

TIARA, kickoff Meeting

2011 February 23 and 24
CERN



Index

- ✓ CIEMAT short presentation
- ✓ Infrastructures
- ✓ Number of students and resources for accelerator science training

CIEMAT: Centro de Investigaciones Energéticas Medioambientales y Tecnológicas



✓ CIEMAT = Public Research Centre of the Ministry of Science and Innovation

✓ Founded in 1951

✓ Shareholder in

[ENRESA \(Empresa Nacional de Residuos Radiactivos\)](#)

[ENUSA Industrias Avanzadas, S.A](#)

[Fundación CENER-CIEMAT](#)

[Fundación Parque Científico de Madrid](#)

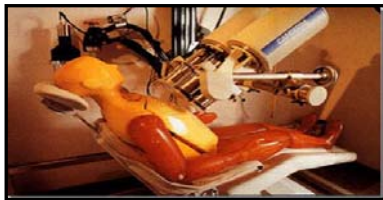
✓ CIEMAT is defined as a Public Research Agency for excellence in energy and environment, technologies and fundamental research.

✓ Dedicated to transfer the capabilities and research results to the industry and society through E & T activities

- **Promote and extend** the R&D activities in line with the directives of our Mission
- **Be a centre of reference** for national and international scientific-technical activities
- **Collaborate** with other research centres
- **Integrate activities** and cooperate with other countries
- Provide technical **services** in the areas within its competence.

• Foster activities derived from its R&D in the fields of scientific-technical diffusion, training and technology transfer

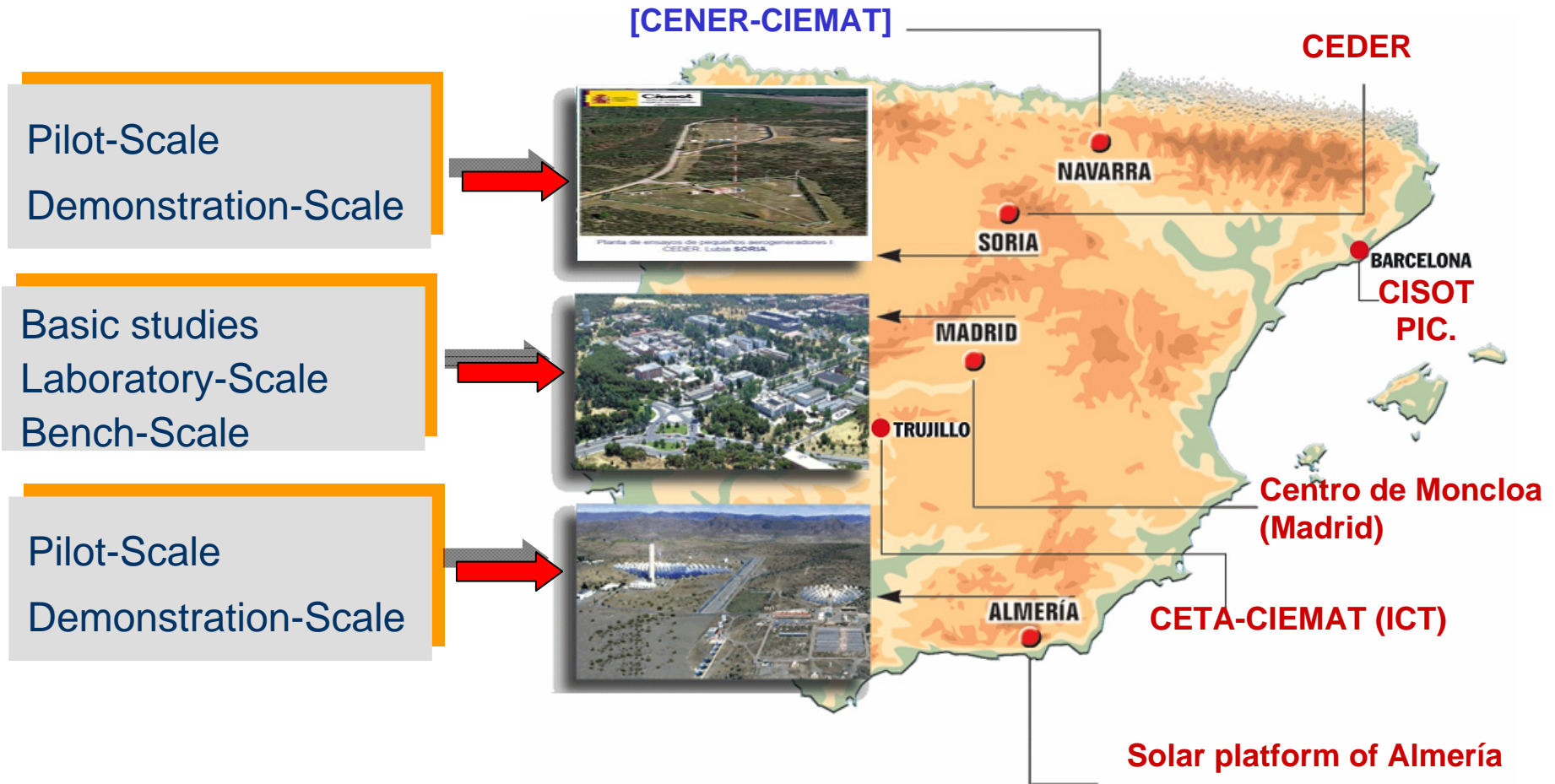




Energy
Environment
Technology
Basic Research
Fusion by Magnetic Confinement
Knowledge Transfer
Safety and Decommissioning
Radiation Protection

Standard Laboratory in the field of metrology of ionising radiations

CIEMAT sites (related to R&D in energy)



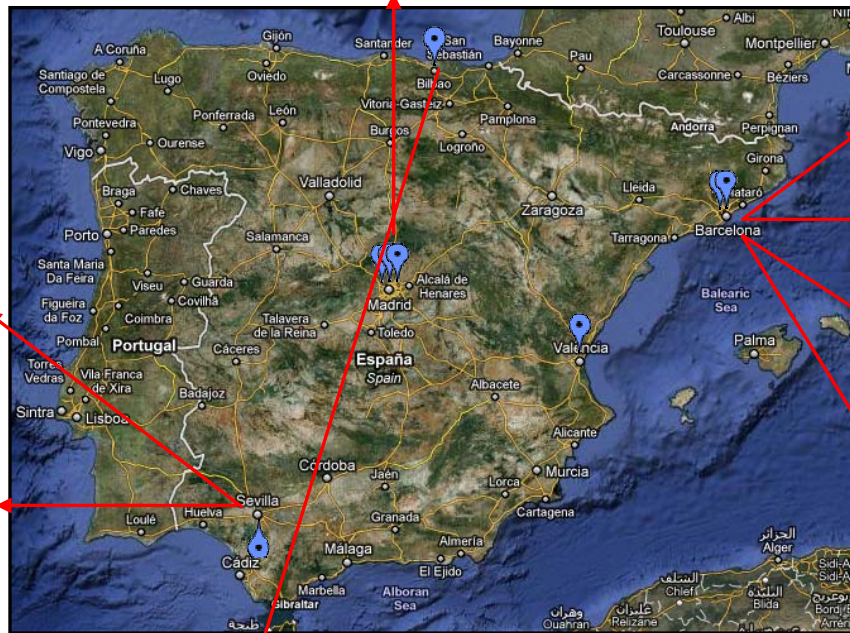
Infrastructure and Accelerator research area



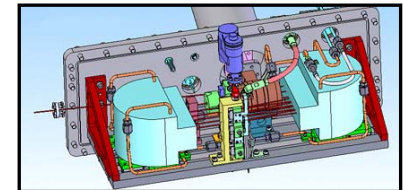
**Tandem 5MV
(Cockcroft-Walton).**



**Tandem 3MV
(Peleton), and 1MV
(Cockcroft-Walton)**



**Synchrotron Light
Facility, 3GeV**



**Microtron,
6,8,10,12 MeV.**

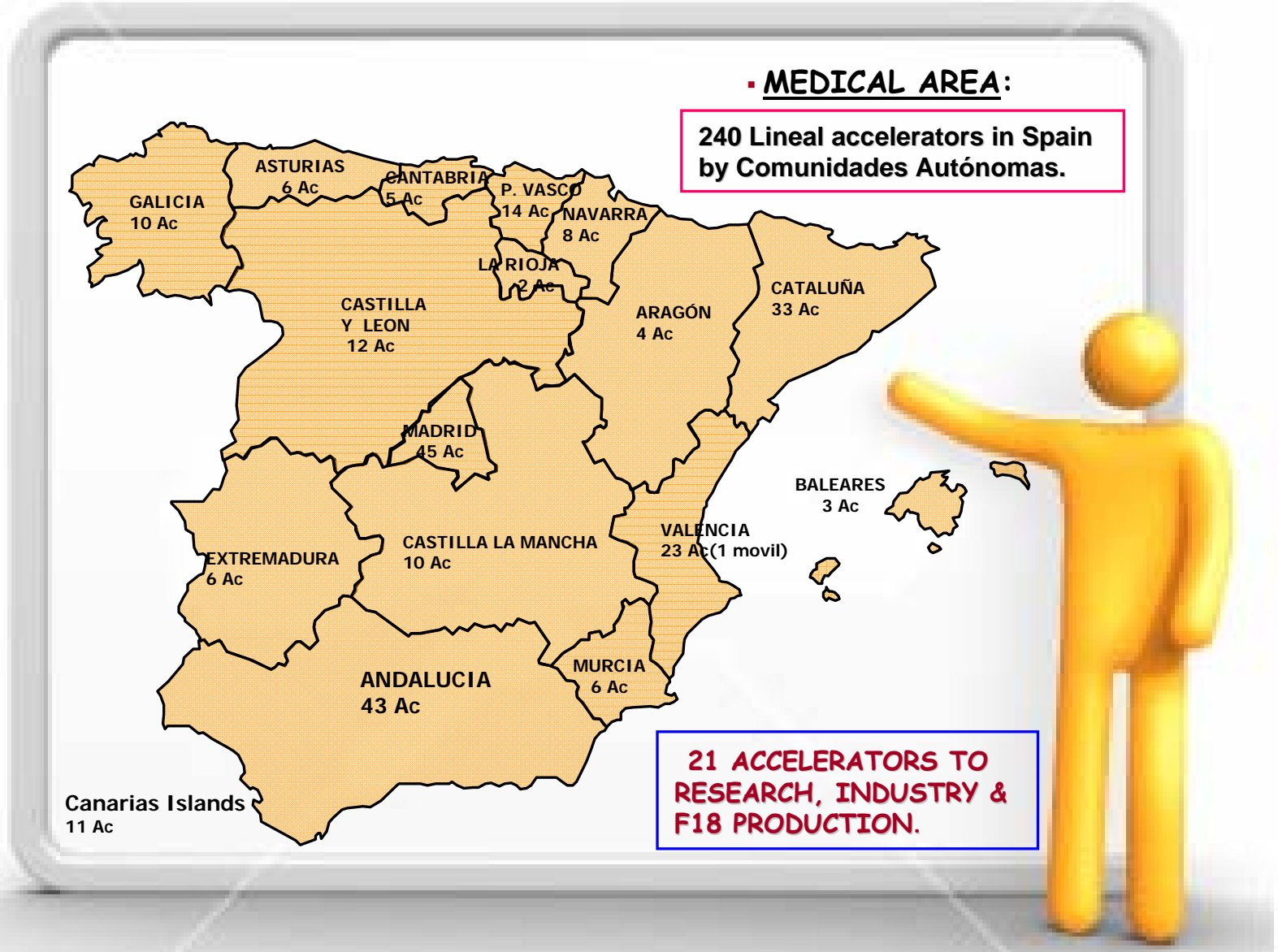


**ESS
bilbao**



**Project: Linac 50 MeV,
H⁺, H⁻**



Industrial & medical area



Resources for accelerator science training







1. Undergraduate:  **Subjects:** 

- ✓ *Synchrotron engineer:* ~20 Students, 20 hours, UPC
- ✓ *Working and application of particles accelerator:* ~25 Students, 60 hours, UPC



2. Master:



- ✓ *Synchrotron radiation and particles accelerator:* ~ 9 students, 60 ECTS, UPC, UAB, UB, ALBA CELLS.
- ✓ *R&D of industrial technology:* ~36 students, 60 ECTS, UNED  **Subjects:** 
 - ✓ *Security and environment impact of nuclear fusion facilities.*
 - ✓ *Technologies for nuclear waste management and disposal.*
- ✓ *Nuclear engineering:*  **Subjects:** 
 - ✓ *Particle accelerators*
 - ✓ *Control and instrumentation for p.a.*
 - ✓ *Components and power systems for p.a.*
 - ✓ *Neutron techniques.*
 - ✓ *Industrial, medical and research facilities.*
 - ✓ *Radiological protection.*
- ✓ *Physics engineering:*  **Subjects:** 
 - ✓ *Particle accelerators*
 - ✓ *Control and instrumentation for p.a.*
 - ✓ *Components and power systems for p.a.*
 - ✓ *Neutron techniques.*
 - ✓ *Industrial, medical and research facilities.*
 - ✓ *Radiological protection.*

3. PhD: 

Institution	CIEMAT	IFIC	UNED	UPC	ESS Bilbao	ALBA
Number of PhD	5	4	3	3	7	*

(*) Pending to receive information.



4. Collaborations:



→ Join Universities Accelerator School: ♦ Contribution of spanish universities, UPC, UV and UAB

→ Program of specialiation on scientific facilities and intertational organism with the suport of MICIN:

Institution	CERN	ITER	DIAMOND	ESRF
Students	5	1	1	2
Institution	FAIR	INFN	CLF-RAL	
Students	1	1	1	

5. Training and transfer of knowledge between research centres:



- ♦ Accelerators
- ♦ Lines/experiments of synchrotron light
- ♦ Other technical tasks, like computing

6. Text books:

- ✓ Yuri Kubyshin: “Acceleradors de partícules. Problemes”.
- ✓ Yuri Kubyshin: “Acceleradors de partícules. Vocabulari català-castellà-anglés”.



But, where are our students?



- ◆ Number of students selected for the Technical and Doctoral Student Programme by nationality over 5 years at CERN (*).

	AT	BE	BG	CH	CZ	DE	DK	ES	FI	FR	GB	GR	HU	IT	NL	NO	PL	PT	SE	SK	NMS	Total
2005	8		2	1	2	6	2	15	2	10	4	2	1	11	1	10	17	2	2			98
2006	12		1		3	6		11	1	19	5	4	4	21	1	16	15	7	11			137
2007	6	2	2	3	2	38		14	1	14	4	3	3	20	3	11	14	6	8		5	159
2008	21	2	5	2		27	1	18	6	10	5	9	1	17	1	14	17	3	5	4	4	172
2009	15	5	2	3	2	36		23	8	13	3	16	3	18	2	12	16	3	5	1	4	190
Total	62	9	12	9	9	113	3	81	18	66	21	34	12	87	8	63	79	21	31	5	13	756

(*). Statistics provided by CERN Human Resources



Most of them use to go abroad...



With our most sincere thanks to



Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas: Susana Falcón, Marisa Marco, Diego Obradors.



Universitat Politècnica de Catalunya:
Dr. Yuri Koubychine



Alba Cells: Dr. Gastón García,
Dr. Alejandro Sánchez and more...



Universidad Nacional de Educación a Distancia:
Dr. Javier Sanz, Dr. Patrick Sauvan



Centro de Microanálisis de Materiales:
Dr. Ángel Muñoz



Instituto de Física Corpuscular:
Dra. Ángeles Faus



European Spallation Source Bilbao:
Dr. Javier Bermejo



Universitat Autònoma de Barcelona:
Dr. Manel Sabes



Centro Nacional de Aceleradores:
Dr. Joaquín Jose Gómez

MICIN: Ministerio de Ciencia e Innovación UV: Universitat de Valencia

UPV/EHU: Universidad de País Vasco /
Euskal Herriko Unibertsitatea

Thank you



UAB

Ciemat

CNA



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