

**Institute of
Space Sciences**



Welcome to the Institute of Space Science

**Diego F. Torres
July 2023**

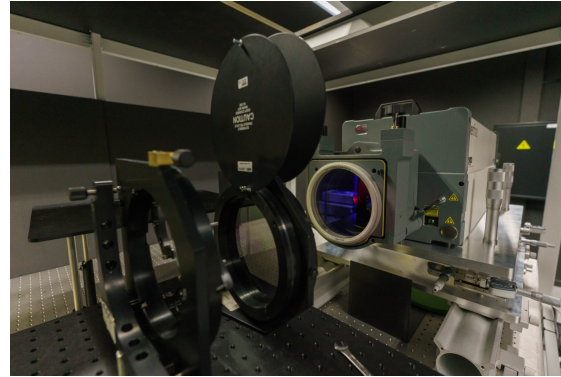
The institute at a glance, in pictures

Institute of
Space Sciences



The institute at a glance, in pictures

- **Payload Lab**
- **Integration Lab**
- **Optical Lab**
- **Radiation Lab**
- **+**

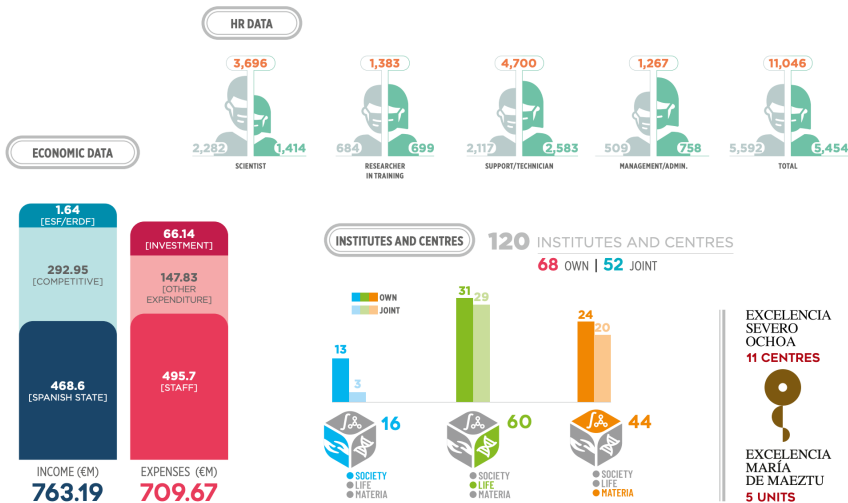


ICE within CSIC

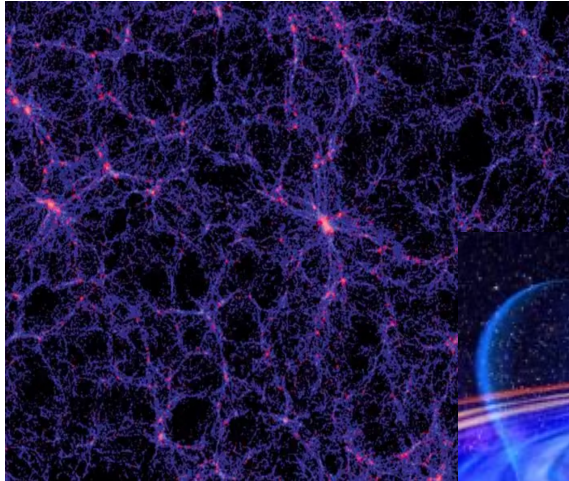
- Officially created in 2008 by the "Consejo Superior de Investigaciones Científicas" (similar to the Spanish National Research Council, usually called CSIC), based on research groups existing 10 yrs before
- CSIC is the largest public institution dedicated to research in Spain and the 3rd largest in Europe (120 institutes, ~3000 permanent researchers).

CSIC IN FIGURES

INSTITUTES & RESEARCH CENTRES, DATA 2020



3 questions to focus our research strategy



What is our universe made of?



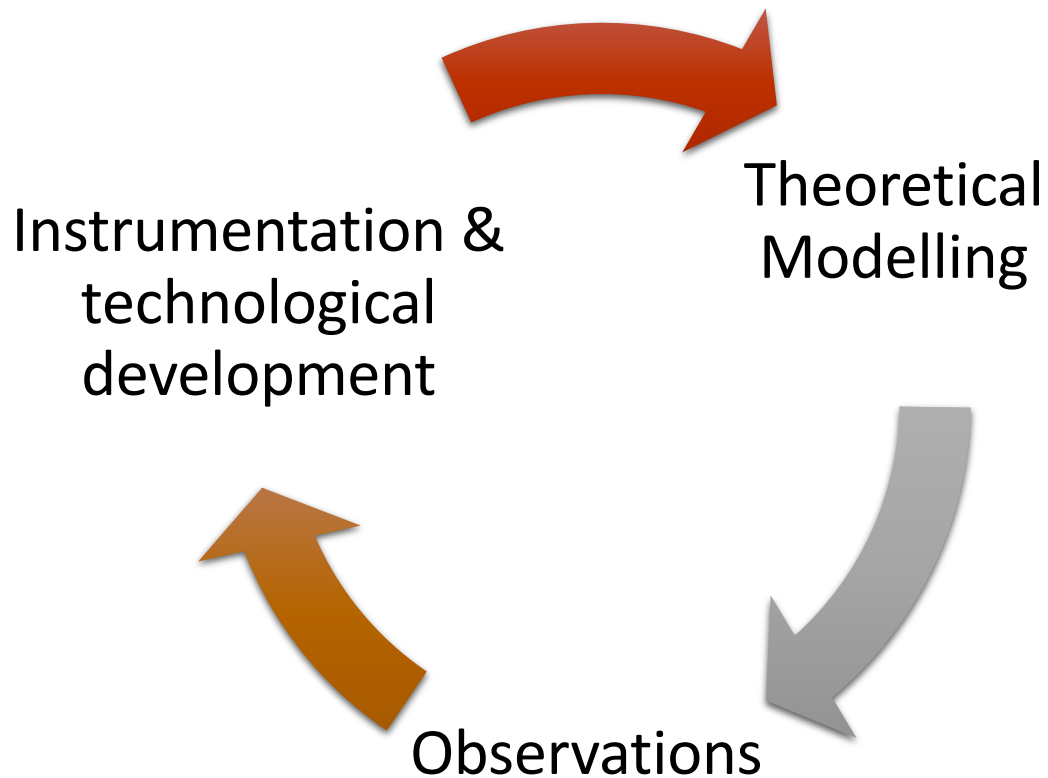
How matter and fields behave in extreme conditions?



Are we alone in the universe?

We aim at creating new knowledge, ideas, methodologies, and instrumentation to advance our understanding of the Universe. Our research aims are linked to develop innovative technologies that can be eventually transferred to industry.

Both, a defining ICE feature and our aim



The main asset of our institute is the ability to produce cutting-edge theoretical modelling of what we study observationally with instruments that we help build.

Theoretical research lines

AGN and Galaxy
Evolution

Analysis Tools for large-
scale galaxy surveys

Asteroids, comets, and
meteorites

Gravitational waves
theory

ISM: star and planet
formation

Magnetic exoplanets &
MHD

MICE Cosmological
Simulations

Nova explosions &
nucleosynthesis

Nuclear & Particle
Astrophysics

Physics of white dwarfs
and related phenomena

Pulsars and their
environments

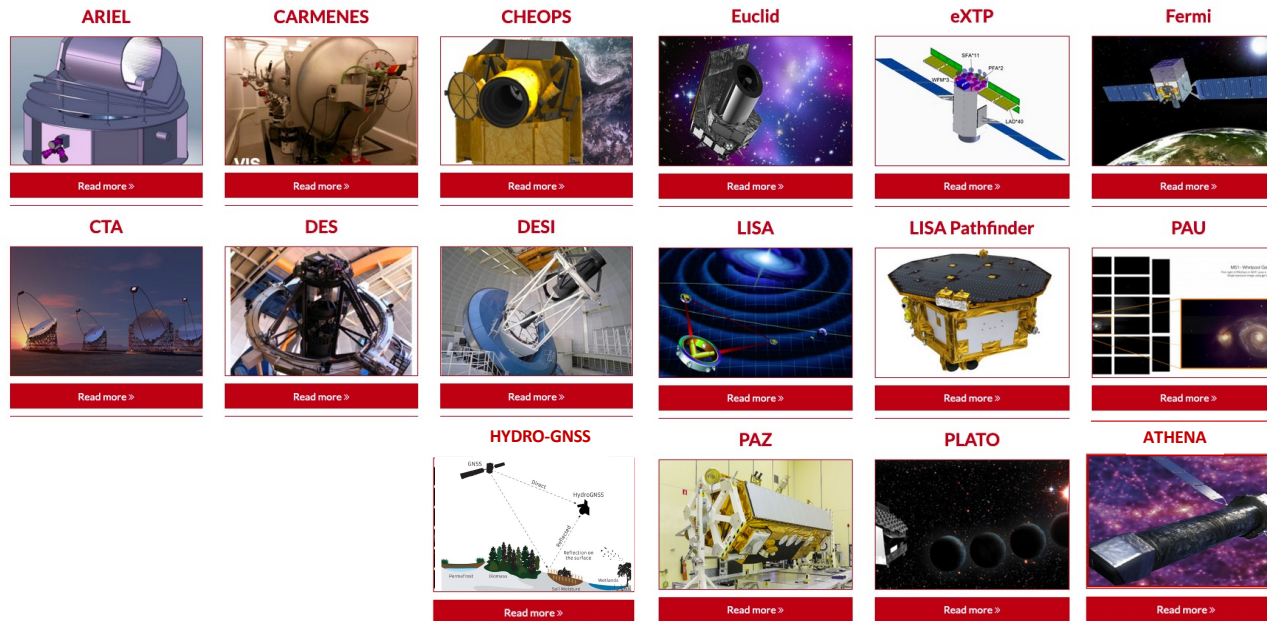
The Black Hole Universe

The star-planet
connection

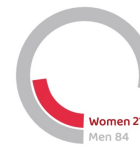
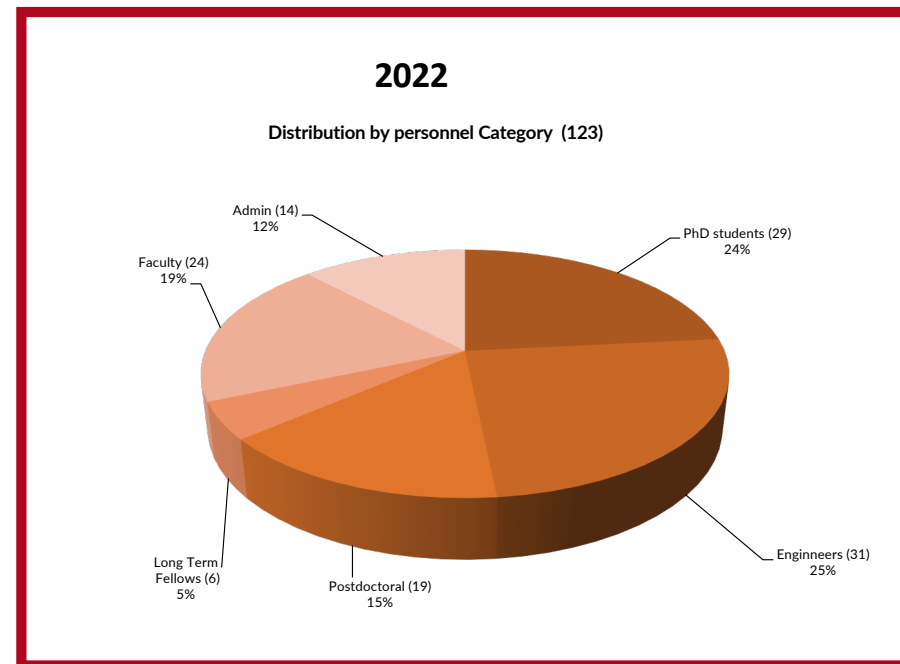
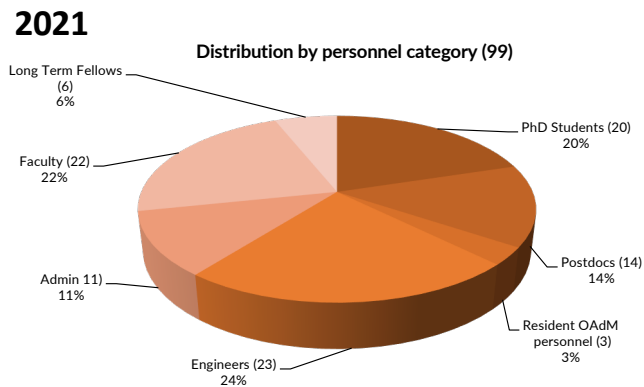
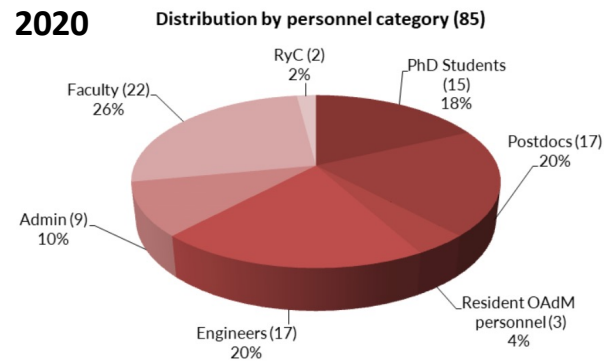
The Sun and
asteroseismology

Supernovae and Stellar
Transients

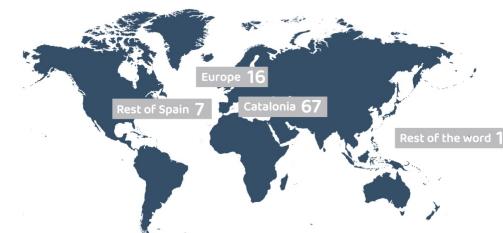
Summary of current missions and experiments



Significant growth of the institute in the last few years



2021



Faculty: you are welcome to talk to all of them

2016

1. Antonio Rius
2. Cristina Manuel
3. Diego F. Torres
4. Emilio Elizalde
5. Enrique Gaztañaga
6. Francisco Castander
7. Ignasi Ribas
8. Jordi Isern
9. José María Torrelles
10. Josep M. Trigo-Rodríguez
11. Josep Miquel Girart
12. Margarita Hernanz
13. Pablo Fosalba
14. Sergei D. Odintsov
1. Aldo Serenelli (stellar evolution)
2. Antonio Rius (Earth observations)
3. Carlos Sopena (gravitational waves, theory)
4. Cristina Manuel (fundamental physics)
5. Diego F. Torres (high-energy astrophysics)
6. Emilio Elizalde (gravitation)
7. Enrique Gaztañaga (cosmology)
8. Estel Cardellach (Earth observations, experimental)
9. Francisco Castander (cosmology)
10. Guillem Anglada (exoplanets)
11. Ignasi Ribas (exoplanets)
12. Jordi Isern (white dwarfs)
13. José María Torrelles (star formation)
14. Josep M. Trigo-Rodríguez (minor bodies)
15. Josep Miquel Girart (cosmology)
16. Ciska Kemper (star formation)
17. Laura Tolos (nuclear astrophysics)
18. Lluís Galvany (cosmology)
19. Mar Mezcua (black hole astrophysics)
20. Margarita Hernanz (white dwarfs)
21. Martín Crocce (cosmology)
22. Miquel Nofrarias (gravitational waves, experimental)
23. Nanda Rea (relativistic astrophysics, ERC)
24. Pablo Fosalba (cosmology)
25. Sergei D. Odintsov (gravitation)
26. Serni Ribó (Earth observations, experimental)
27. Daniele Vigano (magnetism in astrophysics)

Several long-term fellows

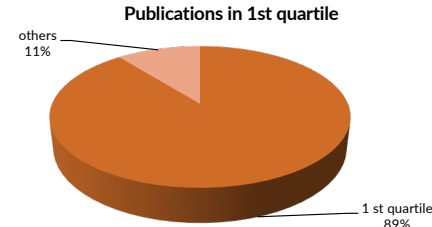
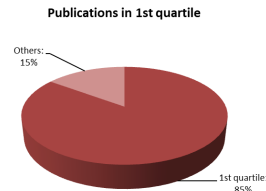
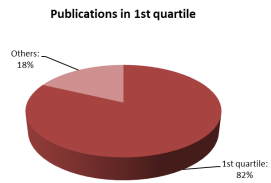
1. Francesco Coti-Zelati (X-rays)
2. Alessandro Patruno (X-rays)
3. Weiquian Li (Earth observations)
4. Ramon Padullés (Earth observations)
5. Alvaro Sanchez Monge (star formation)

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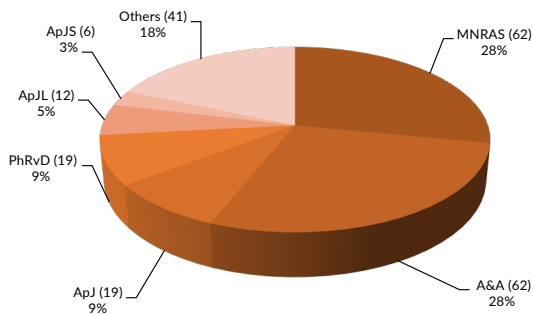


+ 3 new positions this year

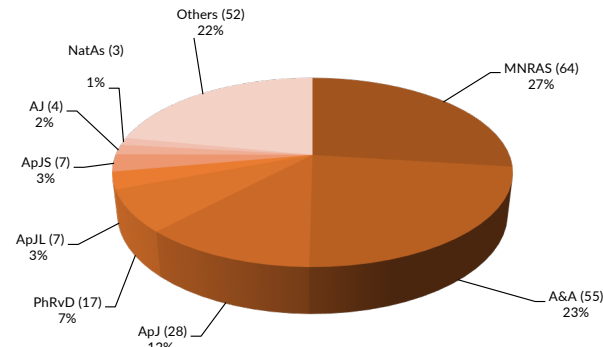
Publications



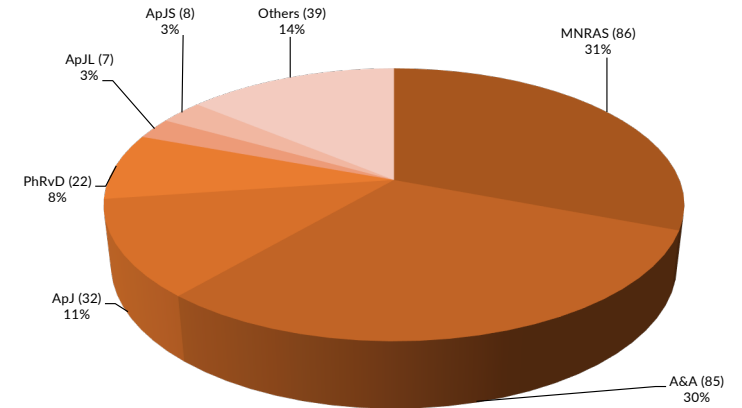
Includes 3 papers in Nature Astronomy
(1 of which was cover of the journal)



2020 (221 publications)



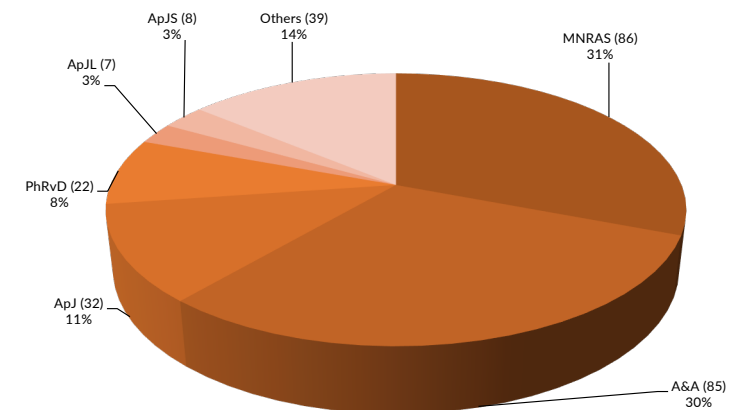
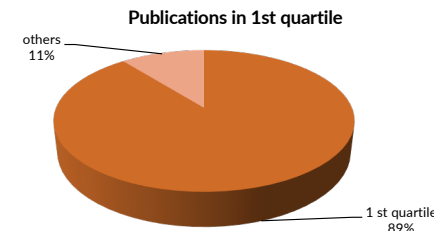
2021 (237 publications)



2022 (279 publications)

Citations

- Published 1026 international journals papers in 2016-2020
 - (ADS, accessible via our website)
 - **85% in Q1,**
 - 9 Nature / Nature Astronomy articles published in this period
- These papers were cited >52.750 times (ADS, accessible via our website)
- h-factor = 97
- **50% of our production is done in small teams** (with <20 authors, most of them have <10 authors) and about **20% directly have a first author in ICE.**



2022 (279 publications)

ICE is the first out of 120 CSIC institutes in productivity per researcher, and the fifth in productivity, disregarding size.

PhD thesis

	2016	2017	2018	2019	2020 (covid)	2021	2022 (w. MdM)
Active PhD thesis	22	15	15	12	16	20	29
Finished PhD thesis	4	7	0	4	5	4	2

	2016	2017	2018	2019	2020 (covid)	2021	2022 (w. MdM)
Pizza Lunches & Colloquiums	27	36	31	32	27	36	30
... with external speakers	8	14	13	11	4	2	9

María de Maeztu Award

The seal is very important for an institute, is given against hard competition and assesment of a long and detailed institutional analysis (strategic program).

Only ~5 are given per year (all topics).

It lasts for 5 years, and provides funding for 4.

It gives us an opportunity for general improvement, visibility, and recognition, that we aim to seize in full extent.

#1

The fabric of the universe

Using multi-disciplinary cosmological probes and gravitational waves to understand what the universe is made of and how it evolves.

#2

The extreme universe

Understanding how matter and fields behave in extreme conditions of density and pressure, gravitational or electromagnetic forces.

#3

From star formation to life

Searching for and characterizing extrasolar Earth-like planets, understanding how they form, and the analogy with our own planetary environment.





**I hope we'll provide a stimulating atmosphere for
your school! Enjoy!
Welcome!**

<https://sites.google.com/view/dft-research>

@dft_research



CSIC

**Institute of
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**EXCELENCIA
MARÍA
DE MAEZTU**

