stability (Italy would be preferred)
  - Obtain a position without having to interrupt the scientific activities to participate to long and exhausting selection procedures
  - Complete the scientific activities in which one is involved since a long time and for which has invested time, intellectual resources, ..

# Future perspectives with a look to the past

- Do you think you'll obtain the position you aim at?

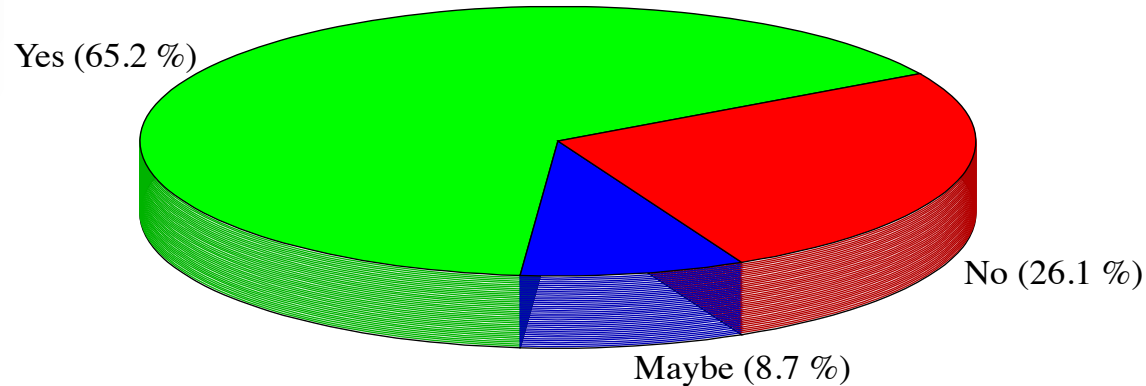


- In the light of your experience, would you choose this field again?



most of the RED turn to GREEN....

# Would you choose this field again? Why?



- for passion
- because it is gratifying
- because it is stimulating and challenging
- because it is a personally enriching experience
- because, in the end, you can also do it abroad...

- Necessity of
  - stable working position
  - stable economic conditions
  - possibility of making personal life plan (before one gets too old)

# Conclusions

- INFN benefits of the work of a very large group of young researchers
- They work with a lot of passion..aware of the fact that they have a poor chance of having a permanent position in the research field
- Even if they don't consider their position to be completely satisfactory, in most of the cases they would choose this field again
  - rationality, largely used in our daily work, is overcome by passion
- Well defined recruitment procedures and schedule are mandatory to make reliable career and personal life plans
  - if this doesn't happen, Italy will lose motivated young researchers, for whose education the state itself has spent a lot of resources
  - also for this reason foreign colleagues are not encouraged to enter the Italian research system, while many Italian young researchers decide to go abroad
- A strong synergy between University/INFN and industry would be desirable
  - in Italy industries rarely foresee research and innovation activities, for which qualified PhD or PostDocs are requested