



# **Space Debris and other projects at the IAC Observatories**

***Synergies between  
ground-based telescopes  
& space missions***

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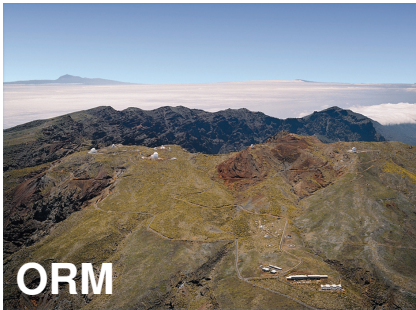
Instituto de Astrofísica de Canarias

Semana del Espacio

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# Instituto de Astrofísica de Canarias - IAC



- ✓ An internationalised public research centre
  - Two HQ and two Observatories
    - Teide Observatory, OT, Tenerife
    - Roque de los Muchachos Observatory, ORM, La Palma
    - Gran Telescopio CANARIAS (GTC)
- ✓ More than 60 research institutions from 19 countries with telescopes & instrumentation for astrophysical research at these Observatories.
  - Around 2,000 visiting astronomers/year



# Research & Technology activities

## Instituto de Astrofísica de Canarias

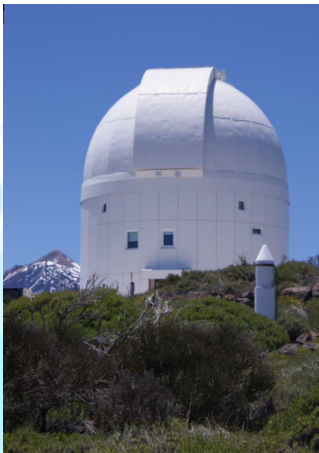
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- Staff ~ 360 pers.
  - ~ 120 researchers, 50 PhD students, 60 engineers, 70 technicians & 60 administration and others.
- Main areas of interest:
  - Structure of the Universe and Cosmology
  - The local Universe
  - Physics of stars, Planetary Systems & Interstellar Medium
  - The Sun and the Solar System
  - Instrumentation and space
    - State-of-the-art capabilities: optics, mechanics, electronics & software
  - Training of researchers and engineers
  - Public Outreach
- More than 40% of our funds are obtained through competitive calls.

# Space debris and other projects at the IAC Observatories

## I / II

- ✓ Excellent quality of the sky for astronomy (protected by Law)
- ✓ Advanced instrumentation and first-class telescopes
- ✓ GTC as the flagship, but other medium & small-sized facilities available.



### ✓ Optical Ground Station – OGS:

- European Space Agency - ESA
- Teide Observatory, 2400 m.
- 1m aperture
- Three configurations:
  - Ritchey-Chretien, f 13,3m.
  - Coudé, f 38,95m
  - Ritchey-Chretien, f 4,5m (0,7x0,7°)
- Main objective: To characterize optical satellite communications.
- Detection of Space Debris (10 cm Ø, mag 21)
  - Geostationary ring and geostationary transfer orbits.

# Space debris and other projects at the IAC Observatories

## II / II



### ✓ Telescopio Carlos Sánchez – TCS:

- 1.52 m aperture
- IR observations (optical observations also available)
- Cassegrain f/13,8



### ✓ Telescopio IAC80:

- 82 cm aperture
- Optical observations
- f/11,3

- Optical & IR Observations.
- & supporting facilities for space missions:
  - Optical & IR counterpart.
  - Long-term series of data.
  - Baseline data and inter-calibration among different space missions.
  - To define and limit regions of the sky.
  - etc.

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## ***Some*** potential ideas / examples for new collaborations (Russia – IAC)

- ✓ Excellent sky conditions and well-equipped site for the installation of telescopes & instruments for astrophysical research (any size!)
  - **i.e.: MASTER-net global:** Federal State Educational Inst. of Higher Professional Education M. V. Lomonosov Moscow State University (MSU)
- ✓ Access to current facilities (i.e. IAC80, TCS, OGS)
  - in support or not of space missions.
- ✓ Cooperation for the development of advanced instrumentation
  - for ground-based facilities or space missions
- ✓ Campaigns for the detection and mapping of Space Debris &
- ✓ Joint RTD activities for optical stellite communications
  - Based on our experience with the Optical Ground Station