



SPANISH ROADMAP OF RESEARCH INFRASTRUCTURES

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SPAIN



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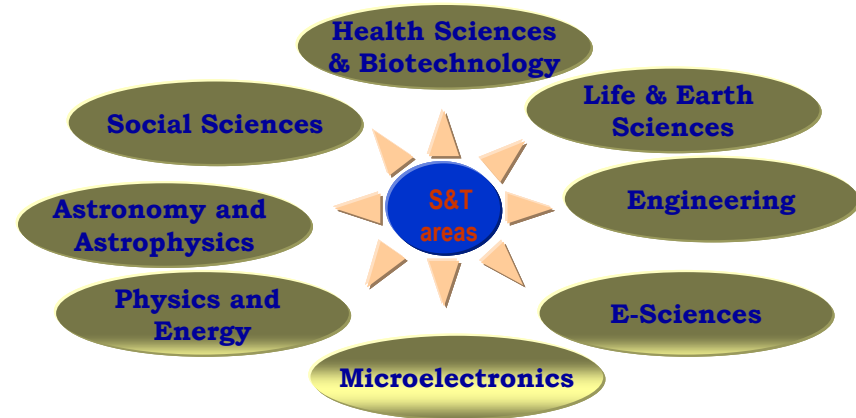
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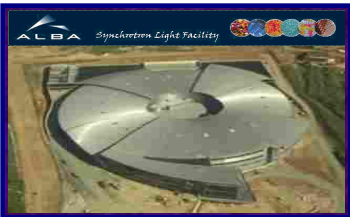
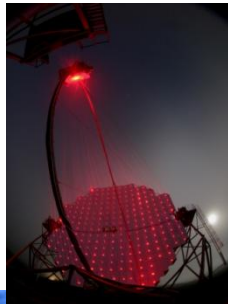
WHAT IS AN ICTS?

ICTS (Infraestructura Científica y Técnica Singular)
Unique Scientific and Technological Infrastructure

Unique infrastructures (facilities, resources or services) which are totally or partially **open to use** by the scientific –technological and industrial community, both national and international.



They can be physically located in a single place or as part of a distributed network



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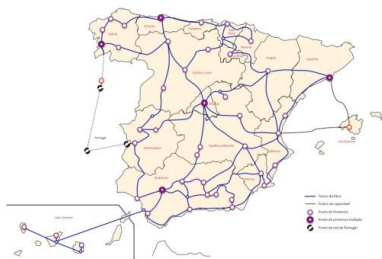
ICTS CRITERIA

- ❑ **Unique** and with **strategic** character
- ❑ **Funding/Investment:**
 - ✓ Construction costs ($>\approx 10$ M€), exploitation costs ($>\approx 1$ M€/year).
 - ✓ Sustainable, from own funds (or external income) and eventually from the Ministries and Regions.
- ❑ Existence of an **Strategic Plan** (for ex-ante and ex-post evaluation)
- ❑ In accordance with National, European and other International Strategies
 - ✓ European Framework, ESFRI Roadmap and other international Strategic Plans (ERANET, JTIs, Technological Platforms...)
- ❑ **Open** to external use (National and International users)
- ❑ With S/T Advisory Committee of recognised international prestige



1st SPANISH ICTS ROADMAP (2007)

Approved in the 3rd Conference of Regional Presidents in 2007



Strategic objectives:

1. Contribute to territorial balance and S/T cohesion.
 - Financial and political agreements between the Spanish and Regional Governments
2. Promote regional development and socio-economic progress around the ICTS, facilitating the creation of a pool of companies with high technological knowledge
3. Facilitate access to all interested research groups (national and international): increase the RI availability as powerful tools for raising quality in science and technology
4. Foster the internationalisation of the Spanish RIs, and the Spanish participation in European and other international initiatives.

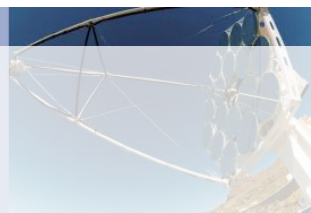


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ICTS INCLUDED IN THE SPANISH NATIONAL ROADMAP (2007)

SINGULAR SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURES IN SPAIN



Implemented since 2007:

7 new RI in operation

5 new RI under construction

During 2013 the Roadmap is being updated

At present, the Spanish National Roadmap is composed of 31 existing RIs labelled as ICTS, 5 under construction



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2013 STATUS: EXISTING ICTS IN OPERATION (31)

Spanish Antarctic Stations:

- Gabriel de Castilla
- Juan Carlos I

Galicia

- R/Vessel Sarmiento de Gamboa
- R/V Cornide de Saavedra
- Supercomputing Center of Galicia-Finis Terrae (CESGA)

Distributed: RedIRIS

Castile and León

- National Research Center on Human Evolution (CENIEH)

Madrid

- The Flexible Heliac TJII
- Animal Health Bio-safety Research Center (CISA)
- Unique Infrastructures for Civil Engineering (CEDEX)
- El Pardo Model Basin (CEHIPAR)
- Center for Technology of the Institute for Electronics Systems (ISOM)
- Research Aircraft Platforms (INTA)

Basque Country

- Molecular Imaging Platform CIC-BiomaGUNE

Aragón

- Canfranc Underground Laboratory (LSC)

Catalonia

- Nuclear Magnetic Resonance Laboratory
- Computing and Communications Center (CESCA)
- Barcelona Supercomputing Center (BSC-CNS)/ Spanish Supercomputing Network (RES)
- Clean Room of the Microelectronics National Center
- ALBA Synchrotron
- The Large Scale Wave Flume of the Maritime Engineering Laboratory (CIEM)

Murcia

- B/O Hespérides

Castile-La Mancha

- Yebes Astronomical Observatory

Canary Islands

- Roque de los Muchachos Astronom. Obs.
- Canary Islands Great Telescope (GTC)
- Teide Astronomical Observatory

Andalucía

- Calar Alto Astronomical Observatory
- IRAM Radio Telescope at Pico Veleta
- Doñana Biological Reserve (RBD)
- National Accelerators Center (CNA)
- Almería Solar Platform (PSA)

Astronomy and astrophysics

Information and Communications Technologies

Sea, Life and Earth Sciences

Energy

Engineering

Materials

Health Science and Biotechnonology

Socio-economic Sciences and Humanities



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GRAN TELESCOPIO CANARIAS



The biggest telescope built (10,4 m diameter) with a segmented primary mirror

Over 70 % of the engineering was delivered by Spanish companies, which have become more competitive and gained an international presence as a result.



Object Name: Sharpless 2-106

Telescope: Grantecan / Nasmyth-B

Instrument: OSIRIS

Filter: G (481nm), R (641nm), Z (970nm), OS657 (657nm, FWHM 35nm), OS902 (902nm, FWHM 40nm)

Color: Blue (G), Green (R), Red (Z). OS657 and OS902 were added as luminance to get resolution

Date: UT July 14th, 2010

- ✓ **Mainly funded by the Spanish Government and the Regional Government from the Canary Islands, co-funded through the European Funds for Regional Development (ERDF).**
- ✓ **Partners: México and USA.**
- ✓ **In operation since 2009**



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SINCROTRÓN ALBA



Alba is a third generation synchrotron and one of the largest Spanish research infrastructures

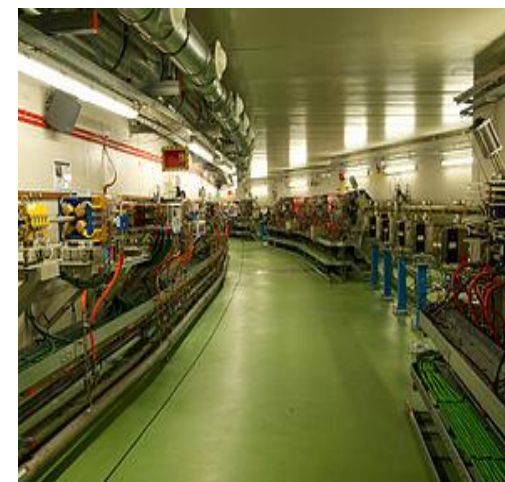
Main ring: 270 m

At present: 7 "beamlines" in operation

- BL22 - CLÆSS: Core Level Absorption & Emission Spectroscopies
- BL04 - MSPD: Materials Science and Powder Diffraction
- BL13 - XALOC: Macromolecular Crystallography
- BL11 - NCD: Non-Crystalline Diffraction
- BL24 - CIRCE: Photoemission Spectroscopy and Microscopy
- BL29 - BOREAS: Resonant Absorption and Scattering
- BL09 - MISTRAL: X-Ray Microscopy

✓ **In operation since 2011**

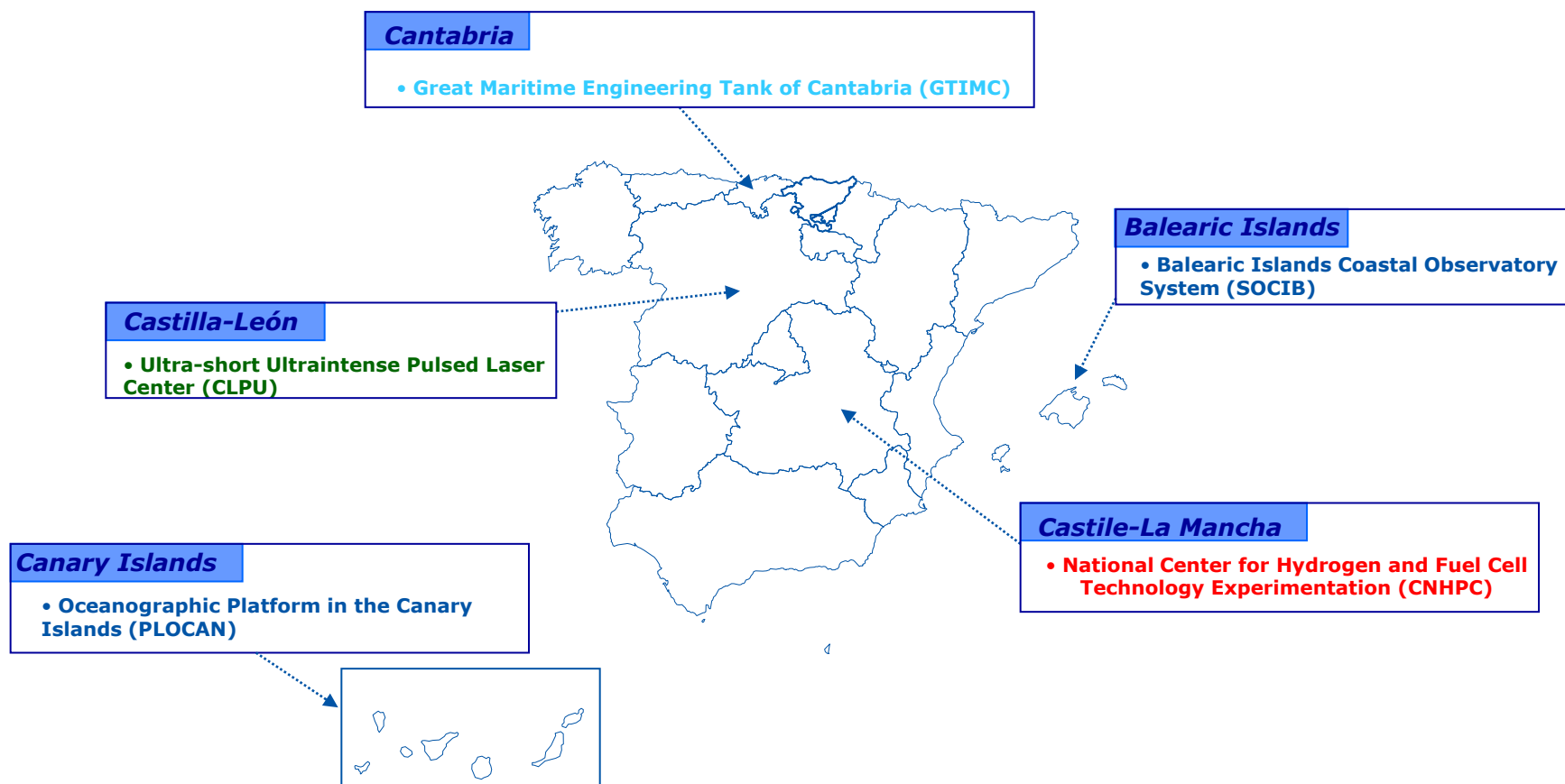
✓ **Public Consortium: 50 % Spanish Central and Regional government: 210 M€**



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2013 STATUS: ICTS UNDER CONSTRUCTION (5)



Astronomy and astrophysics

Information and Communications Technologies

Sea, Life and Earth Sciences

Energy

Engineering

Materials

Health Science and Biotechnonology

Socio-economic Sciences and Humanities



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OCEANIC PLATFORM OF THE CANARY ISLANDS (PLOCAN)

Infrastructure for research, development and innovation in ocean science and technology.

Located at the east of Gran Canary Island, it will provide rapid access to great depths at short distances offshore.

It will provide a permanent deep-sea observatory, a base for underwater vehicles and a test site for innovative technologies.

It will also offer support to training and innovative services delivered by external entities in ocean science and technology.

Operational at the end of 2014



<http://www.plocan.eu>

- ✓ **Public Consortium: 50 % Spanish Central and regional government (~45M€)**
Cofunded by the European Regional Development Fund (ERDF)



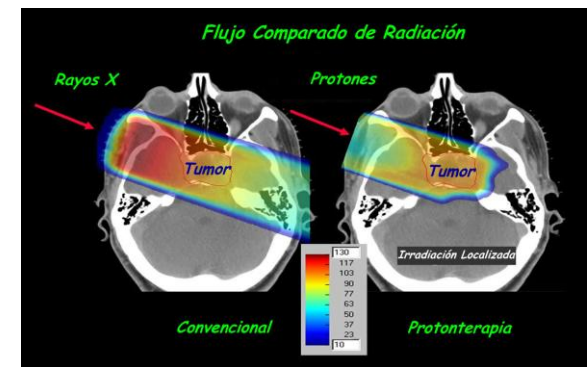
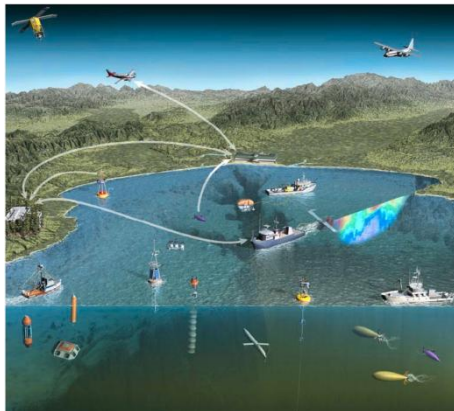
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ASSESSMENT AND CERTIFICATION PROCESS I

1. Creation of new ICTS:

- ❑ The evaluation is carried out by an independent institution (separate from the funding institution, which is responsible for the final decision as to whether to fund the action or not). This adds an additional mechanism to guarantee the quality of the evaluation.
- ❑ Therefore, a report on creation of the new ICTS is evaluated by ANEP (*National Evaluation and Foresight Agency*) and CAIS (*Advisory Committee for Unique Infrastructures*), who will send a recommendation report to the Ministry of Economy and Competitiveness (MINECO).



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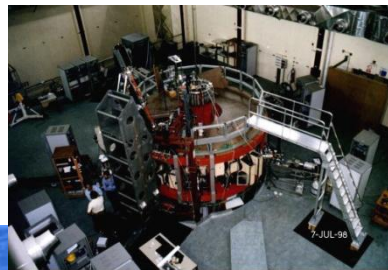
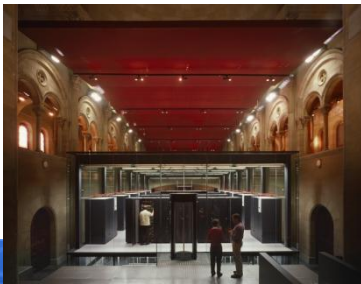
ASSESSMENT AND CERTIFICATION PROCESS II

2. Request for "certification" as ICTS (for existing infrastructures)

- ❑ Once the infrastructure construction has finished, and if the access is open for users in more than 20% of the infrastructure capacity (with access protocol and access committee), a request will be sent to MINECO. ANEP and CAIS will inform about it previously.
- ❑ If the evaluation is positive, this infrastructure will be included as ICTS in future updates of the Spanish ICTS roadmap.

3. Periodic assessment of the Strategic Plan and performance indicators (for ICTS already operational)

- ❑ An strategic plan will be evaluated by MINECO. This is used as a tool to maintain or not the "ICTS certification"



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LESSONS LEARNT FROM THE DEFINITION OF THE FIRST ROADMAP

- ❑ The Roadmap approved in 2007 allowed the launching of an ambitious programme for research infrastructures in Spain when the budget was increasing.
- ❑ 60% of the RIs identified in 2007 has been implemented (up to date), but the economic crisis reduced the margin for allocating funds and the complete fulfilment is not realistic at present.
- ❑ The fact of a RI being included in the roadmap showed not to guarantee its funding. A multiannual budget is essential.
- ❑ The weak commitment of the regional governments for funding their proposals has prevented some of the new RI.
- ❑ There have been difficulties to ensure the operation of the research facilities once finished the construction phase, due to the restrictive economic situation.
- ❑ Improving links with industry should be an objective.
- ❑ Periodic revision of the performance of the RIs is mandatory to verify their competitiveness and their maintenance at the forefront of knowledge.
- ❑ Importance of international cooperation (links to ESFRI programme and other international, bilateral or multilateral, agreements)





MAIN CHALLENGES FOR THE UPDATE OF THE ROADMAP

- ❑ The Roadmap should promote the long-term planning and must combine the interests of Central and Regional governments with strong commitments.
- ❑ It is mandatory to find a definition and criteria widely accepted to avoid the access of a myriad of equipment to scarce resources: well established assessment and evaluation process.
- ❑ It would be necessary to involve all actors: host institutions, users, owners (central and regional governments), industry, universities, EU
- ❑ To coordinate the Roadmap with another regional and European programmes (i.e. ESFRI), although respecting the National objectives
- ❑ The efficient allocation of Structural Funds is a main objective.
- ❑ To involve industry
- ❑ To foster programs for specialised Human resources
- ❑ Periodic revision of the results and performance of the RI to maintain the ICTS consideration
- ❑ Spain is updating the RI Roadmap in 2013. Unrealistic projects for new RIs will be abandoned. Focus in supporting the existing RIs and strengthening coordination.





CONCLUSIONS

- ✓ The Spanish RI Roadmap has been proved as an excellent tool for the country to promote a long-term RI planning. It includes the present catalogue of Unique Spanish RIs and future actions. It should not be a frozen list: its content will be periodically reviewed and updated.
- ✓ 31 RI are in operation and New RIs have been built since 2007: i.e. GTC, ALBA.
- ✓ The definition of a RI roadmap needs the political commitment to maintain the budget for construction and **for operation**.
- ✓ An economical study of the overall costs has to be defined to guarantee the operational phase.
- ✓ Structural Funds have been allocated.
- ✓ New capacities for industry have been achieved: i.e. Gran Telescopio Canarias, Stellarator TJ-II.
- ✓ It is necessary to act on the industrial tissue by fostering public-private partnerships and fiscal measures to promote innovation.
- ✓ Specific programs for specialized human resources are needed.





THANK YOU FOR YOUR ATTENTION