

ASTROPHYSICS AT THE CANARY ISLANDS

ERASMUS+ Meeting
2nd October 2017

Representatives from the IAC: Jorge García-Rojas & David Jones



The Instituto de Astrofísica de Canarias (IAC)

Offices and observatories on
both La Palma and Tenerife



The Instituto de Astrofísica de Canarias (IAC)

Public research consortium

- ✧ Central Administration (Ministry of Economy and Competitiveness)
- ✧ Canary Islands Autonomous Community
- ✧ University of La Laguna
- ✧ Higher Council for Scientific Research.

2 headquarters and 2 international Observatories



OT



ORM



Main Headquarter



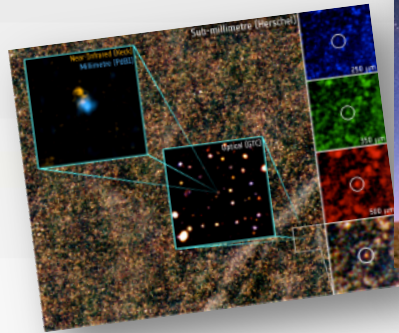
CALP

International cooperation

- ✧ More than 60 collaborative agreements have been signed with institutions that operate facilities at the IAC's Observatories

IAC's vision

Perform top-class science in main fields of astrophysics.



Consolidate the Canary Islands as “astronomical reserve” of international relevance.

Promote the installation of first class research infrastructures at the Canarian Observatories.



Foster an environment of stable international collaborations.

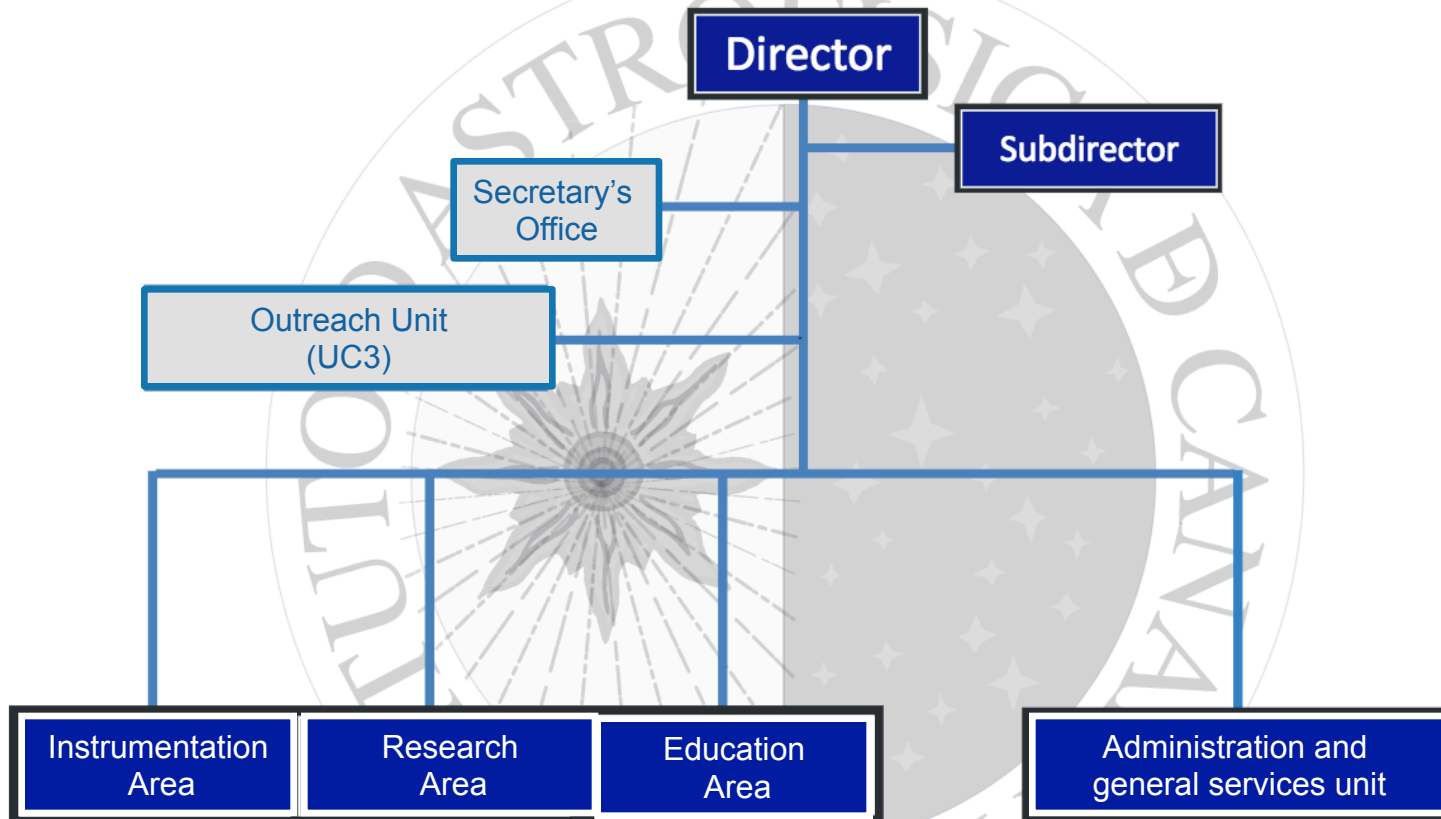
Contribute towards social awareness of research and the importance of a knowledge-based economy.



Support education and training of early-stage researchers and technicians.

The IAC Structure

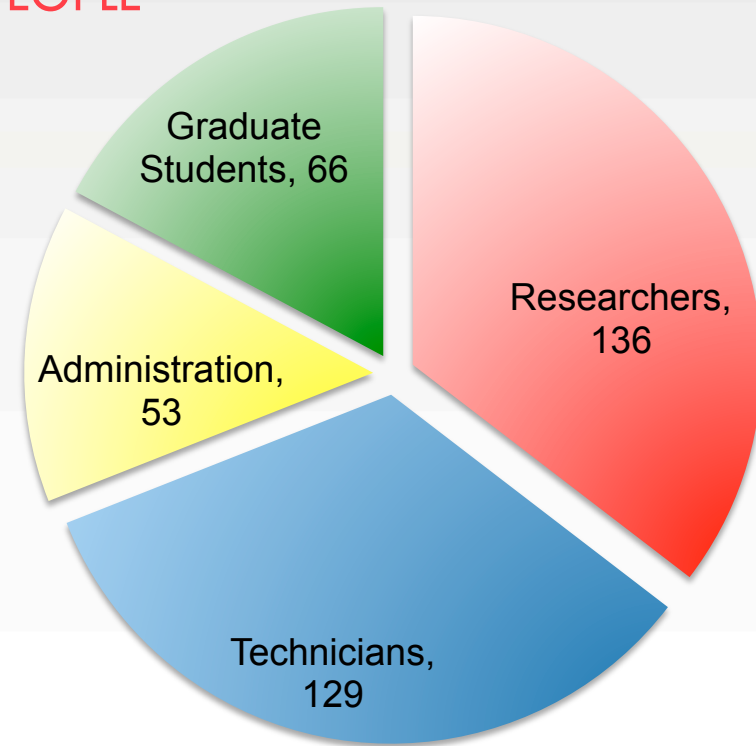
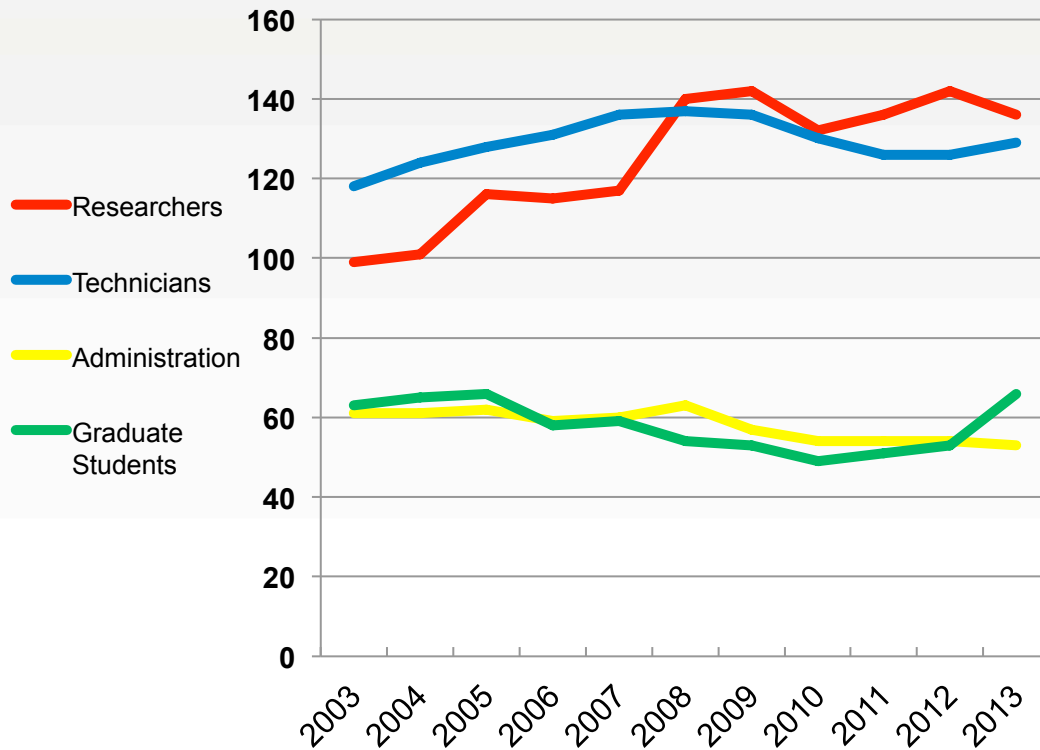
IAC Organigram



Organigrama de la estructura del Instituto de Astrofísica de Canarias

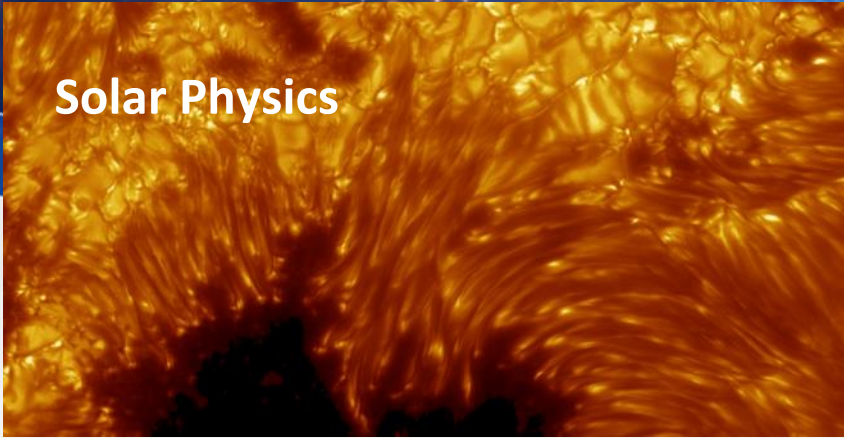
The IAC human resources

IAC PERMANENT AND TEMPORARY STAFF ~400 PEOPLE



Research at the IAC

Solar Physics



Galactic Formation and Evolution



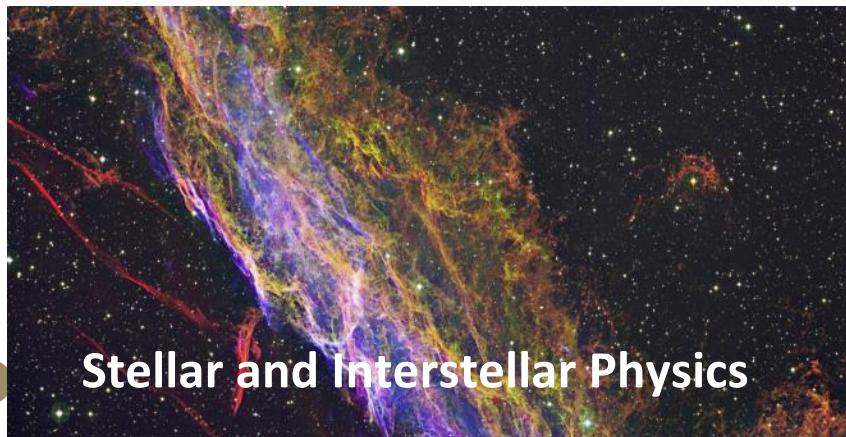
Exoplanets and Solar System



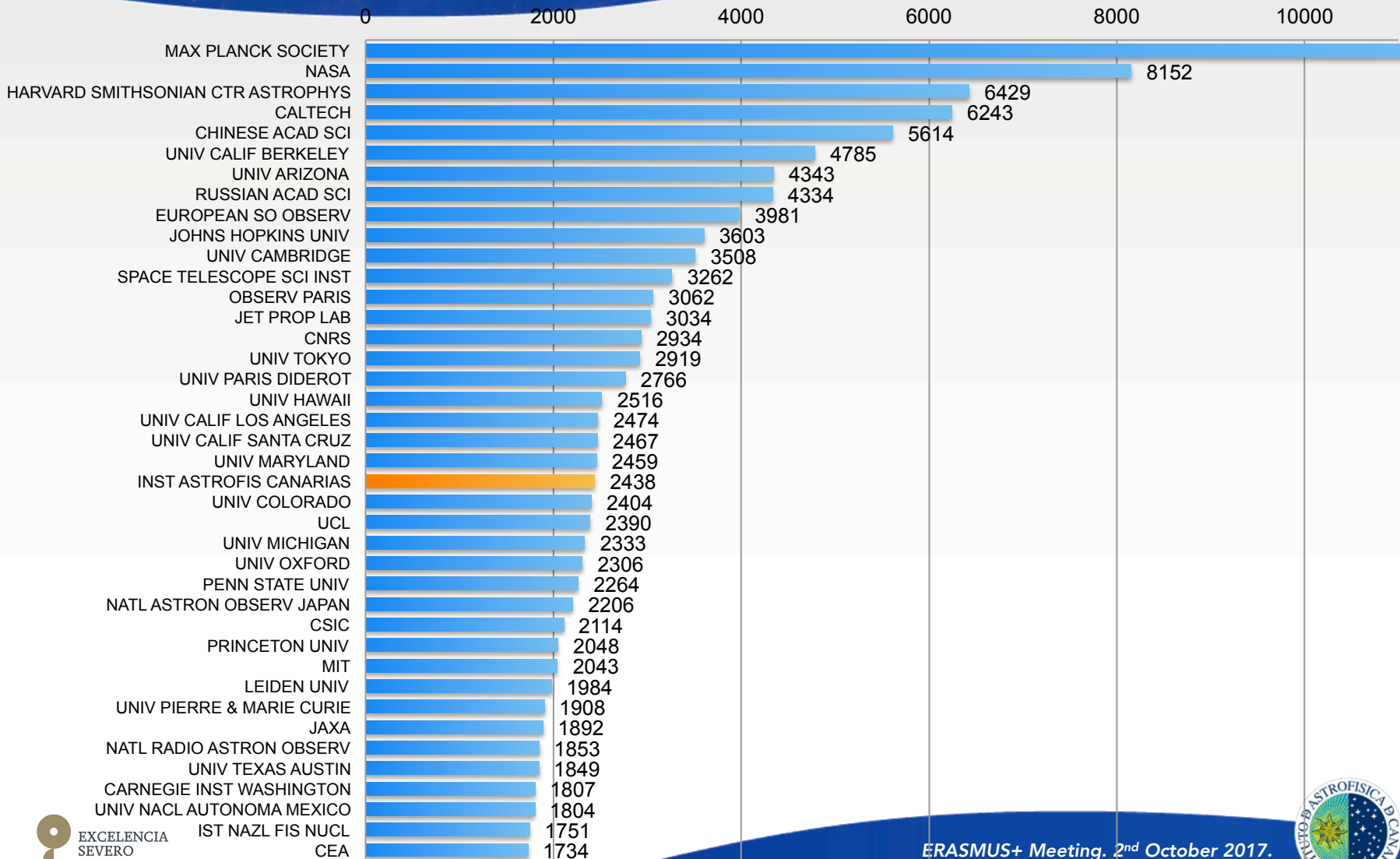
Astroparticles and Cosmology






















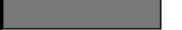









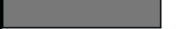



























Stellar and Interstellar Physics



Number of papers during the last 10 years



Astronomical Instrumentation Projects

PROJECTS IN DEVELOPMENT	DETAILS	Type	Telescope	PI Institution	Present Phase
EMIR	  	IR	GTC	IAC	
MIRADAS	 	IR	GTC	U Florida	
FRIDA	  	IR	GTC	UNAM	
GTCAO-LGS		OA	GTC	IAC	
HORUS	 	V	GTC	IAC	
EST-SOLARNET-GREST			EST	IAC	
QUIJOTE			QUIJOTE	IAC	
ESPRESSO	 	V	VLT	O Geneva	
HARMONI	 	IR	E-ELT	U Oxford	
EDIFISE	  	OA	OGS	IAC	
AOLI (&FASTCAM)	 	V	WHT	IAC	
WEAVE	 	V	WHT	ING	
SOPHI (SOLAR ORBITER)			SOLAR ORB.	MPS	
NISP (EUCLID)			EUCLID	IA Paris	
PLATO			PLATO	CAB/IAA	
SUNRISE-3			SUNRISE	IAA	
HIRES	  	IR	E-ELT	OA Brera	
HARPS3	 	V	INT	U Cambridge	
NIRPS	  	IR	ESO 3.6	U Montreal	
OPTICON H2020			-	UK ATC	

Total of 20 projects

The Roque de los Muchachos Observatory



Home to >10 different telescopes.

Optical, IR, Solar, Robotic, Gamma-ray Cherenkov...

World's biggest optical telescope! → GTC

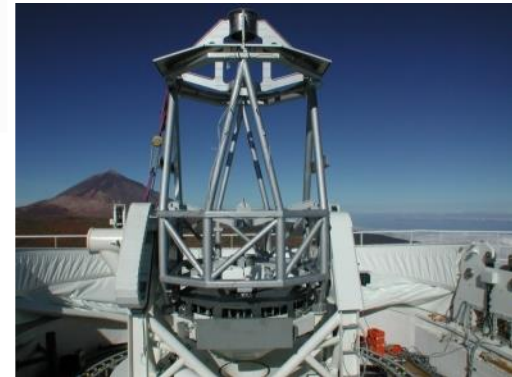
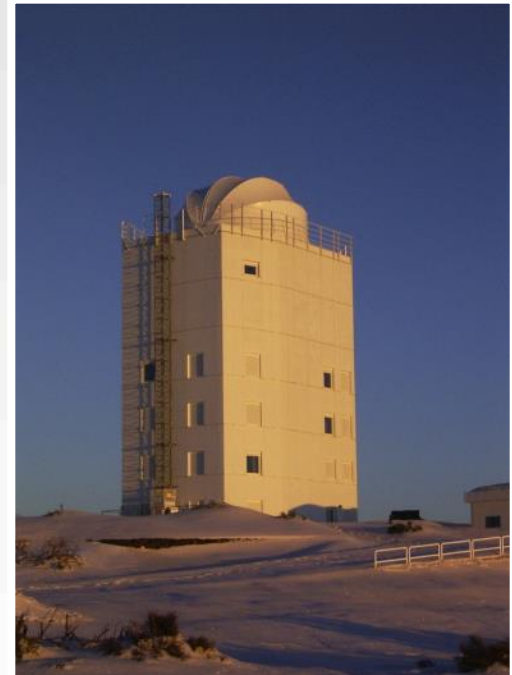
Access to 5 available through OPTICON

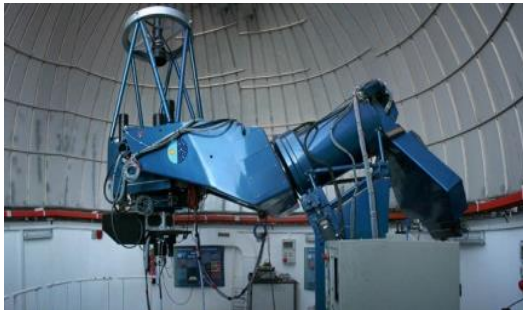
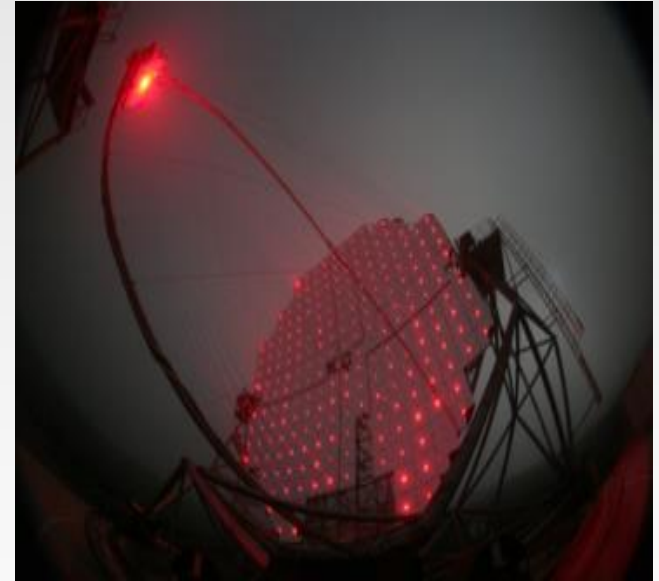
Others only through IAC staff, national TACs or telescope consortia

Next-generation 4m Solar telescope → EST

The Teide Observatory

Home to >20 telescopes (Solar, optical, IR, microwave, robotic)
Access to the 1.5m IR Carlos Sanchez telescope (TCS) via OPTICON

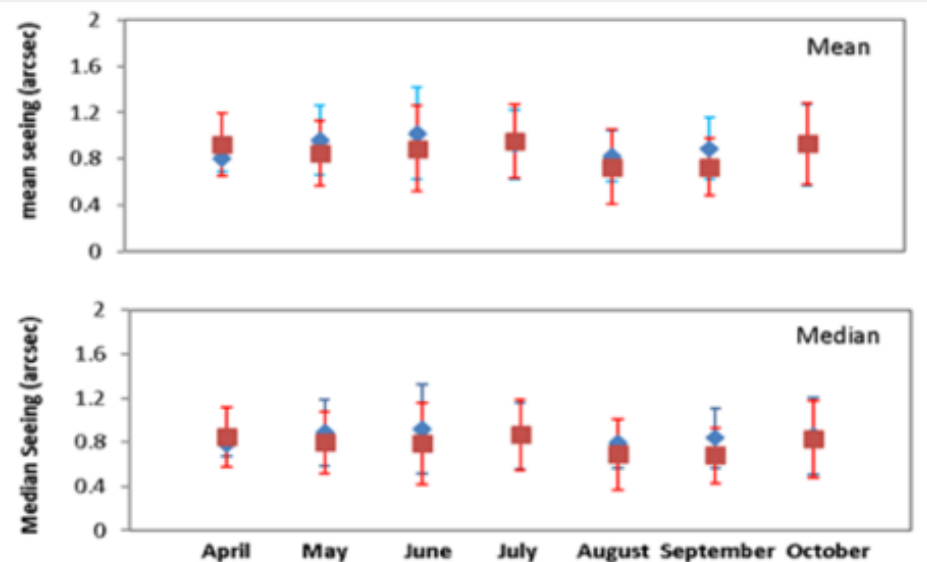
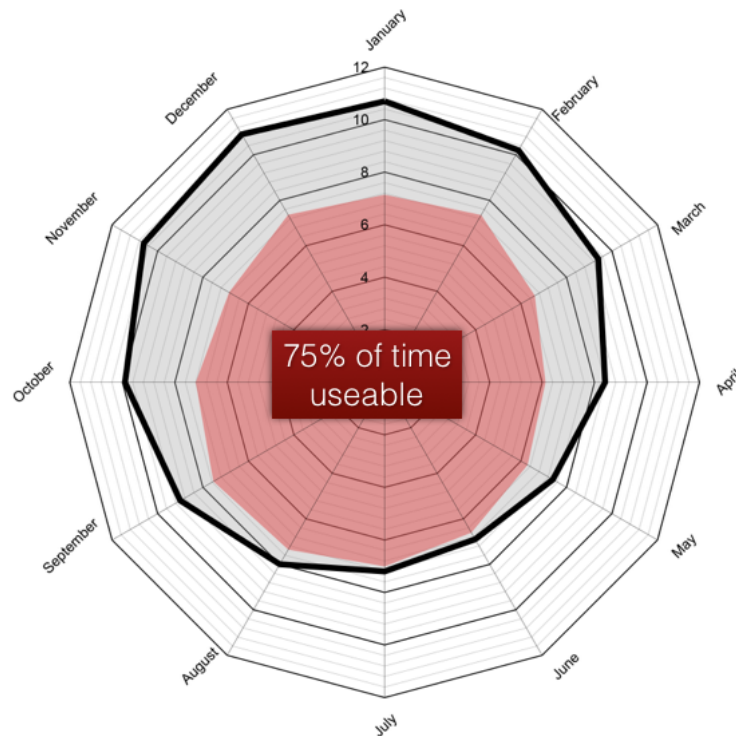




La Palma sky quality and usable hours

“Sky Law” protects observing conditions:

- Light pollution
- Radioelectrical pollution
- Atmospheric pollution
- Aviation routes



Median seeing ~0.8”

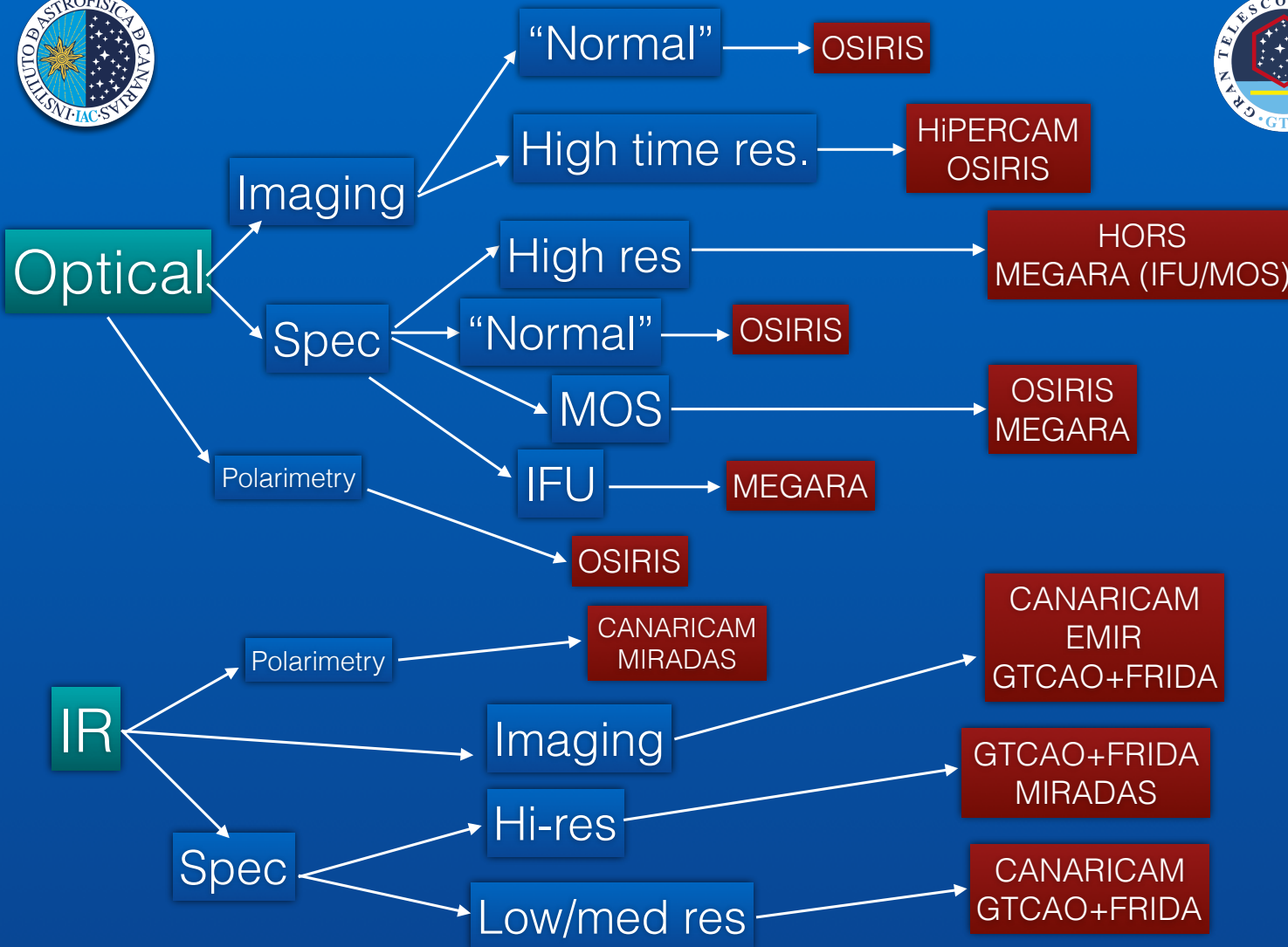
Varela et al. (2014, CUpS 2-2014)



GTC

big science for
a big telescope

GTC Instrumentation



For additional info. Visit www.iac.es
COME AND JOIN US AT THE IAC!!!

Astronomical Instrumentation Projects

- ❖ *Development of advanced instrumentation for current and future telescopes (ESPRESSO, HARMONI...)*
- ❖ *Space missions (Herschel, Planck, Sunrise, ...)*
- ❖ *New telescopes (GTC, QUIJOTE Experiment,...)*
- ❖ *New laboratories in operation (LISA, AIV, ...)*

Expertise gained in several technical capabilities (Optical system design and testing, Mechanical and opto-mechanical system design and development, Cryogenic and vacuum system design and development, Precision mechanics, Adaptive optics, Cophasing, Control systems, Fiber optics, Sensor characterization, RTD project management, Electronic system and software design and development, Laser communications)

- ❖ *Creation of a Technology center (IACTech)*