

Theoretical Particle Physics in Spain

A brief overview and some comments

**RECFA Meeting,
Madrid 2011**

Alberto Casas

Instituto de Física Teórica,
IFT-UAM/CSIC, Madrid

- Human Resources
- Funding
- Research
- Conclusions

Human Resources

Since the last RECFA Meeting (2003) there has been a notable increase of the TH community in Spain

	2003	2011
permanent	151	198 (30% ↑)
RyC tenure track	22	32 (50% ↑)
postdocs	25	65 (260% ↑)
PhD students	90	115 (30% ↑)
Total	292	410 (40% ↑)

Based on FPA (Plan Nacional) data

The most positive aspect

The largest proportional increase corresponds, by far, in postdocs (260% ↑). **It was badly needed.**

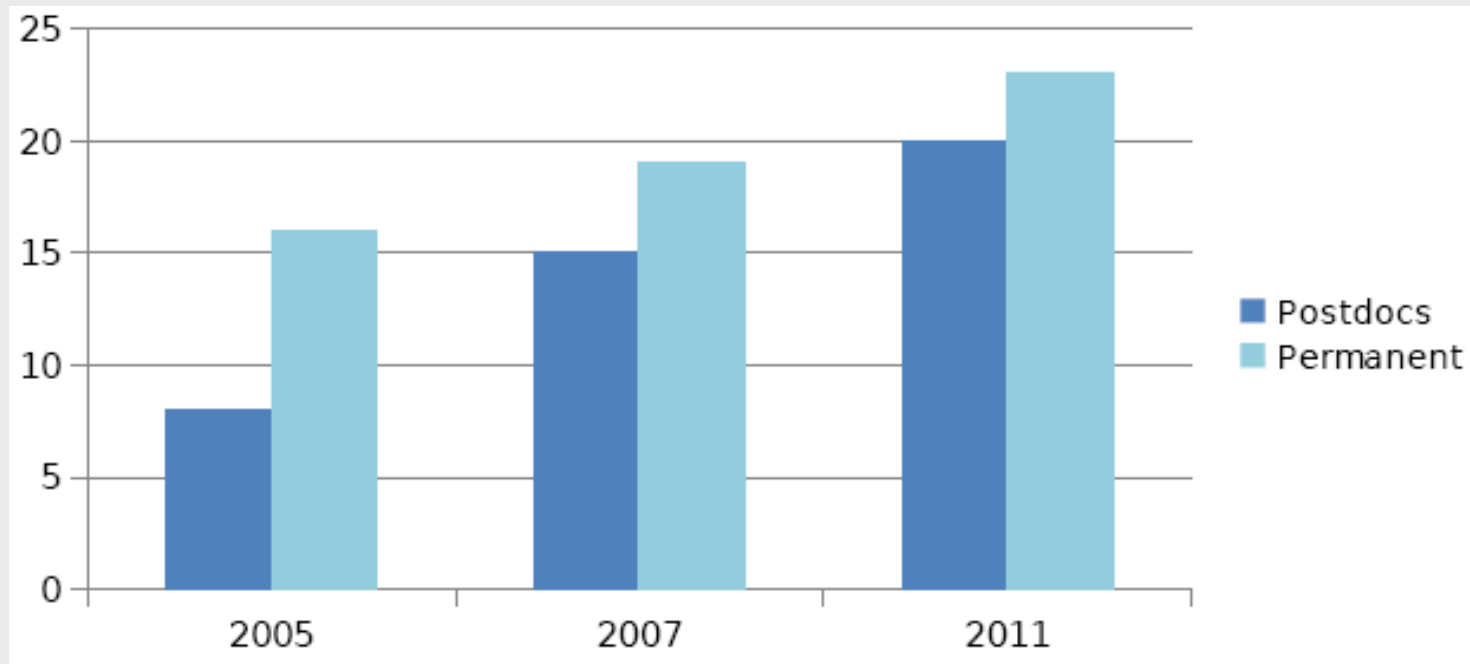
This has occurred thanks to significant improvements in the science system along these years

- Part of the FPA funding was allocated for postdocs associated to the projects
- Juan de la Cierva program (MICINN)
- Postdoc programs of the CSIC (“JAE-doc”)
- Consolider Programs: CPAN, MultiDark, PAU, etc.
- Postdoc programs supported by autonomous communities (e.g. ICREA in Cataluña or Comunidad de Madrid programs)
- European networks

etc

Example:

Small Statistics in my Institute: IFT-UAM/CSIC



But since 2009 the growth is almost frozen due to the crisis...

A worrying aspect

Ramón y Cajal (RyC) contracts were conceived as ~ tenure tracks

They have been very useful to attract very good young researchers (~ 30-35 y/o) to Spanish institutions.

However

- The “rules” to get established are not clear. Sometimes there are not even any rules. And everything depends a lot on the institution and on the year.
- E.g. in the CSIC essentially there is no commitment at all with RyCs. During the “good years” before the crisis, RyC people had very reasonable chances to get a permanent position. But now, there are very few permanent jobs offered.



- Very good researchers in the most productive range of age do not have a reasonable future ahead.
- Now many RyCs, especially the best ones, seek stabilization abroad.

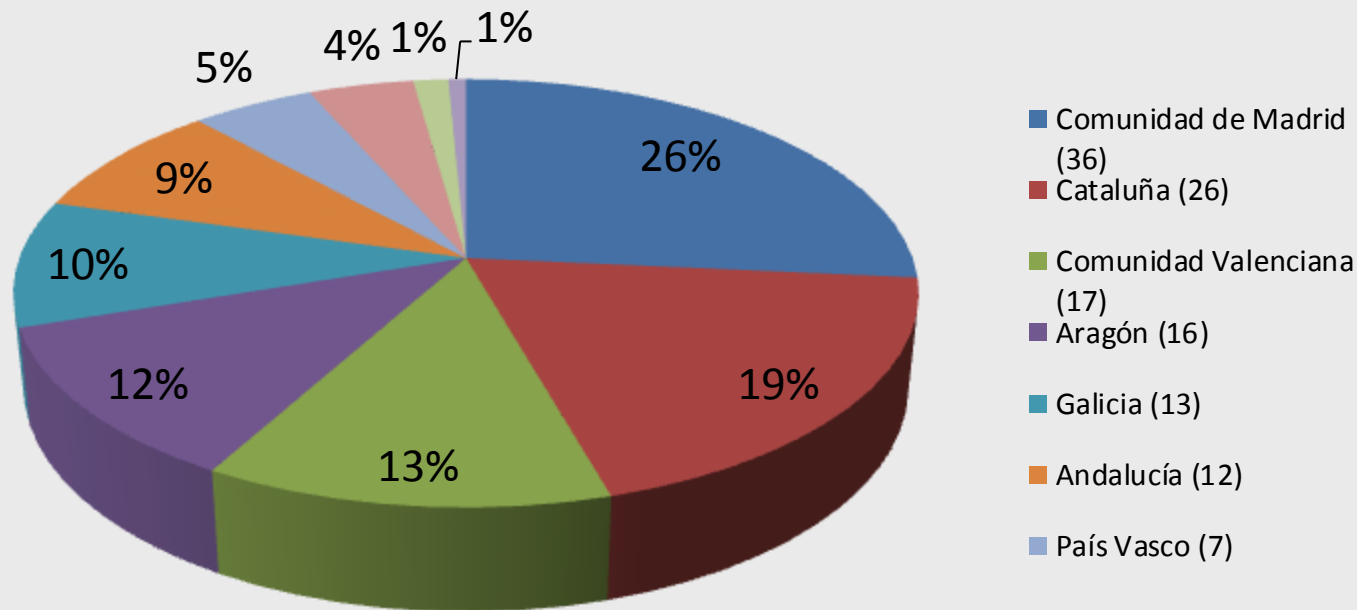
It seems pretty clear that the number of RyC contracts and the possibilities of estabilization of a reasonable number of them should be harmonized

Other “sociological” aspects

The (theoretical) research in particle physics is concentrated around **Madrid, Barcelona and Valencia**, representing more than 60% of total.

There are also very important groups in Zaragoza, Granada and Santiago.

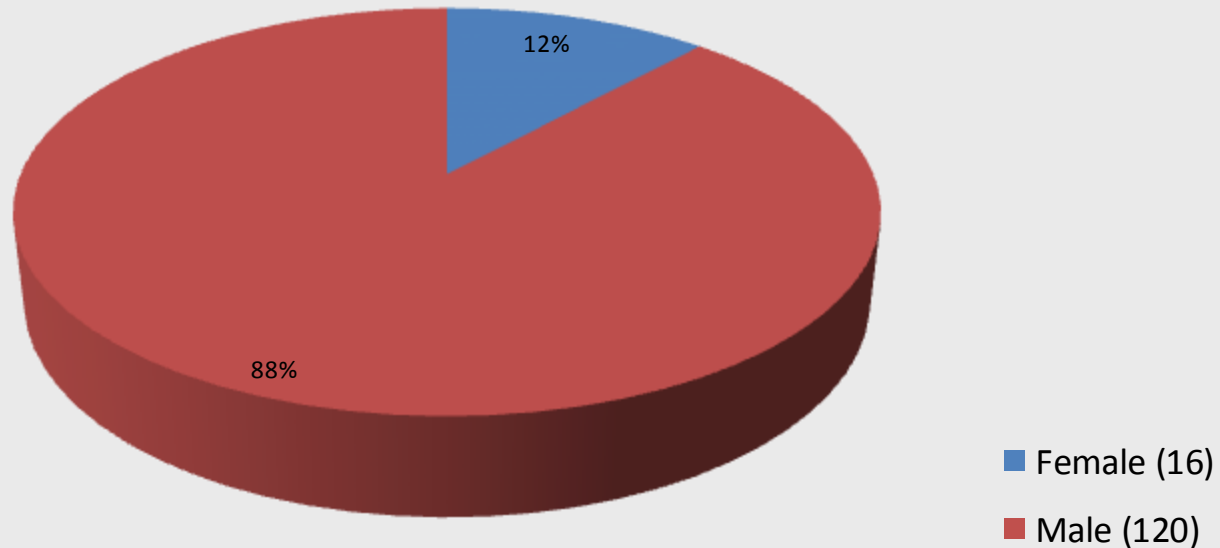
And much smaller groups in Santander, Oviedo, Basque Country, Murcia, ...



Other “sociological” aspects

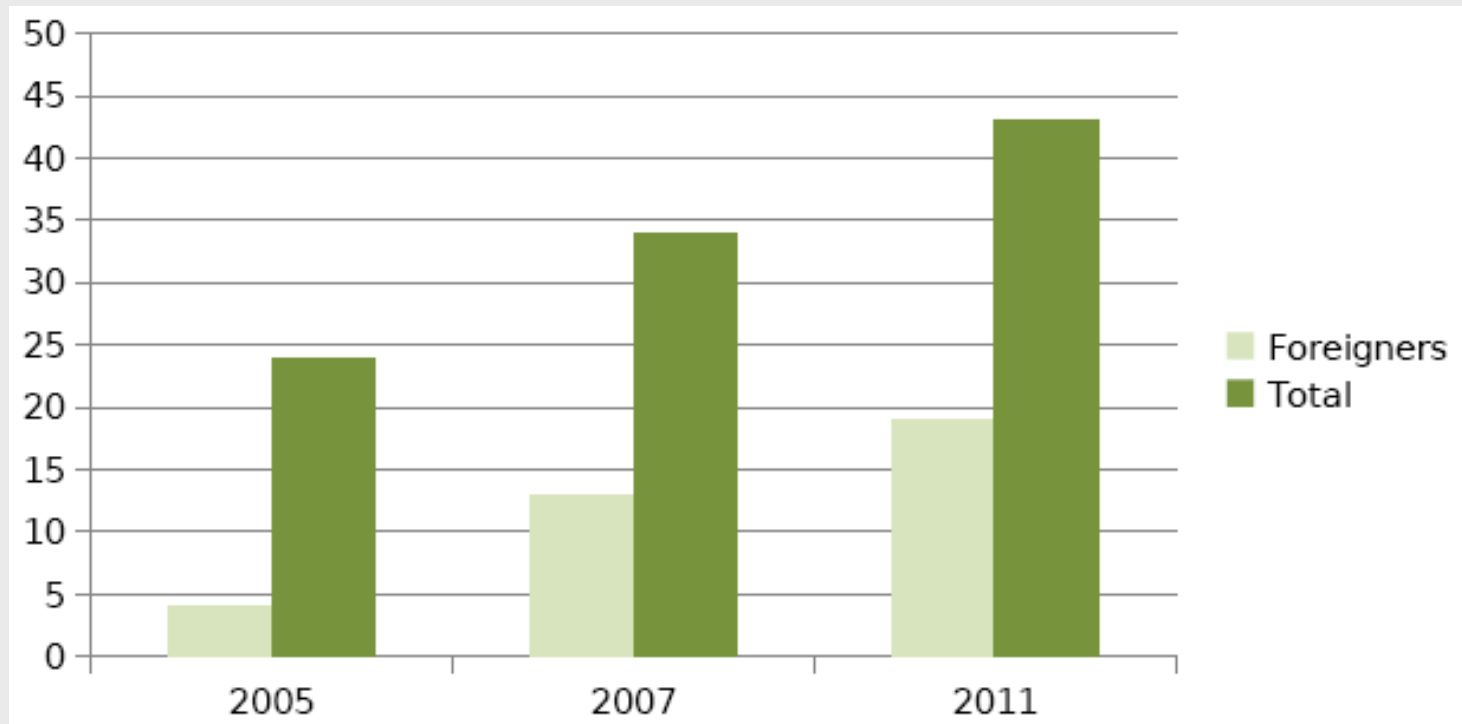
Number of women researchers continues to be small

**Distribution of TH-CPAN researchers
by Gender
Total=136**



Other “sociological” aspects

Number of foreign researchers has increased



IFT statistics

Funding

From 2003 to 2008 continuously increasing financial support from Plan Nacional and other sources (e.g. CSIC).

This has come to a standstill or even dropped due to the economical crisis

Details in F. del Aguila's talk...

Still present funding seems quite reasonable to do research, despite the cuts in the last years.

...except for administrative and computing management support... **badly needed !**

Funding

Important fact: **New** sources of funding, focussed on **excellence**

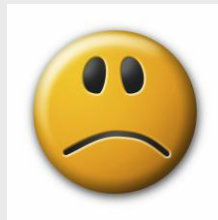
- Programs of “**Comunidades Autónomas**”. E.g.
 - Cataluña: ICREA
 - Madrid: IMDEAs (not in Particle Physics) + Comunidad Projects
- **Consolider** Ingenio Program: CPAN, CUP, PAU, MultiDark, It provides, in average ~ 1 ME/year for each net of groups during 5 years.
- “**Campus of Excellence**” Program: UAM+CSIC, UAB, ...

Funding

Important fact: **New** sources of funding, focussed on **excellence**

- **CSIC** programs: i-link, EQUIPA, etc. (mainly cut due to the crisis)
- “**Centros de Excelencia**” program.

Two days ago it was decided: although there were three institutes related to HEP among the final 22 finalist (IFT, ICC, IFAE), none has been finally selected



This year we have inaugurated the new building in the UAM campus for the IFT and the Institute of Mathematics



IFT Building

The new building has ~ 100 offices and several seminar rooms, library, etc.

Its construction in the UAM campus has been financed by the CSIC.



Official Inauguration, 19-Sep-2011

Research

Spanish production in Theoretical Physics has good, even **excellent**, numbers.

Scientific Publications
(CERN SCOAP³ Study Group)

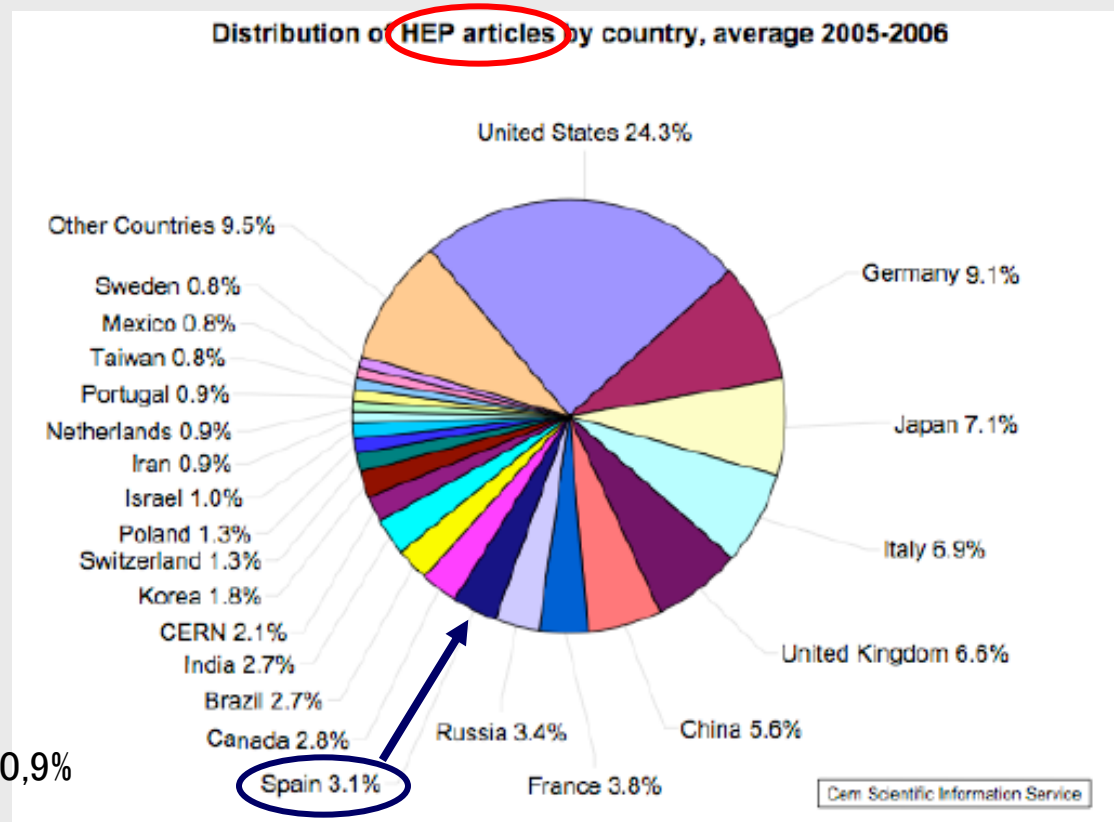
Spain 9th in ranking

Spanish Theoretical Phys
publication rates and impact are
in good position

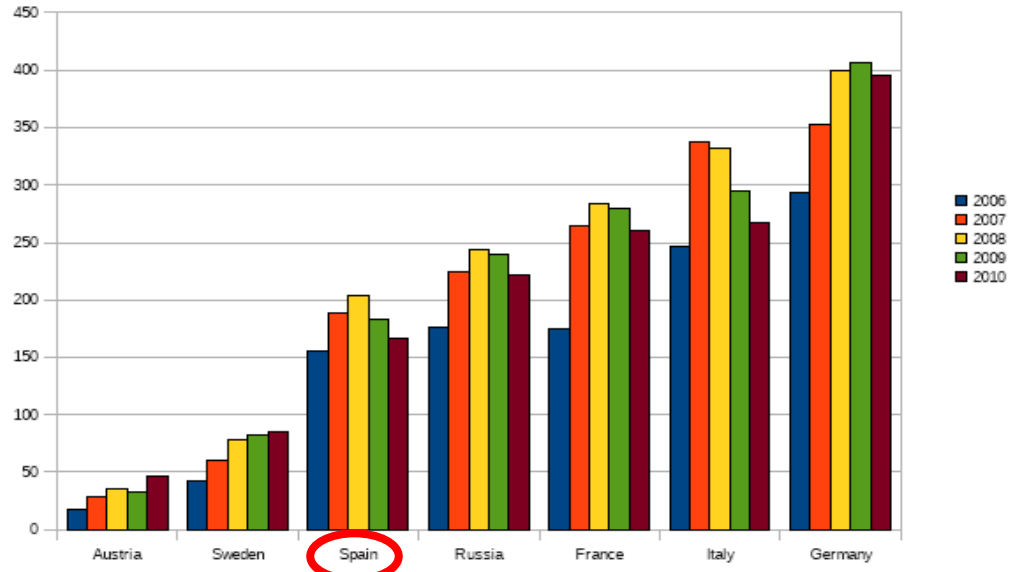
(from Fuster' s talk PNFFPA Sep 2009)

N(authors)<10 (mainly theory): **Spain 3,2%**

N(authors)>10 (mainly experiments): Spain 0,9%



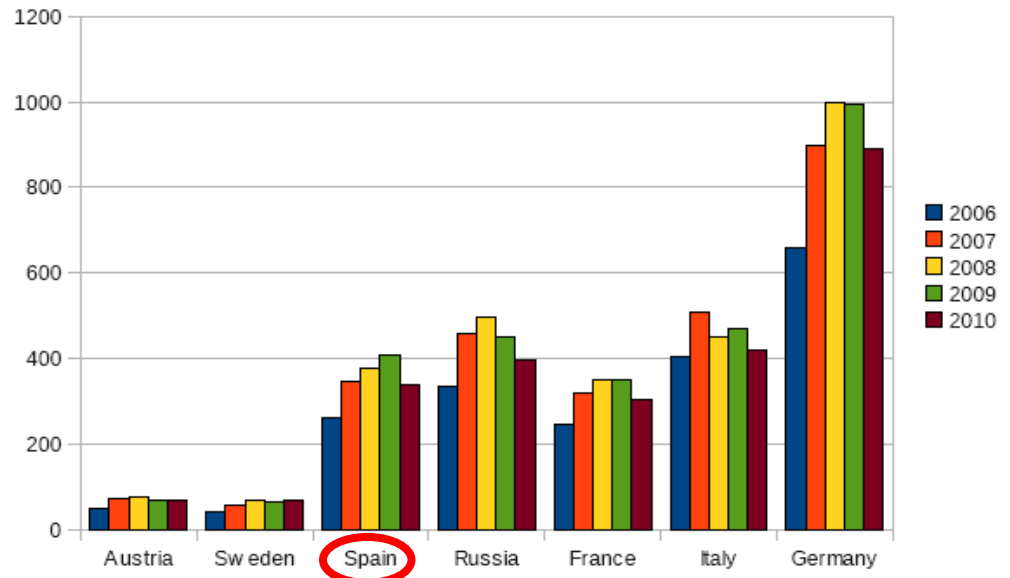
HEP-th # papers



Comparison of # papers in HEP-th and HEP-ph of Spain vs. other European countries

Impact numbers are analogous

HEP-ph # papers

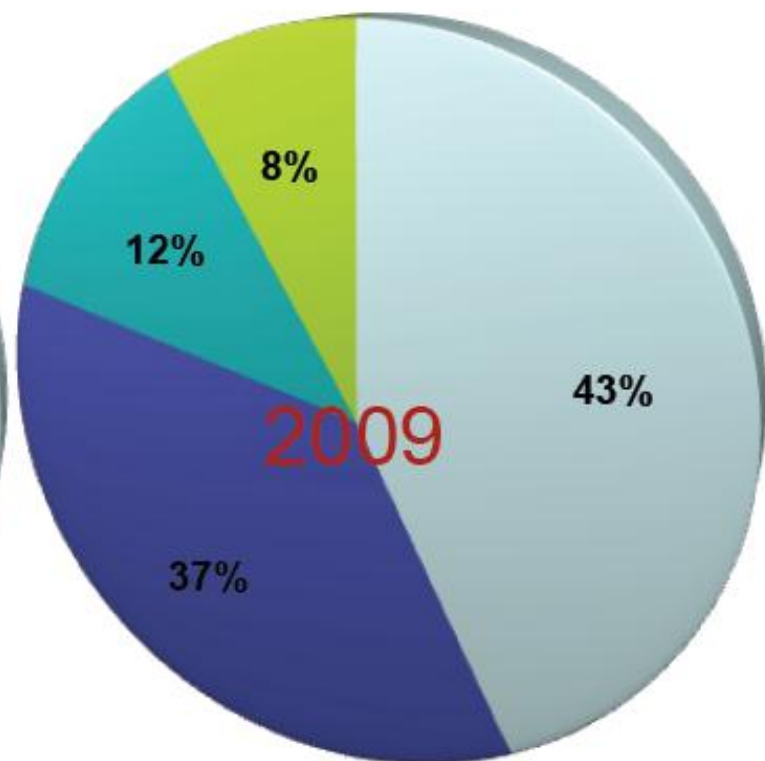
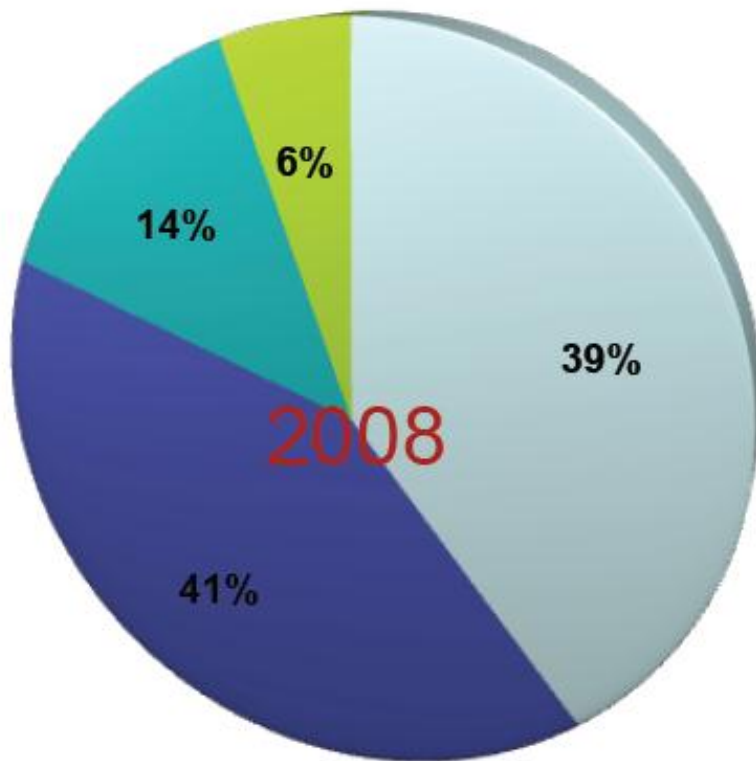


Spain has slightly more relative weight in TH, but it is slowly gaining more weight in PH

After 2009 there is a general decreasing

Source: InSpire

This is also visible in CPAN statistics of researchers



Madrid, October 2010

F. del Águila
Universidad de Granada

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Research

- The Spanish community of Theoretical Physics is moving from more formal and mathematical developments to phenomenology and also astroparticle/cosmology.
- This is clearly a healthy response to the start of the LHC and also relevant astro/cosmo observational projects.
- Still, the theoretical particle physics community has to get more involved in LHC physics, e.g. collaborating with LHC experimentalists in analysis and physical interpretation of present and future LHC data.
- Some nice examples of such collaboration are already on the way.
- CPAN networks, like LHC-net, have become very useful forums for Theory/Experiment interaction

Theoretical Particle Physics in Spain

Minimalistic SWOT and conclusions

Strengths

- Excellent and competitive research in Theor. Particle Physics
- Very attractive and active groups in several cities

Weaknesses

- More interaction theory/experiment needed (but it is improving)
- Need of a clear scientific career to attract outstanding (especially young) researchers

Theoretical Particle Physics in Spain

Minimalistic SWOT and conclusions

Opportunities

- Good experimental groups around to interact with.
- Potentially, there is a lot of “wisdom” and expertise to play a major role in the physical interpretation of LHC data

Threats

- Decreasing funding support for basic science in difficult economic times