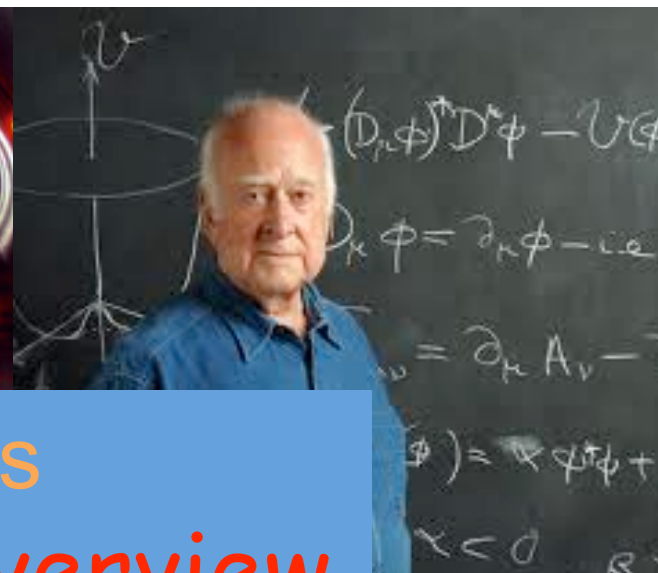
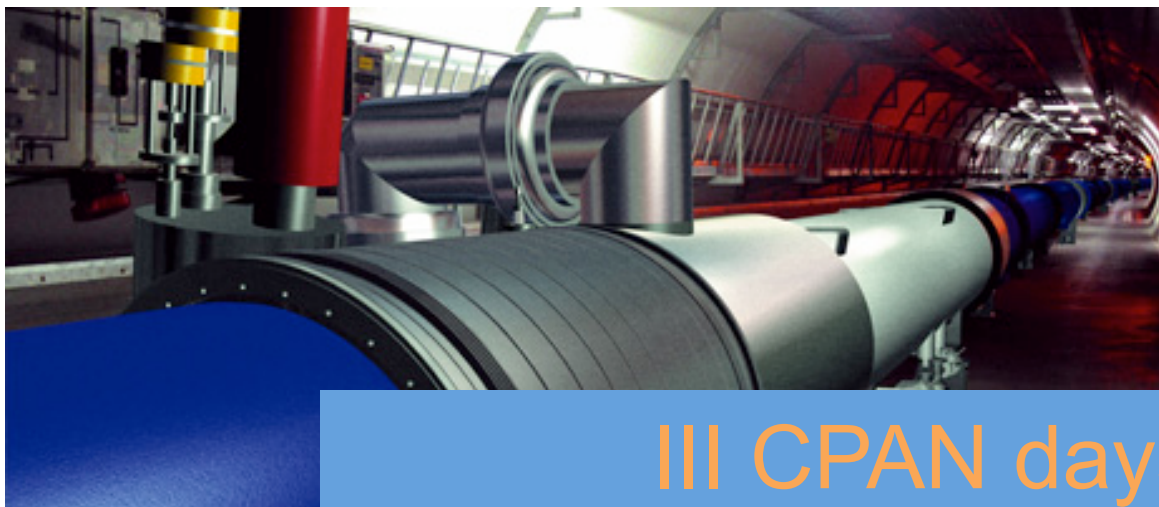
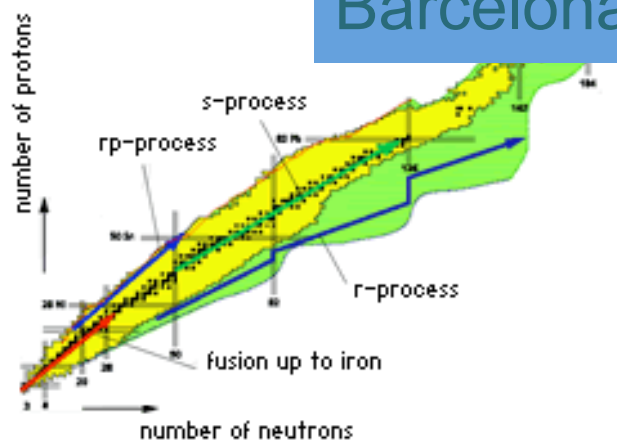




III CPAN days

Barcelona 2011: **FPA overview**



Francisco del Águila,
 María José García Borge,
 Inés Fernández (especialista en documentación)

November 4, 2011



HEP Research in Spain

Areas covered by the program FPA

Particle Physics

Experiment (all) & Theory (all)

Nuclear Physics

Experiment (all) & Theory (some)

Astroparticle Physics & Cosmology

Experiment (most) & Theory (some)

Information Technology

GRID, e-Science (all)

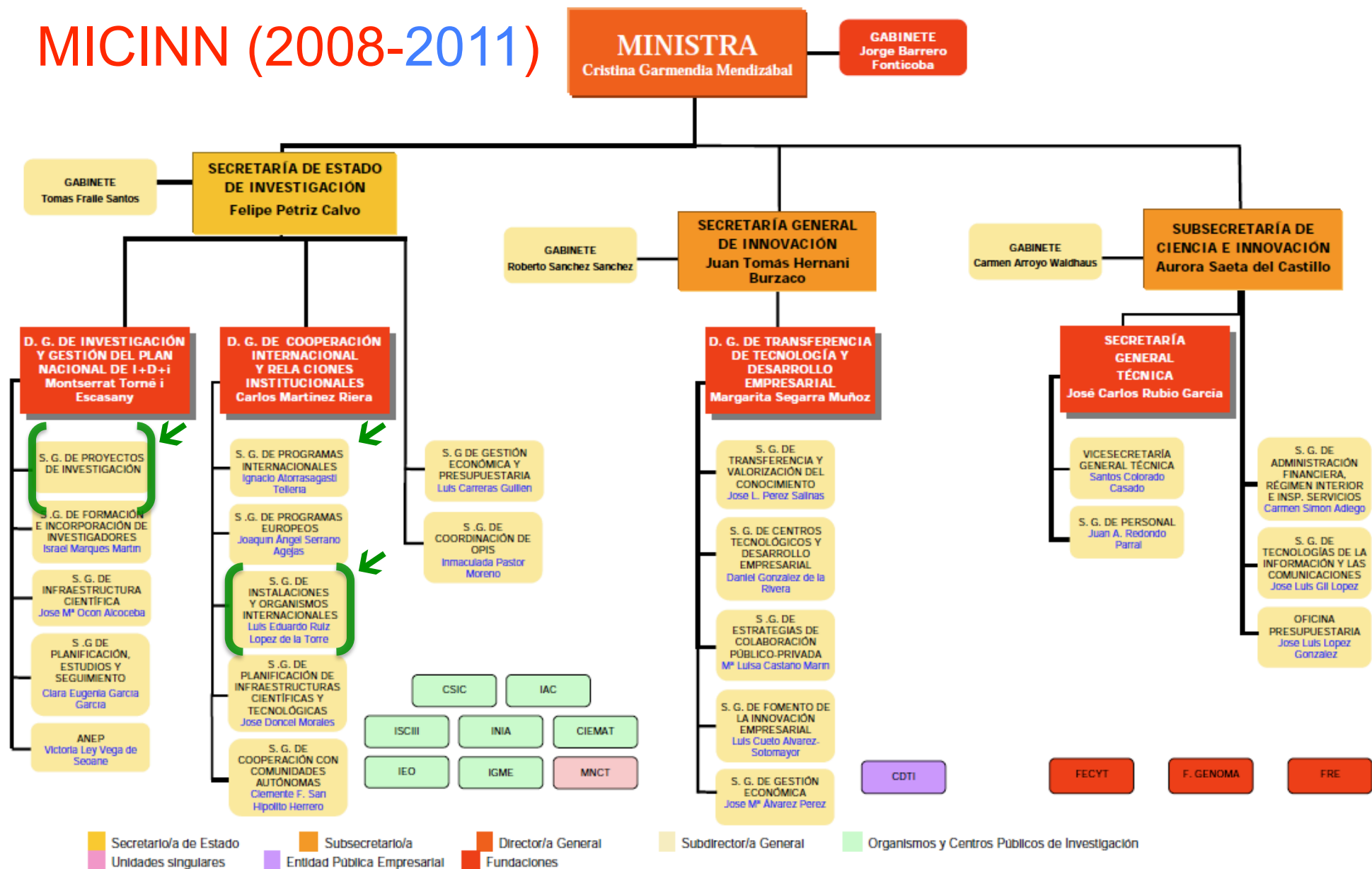
R&D in Accelerators and Detectors

(most)

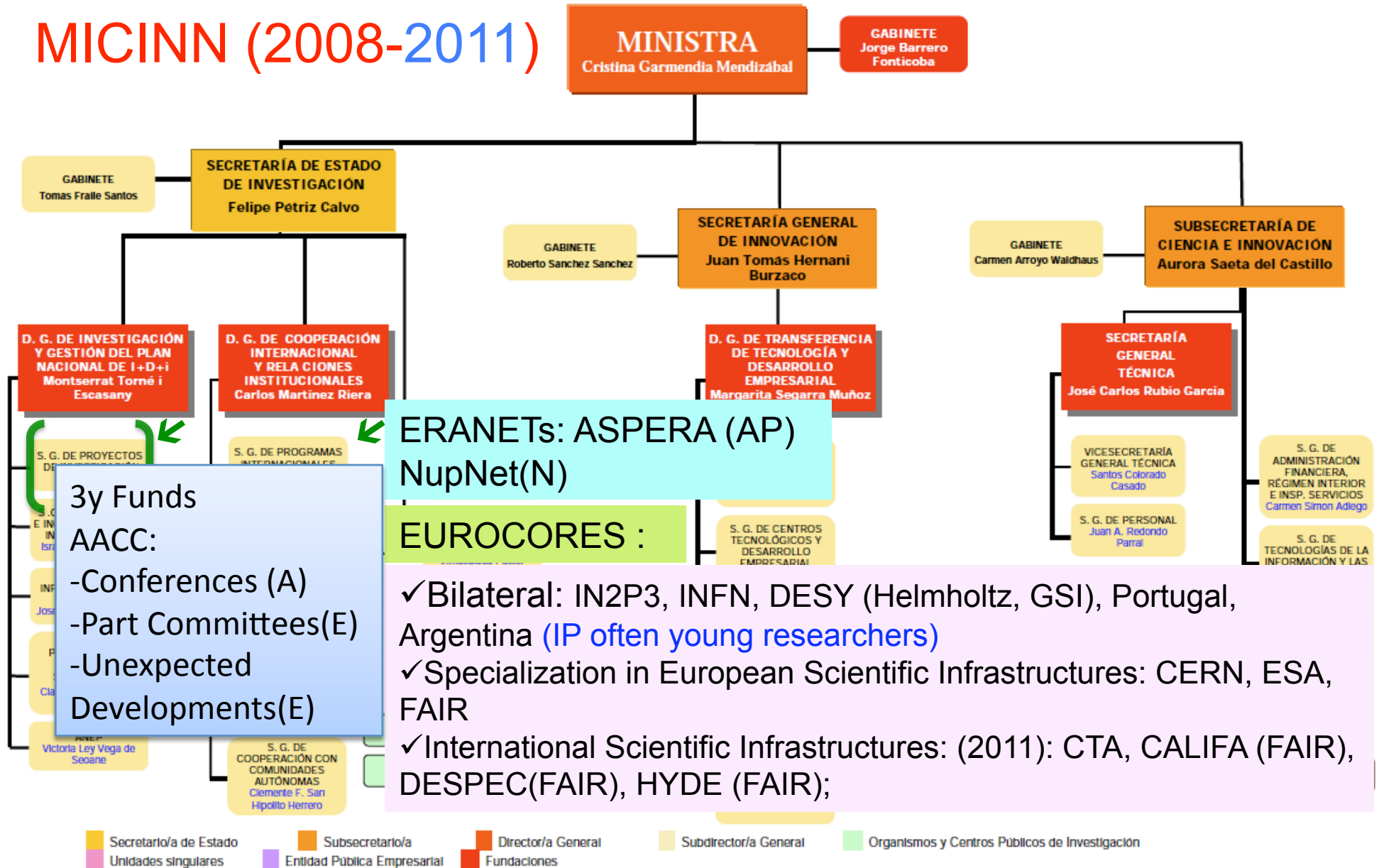
Physics Applications

Medical Physics (some)

MICINN (2008-2011)



MICINN (2008-2011)





El Plan Estatal de Investigación Científica y Técnica

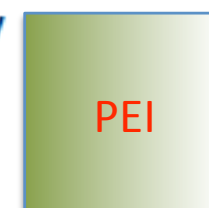
RESEARCH **Agency (2012-)**

CDTI INNOVATION

Proyecto de *Ley de la Ciencia, la Tecnología y la Innovación*



Título IV: Fomento y coordinación de la investigación científica y técnica en la Administración General del Estado



Artículo 41: Plan Estatal de Investigación Científica y Técnica

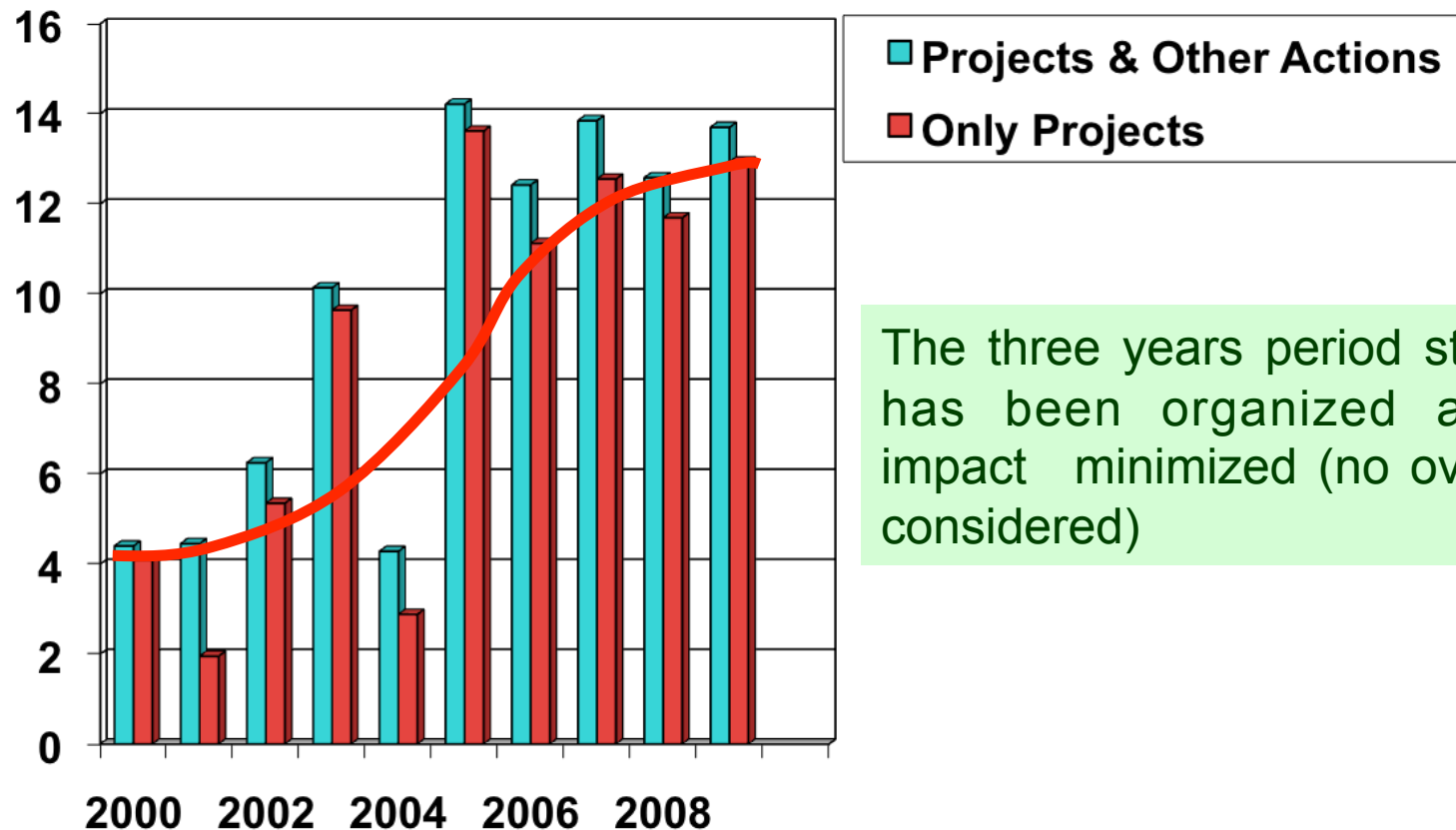


El desarrollo por la Administración General del Estado de la Estrategia Española de Ciencia y Tecnología se llevará a cabo a través del Plan Estatal de Investigación Científica y Técnica.



(2011)

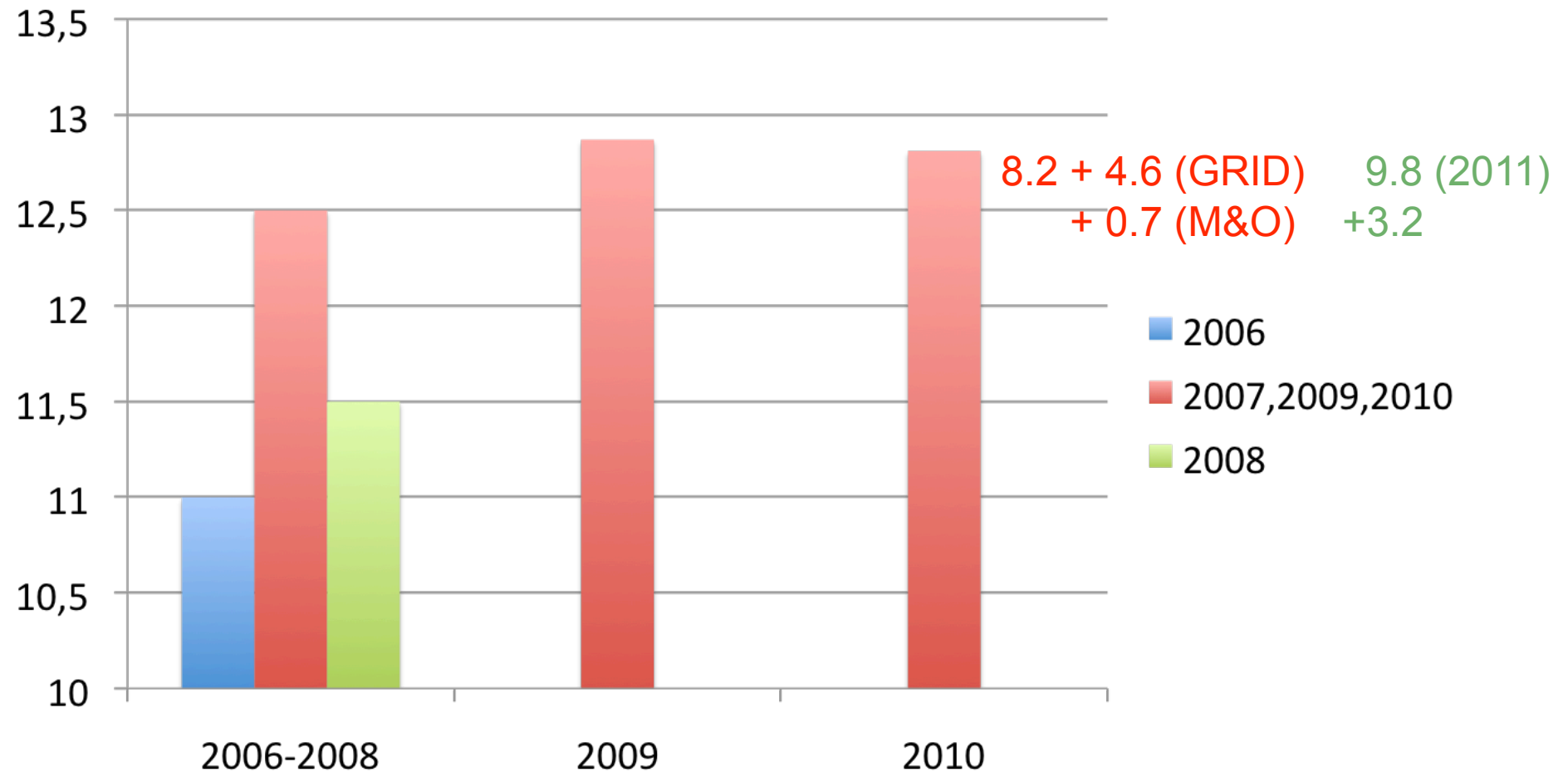
FPA Funding from PNIDi+DGInt



The three years period structure has been organized and its impact minimized (no overhead considered)

- Only Direct/Operational cost funding is shown (equipment, travelling, personnel). MICINN contributes additional 21% overheads
- Complementary Actions: MoUs, conferences, strategic actions **CONSOLIDER**
- 5th contributor to the CERN budget (8,5% ~60M€, 2009)

Funding in Million €, without overheads [21 %] (Research projects)



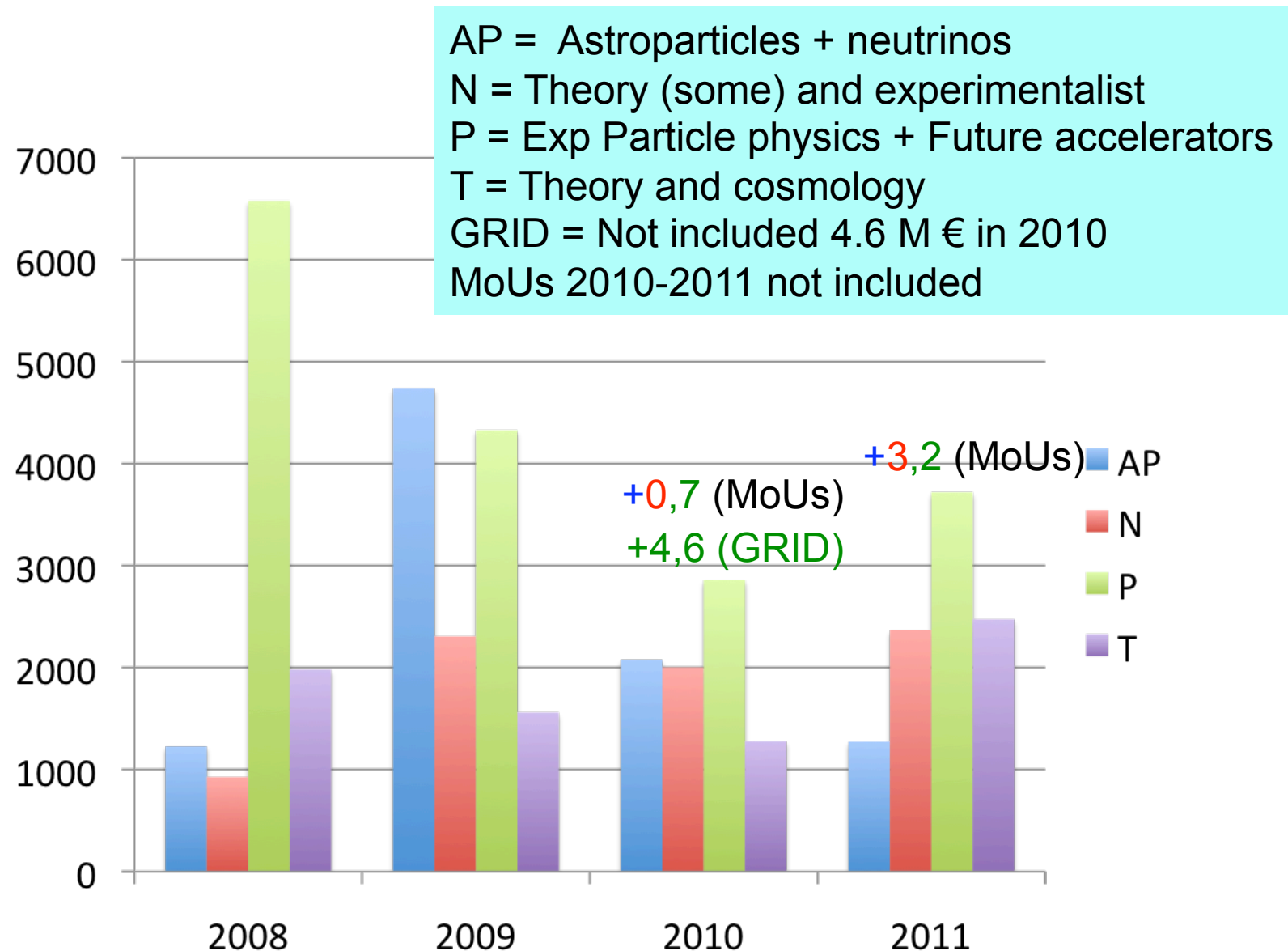
CONSOLIDER funding

(Program of 5 years projects, starting in 2006 and ending last year)

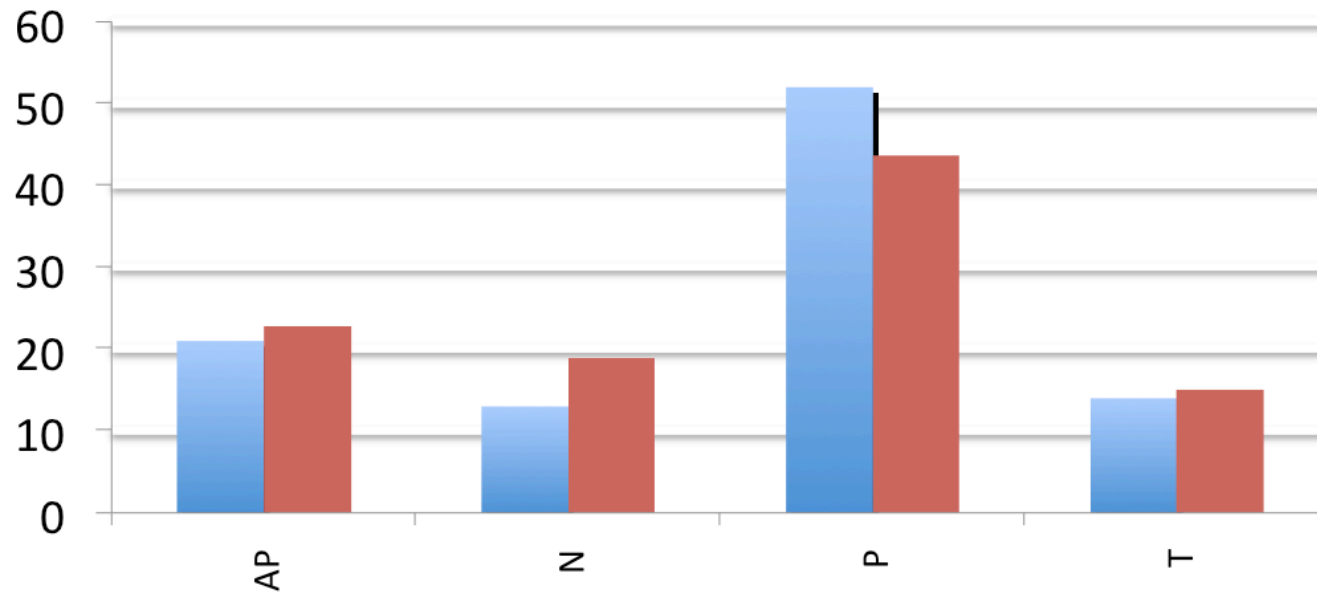
- CSD 2007-00042, Centro Nacional de Física de Partículas, Astropartículas y Nuclear (CPAN), IFIC, 10.000.000 €
- CSD 2007-00060, Physics of the Accelerating Universe, IFAE, 5.000.000 €
- CSD 2008-00037, Canfranc Underground Physics, UB, 5.000.000 €
- CSD 2009-00064, Multimessenge Approach for Dark Matter Detection, IFT, 3.200.000 €

**All together 20 M € per year + CCAA + CERN contribution
(+ Infrastructures + human resources programs + salaries, etc.)**

Total Funds distributed by Subareas (k €)



Funding distribution [%] (Research Projects)



AP = Astroparticles + neutrinos

N = Theory (some) and experimentalist

P = Exp Particle physics + Future accelerators + GRID

T = Theory and cosmology

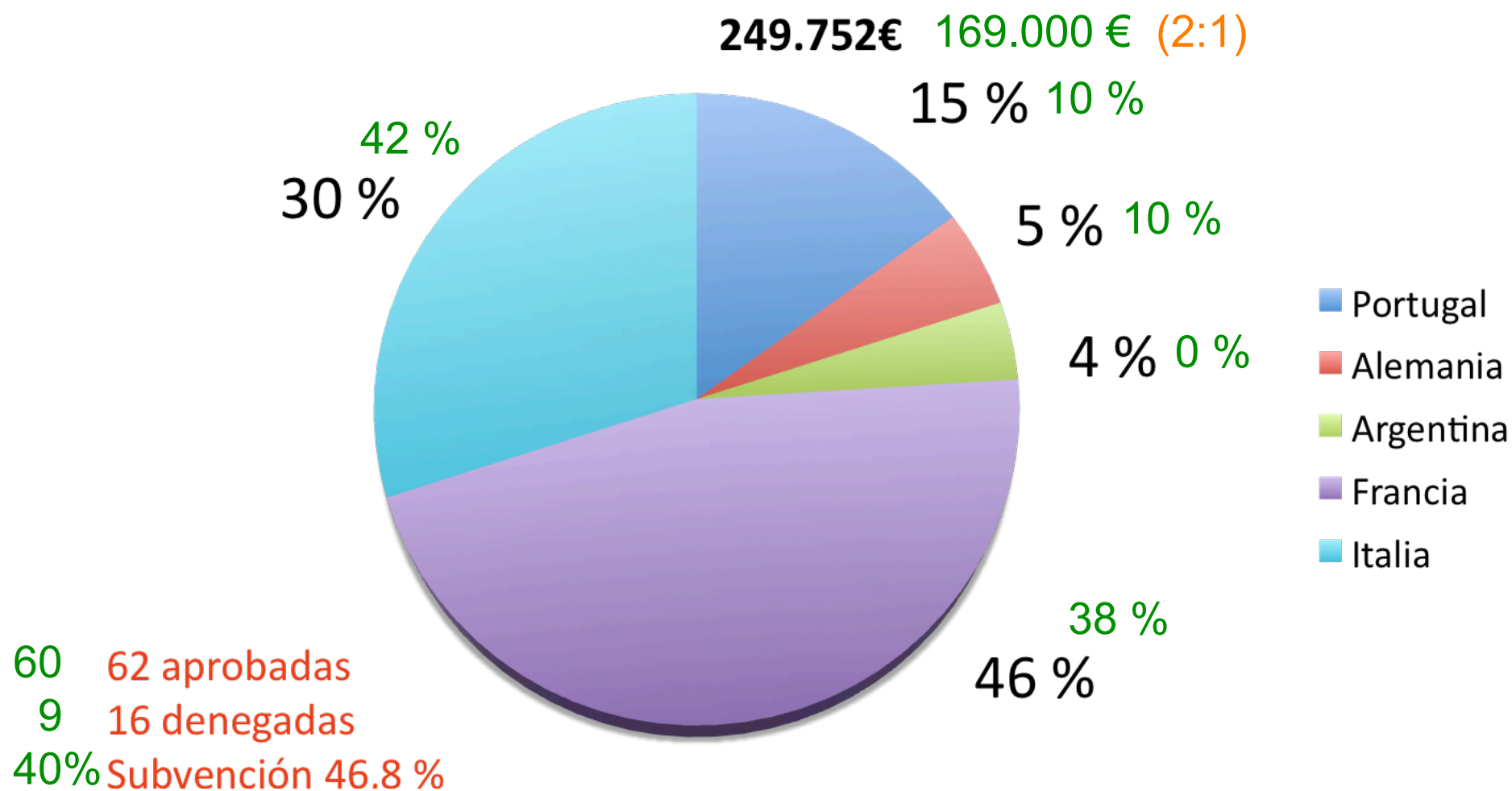
MoUs 2010-2011 not included

2006-2008 CERN: 65 %

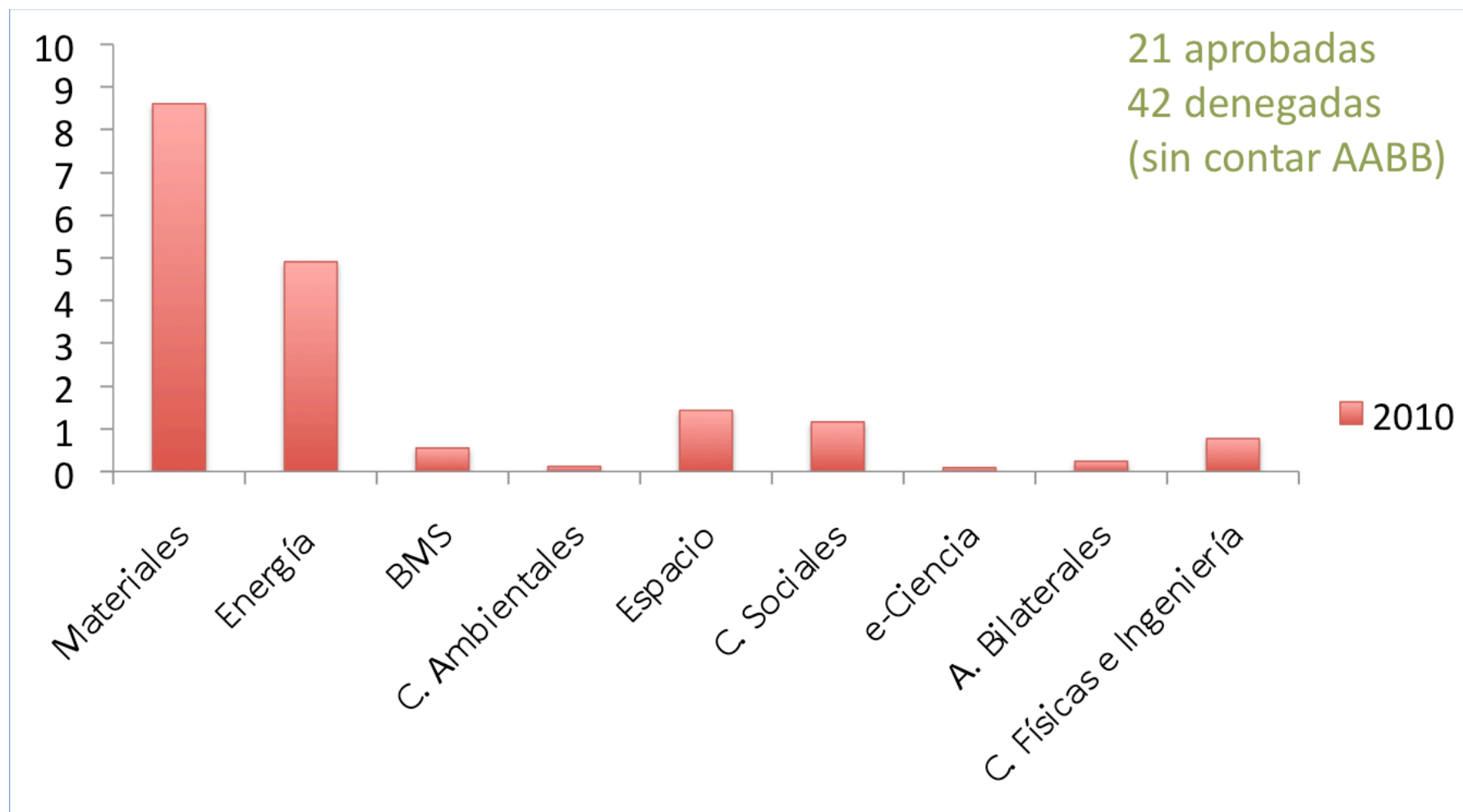
2009-2011

Acciones Bilaterales 2010 2011

(Programa de Internacionalización)



Financiación en millones de € (Programa de Internacionalización 2010)

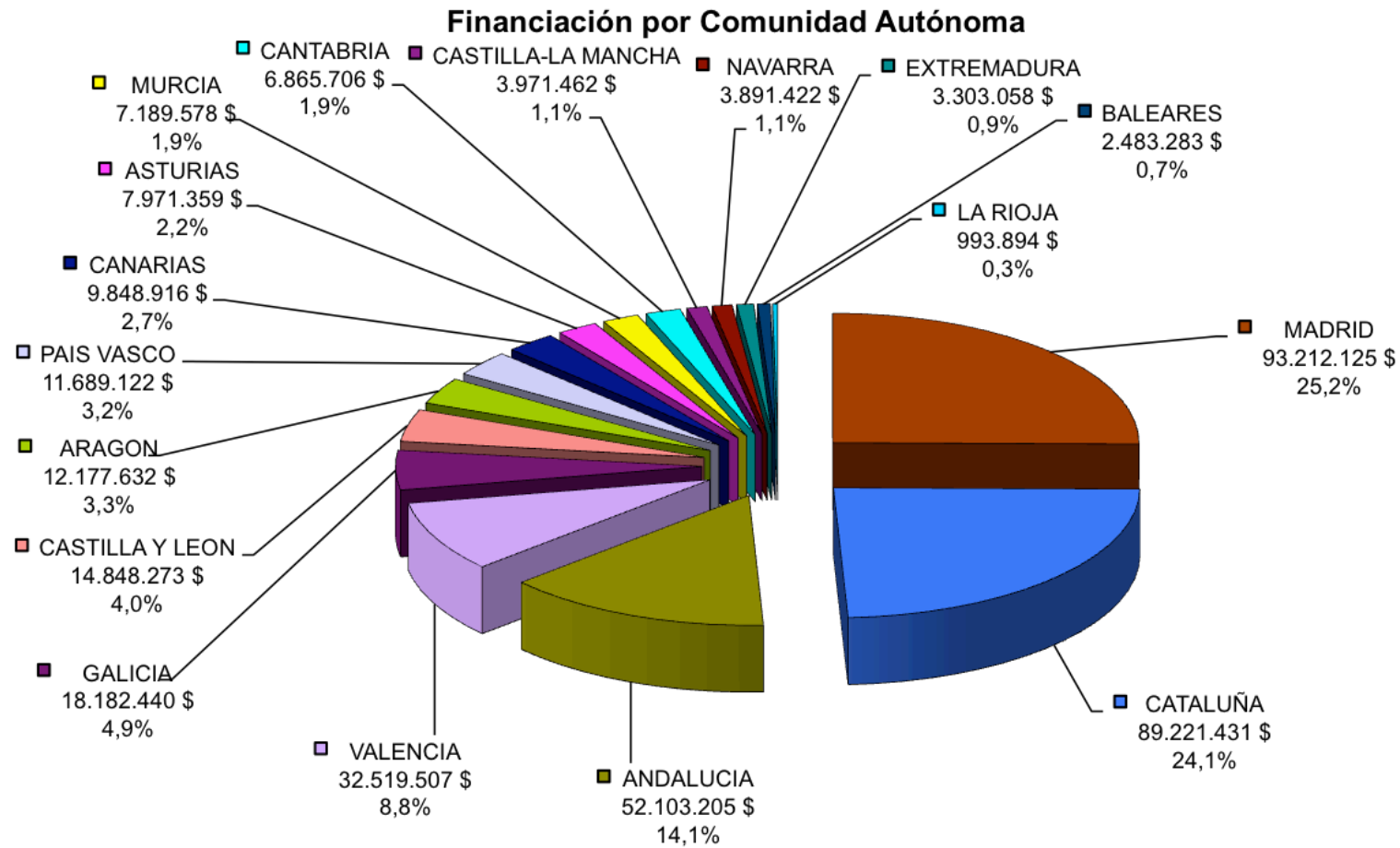


2010 funding

PROGRAMAS		
	Nº	€
Formación de Personal Investigador	1054	71.834.485 €
Juan de la Cierva	350	35.343.000 €
Ramón y Cajal	231	44.462.880 €
Torres Quevedo	1655	88.262.892 €
Personal Técnico de Apoyo	298	15.841.980 €
Proyectos de Investigación Fundamental no orientada	3378	370.472.413 €
Acciones Complementarias	988	12.527.741 €
Proyectos CONSOLIDER	7	25.000.000 €
Infraestructura Científica*		
TOTAL	7.961	663.745.391 €

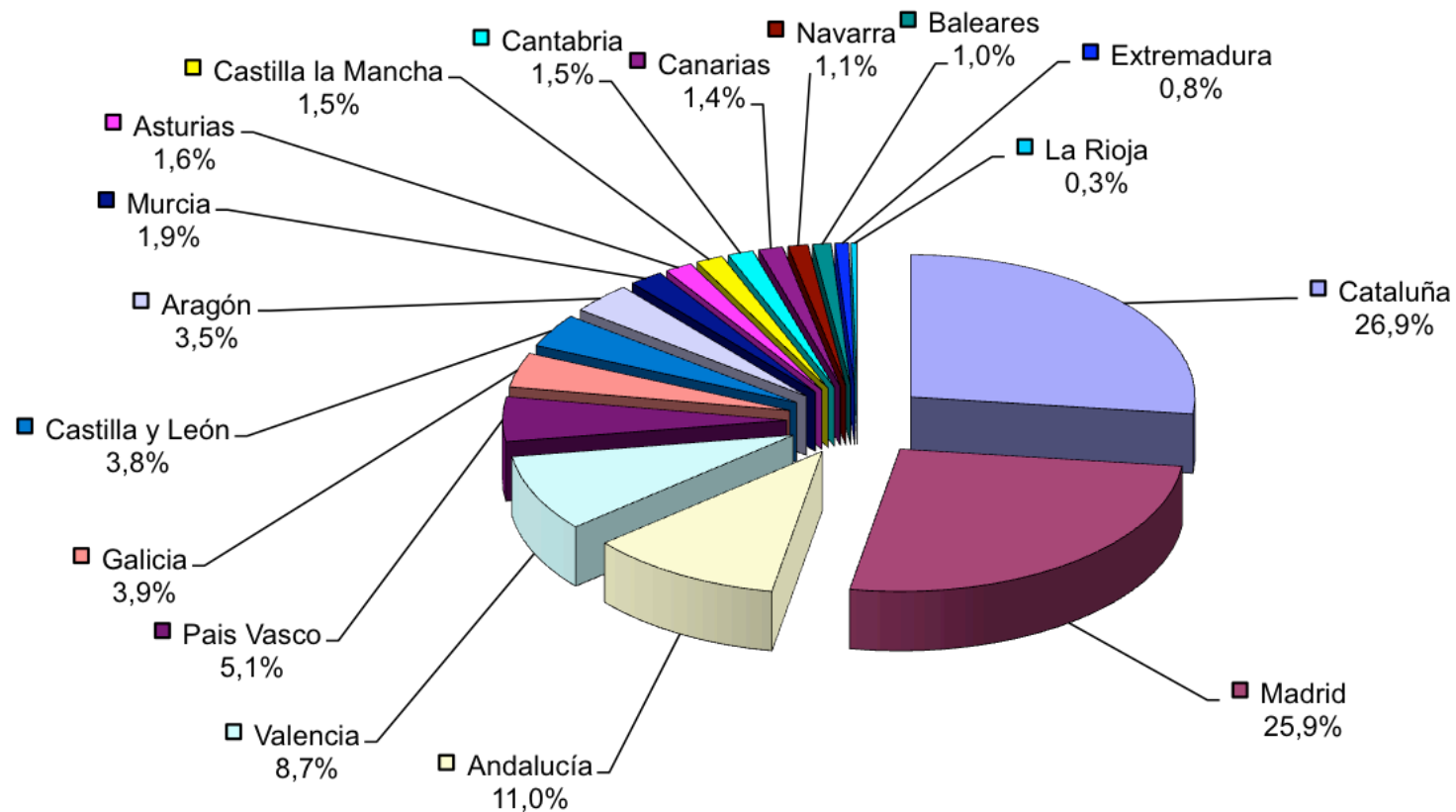
* Convocada en 2010, se resolverá en 2011. **All (FPI, RP, Int.): 15 M € (variation 2010-2011 < 3%)**

2010 research projects distribution by CCAA



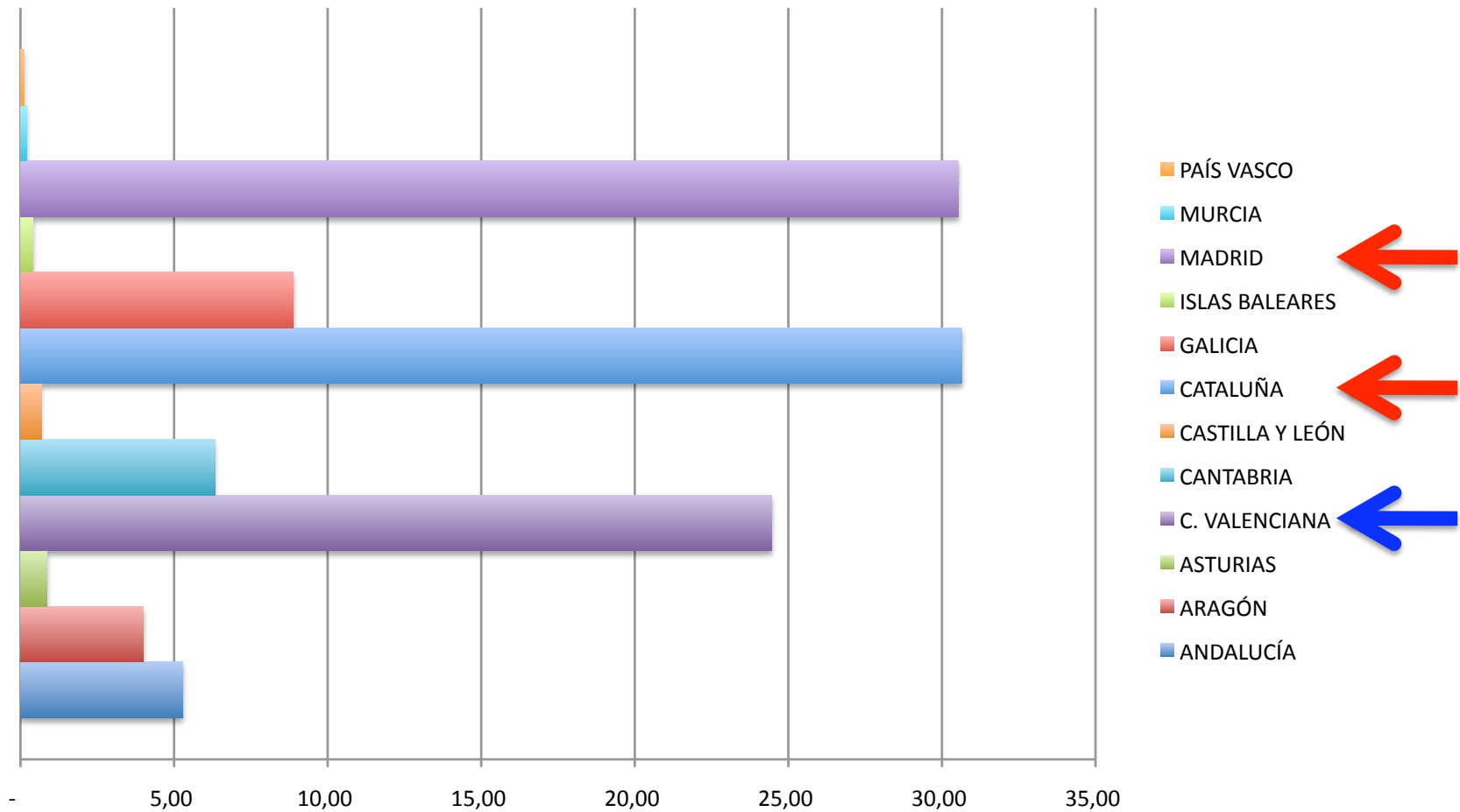
2010 funding for new personnel distributed by CCAA

FPI, Juan de la Cierva, Ramón y Cajal, Torres Quevedo, Technicians



Funding of the Spanish HEP groups along 2003-2010, distributed by Comunidades Autónomas (in Million €)

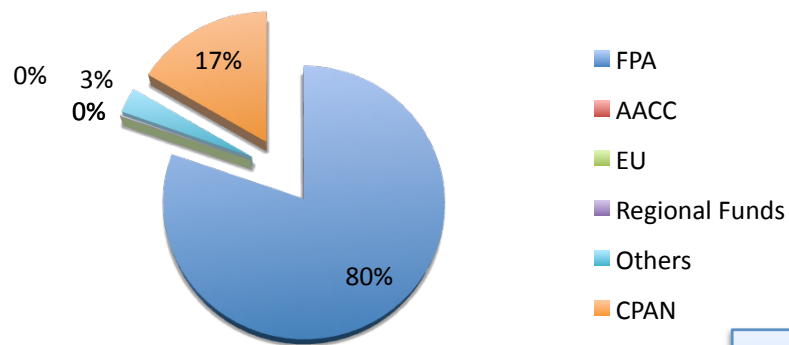
Total: 112.5 Million €



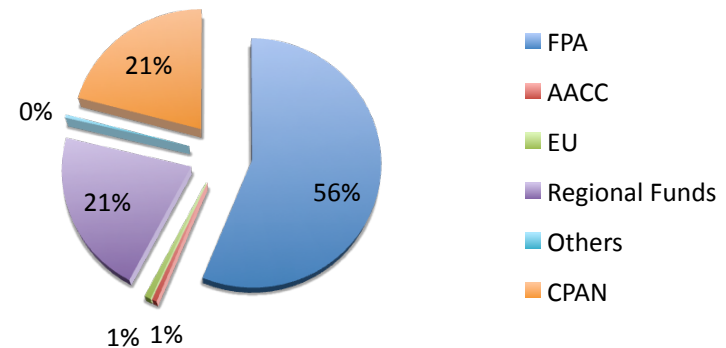
Influence of CPAN in the Subareas

Period (2008 -2010) average per year

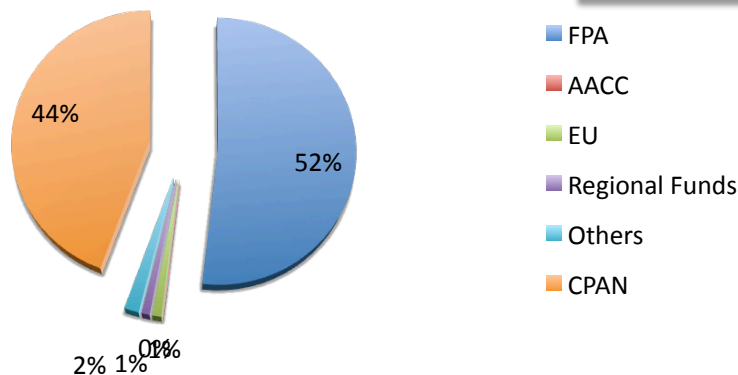
PARTICLE PHYSICS



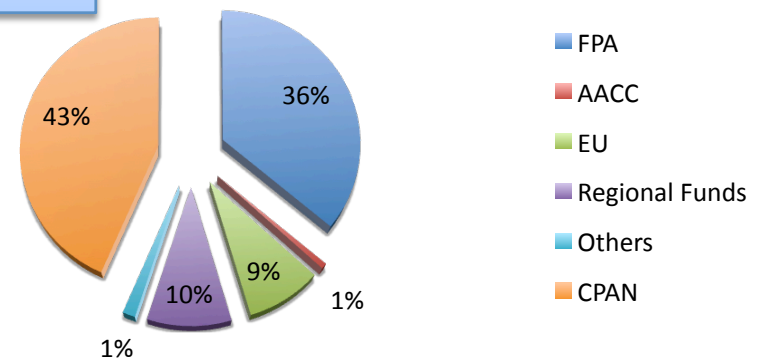
THEORY



ASTROPARTICLE PHYSICS



NUCLEAR PHYSICS



Total (2008-2010)
78 % FPA
8 % CPAN
8 % Regional Funds

Distribution of HEP personnel in Spain

(members of projects supported by PNFP 2006-2008 [2009-2011])

	Total	Theory	Experiment
Doctors	496 [485]	202	294
PhD Students	187	58	129
Engineers, technicians, etc..	79	2	77
Collaborators	116	70	46
Total	878 [869]	332	546
Permanent Staff	282	114	168
Ramón y Cajal	47	22	25
Juan de la Cierva	25	9	16

Distribution HEP Experimental personnel in Spain (members of projects supported by PNFP 2006-2008 [2009-2011])

	Accelerator Particle Physics	Astroparticle Physics	Nuclear Physics	Comp./GRID	R&D Accelerators Medical Phys.
Doctors	88	67	84	17 [24]	41
PhD Students	64	33	23	4	6
Engineers, technicians, etc..	22	13	15	19	9
Collaborators	2	21	11	6	4
Total	176	134	133	45 [41]	60
Permanent Staff	50	32	48	11	28
Ramón y Cajal	9	9	4	1	3
Juan de la Cierva	5	5	6	0	1

Situación de la I+D en España

Posición en el mundo en 2006

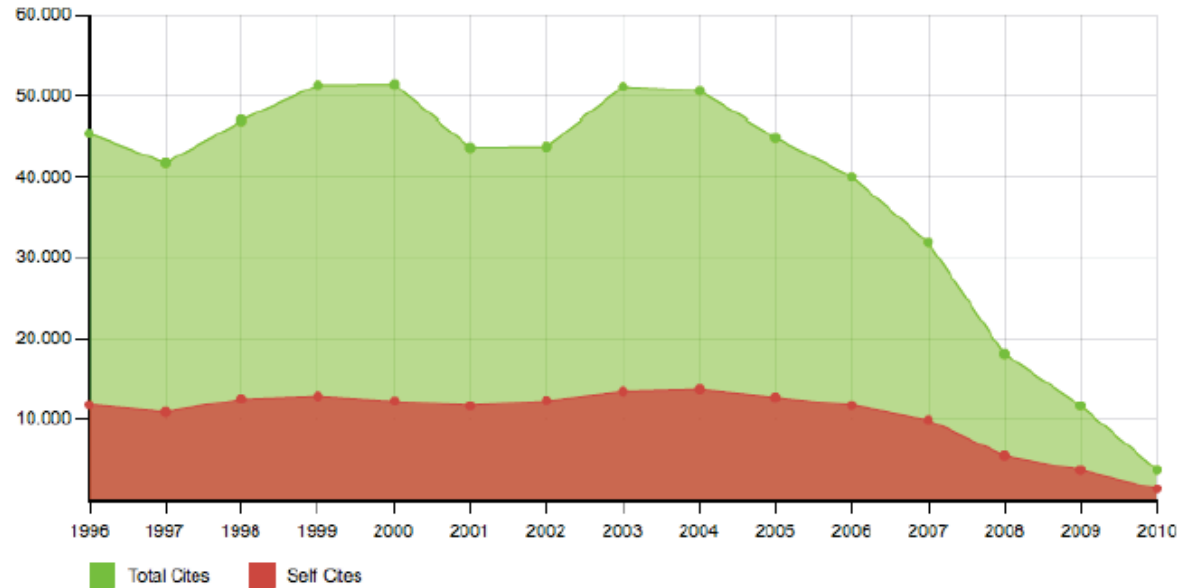
Producción científica (ISI)	3,1%	9º	I
Patentes PCT	0,8%	16º	D
Cuota mundial de productos de alta tecnología	0,5%	26º	i

PIB	2,7%	8º
-----	------	----

Fuente: ISI, WIPO, Cotec

Physics and Astronomy (Spain)

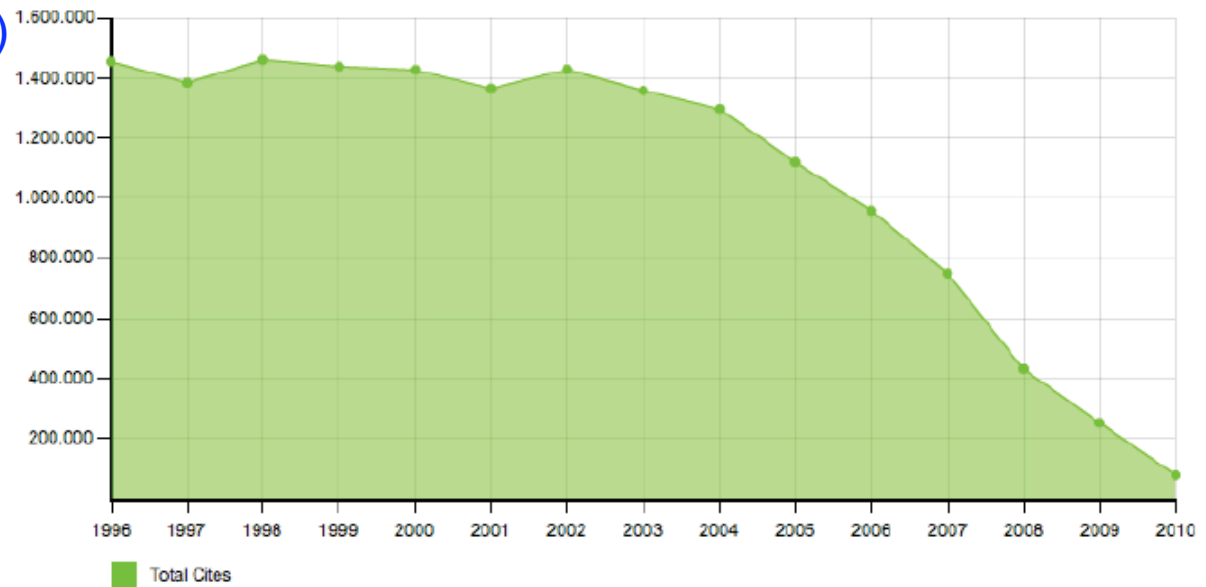
	1996-2010
H Index	185
Documents	51.594
Citable Documents	51.021
Citations	576.900
Self Citations	155.781
Citations per Document	11,18



(c) SCImago Research Group

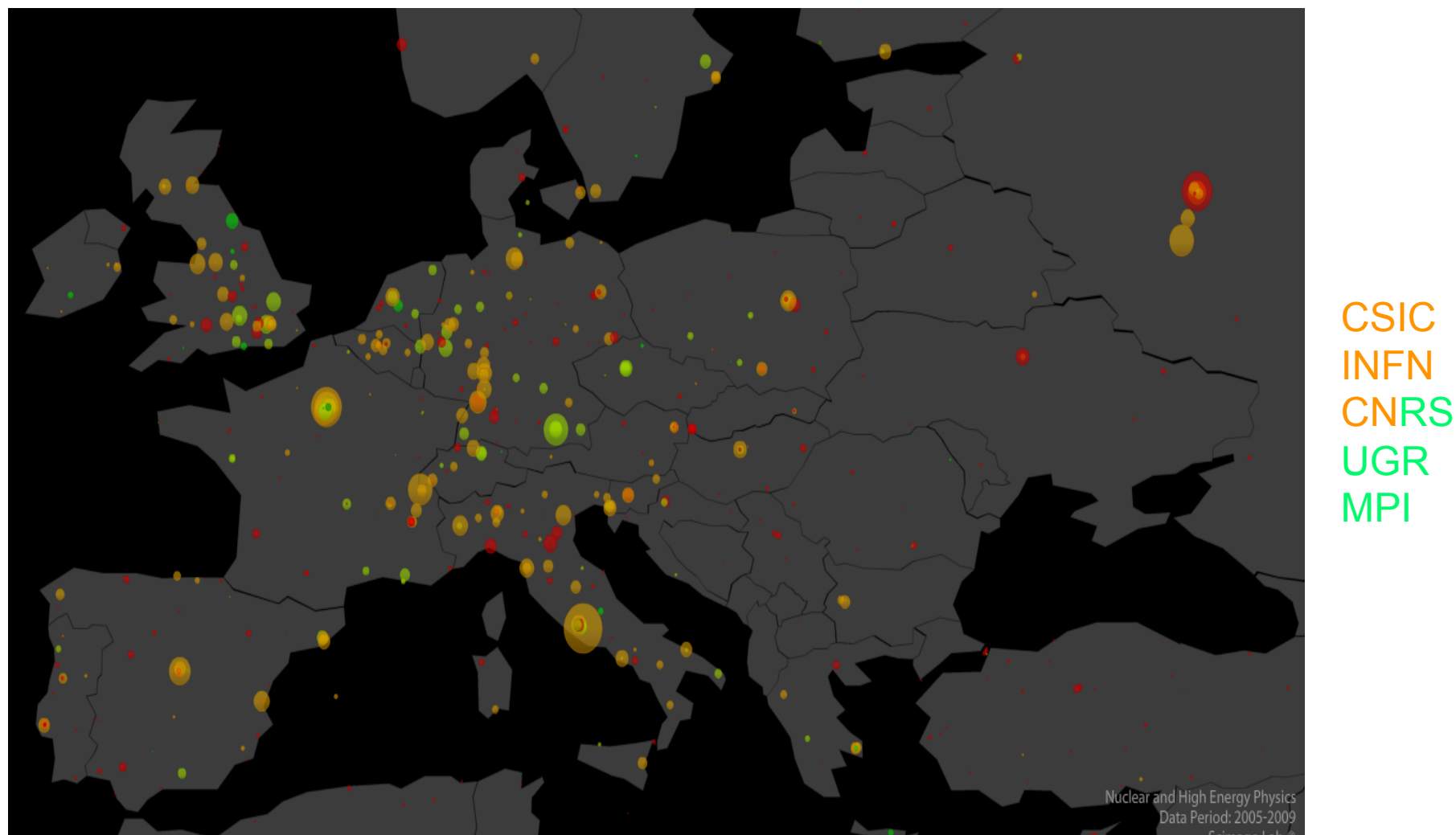
Physics and Astronomy (World)

	1996-2010
Documents	1.713.583
Citable Documents	1.675.119
Citations	16.211.428
Citations per Document	9,46



(c) SCImago Research Group

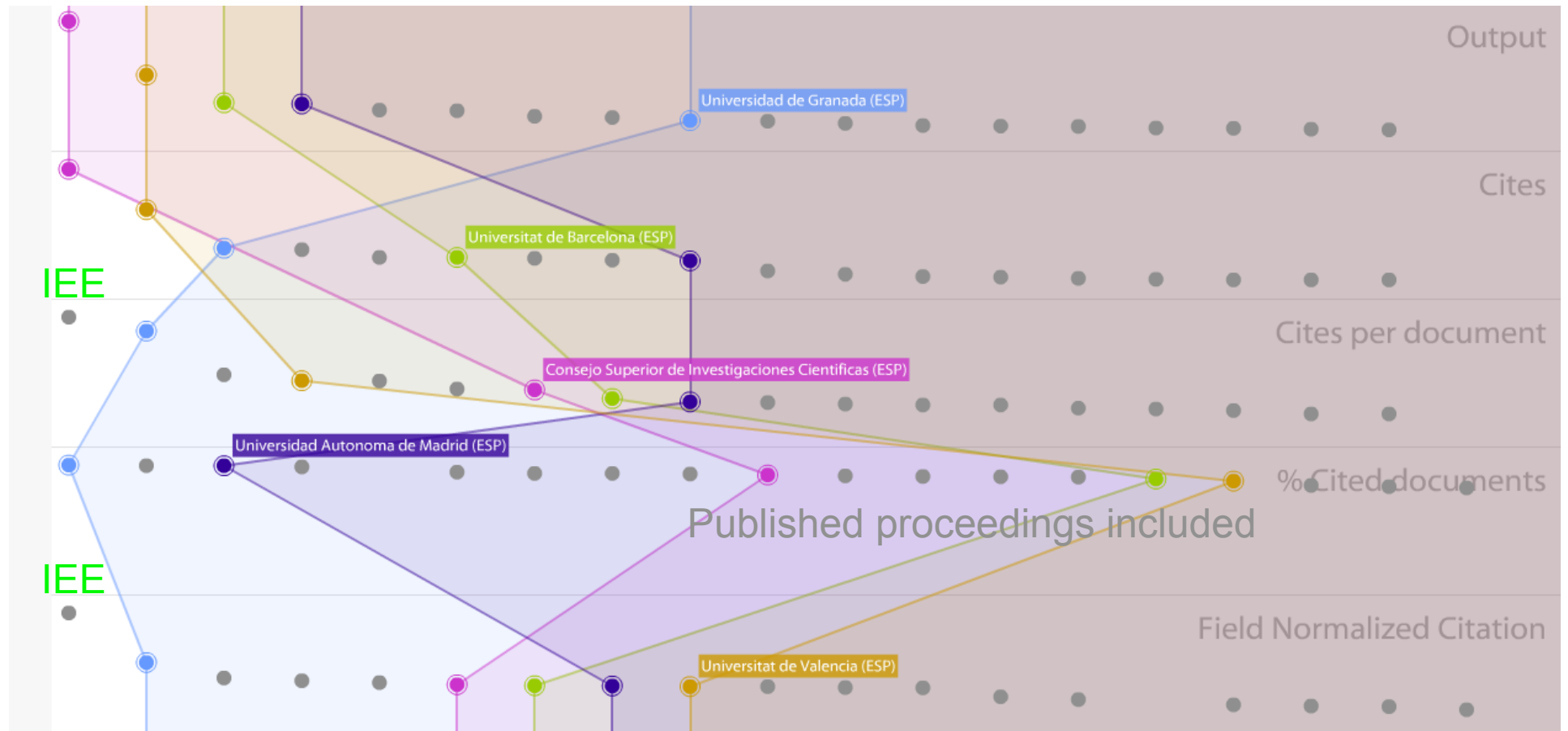
Nuclear and High Energy Physics (2005-2009)



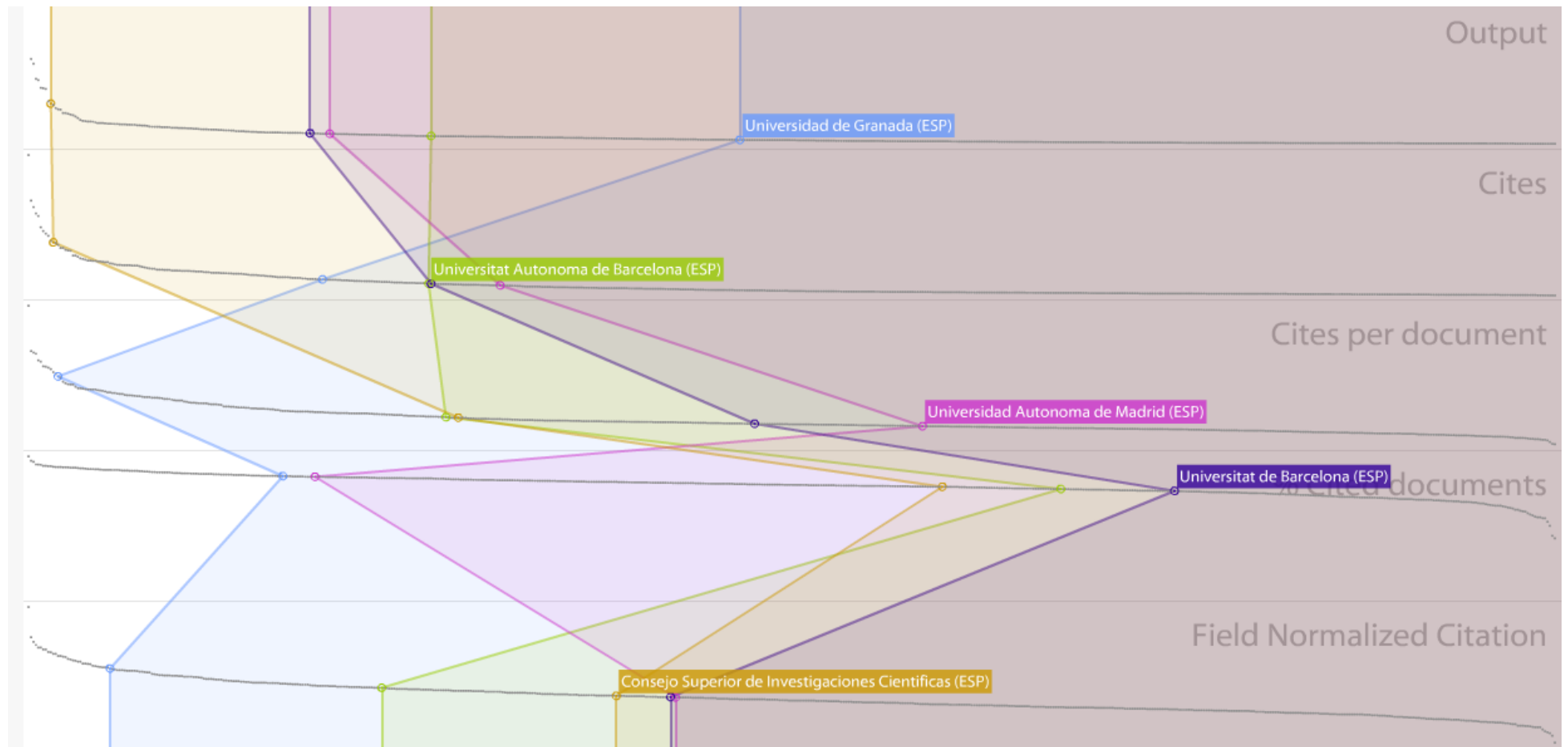
Colour = cites / documents: Red (below world average) Size = number of publications
Orange (up to 50 % over)
Green (over 50 %)

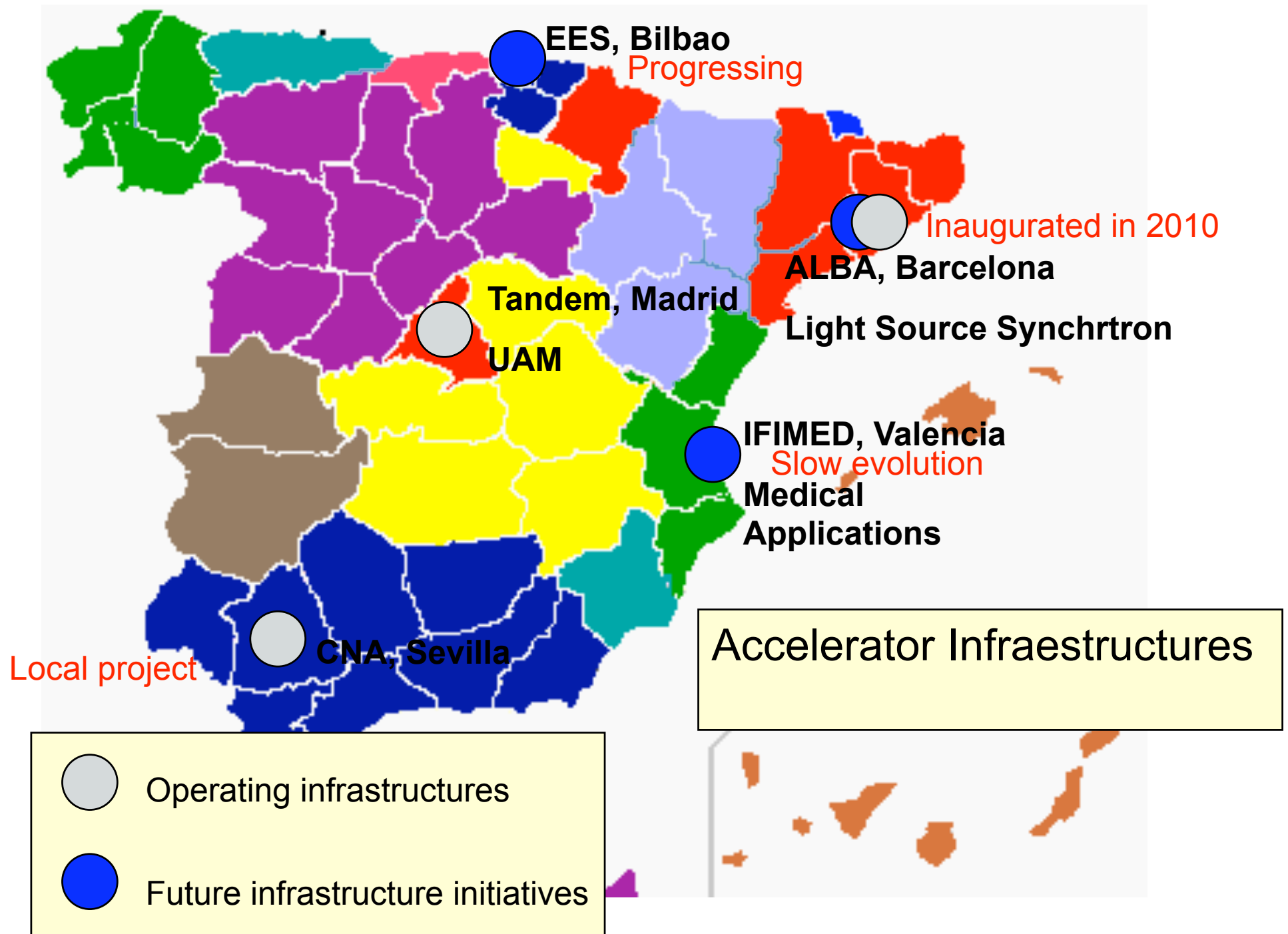
SciImago SJR (Félix de Moya)

Nuclear and High Energy Physics (2005-2009)



Nuclear and High Energy Physics (2005-2009)





Magic I started taking data in 2004, and
Magic II in 2009



Roque de los Muchachos

The Roque de los Muchachos site is situated on the Canary island of La Palma, a volcanic island off the African coast at 28°N and 17°W.. International collaborations operate multiple high-quality optical telescopes; The altitude above sea level is from 2200 to 2500m.



MAGIC (Roque de los Muchachos-2005) is a 17m diameter Cherenkov telescope aimed at the exploration of the 50 GeV – 10 TeV γ -ray band..

The collaboration has built a second telescope to operate in coincidence (2008).

CTA Nord (Teide)

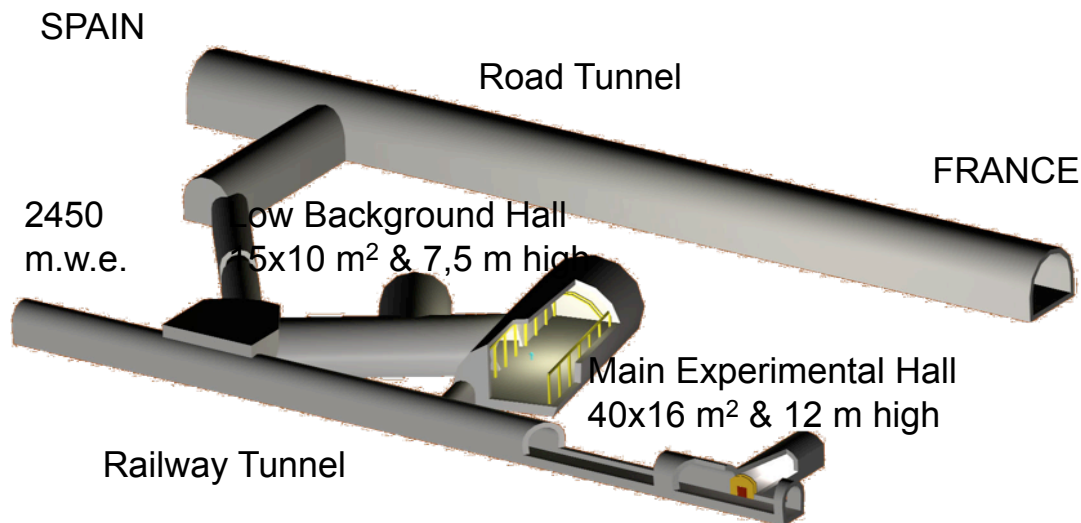
Canfranc Underground Facility (LSC)



The Canfranc Underground Laboratory is an underground scientific facility dedicated to experimental research in Astroparticle Physics since 1985.

The LSC has been operated by the Research Group of the Zaragoza University up to 2006. At present, after an important enlargement, it is operated by a consortium: MEC/MICINN, DGA and UZ and open to International Experiments (dark matter and $\beta\beta 0\nu$ searches, etc..)

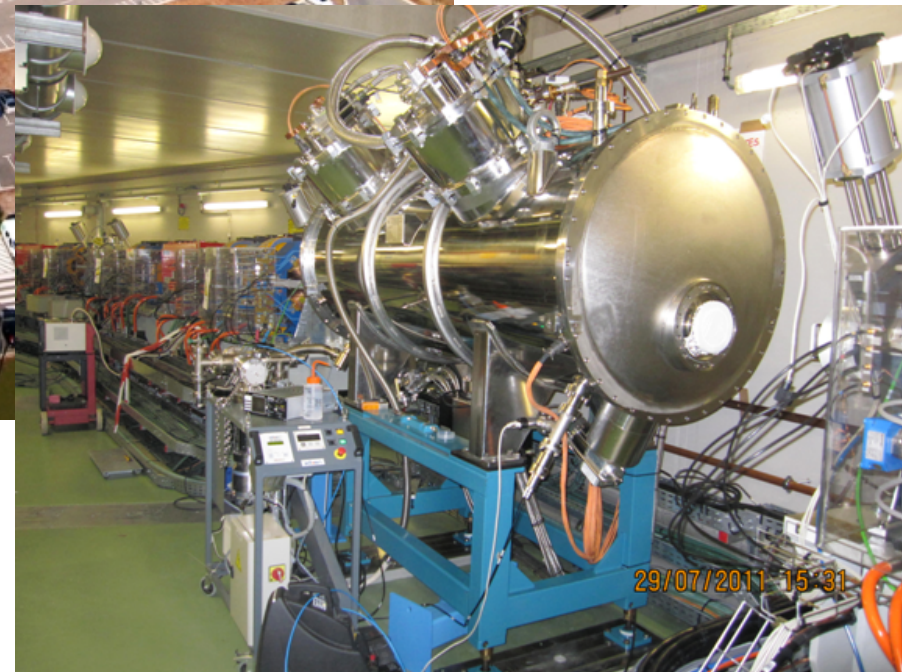
The LSC is located under the Tobazo mount (1980 m. high) in the new Somport road tunnel, connecting Spain and France across the Central Pyrenees.





Synchrotron
inaugurated
in 2010

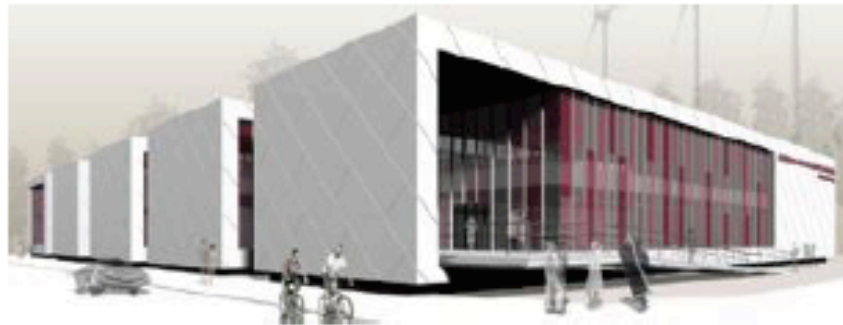
Executive Commission
Chairperson: Prof. Ramón Pascual





LINAC RESEARCH FACILITY (LRF-Huelva)

– New University Campus at the Science & Technology Park (PCTH, Huelva -Spain) Fondos tecnológicos



The Linac Research Facility is foreseen to be a leading facility for producing intense **HEAVY ION BEAMS** for basic research on nuclear physics and applications.

Basic nuclear physics research with heavy ions

- Nuclear reactions and spectroscopy with stable heavy ions using high intensity beams: coulomb barrier, astrophysics, super-heavies, clustering,...
- European **ECOS** initiative: run experiments where high intensity beams/long run periods are needed
- Wide range of ions and energies, from keV/u ~15 MeV/u
- Possibility to install IGISOL type ion source for stopped beams.

Applications

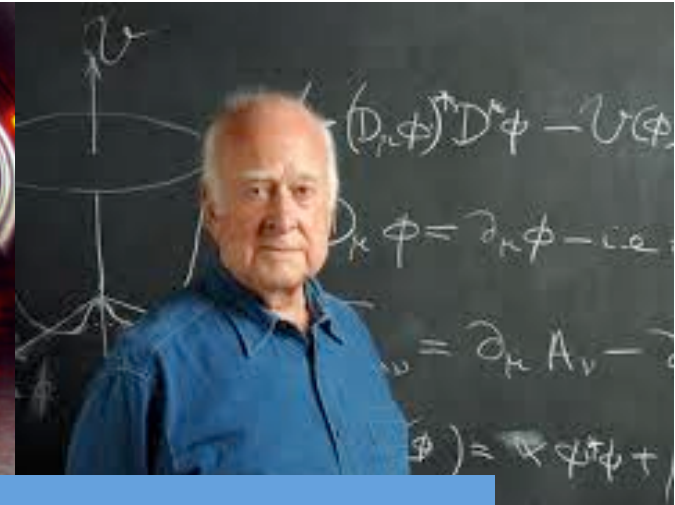
- Possibility to accelerate protons & deuterons at moderate intensities
- Modern radio-isotope production
- Material research for energy and aerospace
- Medicine (brachiotherapy; proton therapy; dosimetry, etc)

Ismael Martel

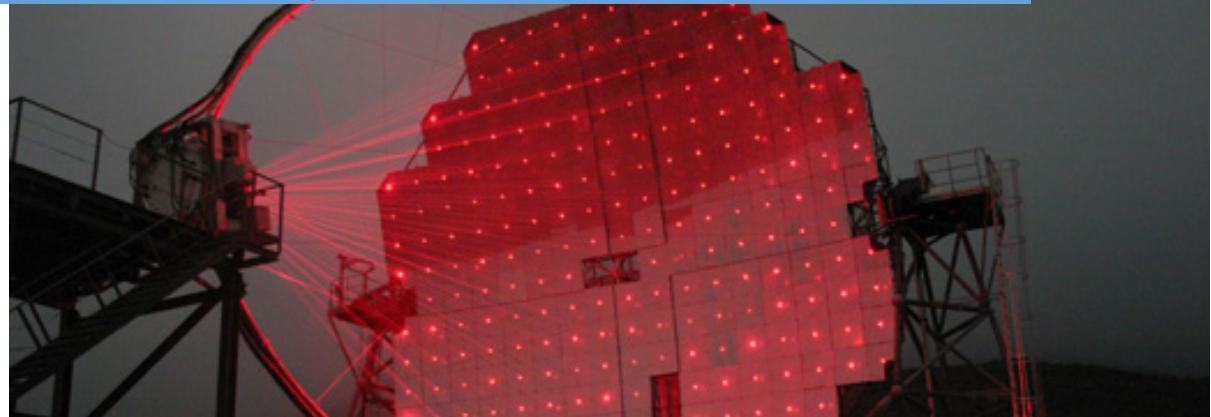
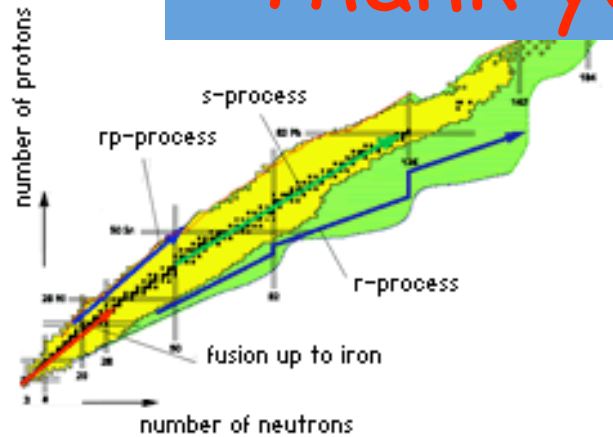
Conclusions

(Evolution during the last eight years)

- Spain has increased a lot the public funding of research, opening many new programs
- The size and the groups themselves have grown becoming more visible, but not many new ones
- Funding is stable now, and we would like to maintain our present activity and size
- Hopefully, the forthcoming organization ([Agencia Estatal](#)) shall fit better with the characteristics of the research in HEP: long, global and expensive projects at the knowledge frontier
- The [CPAN](#) contribution has been crucial and complementary



Thank you for your attention



The Dark Matter Community as seen by the Funding Agencies



New technologies bloom for **Good Reasons**
new ideas to cheaply scale up
new place to look → new technique

and for **Bad Reasons**
Status, Personalities, National Pride

But we cannot take the next step without **Unifying the Field**

*Prospects and Frontiers of
Dark Matter*

Priscilla Cushman
University of Minnesota
CERN ICFA Symposium
Oct 4, 2011