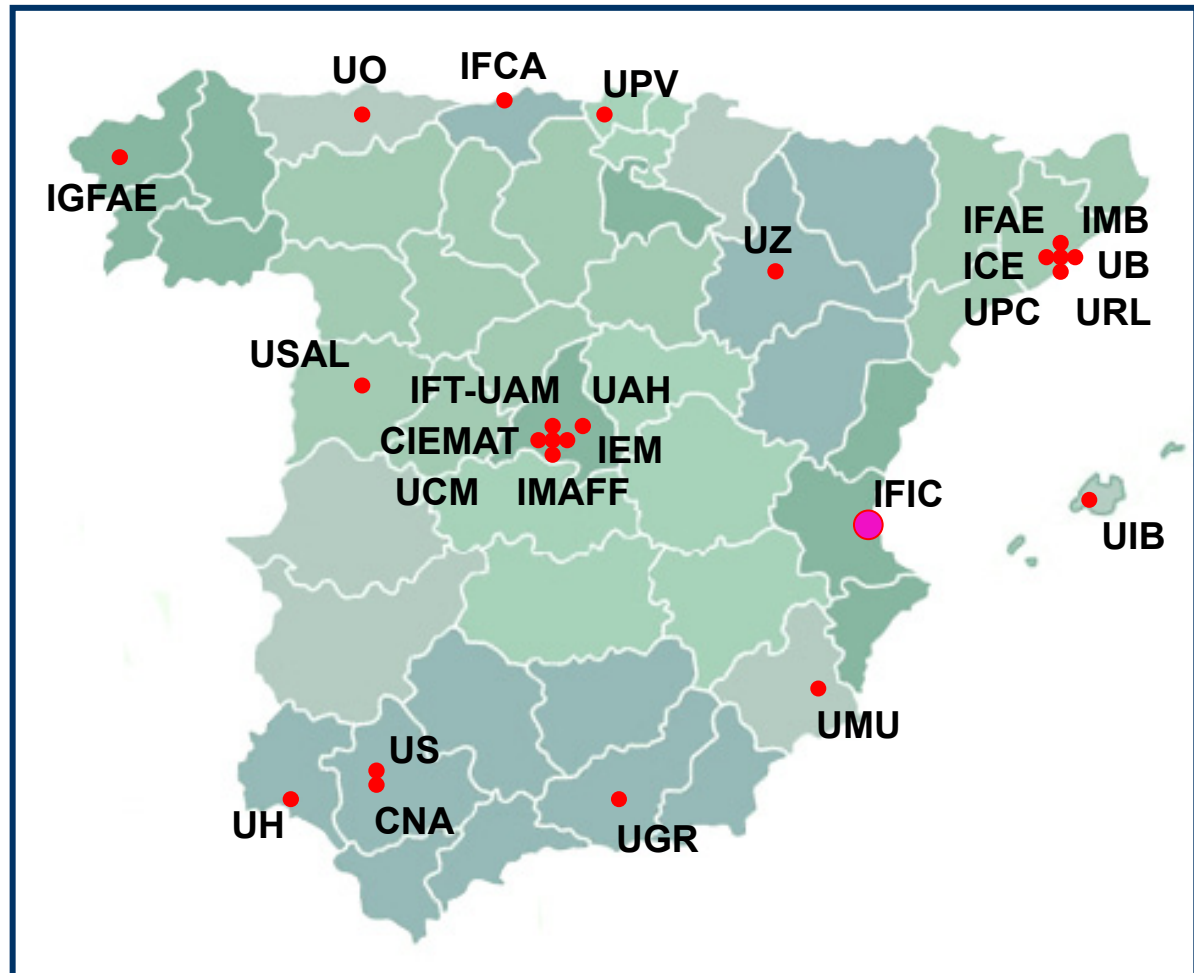


HIGH-ENERGY PHYSICS IN SPAIN

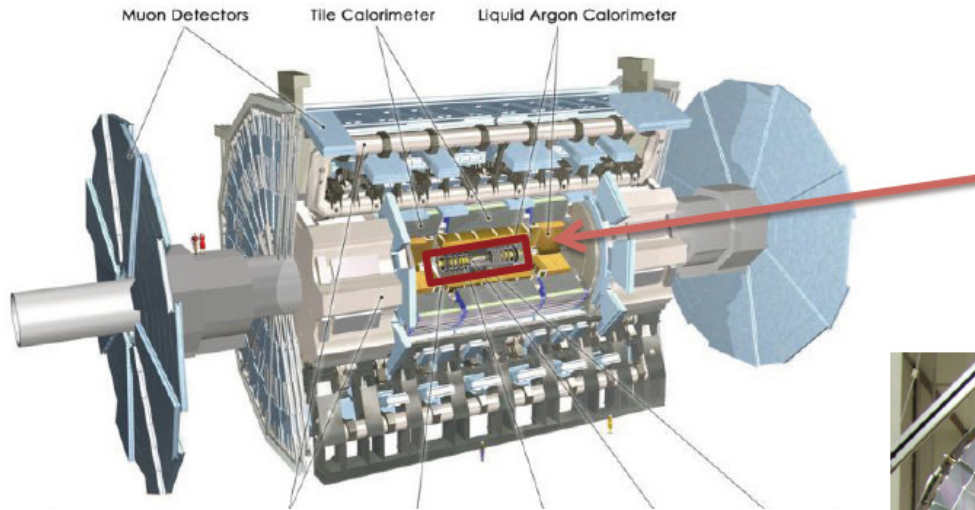


CPAN
Ingenio 2010

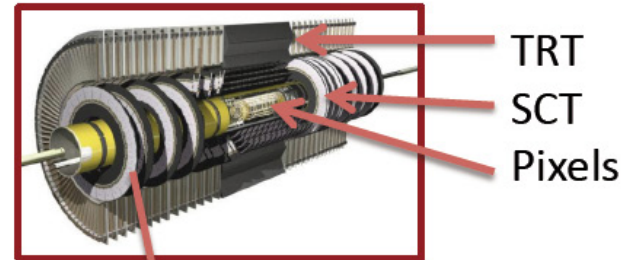
<http://www.i-cpan.es>



- ❑ **Spanish contribution:** 8,53%
- ❑ **Spanish CERN community:** 250+400+250 persons
- ❑ **ATLAS:** IFAE, IFIC, IMB, UAM
- ❑ **CMS:** CIEMAT, IFCA, UAM, UO
- ❑ **LHCb:** IGFAE, UB, URL
- ❑ **ALICE:** CIEMAT, IGFAE
- ❑ **ISOLDE, nTOF:** CIEMAT, IEM, IGFAE, IFIC, UPC, US
- ❑ **AMS:** CIEMAT, IAC
- ❑ **Theory:** ICE, IEM, IGFAE, IFAE, IFCA, IFF, IFIC, IFT, UAB, UB, UCM, UGR, UH, UO, UMU, UPV, UZ

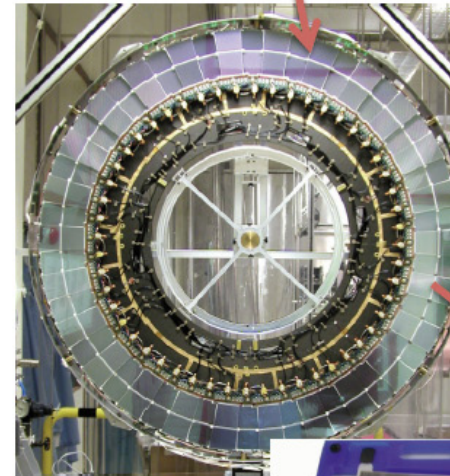


TileCal
IFAE / IFIC

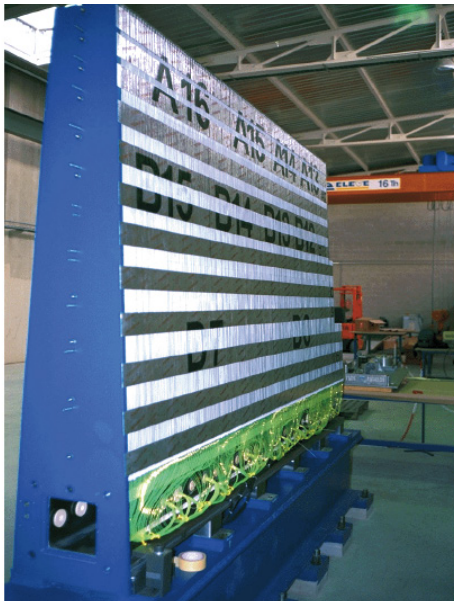


SCT:

- 4087 módulos
- 61m² de Si



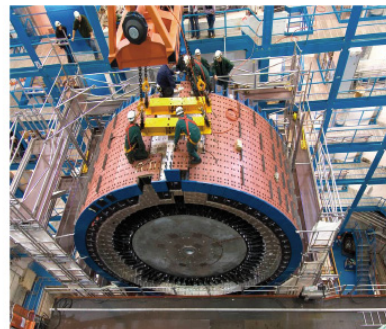
SCT
IFIC / IMB



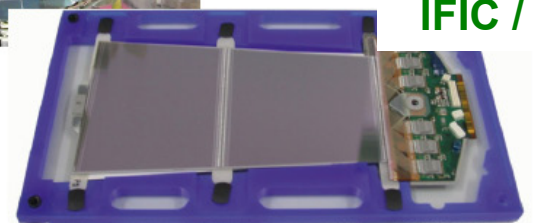
A. Pich



Test of photomultipliers



Installation at CERN

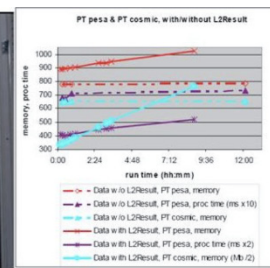


Trigger
IFAE



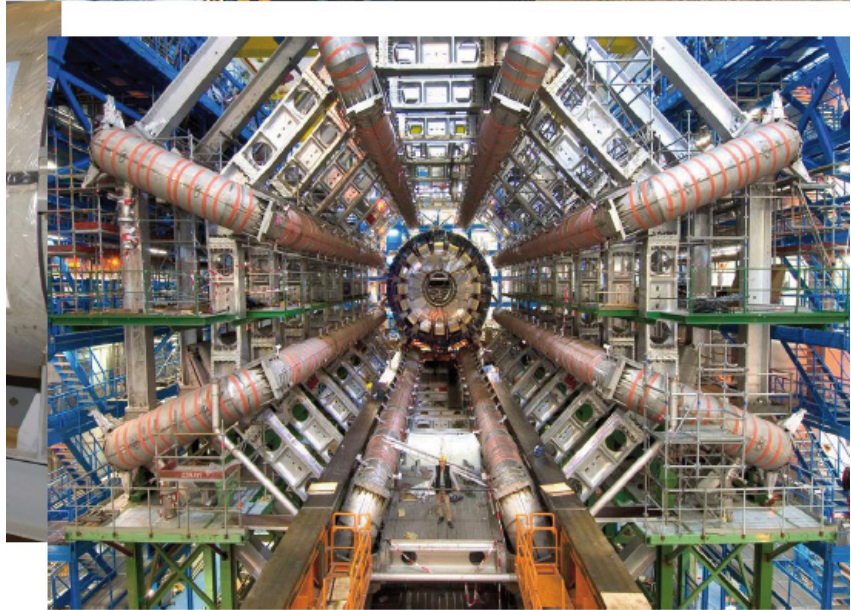
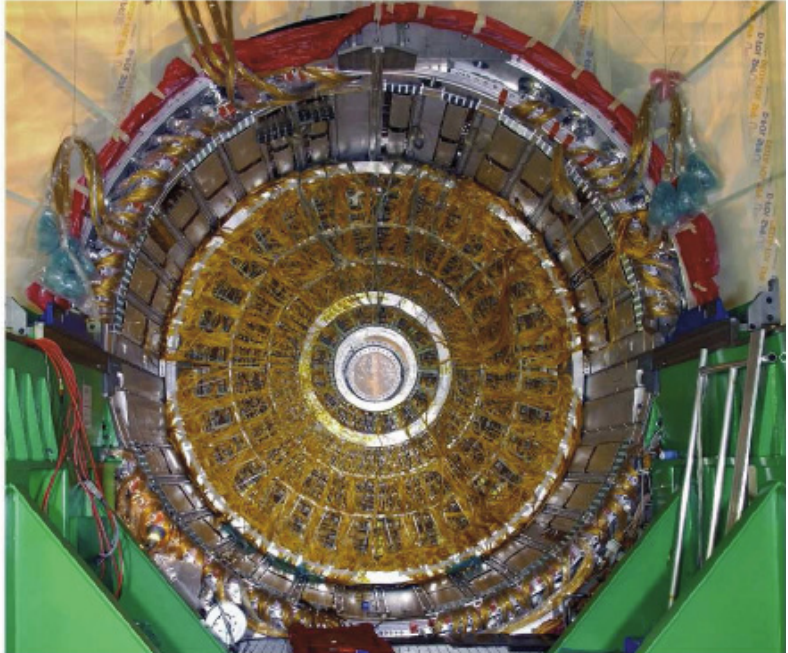
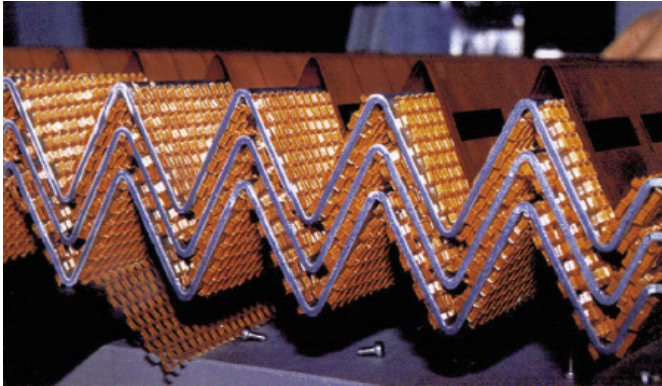
1500 dual-CPU hosts

Level2 & Event Filter Farms



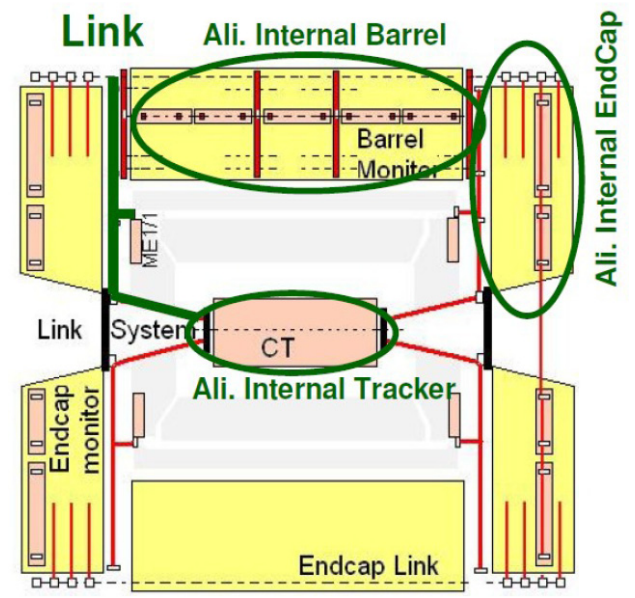
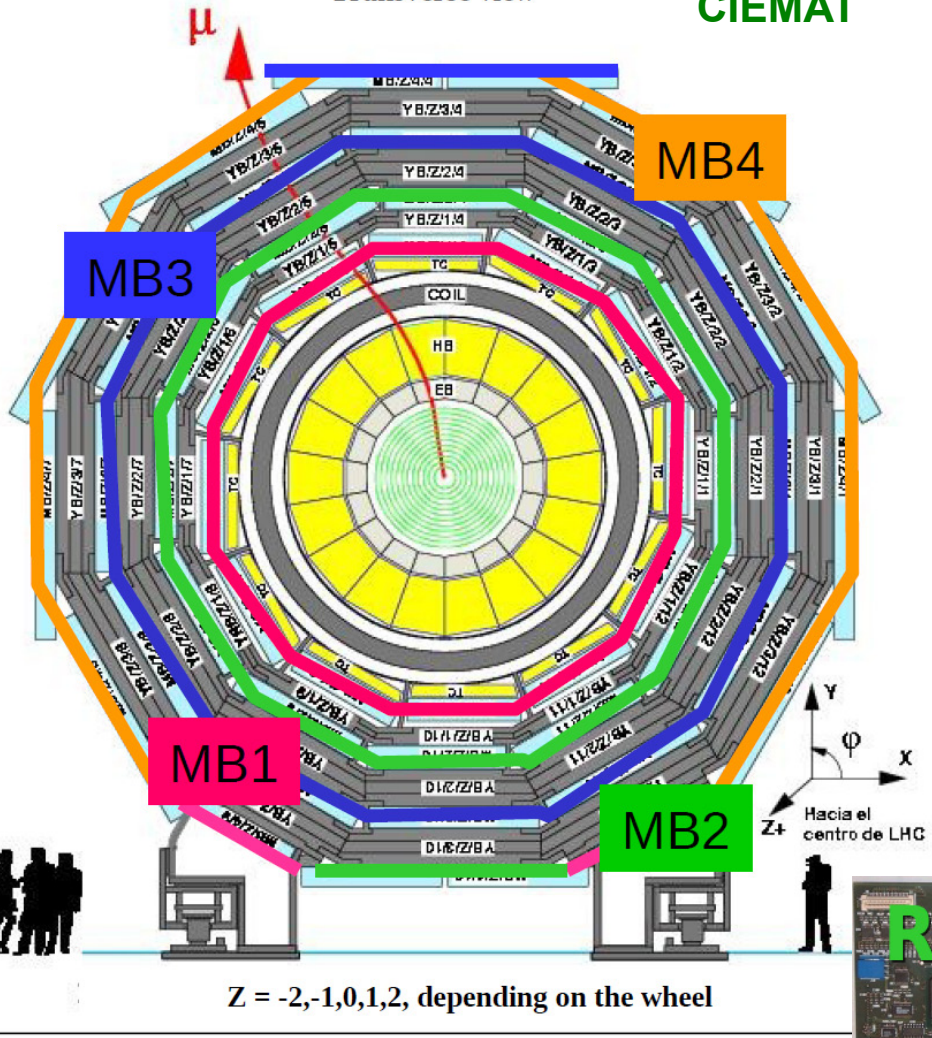
Barrel Toroid Duro-Felguera (Asturias)

LAr Cal
UAM



C.M.S.
Compact Muon Solenoid
Transverse view

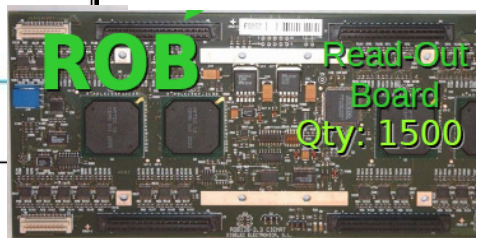
Muon Chambers
CIEMAT

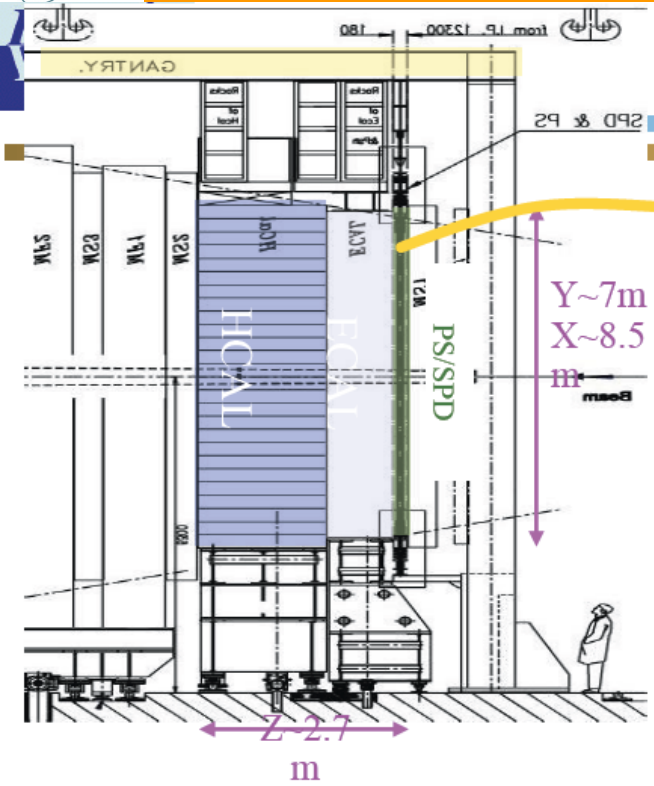


Optical Link Alignment
IFCA, UO

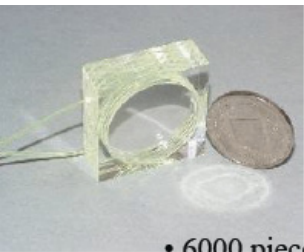
DTTF
UAM

DT ROB, ROS
CIEMAT





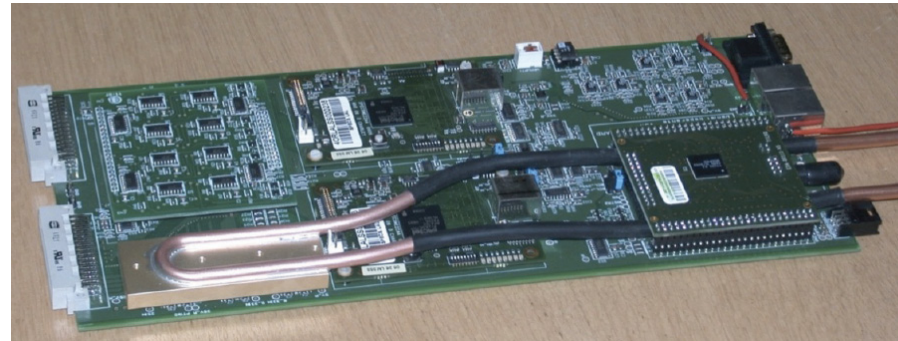
HCAL, ASIC
UB, URL



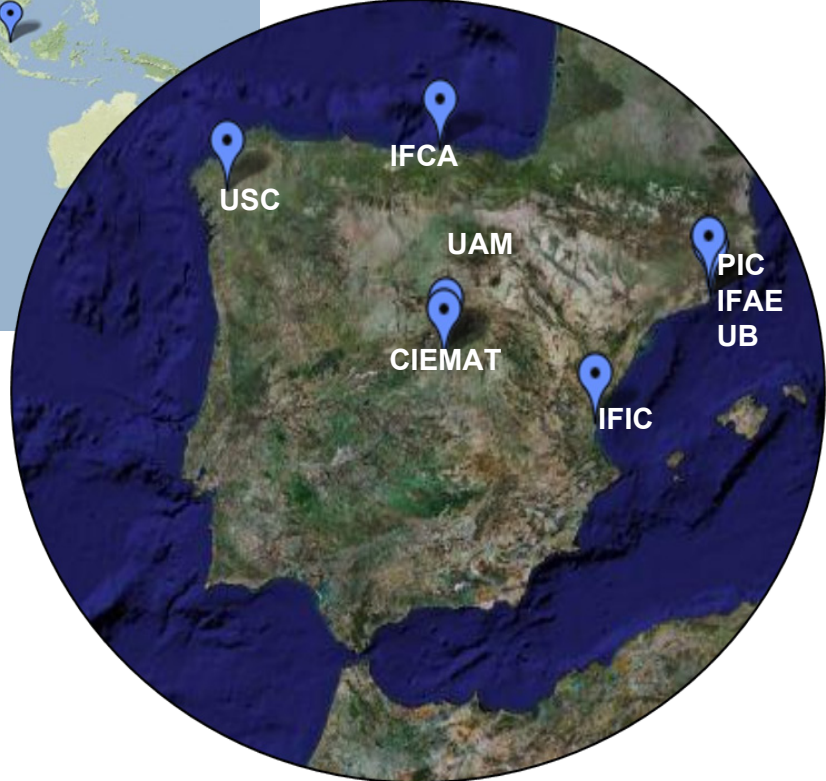
• 6000 pieces



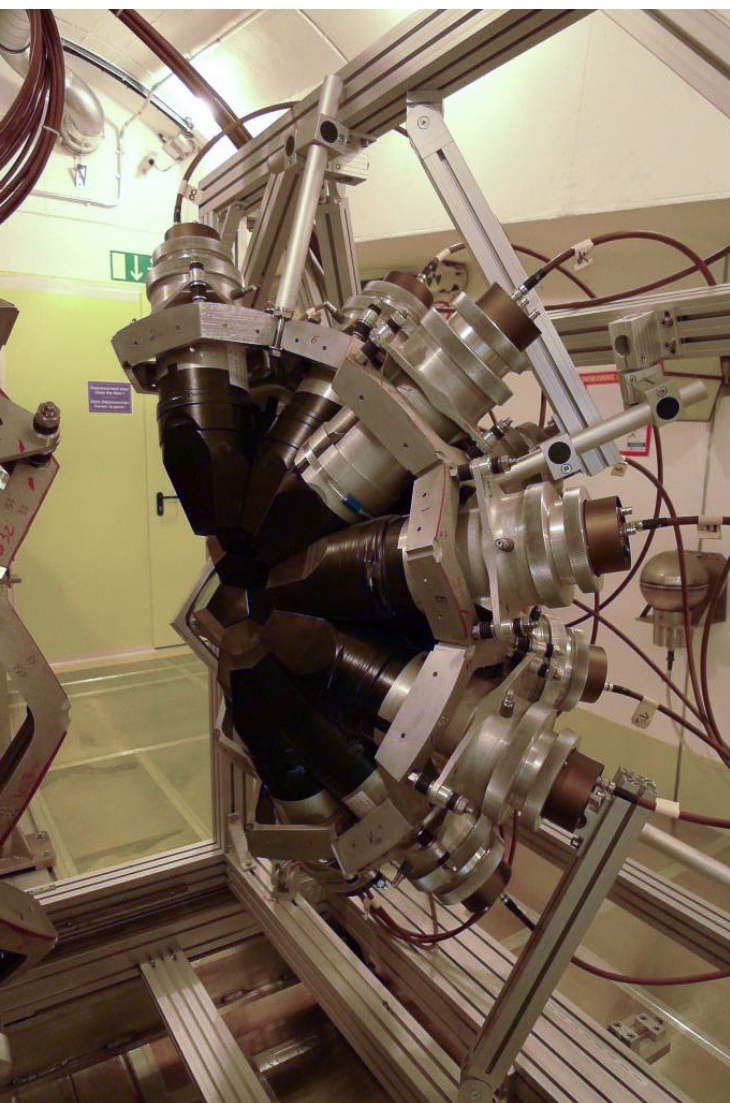
ST
IGFAE



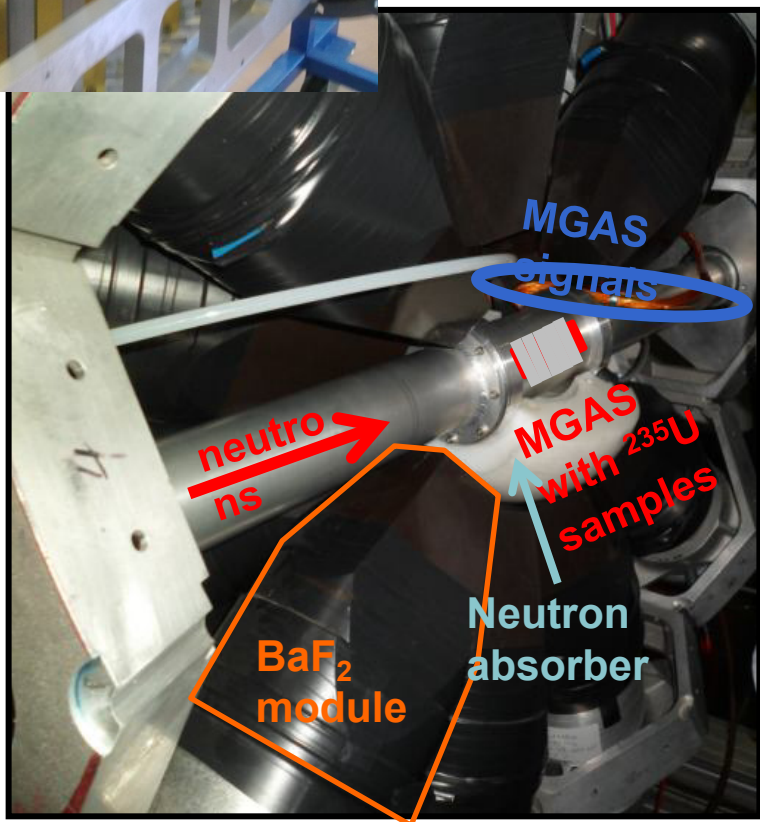
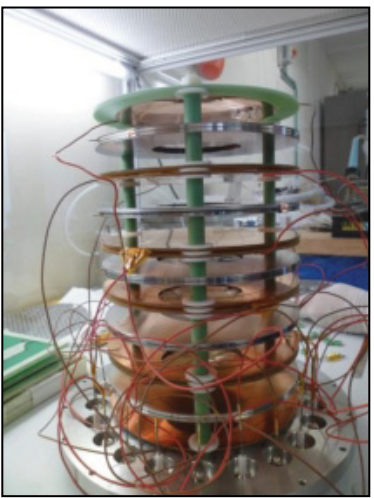
Worldwide LHC Computing GRID



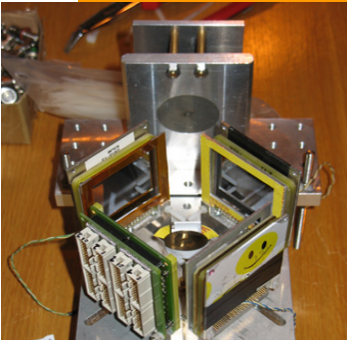
CIEMAT, IGFAE, IFIC, UPC, US



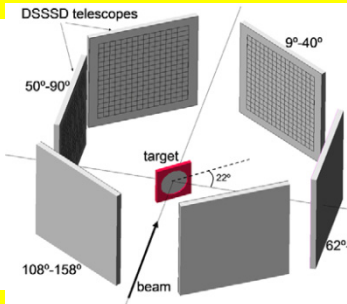
MGAS detector



ISOLDE



Decay Ligth Nuclei IEM

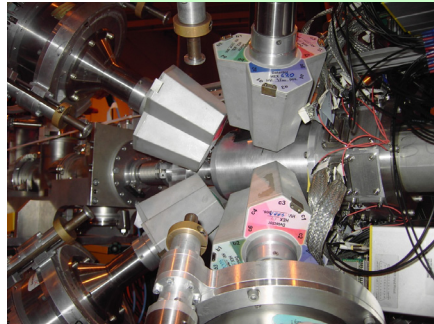


Post-accelerated beams

REX-ISOLDE

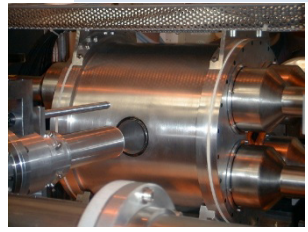
Reaction with Ligth Nuclei IEM, U Huefva, US, USC

MINIBALL and T-REX



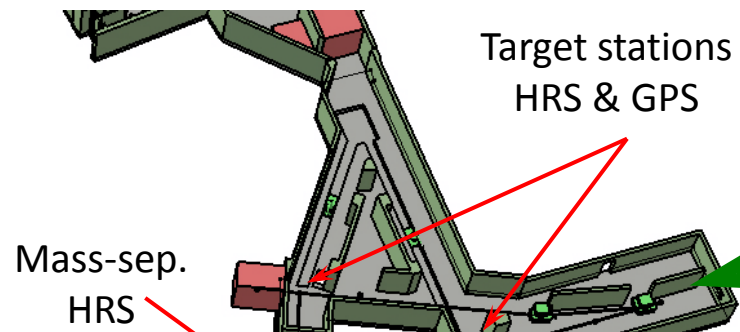
MiniBall IEM

TAS



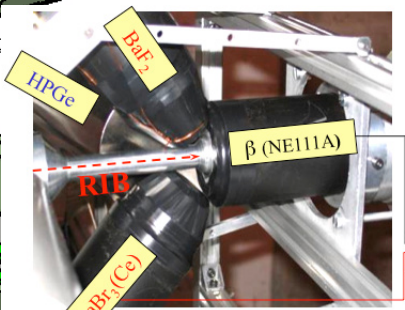
TAS IFIC, IEM

Decay experiments



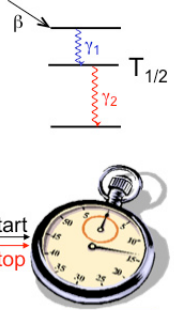
**PS-Booster
1.4 GeV protons**

3×10^{13} ppp



Fast Timing UCM, IEM

Travelling setups

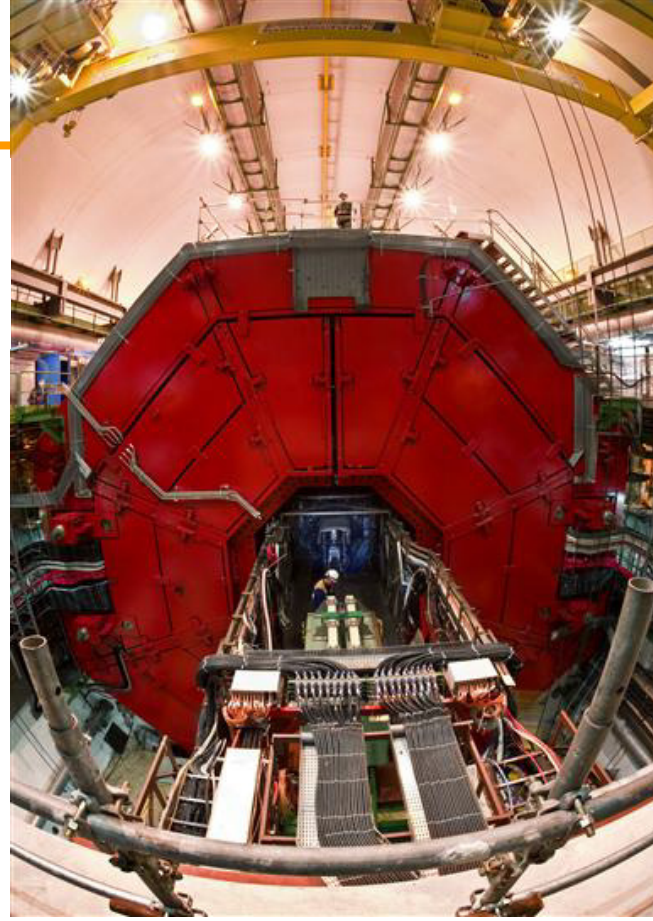


TAC



ALICE
CIEMAT,
IGFAE

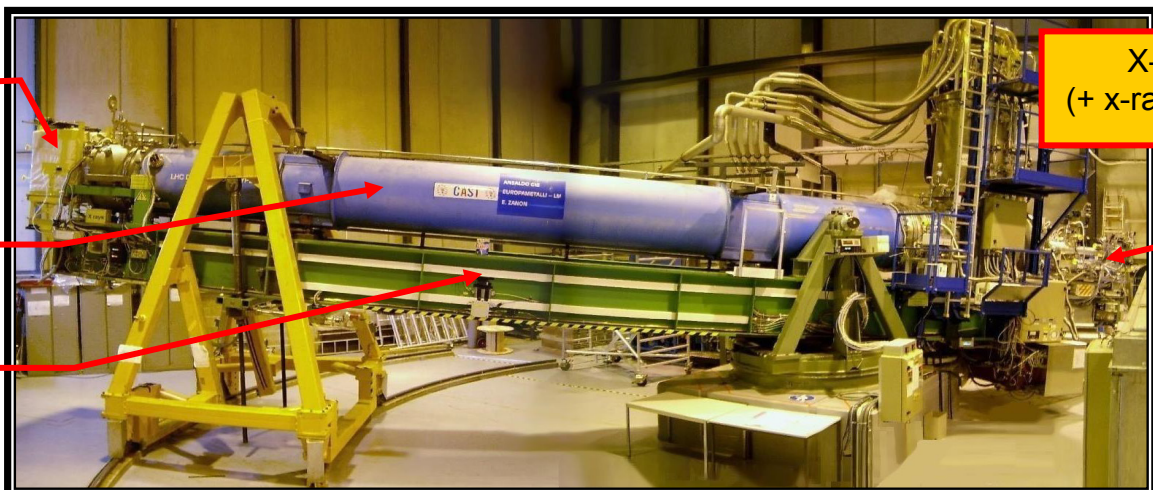
AMS
CIEMAT,
IAC



X-ray detectors

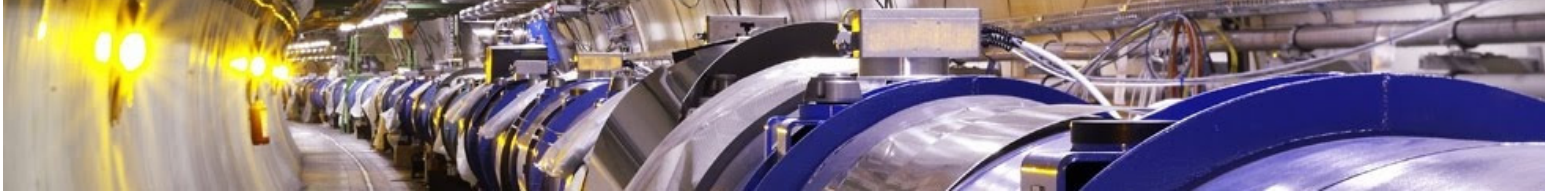
LHC test magnet
9 T, 10 m

Platform to track the
Sun ($\pm 8^\circ V \pm 40^\circ H$)
3 h/day



X-ray detectors
(+ x-ray focusing optics)

CAST
UZ



NATIONAL CENTER FOR PARTICLE, ASTROPARTICLE AND NUCLEAR PHYSICS

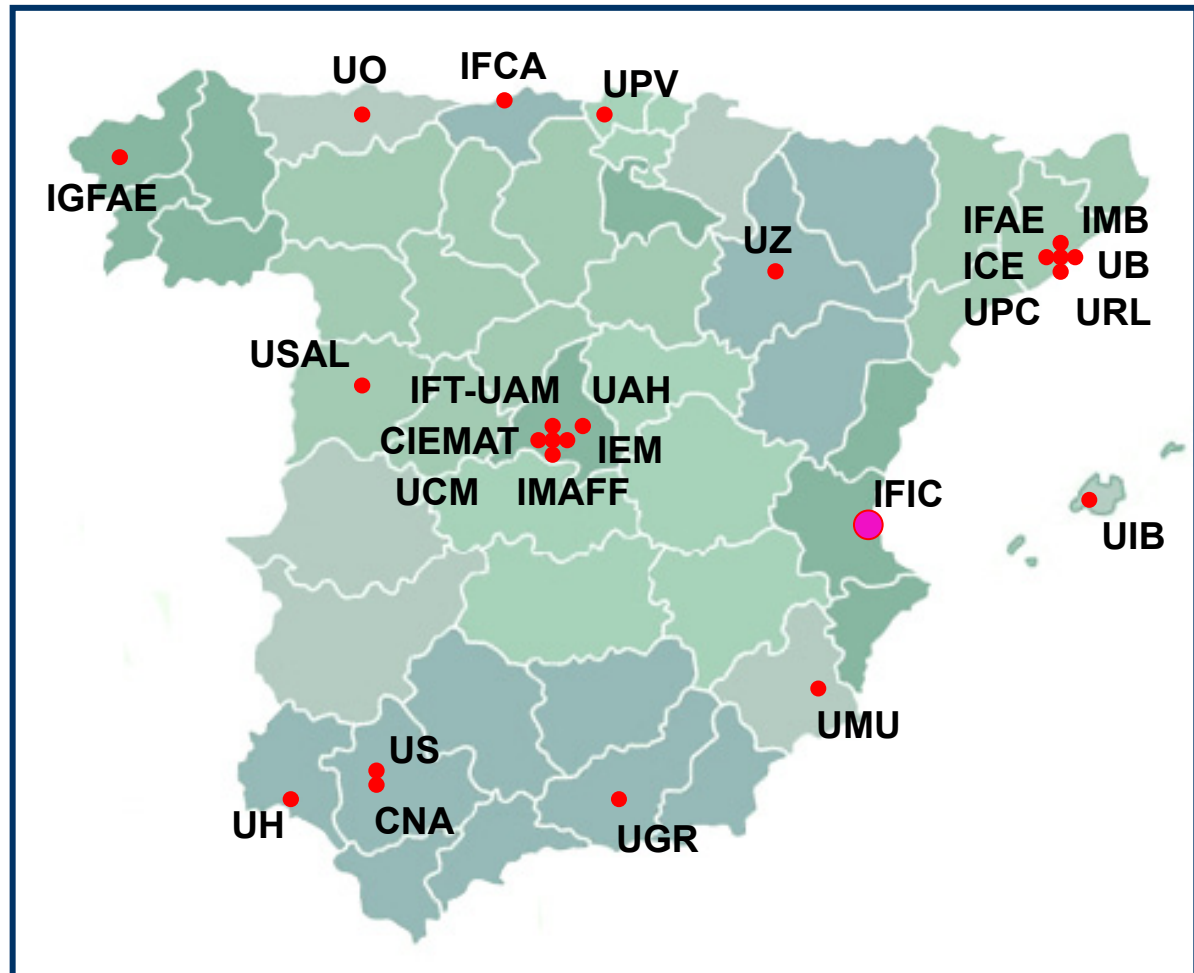


<http://www.i-cpan.es>

Consolider – Ingenio 2010

Project CSD2007-42

2007 – 2014



#	Inst.	PIs	Drs	% PIs	% Drs
1	IFIC	19	58	15,57	14,43
2	CIEMAT	11	44	9,02	10,95
3	CNA	1	14	0,82	3,48
4	ICE	1	2	0,82	0,50
5	IEM	4	12	3,28	2,99
6	IFAE	9	28	7,38	6,97
7	IFCA	5	12	4,10	2,99
8	IFT	7	17	5,74	4,23
9	IGFAE	9	29	7,38	7,21
10	IFF	1	3	0,82	0,75
11	IMB	2	5	1,64	1,24
12	UAH	1	1	0,82	0,25
13	UAM	7	10	5,74	2,49

#	Inst.	PIs	Drs	% PIs	% Drs
14	UB	8	32	6,56	7,96
15	UCM	7	28	5,74	6,97
16	UGR	8	25	6,56	6,22
17	UH	2	5	1,64	1,24
18	UIB	2	12	1,64	2,99
19	UMU	2	4	1,64	1,00
20	UO	3	11	2,46	2,74
21	UPC	1	4	0,82	1,00
22	UPV	1	7	0,82	1,74
23	URL	1	1	0,82	0,25
24	US	3	14	2,46	3,48
25	USAL	2	6	1,64	1,49
26	UZ	5	18	4,10	4,48

TOTAL	122	402	100	100
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Managing Institution: **CSIC (IFIC)**

OBJECTIVES

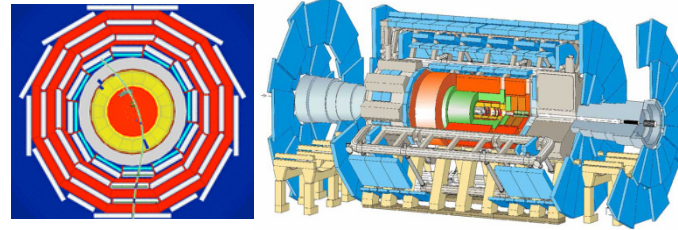
- ❑ **Creation of the National Center for Particle, Astroparticle and Nuclear Physics**
- ❑ Definition of strategies and priority lines. **Coordination** of the Spanish participation in large **international projects**
- ❑ **Representation** of the Spanish physics community
- ❑ **Human resources** (technicians, postdocs, young scientists, ...)
- ❑ Development of common R&D activities
- ❑ **Technology transfer**
- ❑ **Scientific training**
- ❑ **Outreach**

□ Strategic

- SA1: **LHC** Physics
- SA2: Experiments in **Canfranc & Astroparticles**
- SA3: **FAIR** R&D
- SA4: **Future Factories** (ILC, ν F, SuperB, ...)

□ Horizontal

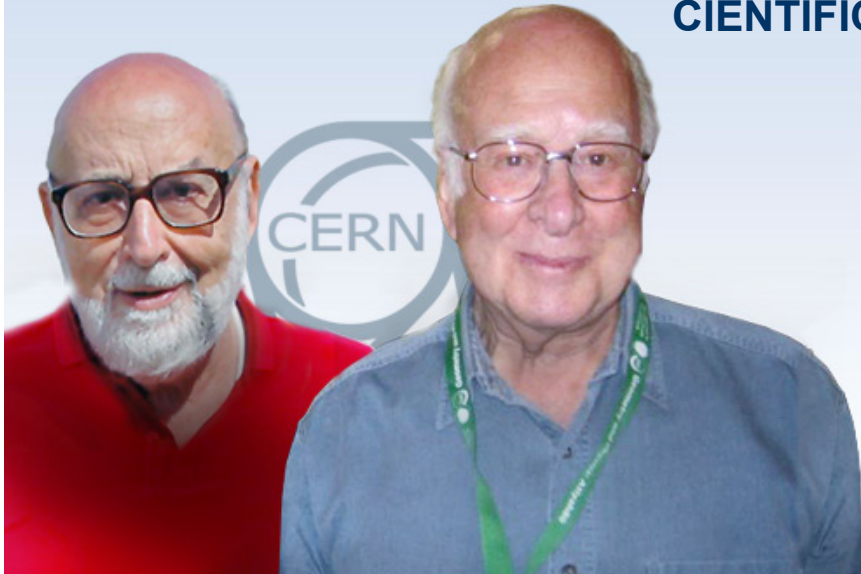
- HA1: R&D and training of personnel in **accelerators**
- HA2: **Data processing &** numerical simulations
- HA3: **Advanced Technology Transfer**
- HA4: **Scientific Training**
- HA5: **Outreach**



Higgs Boson Discovery



PREMIO PRÍNCIPE DE ASTURIAS DE INVESTIGACIÓN
CIENTÍFICA Y TÉCNICA 2013



"El descubrimiento del bosón de Higgs constituye un ejemplo emblemático de cómo Europa ha liderado un esfuerzo colectivo para resolver uno de los enigmas más profundos de la Física"

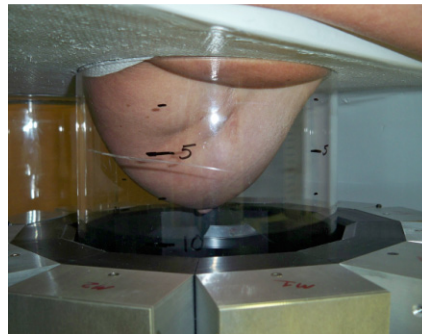
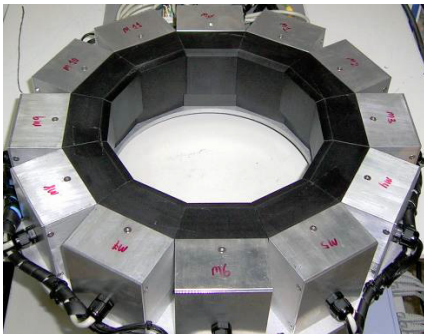


The Nobel Prize in Physics 2013: François Englert, Peter Higgs

"for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider"



PET MAMMI



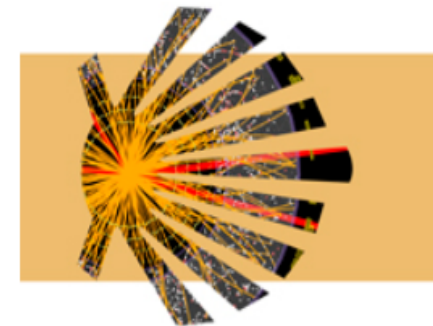
- **Detector development.** Bump-bonding. Chemical Mechanical Polishing. APDs, SiPM. Neutron detection (IMB)
- **Pixel development** (IFAE)
- **DIRAC Grid** (UB)
- **Grid Technologies** (IGFAE, IFAE, IFIC, IFT, UAM, UGR)
- **Medical instrumentation and imaging** (IFIC, UCM)
- **Accelerator components** for XFEL, FAIR e IFMIF (CIEMAT)
- **Metrology** in nuclear environments. Monitorisation of nuclear waste (IFCA)
- **Radioactivity control** (CNA, IGFAE)



Seguir a @CPAN_Ingenio



CPAN DAYS
Centro Nacional de Física de Partículas, Astropartículas y Nuclear
Proyecto Consolider-Ingenio 2010
Santiago de Compostela
25 - 27 November 2013



Noticias

Convocatorias y Eventos

Divulgación

Transferencia de Conocimiento y Promoción Tecnológica

Información Institucional

Intranet

25/10/2013 Higgs, Englert y el CERN reciben el Premio Príncipe de Asturias de Investigación



El CERN recibirá hoy, junto a Peter Higgs y Françoise Englert, el Premio Príncipe de Asturias de Investigación Científica y Técnica "por la predicción teórica y la detección experimental del bosón de Higgs". El director general del CERN, Rolf Heuer, aceptará el prestigioso premio en representación del Laboratorio Europeo de Física de Partículas durante una ceremonia que se celebrará en el Teatro Campoamor de Oviedo.

14/10/2013 Ciclo de conferencias sobre el descubrimiento del bosón de Higgs

El CPAN y sus centros participantes organizan el ciclo de conferencias "El bosón de Higgs: un descubrimiento con participación española", que pretende acercar al público general la importancia del hallazgo, que ha contado con una importante participación española. El descubrimiento