The Canary Islands Astronomical Observatories: Europe's own natural RI resource for attracting

young scientists and engineers

INSTITUTO DE ASTROFÍSICA DE CANARIAS

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Conference Research Infrastructures and the Regional Dimension of ERA
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24 – 25 March 2009

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Outermost Regions

- Structural handicaps and cultural backgrounds have historically led to quite dependent economies
  - Environmental constraints: remoteness, insularity, small size, difficult topography and climate
  - Economies relying on few specialised and frequently vulnerable activities: agriculture, tourism, other traditional activities
  - Social and cultural factors: low education, immigration (particularly for Canaries and French Guyana), emigration, low women activity rates, etc.

- New development strategies seek to address those regions' strengths and potential, based on spill-over effects
  - Natural resources
  - Strategic geographical position and export potential
  - Collaborative work between industry and research

Strengths and opportunities

- In this context, outermost regions base their development on:
  - The valuation of their strengths and natural potential
  - The reduction of their constraints' effects
  - The improvement of their economic independence

- For a better utilisation of natural resources
  - Outermost regions are the only European areas that provide such a rich biodiversity

- The existence of an environment favourable to research and innovation
  - These regions are now endowed with the fundamental infrastructures (Research, education, IT, etc.)
  - A genuine "innovation mentality" is emerging and collaborative works are being launched involving universities, national research centre and enterprises

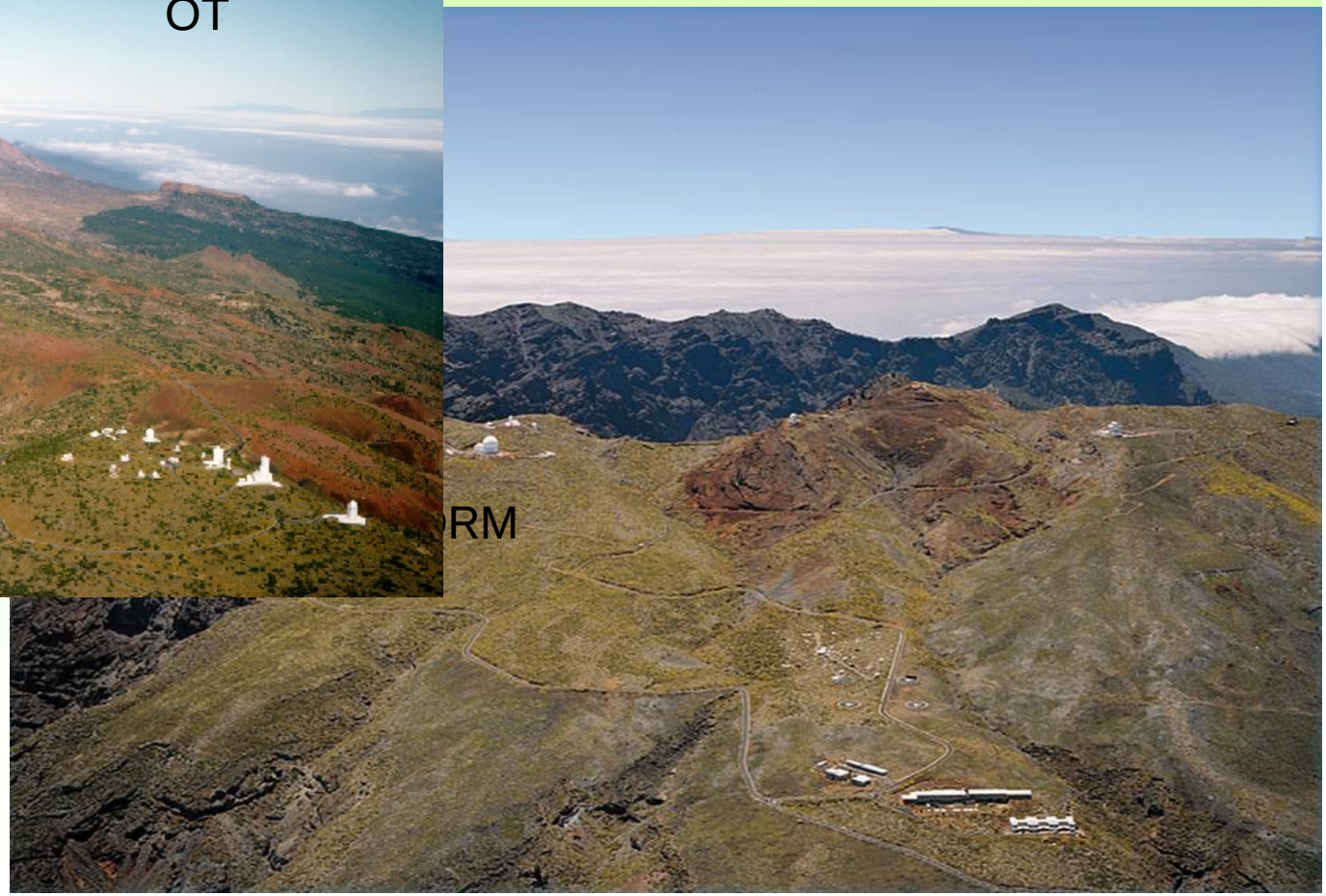
Strengths and opportunities

- Specific research areas of excellence are emerging
  - Specific characteristics have stimulated research in some specific areas (meteorology/**astronomy**, volcanology, tropical diseases, etc.)

COMMISSION OF THE EUROPEAN COMMUNITIES
Brussels, 17.10.2008

COMMUNICATION FROM THE COMMISSION
The outermost regions: an asset for Europe
"Offering excellent visibility of celestial objects to astronomers, the Canary Islands Astrophysics Centre is a research infrastructure renowned at international level, housing the most advanced telescopes and astrophysical installations in the European Union. Once the Great Canary Telescope (GCT), the only one of its kind in the world, is put into service it will enable European astrophysics researchers to participate in projects of a highly technological nature."

Why do the Canarian Observatories house Europe's largest collection of telescopes?



CANARY ISLANDS CLIMATOLOGY

Geographical factors:

- Lat. 28ºN, Long.16-17ºW
- Visibility of North Hemisphere and part of Southern
- Far from tropical storms

Climate:

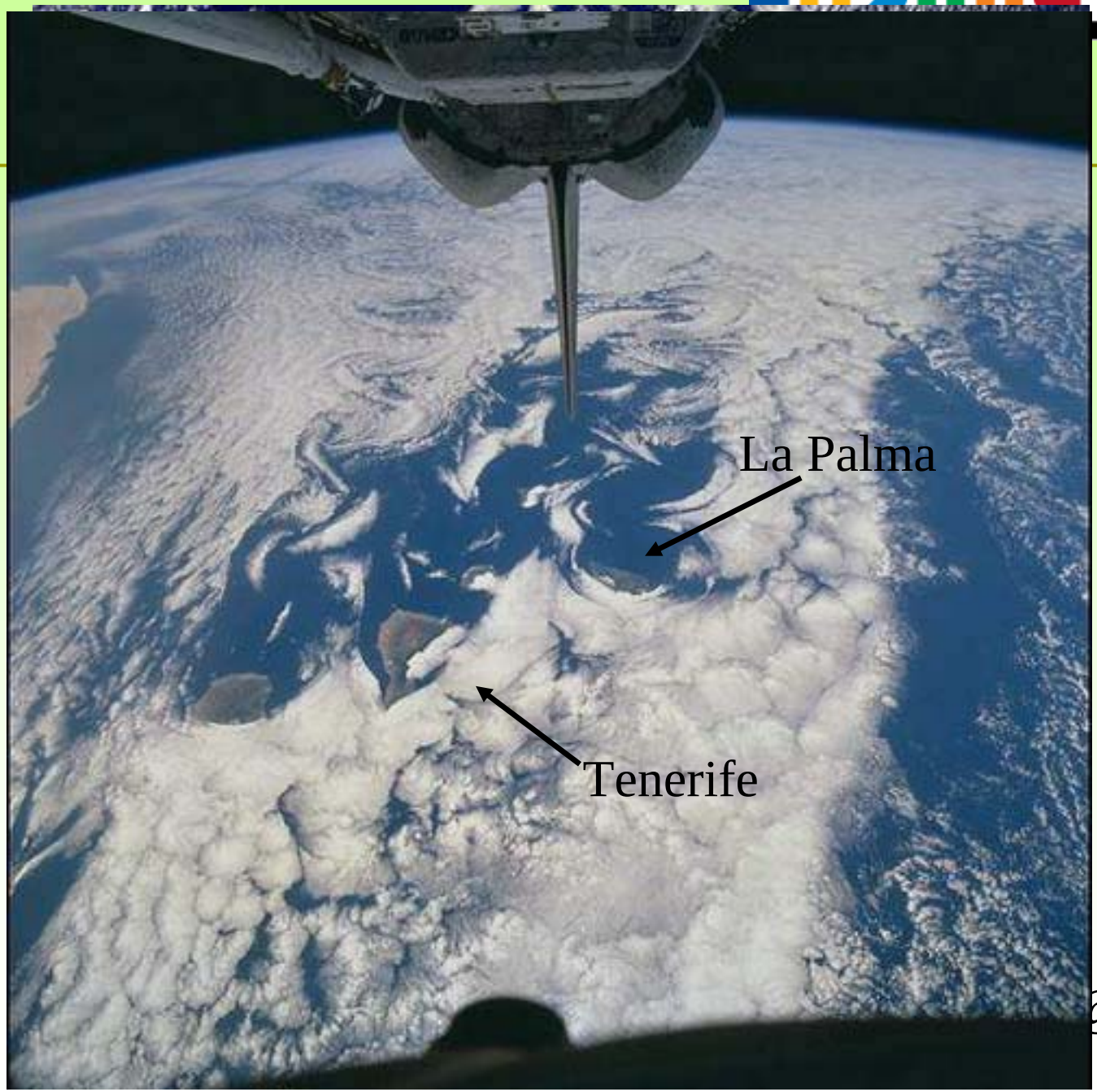
It is dominated by a persistent area of high pressure in the North Atlantic (the Azores anticyclone or the Bermuda High)

- Trade winds+cold current
- Troposphere above the cloud level

Altitude:

- 2400 m, above the inversion layer
- Dry wind regimes (trade winds)
- Transparent atmosphere.
- Clouds level covering light contamination
  and aerosols

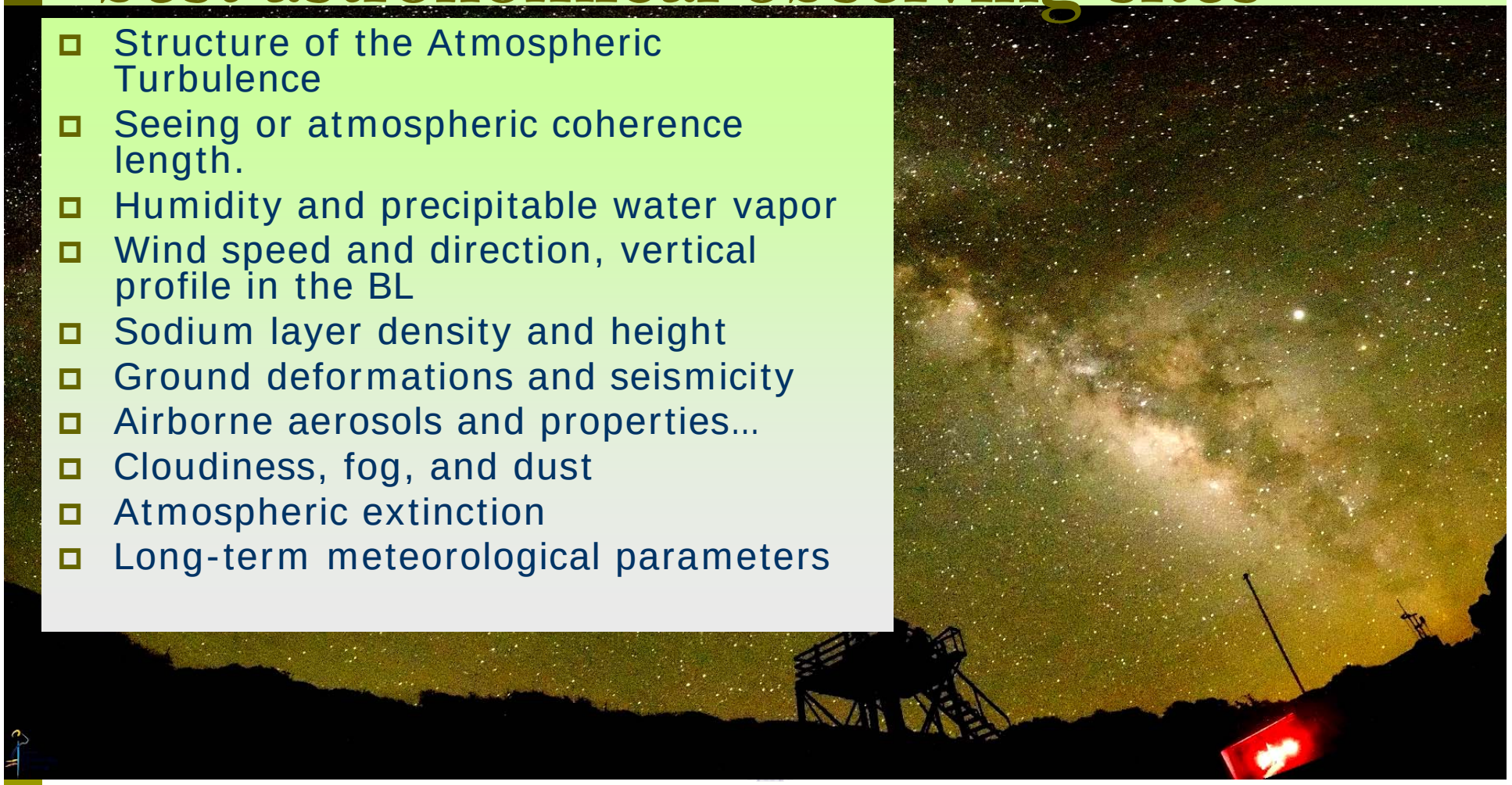
CLOUDINESS AND OROGRAPHY



@INM

Parameters for selecting the best astronomical observing sites

- Structure of the Atmospheric Turbulence
- Seeing or atmospheric coherence length.
- Humidity and precipitable water vapor
- Wind speed and direction, vertical profile in the BL
- Sodium layer density and height
- Ground deformations and seismicity
- Airborne aerosols and properties…
- Cloudiness, fog, and dust
- Atmospheric extinction
- Long-term meteorological parameters



The Canarian Observatories

The Canarian Observatories are a very powerful attractor for young scientists and engineers.

They provide the opportunity to participate in frontline international projects.

This can make a major contribution to their professional careers.

What do the Canarian Observatories offer Europe's young astrophysicists?

What do the Canarian Observatories offer Europe's young astrophysicists?

For example, the GTC, 10.4m, is the world's largest and most powerful optical/IR telescope.

It has just entered service and is playing a major role in internationally funded research projects that feature some of the brightest young astrophysicists.

GTC:

What is Consolider-GTC

For the **"Consolider-Ingenio 2010 GTC project"** it is fundamental that the GTC, a complex & expensive installation, produces science from the very beginning: it's just a must.

There are **12 scientific groups** involved. For the Consolider-GTC Project, the main thrust bonding so many different scientific groups together is their interest for getting the best Science out of the GTC.

@Natalia Zelmanovich

GTC:
What is Consolider-GTC

The project

- Over 150 participants
- 19 research teams in 12 different centers (including centers in Mexico and Florida)
- Object Oriented approach
- Funded by the Spanish Ministry of Science & Innovation with over 5 M€ for 5 years

@Natalia Zelman

GTC:

What is Consolider-GTC

Main Objectives

1) Accelerate the GTC commissioning so it starts producing Science as soon as possible.
2) To carry out a number of scientific projects that results in qualitative advancements in astronomy.
3) To benefit from the know-how acquired during the GTC construction to get involved in the new generation of ELTs.

@Natalia Zelman

ESTALLIDOS

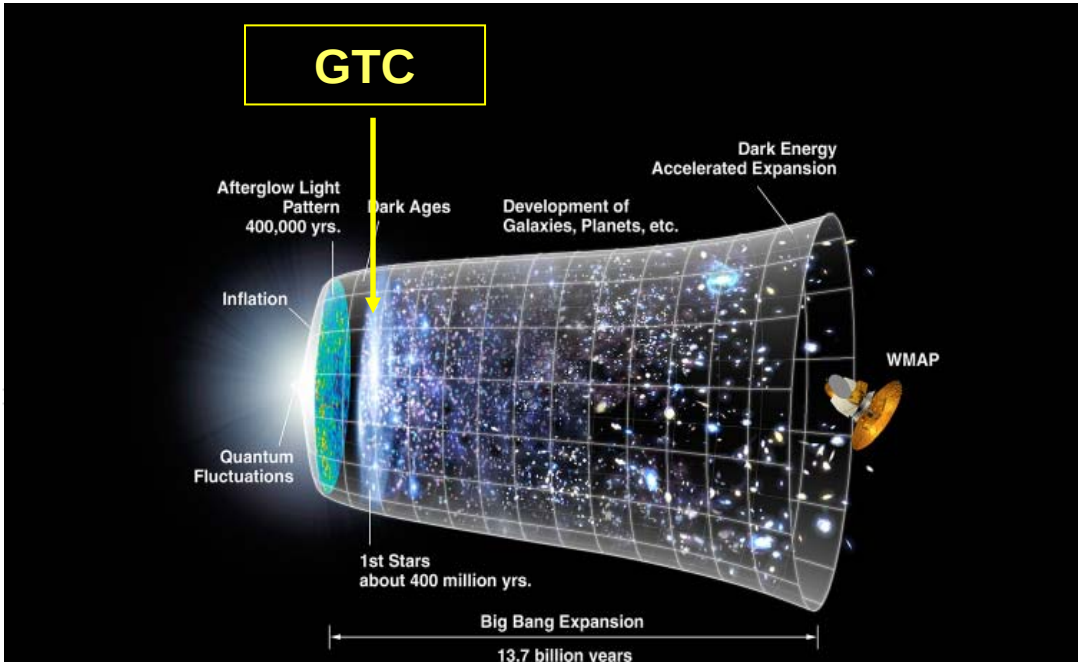
GRUPOS CONSOLIDER INGENIO 2010-GTC

MENÚ PRINCIPAL

- INICIO
- CONSOLIDER-GTC
- OBJETIVOS
- ORGANIZACIÓN
- EQUIPOS CONSOLIDER
- QUIÉN ES QUIÉN
- OFERTAS DE EMPLEO
- DIFUSIÓN
- ISCAI
- AIA2009

GRUPO GTC

EAST	ESTALLIDOS	ESTRELLAS DE BAJA MASA
ESTRELLAS MASIVAS	ESTRELLAS VARIABLES	GALAXIAS
GOYA	OBJETOS SUBESTELARES	OBSERVATORIO VIRTUAL
OTELO	PLANETAS	UNIVERSO LOCAL



FP6 - OPTICON Objective & spirit

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- *"... to sponsor <u>new opportunities</u> for research teams to obtain access to individual major research infrastructures."*
  - ... medium size telescopes providing a world-class service for top quality research

Strengthening the participation of New users, young researchers and users from countries with NO similar facilities . . .

Approx. 1200 observing nights/days + 200 hours

~630 users, ~ 400 observing runs, ~ 400 - 500 T&S grants.

New observers – Young researchers

ACCESS PROGRAMME











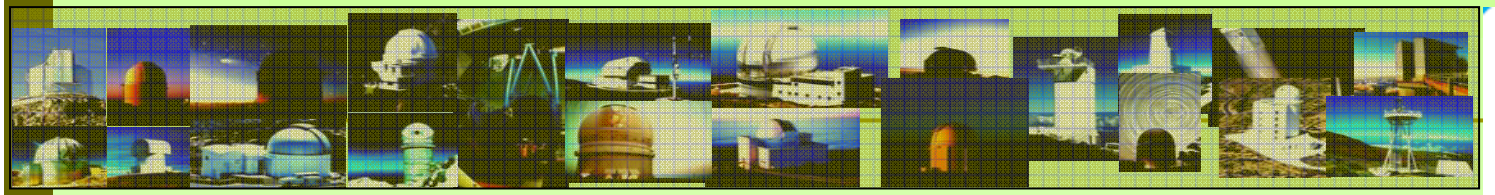
"OPTICON gave me the excellent opportunity to familiarize myself with the NOT telescope. Without OPTICON I would not have been able to afford the cost of the trip. I wish all the young astronomers had the same funding opportunity as I did."

Edita Stonkute. Vilnius University. July 2008

- Main promotional activity
- Available in ES & EN
- Educational contents
- Audiovisual material
- Highlights of facilities at OT & ORM

New layout expected for the Web: www.eno.iac.es

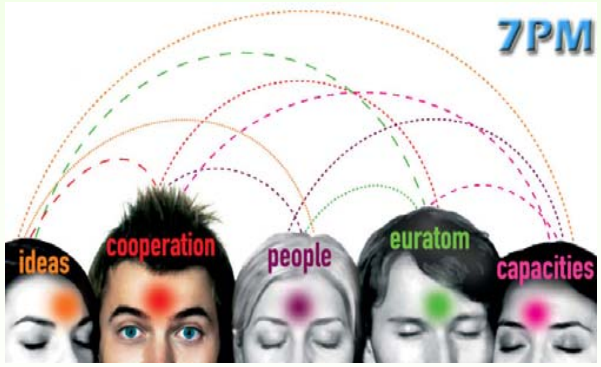
FP7 –RESEARCH POTENTIAL

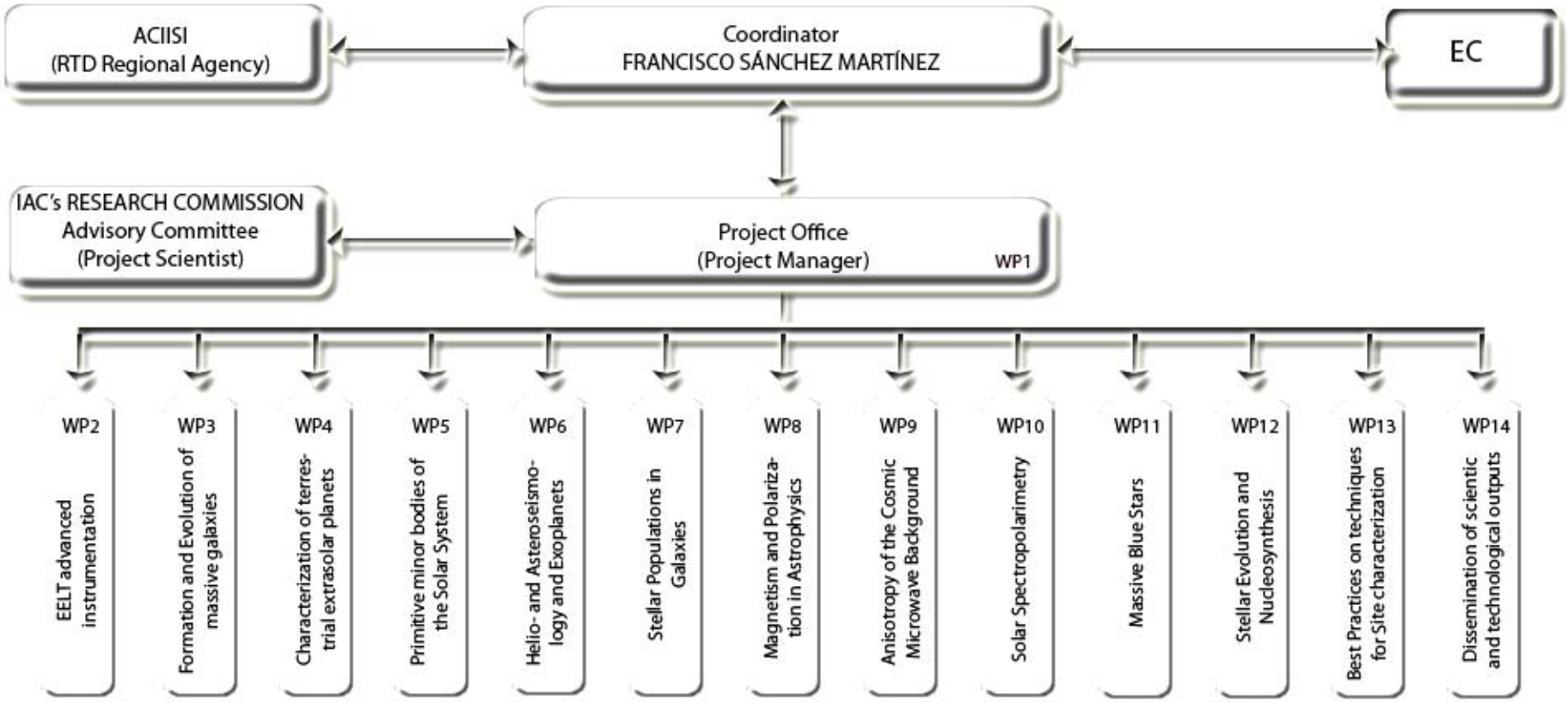


2007 - 2013

IAC leads the SMART-IAC proposal:

- Strengthening the Most Advanced Research & Technology (SMART) at the Instituto de Astrofísica de Canarias.
  - 27 collaborative institutions
  - 1,3 M€uros
  - Focussed on secondments and workshops




ACIISI
(RTD Regional Agency)
Coordinator
FRANCISCO SÁNCHEZ MARTÍNEZ
EC
IAC's RESEARCH COMMISSION
Advisory Committee
(Project Scientist)
Project Office
(Project Manager)
WP1
WP2
EELT advanced instrumentation
WP3
Formation and Evolution of massive galaxies
WP4
Characterization of terrestrial extrasolar planets
WP5
Primitive minor bodies of the Solar System
WP6
Helio- and Asteroseismology and Exoplanets
WP7
Stellar Populations in Galaxies
WP8
Magnetism and Polarization in Astrophysics
WP9
Anisotropy of the Cosmic Microwave Background
WP10
Solar Spectropolarimetry
WP11
Massive Blue Stars
WP12
Stellar Evolution and Nucleosynthesis
WP13
Best Practices on techniques for Site characterization
WP14
Dissemination of scientic and technological outputs

Site Selection for the European Extremely Large Telescope

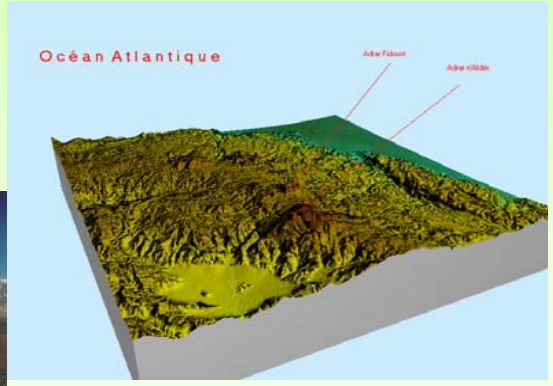
http://www.eso.org/project/e-elt/

Backasskög, Suecia

ELT Design Study, WP12000, Site Characterization
J. Vernin, C. Muñoz-Tuñon, M. Sarazin

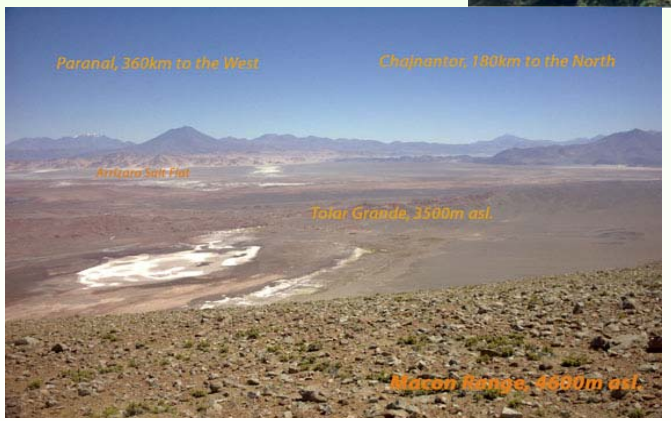
Spain-ORM
2400m

Morocco-Anti Atlas
2400m



Spain-OT
2400m

Argentina-Macon
4500-5000m



Chile-Ventarrones
2400m

Paranal

ESO - Future Facilities: E-ELT - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.eso.org/public/astronomy/projects/e-elt.html

Members WebMail Connections BizJournal SmartUpdate Mktplace

RIC 2009 | ESO - Future Facilities: ... | Doodle: La Palma IYA Meeting

ESO
European Organisation
for Astronomical
Research in the
Southern Hemisphere

Future Facilities: E-ELT

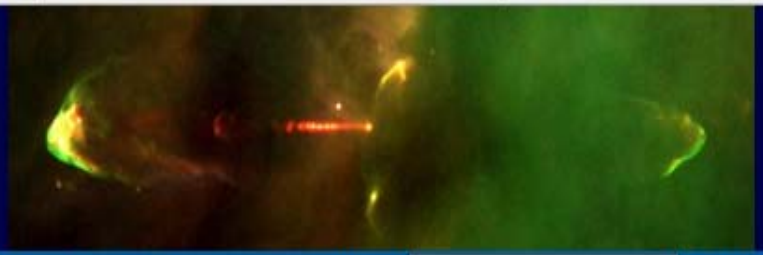
ESO Home | User Portal | Contact | Site Map | Search | Go!

ESO for the Public > Astronomy at ESO > Future Facilities > E-ELT

13 Mar 2

- The E-ELT Concept
- Europe's Window on the Universe

ESO - Future Facilities: ... | Doodle: La Palma IYA Meeting



Future Facilities: E-ELT

Portal | Contact | Site Map | Search | Go!

at ESO > Future Facilities > E-ELT

13 Mar 2009

Europe's Window on the Universe

ESO has built up considerable expertise in planning, constructing and operating large astronomical telescopes at remote sites. ESO's Very Large Telescope is the world's most advanced ground-based optical telescope and has enabled many scientific breakthroughs.

This expertise forms the backbone of efforts to develop an Extremely Large Telescope for Europe's astronomers. The basic reference design was completed by the end of 2006. The final design of this facility, a study costing 57 million Euros, is now underway, with the aim of having the E-ELT observatory starting operation around 2018. In addition to these design activities, more than 30 European scientific institutes and high-tech companies are studying the technological aspects of large telescopes within the Framework Programme 6 ELT Design Study, partially funded by the European Commission. The E-ELT is a high technology, highly prestigious science-driven project that incorporates many innovative developments. It offers numerous possibilities for technology spin-off and transfer, together with lucrative technology contract opportunities and provides a dramatic showcase for European industry.

The E-ELT has already gained wide support in the European scientific community. This venture is the only optical astronomy project selected in the roadmap of the European Strategy Forum on Research Infrastructures. It also features very prominently in the ASTRONET European Infrastructure Roadmap for Astronomy.

The European leadership of this major flagship project will indisputably raise the European scientific, technological and industrial profile.

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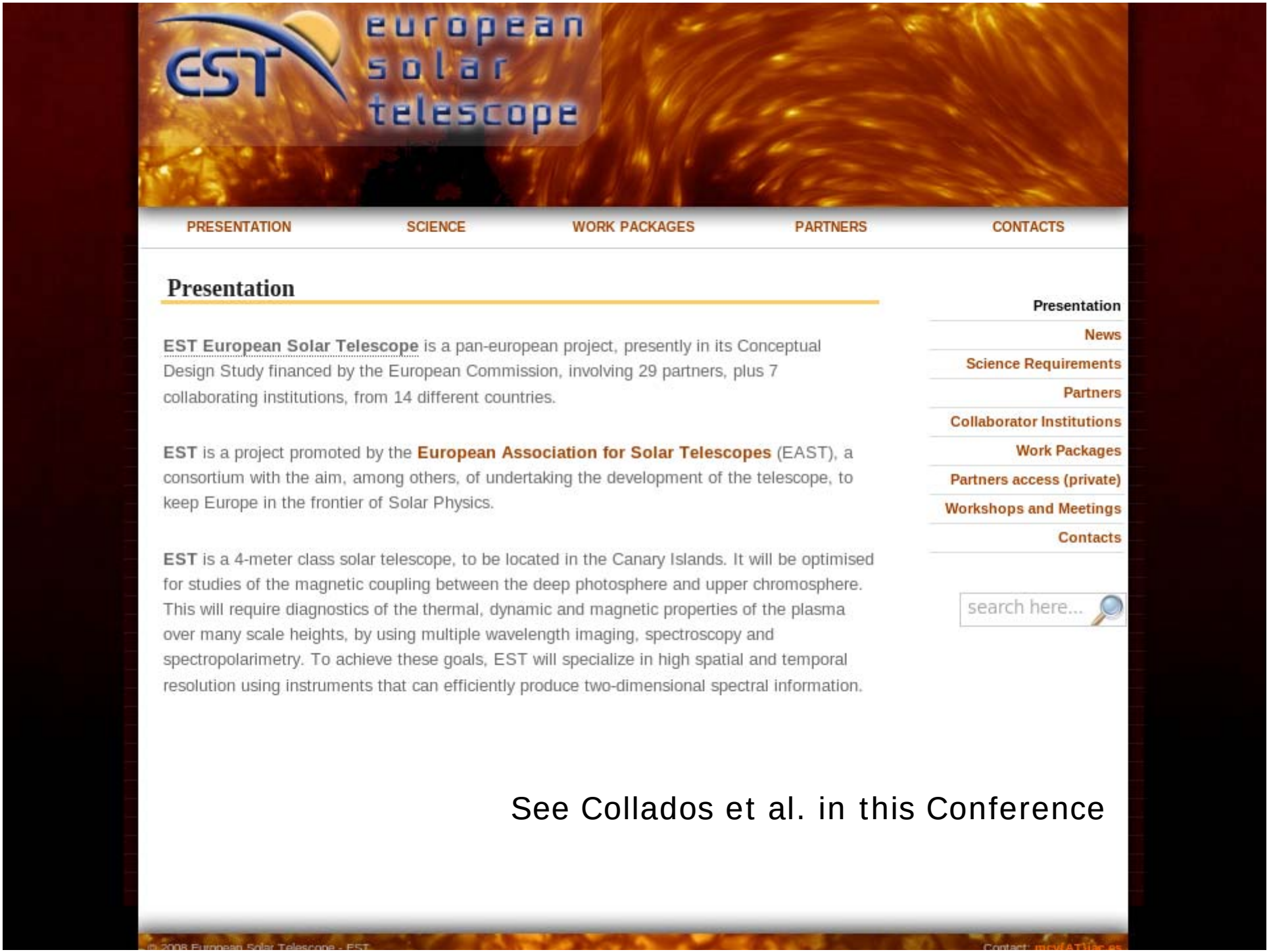

See Collados et al. in this Conference

Collaborator Institutions

Institution	Country
Hvar Observatory	Croatia
Konkoly Observatory	Hungary
Institute of Theoretical Astrophysics	Norway
ETH Zürich	Switzerland
Università di Catania	Italy
IGAM, University of Graz	Austria
Università della Calabria	Italy
Astronomical Institute, University of Wroclaw	Poland

Presentation
News
Science Requirements
Partners
Collaborator Institutions
Work Packages
Partners access (private)
Workshops and Meetings
Contacts

search here...

Points for discussion:

- How relevant is it for the careers of young European astrophysicists and engineers that the E-ELT and EST be built and sited in Europe?
- Why is it vital for their careers that the EC develops a strategic role in prioritizing resources and opportunities?
- In view of the need for socio-economic stimulous measures, should the EU dedicate much more of its resources to designing, building and operating world class Research Infrastructures?

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Thanks for your attention