

ANNUAL REPORT

SUMMARY 2019

01

ABOUT US



About ICMAB

ICMAB is a public and multidisciplinary research center dedicated to cutting-edge research in **functional advanced nanomaterials**, pursuing excellence in the generation and transfer of knowledge, and in the development of scientific and technical tools and methodologies.

Our aim is to create new knowledge and innovative solutions in **some of the biggest and more complex challenges that our society currently faces**: materials for a clean and secure energy, materials for low-cost electronics, and materials for nanomedicine.



About ICMAB

Almost **500** ICMAB Members
120 Senior & Postdoc Researchers
9 Research Units
10 Scientific Equipment Platforms



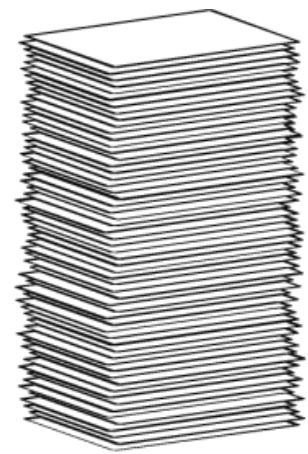
A blue-tinted photograph of a library interior. Tall bookshelves filled with books line the walls. In the center, a person is seated at a desk, working on a computer. A fire extinguisher is mounted on the wall to the right. Large white geometric shapes, resembling stylized 'V's or chevrons, are overlaid on the left and right sides of the image.

02

PUBLICATIONS

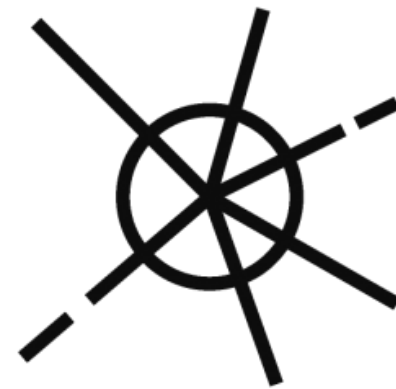
Our Institute is characterized by its high quality research outcomes and by its highly talented people. By the end of 2019, we counted with **5,383 publications**, and more than **164,000 citations**.

In 2019:



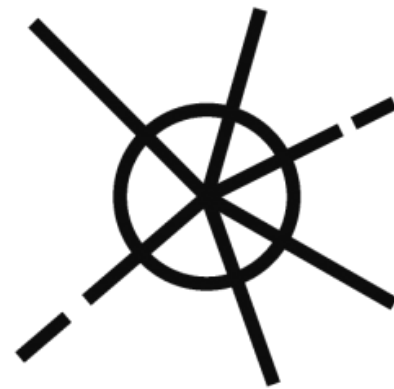
TOTAL PUBLICATIONS

240



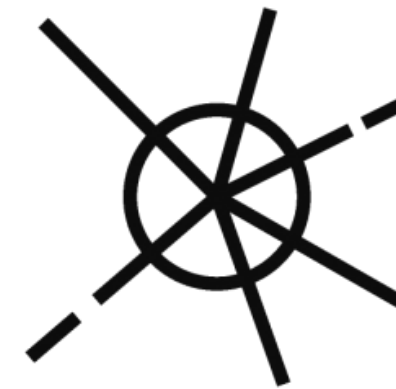
PUBLICATIONS WITH IF

222



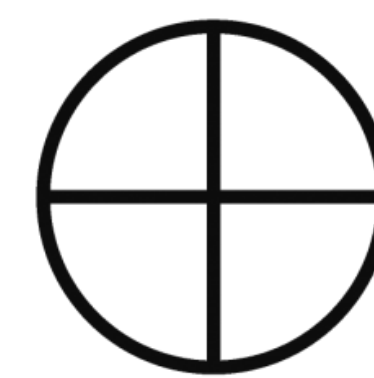
AVERAGE IF

6.07



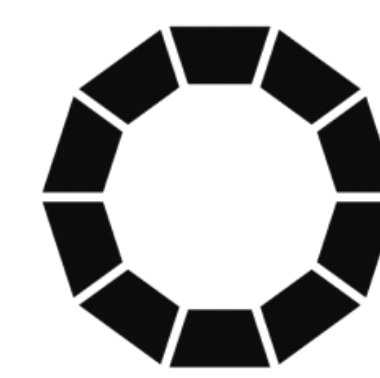
PUBLICATIONS
WITH IF>10

30 (14%)



FIRST QUARTILE
PUBLICATIONS (Q1-SJR)

183 (82%)



FIRST DECILE
PUBLICATIONS (D1-SJR)

126 (57%)



HIGHLY CITED PAPERS

4



GOLD OPEN ACCESS

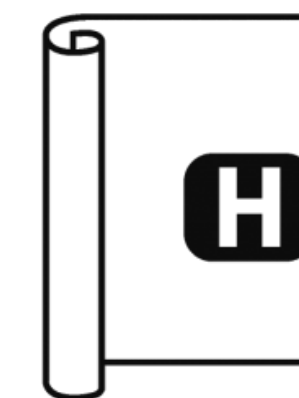
81 (34%)



GREEN OPEN ACCESS

159 (66%)

EMBARGOED: 73
ONLY METADATA: 34



h-index

147



AVERAGE CITATIONS
PER ITEM

30.63

Data from Web of Science (April 2020)

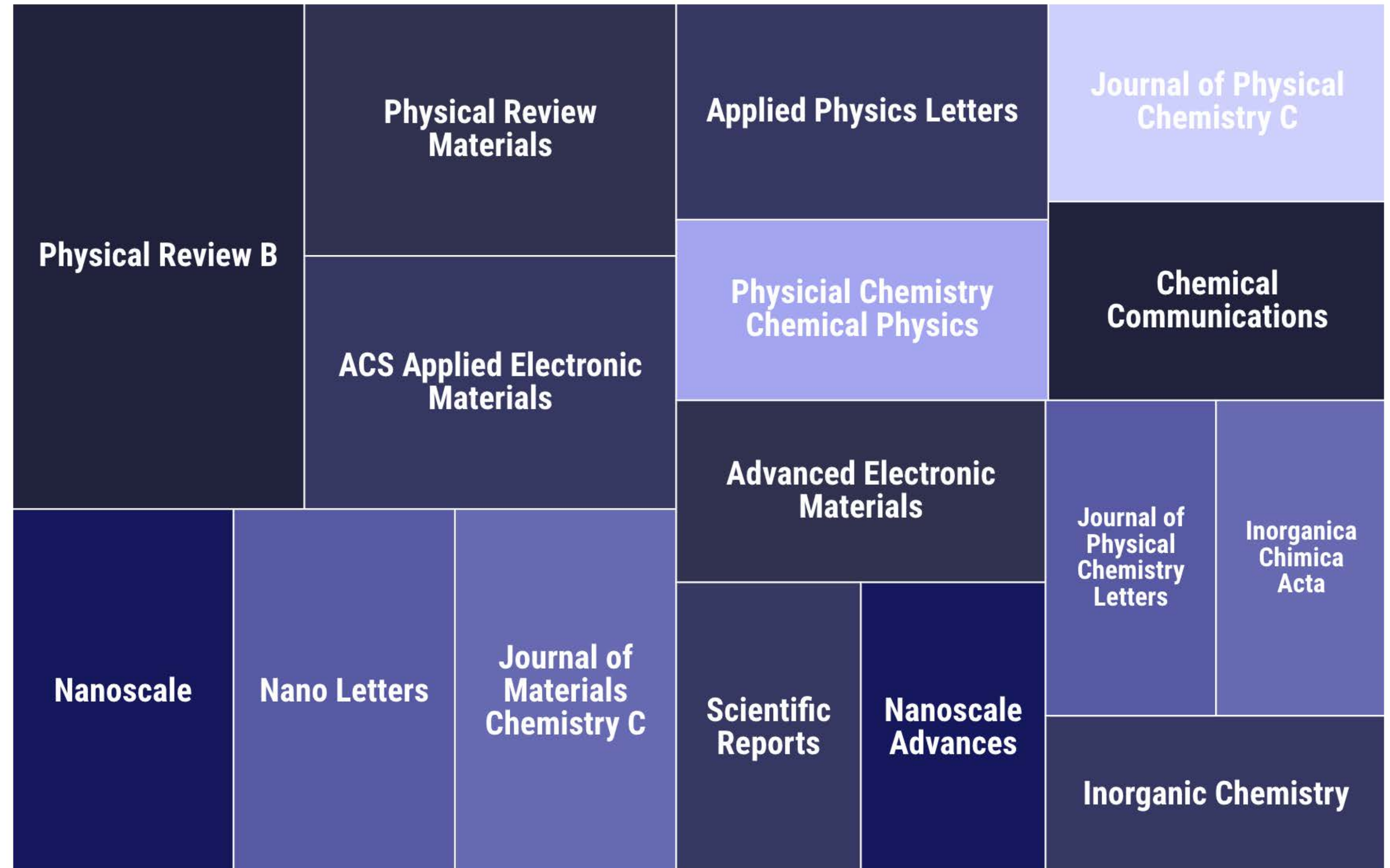
And throughout our history:



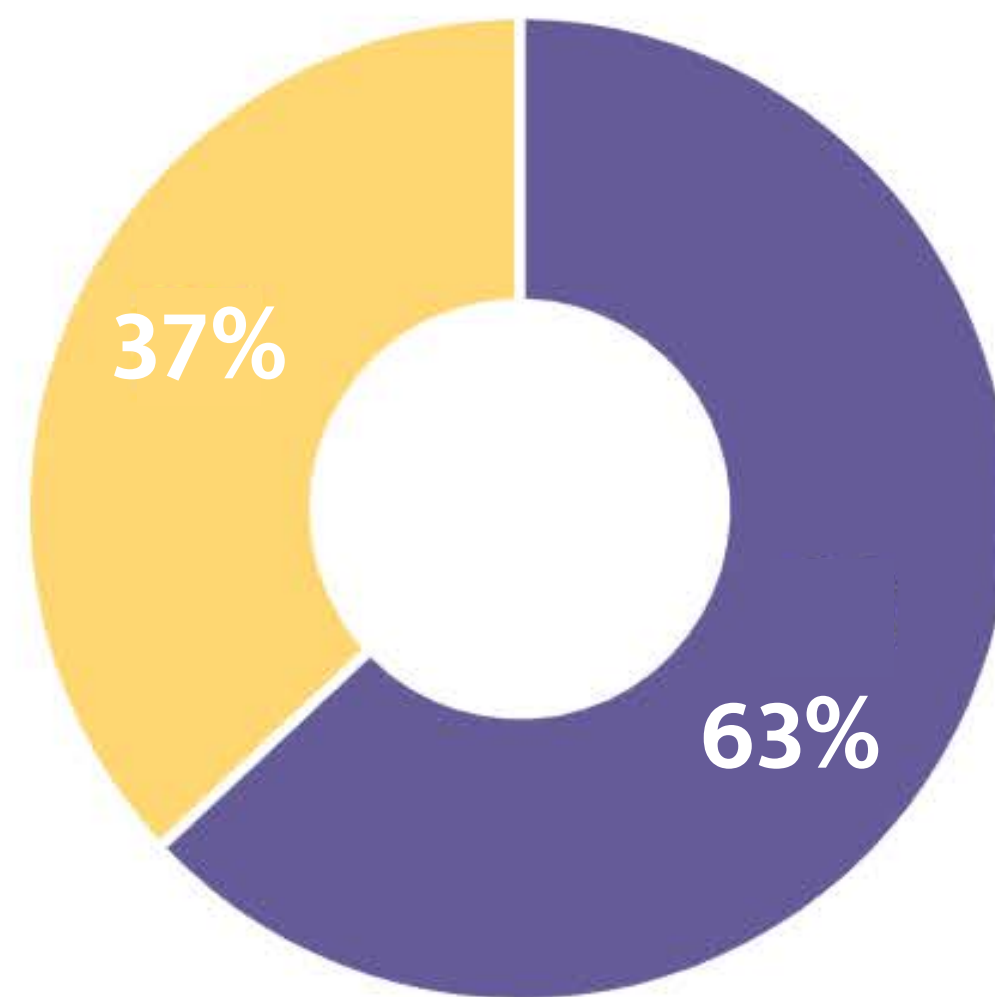
Most Published Journals (ordered by area) (2019)

ICMAB articles are published in some of the top Scientific Journals in the world.

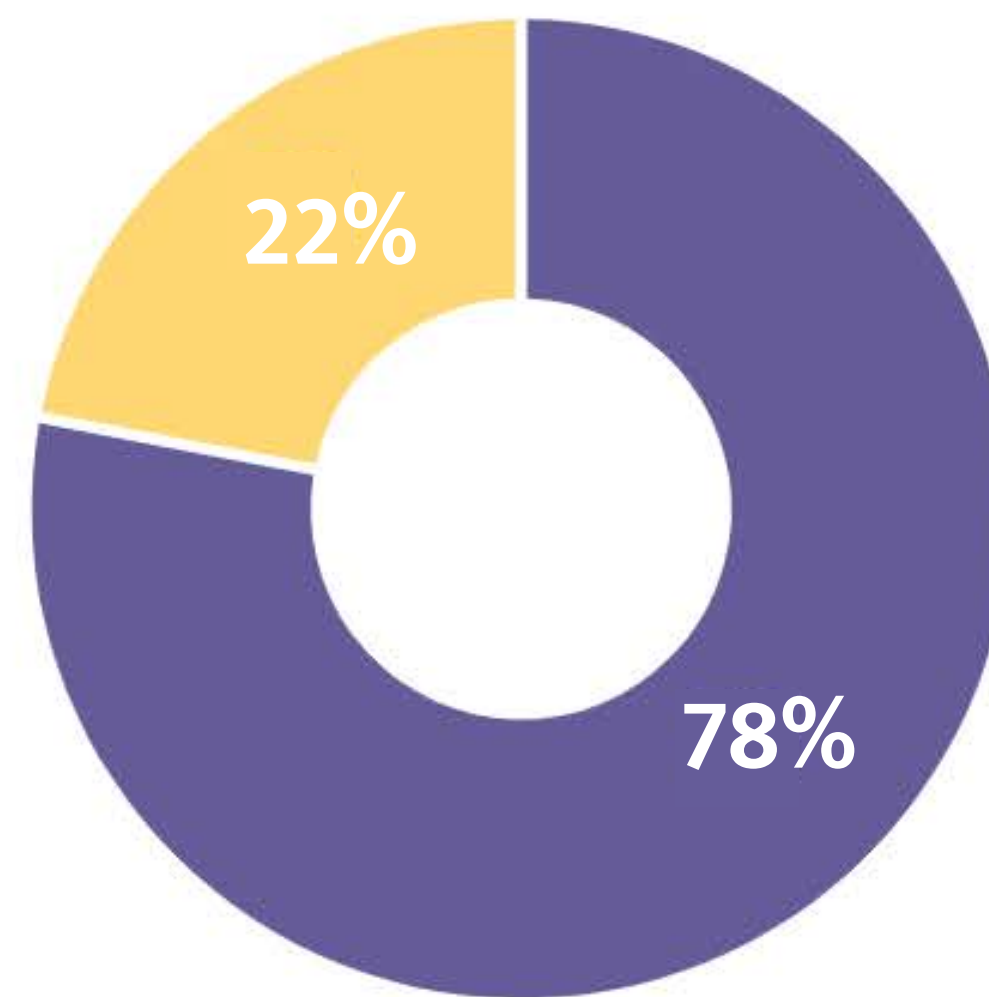
In 2019, 30 of our published articles had an **IF > 10**.



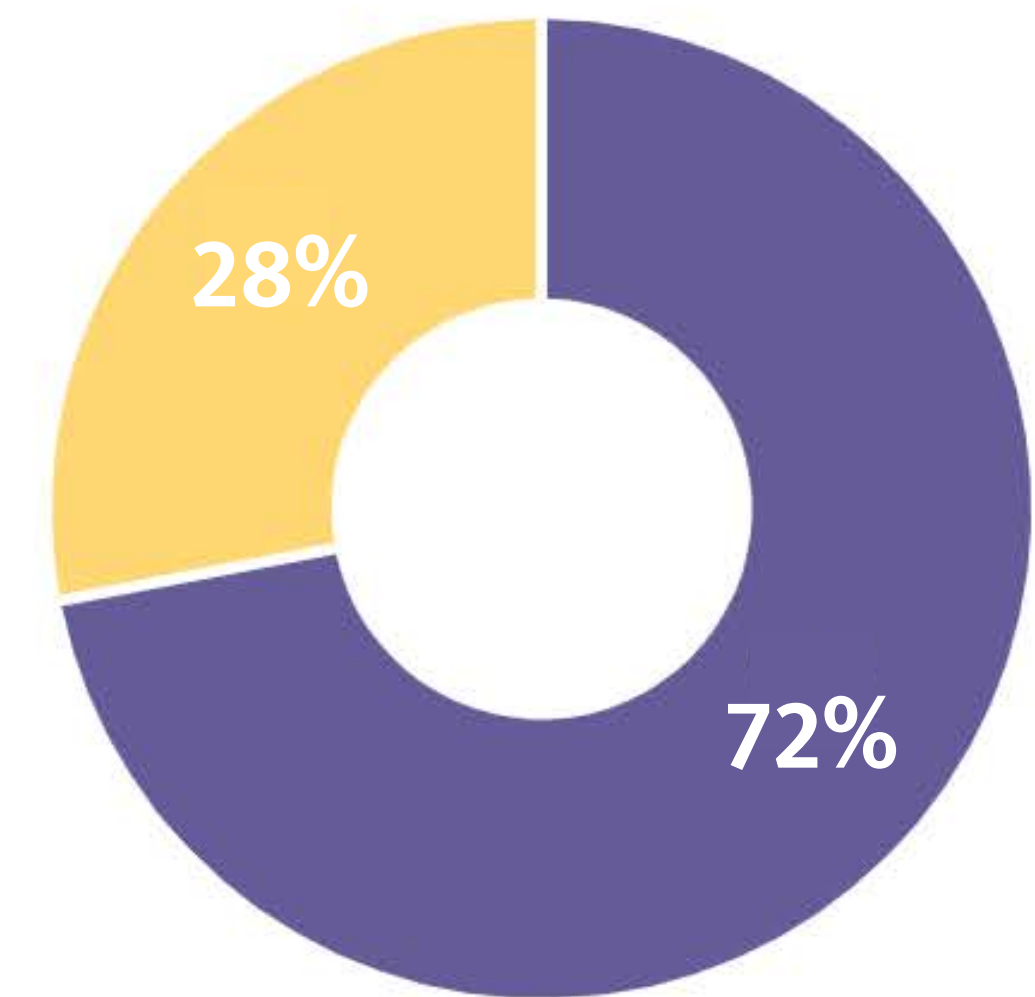
1st Author



Last Author



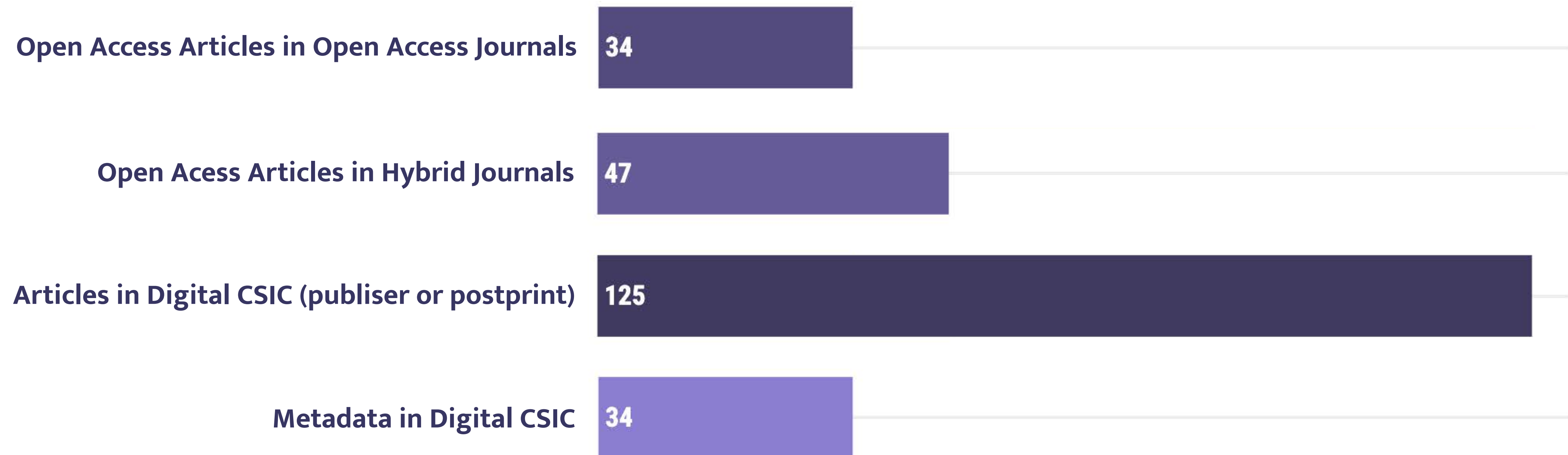
Corresponding Author



● Women ● Men

Gold and Green Open Access Publications (2019)

Some of ICMAB's articles have **open access** either through open access journals or through freely accessible copies in the Digital CSIC repository.



Highlights Research Line 1 (2019)

Sustainable Energy Conversion and Storage Systems

Energy alignment and recombination in perovskite solar cells: Weighted influence on the open circuit voltage

Energy and Environ. Sci. 12, 1309-1316, 2019

Farming thermoelectric paper

Energy and Environ. Sci 12, 716-719, 2019

Ferroelectricity-free lead halide perovskites

Energy and Environ. Sci 12, 2537-2547, 2019

Role of Manganese in Lithium- and Manganese-rich layered oxides cathodes

J. Phys. Chem. Lett. 10, (12), 3359-3368, 2019

Pores dominate ice nucleation on Feldspars

J. Phys. Chem. C 123, 34, 20998-21004, 2019

Giant electrophononic response in PbTiO_3 by strain engineering

Phys. Rev. Lett. 123, 185901, 2019

Highlights Research Line 2 (2019)

Superconductors for Power Applications

Depairing current at high magnetic fields in vortex-free high-temperature superconducting nanowires

Nano Lett. 19, 4174-4179, 2019

Control of nanostructure and pinning properties in solution deposited $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ nanocomposites with preformed perovskite nanoparticles

Sci. Rep. 9, 5828, 1-14, 2019

Accelerated growth by flash heating of high critical current trifluoroacetate solution derived epitaxial superconducting $\text{YBa}_2\text{Cu}_3\text{O}_7$ films

J. Mater.Chem. C 4748-4759, 2019

Coated conductor technology for the beamscreen chamber of future high energy circular colliders

Supercond. Sci. Tech. 32, 094006 (8pp), 2019

Highlights Research Line 3 (2019)

Oxide Electronics

First-principles theory of spatial dispersion: Dynamical quadrupoles and flexoelectricity

Phys. Rev. X 9, 2, 021050-22, 2019

Plasticity of persistent photoconductance of amorphous $\text{LaAlO}_3/\text{SrTiO}_3$ interfaces under varying illumination conditions

ACS Appl. Electron. Mater. 2019, 1, 6, 810–816, 2019

Independent tuning of optical transparency window and electrical properties of epitaxial SrVO_3 thin films by substrate mismatch

Adv. Funct. Mater. 29, 1904238, 2019

Dynamic magnetic properties and spin pumping in polymer-assisted-deposited $\text{La}_{0.92}\text{MnO}_3$ thin films

J. Mater. Chem. C 7, 12633-12640, 2019

Complementary resistive switching using metal-ferroelectric-metal tunnel junctions

Small 15, 1805042, 2019

Highlights Research Line 4 (2019)

Molecular Electronics

Organic free radicals as circularly polarized luminescence emitters

Angew. Chem. Int. Ed. 58, 16282 –16288, 2019

Redox active PTM radical dendrimers as promising multifunctional molecular switches

Chem. Mater. 31, 22, 9400-9412, 2019

3,2,1 and stop! An innovative, straightforward and clean route for the flash synthesis of metallacarboranes

Green Chem. 21, 1925, 2019

Carbon-paste nanocomposites as unconventional gate electrodes for electrolyte-gated organic field-effect transistors: electrical modulation and bio-sensing

J. Mater. Chem. C 2019, 7, 14993

Solution-processed thin films of a charge transfer complex for ambipolar field-effect transistors

J. Mater. Chem. C 2019, 7, 1025

Effect of the molecular polarizability of SAM on the work function modification of gold: closed-versus open-shell donor-acceptor SAMs

Adv. Mater. Technol. 4, 1800152, 2019

Highlights Research Line 5 (2019)

Multifunctional Nanostructured Biomaterials

Molecular insight into the wetting behavior and amphiphilic character of cellulose nanocrystals

Adv.Colloid Interface Sci. 267, 15–25, 2019

Non-cytotoxic carbon nanocapsules synthesized via one-pot filling and end closing of multi-walled carbon nanotubes

Carbon 141, 782-793, 2019

Combining magnetic nanoparticles and icosahedral boron clusters in biocompatible inorganic nanohybrids for cancer therapy

Nanomed. Nanotechnol. 20 (2019) 101986

Efficient blue light emitting materials based on m-carborane-anthracene dyads. Structure, photophysics and bioimaging studies

Biomater. Sci. 7, 5324, 2019

Enhancing localized pesticide action through plant foliage by silver-cellulose hybrid patches

ACS Biomater. Sci. Eng. 5 (2), pp 413–419, 2019

High-throughput cell motility studies on Surface-bound protein nanoparticles with diverse structural and compositional characteristics

ACS Biomater. Sci. Eng. 5, 5470-5480, 2019

European Projects

 **1** ERC EUROPEAN RESEARCH COUNCIL

 **3** MARIE SKŁODOWSKA-CURIE ACTIONS

 **1** NMBP-TO-IND

 **1** FET-PROACTIVE

 **1** EUROFUSION

National Projects

 **4** CSIC i-LINK+

 **5** PROYECTOS I+D+I
RETOS SOCIEDAD

 **2** PROYECTOS I+D+I
GENERACIÓN CONOCIMIENTO

 **1** INFRAESTRUCTURAS

 **1** FGCSIC – CUENTA LA CIENCIA

 **1** INTRAMURAL

Regional Projects

 **1** LA MARATÓ TV3

 **1** FUSIÓ CATALUNYA

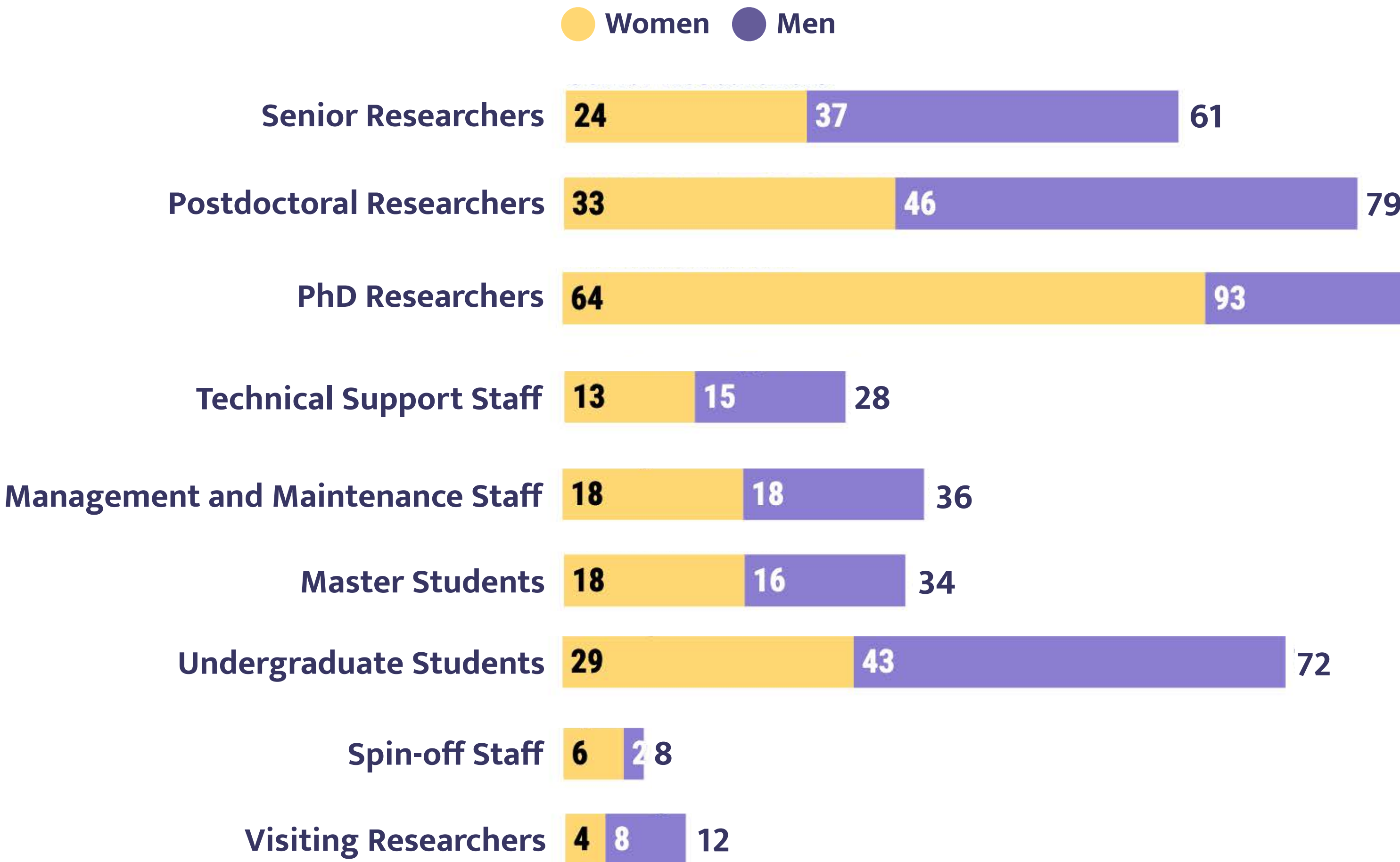
 **1** AJUTS PRODUCTE AGAUR

A person in a white lab coat is seen from behind, working in a laboratory. The lab is filled with various pieces of equipment, including a large piece of machinery with multiple gauges and pipes in the background, and a workbench in the foreground with a black container and a white bottle. Large white numbers '03' and 'K' are overlaid on the image, separated by a white triangle. A yellow horizontal line is positioned below the number '03'.

03

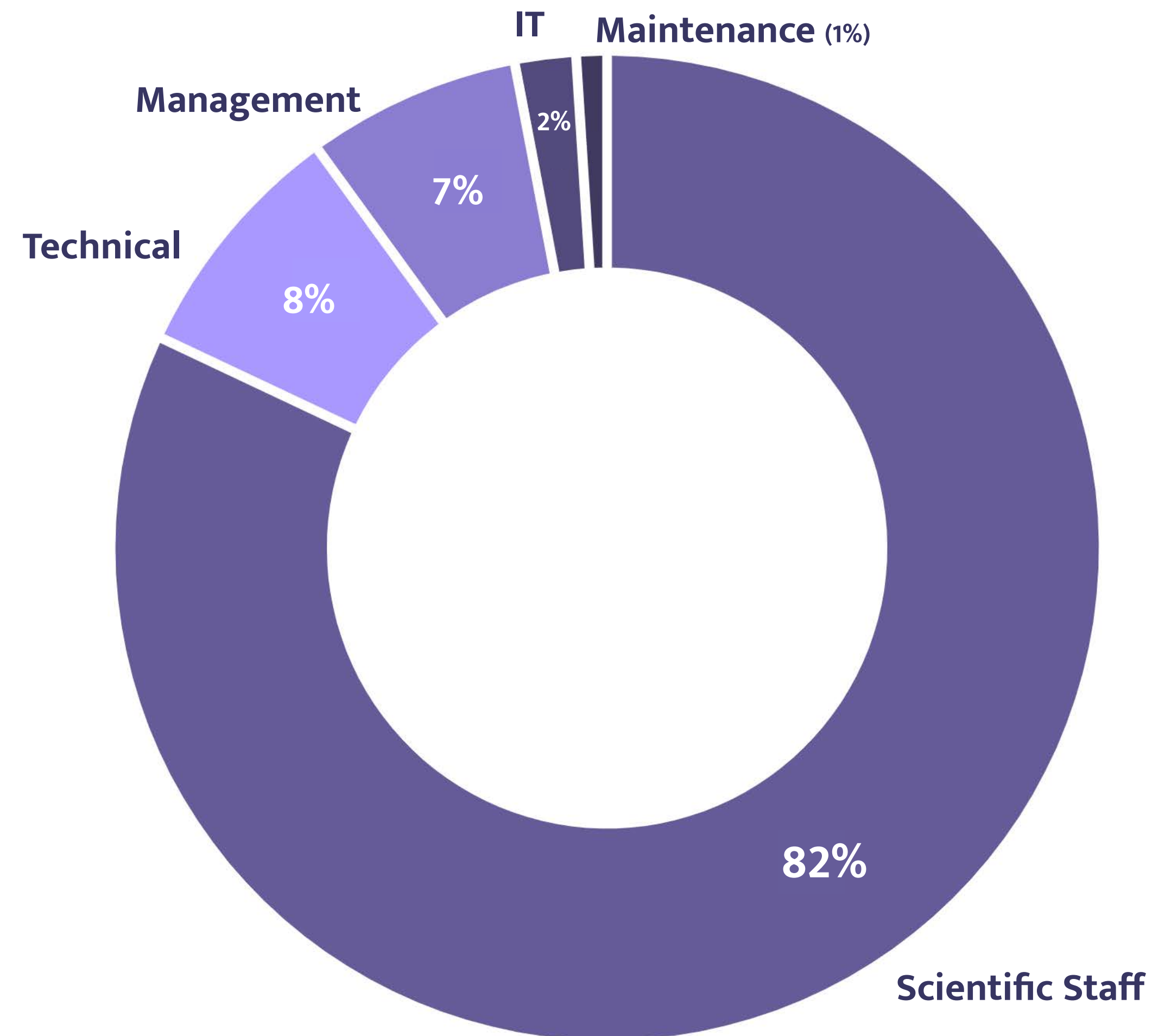
STAFF

Personnel by categories (2019)



ICMAB is the people. During 2019, **487 people have been working at ICMAB**, either as an undergraduate or MSc student, as a PhD or postdoc researcher, as a technician or maintenance staff, working in administration or project managing, or as a full time scientist.

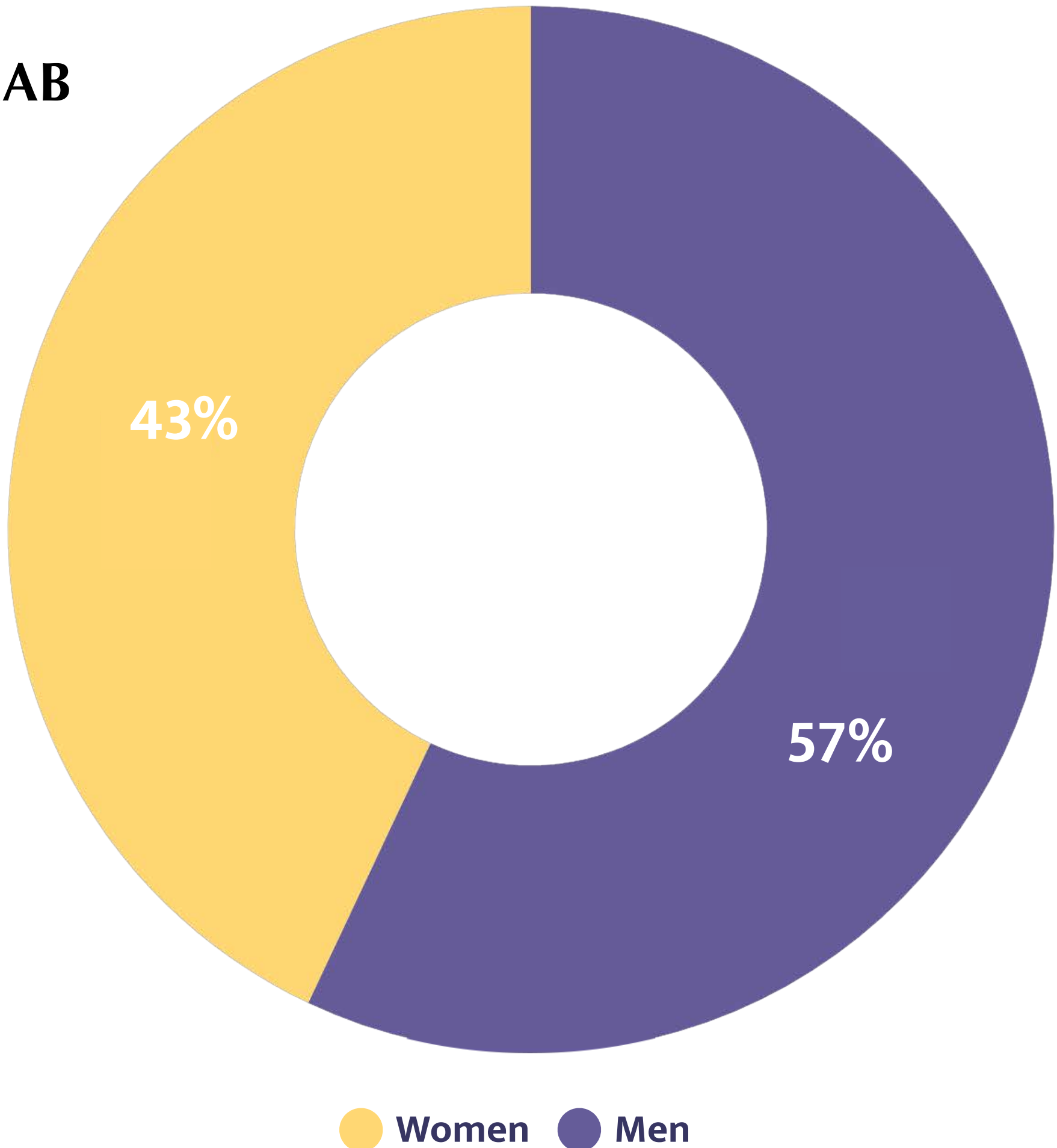
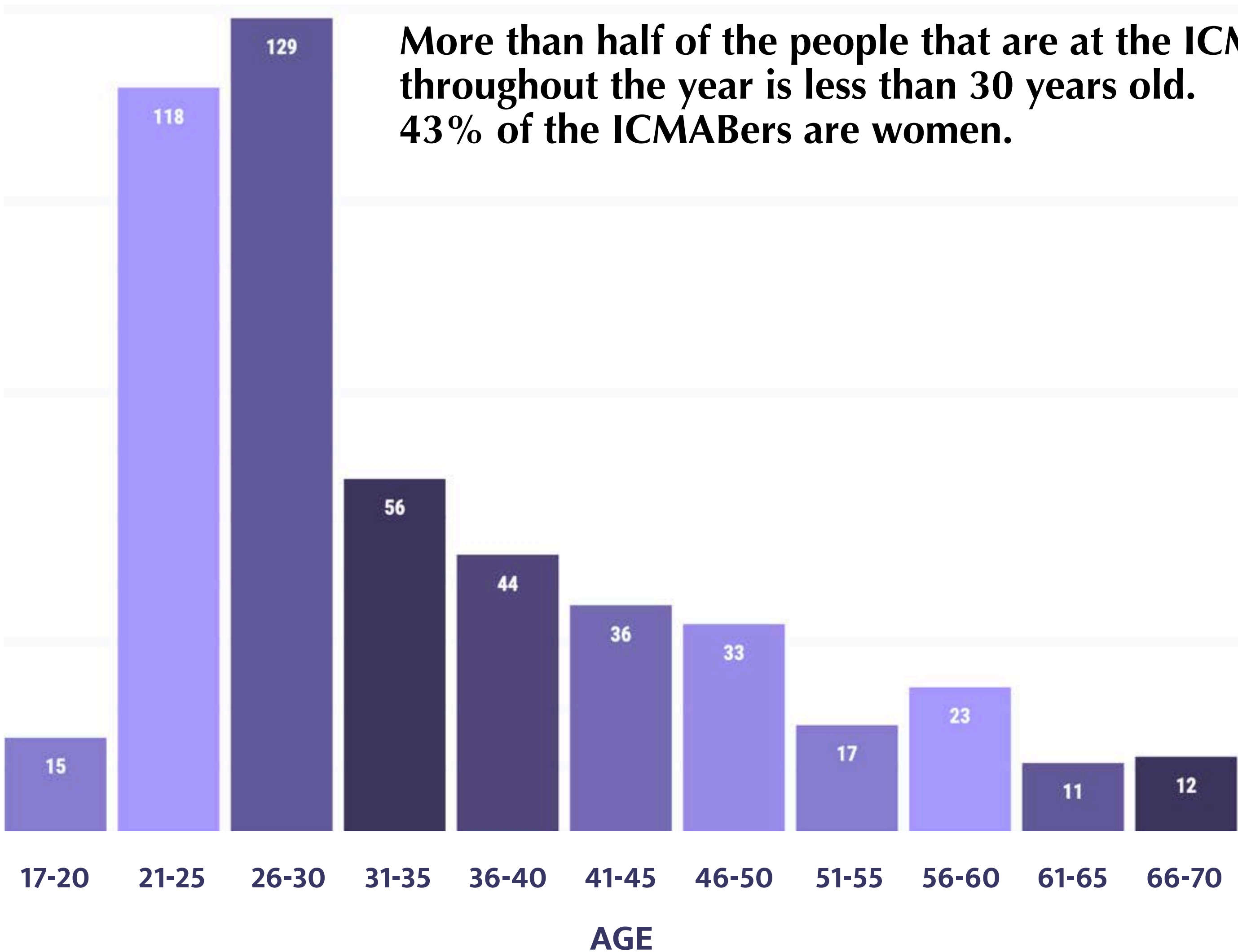
Total Staff (2019)



Scientific staff is formed by the permanent research staff (61), postdoctoral fellows (79), and PhD and Project researchers (157), giving a total of 297 researchers.

The support staff (64) is formed by the technical staff (28), the administration staff, the library staff, the IT department and the maintenance and safety staff (36).

In addition, we have **visiting** researchers (12), **undergraduate** (72) and **master** students (34), and the staff **working in spin-offs** (8).

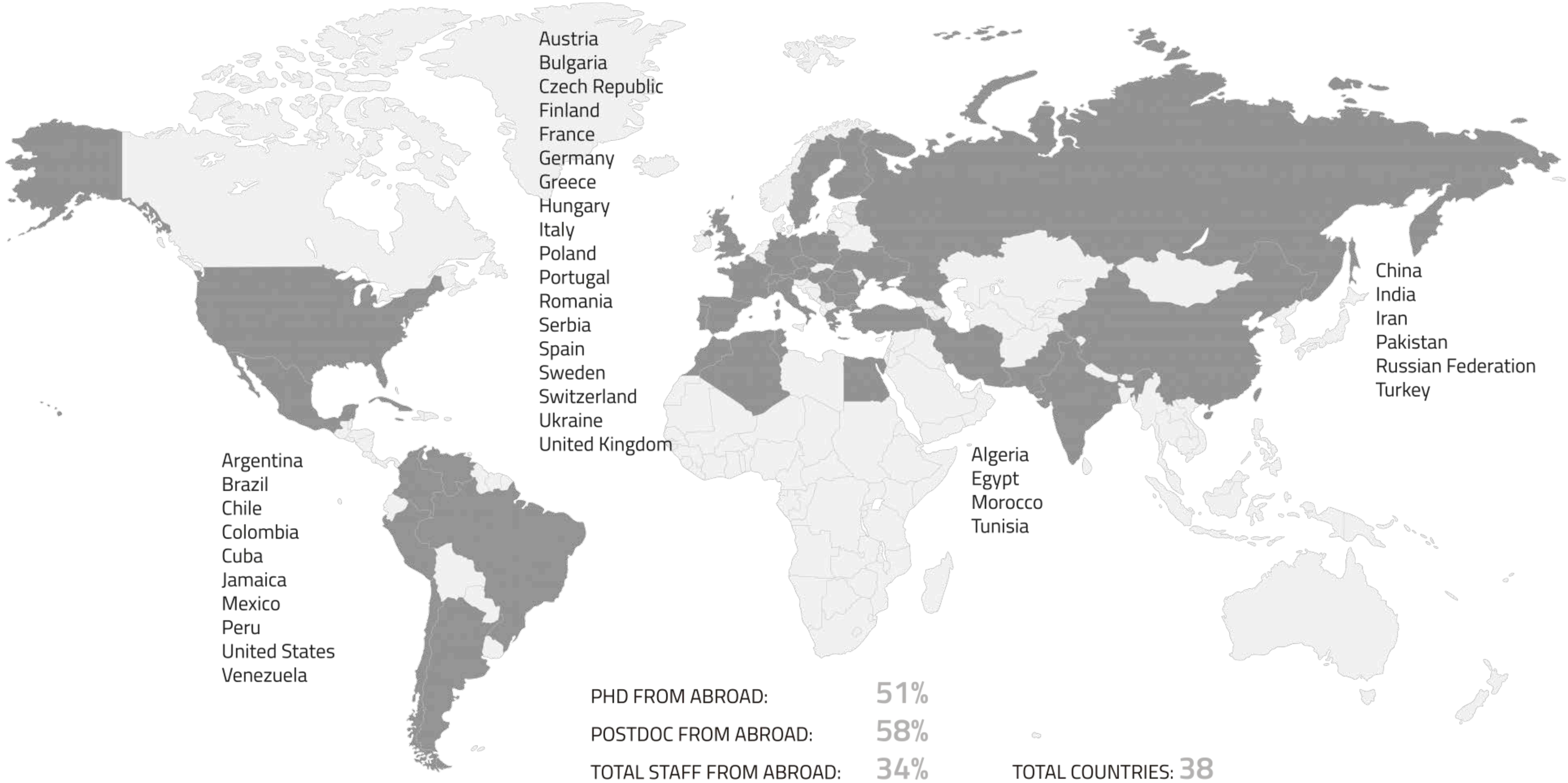




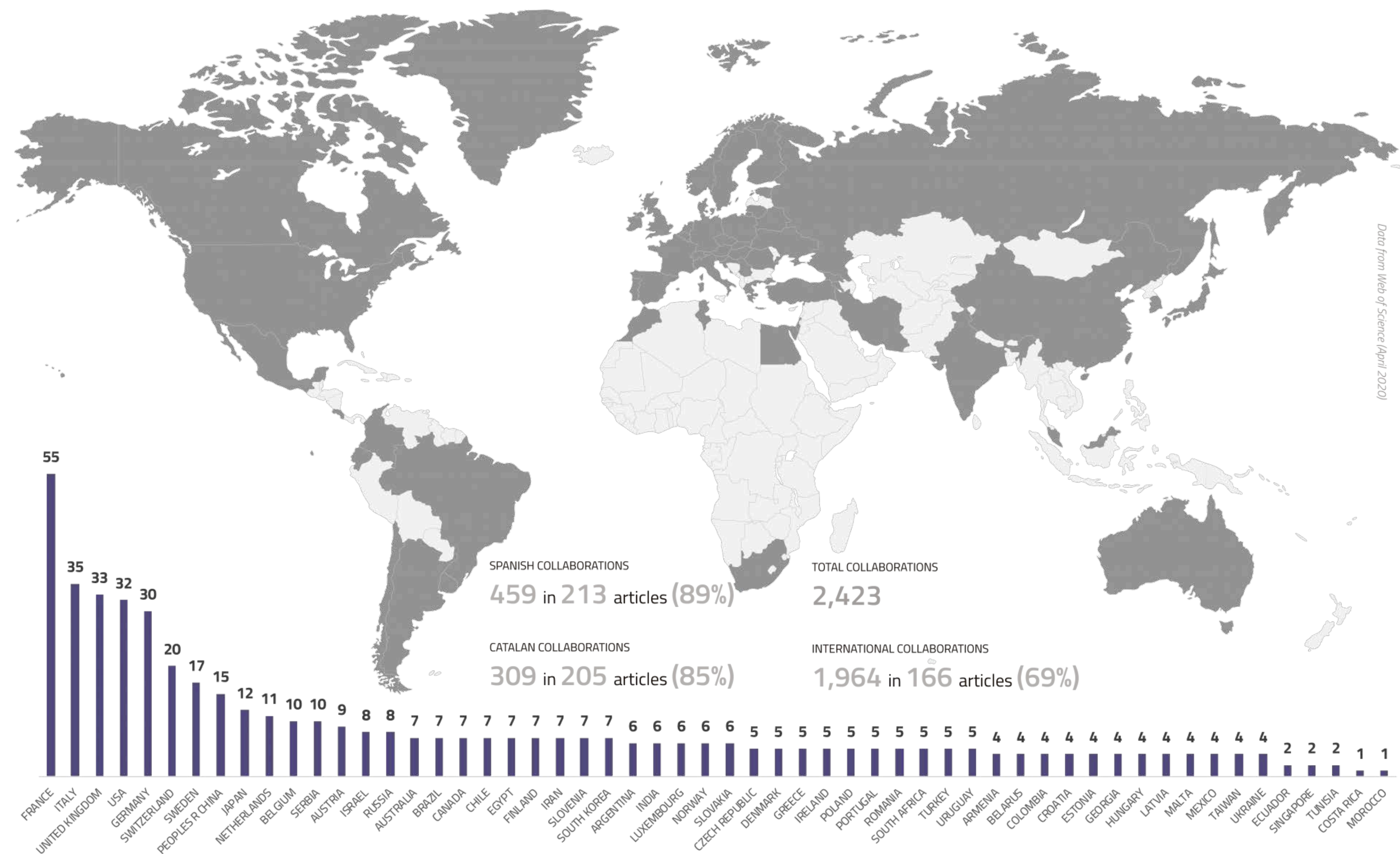
04

**INTERNATIONALIZATION
& COLLABORATION**

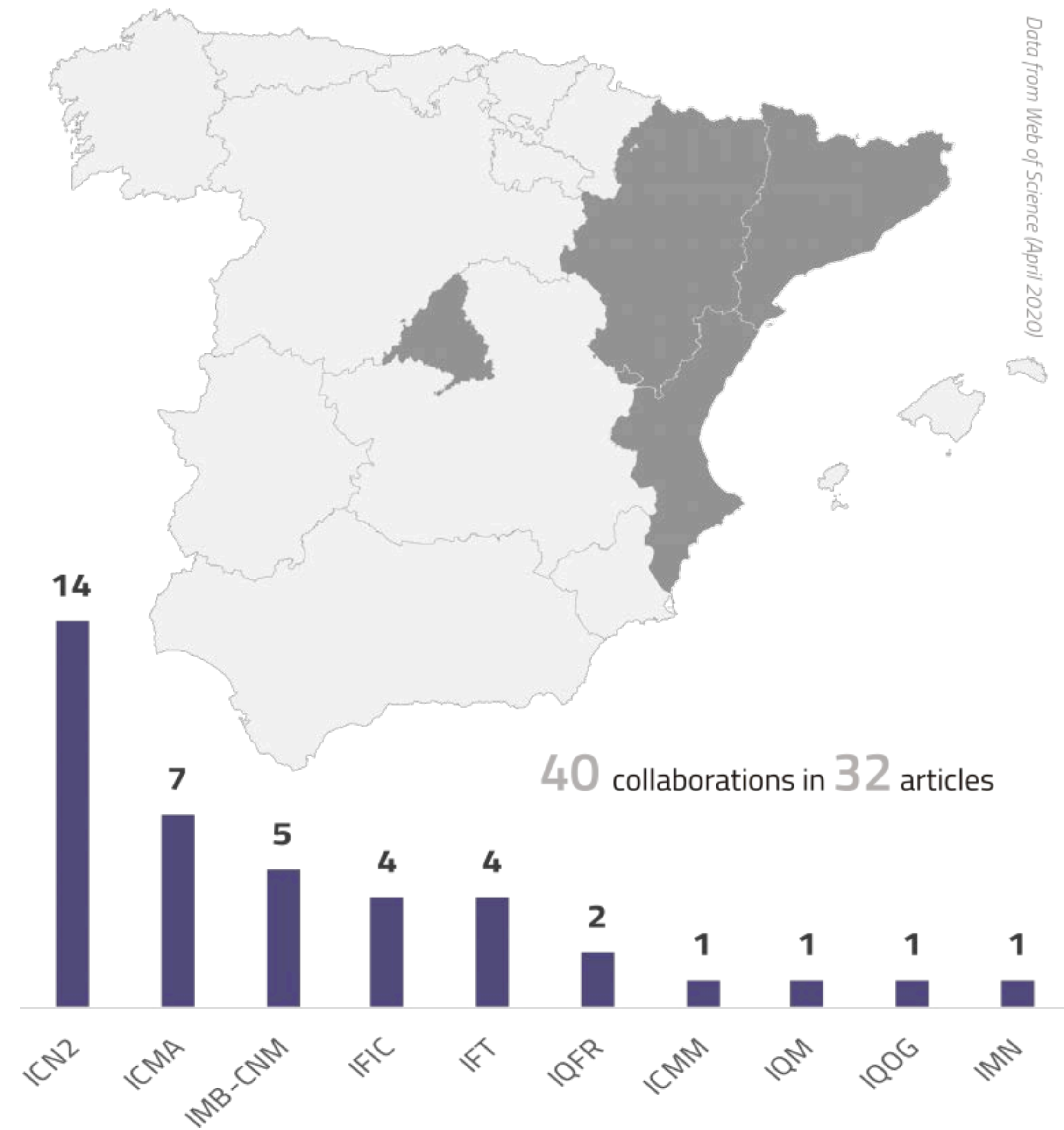
ICMAB is an international institution and our members come from countries all around the world. In 2019, **a third of our staff** came from abroad.



Collaborations worldwide (2019)



ICMAB is one of the 120 CSIC centers. As part of the largest research public institution in Spain, ICMAB Researchers have been able to collaborate with other centers and institutes in order to produce 32 articles through 2019.



Collaborations with other Institutions (2019)

Others



CSIC Centres



Private Companies



Research Institutes



Universities



However, collaboration is not limited between CSIC centers. During 2019, ICMAB Researchers collaborated with different institutions **more than 2000 times**.

05

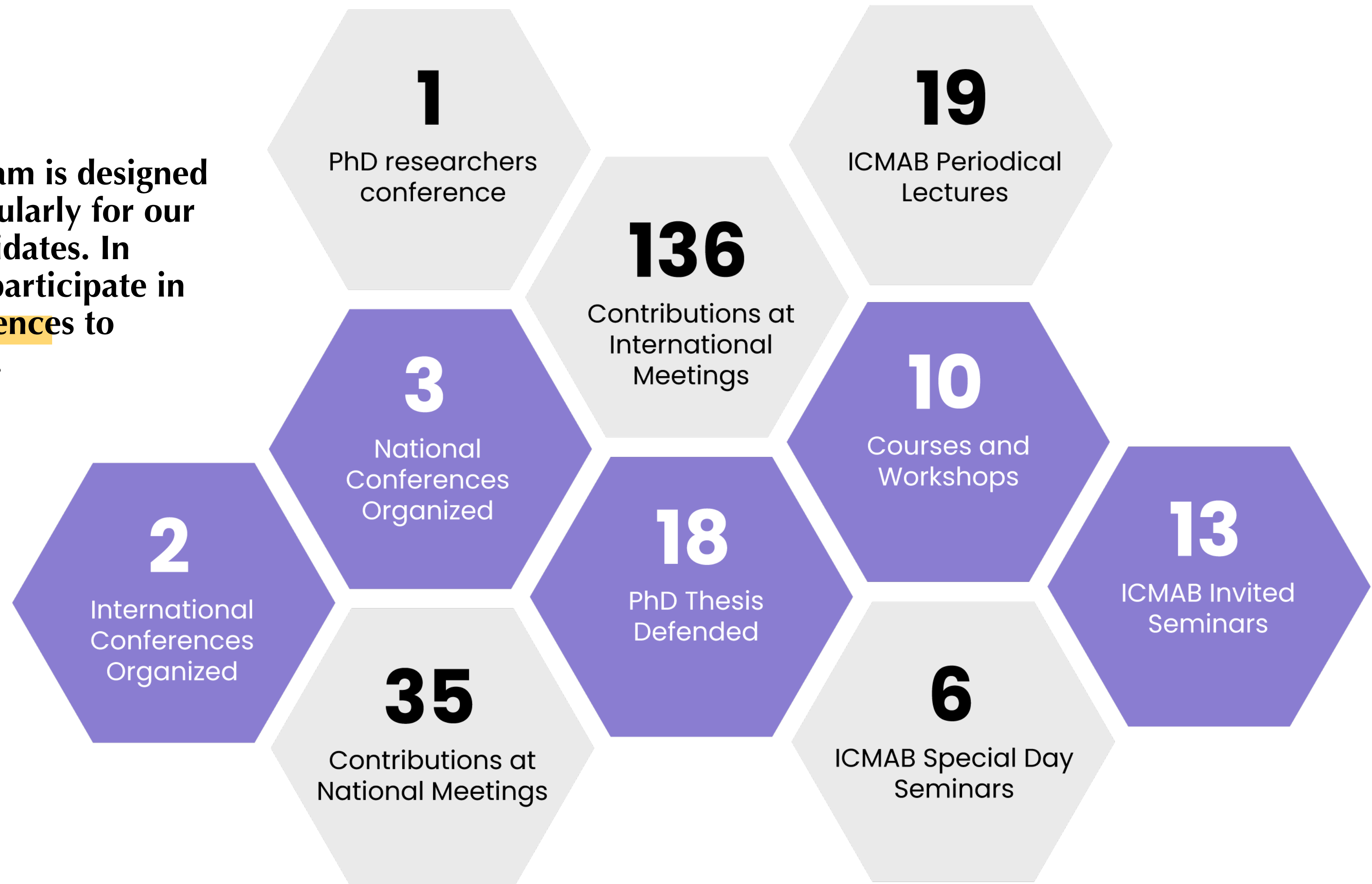
RESEARCH EXPLOITATION & DISSEMINATION

1 Institut de Ciència de Materials de Barcelona Bellaterra, Campus de la Universitat Autònoma de Barcelona (Barcelona)

1 The Institute of Materials Science (ICMAB) is a research institute recognized since 2016 as a Severo Ochoa Center of Excellence, and focused on basic ... See More

Meetings and Advanced Training (2019)

A complete training program is designed for all our staff, and particularly for our researchers and PhD candidates. In addition, our researchers participate in many **international conferences** to disseminate their research.



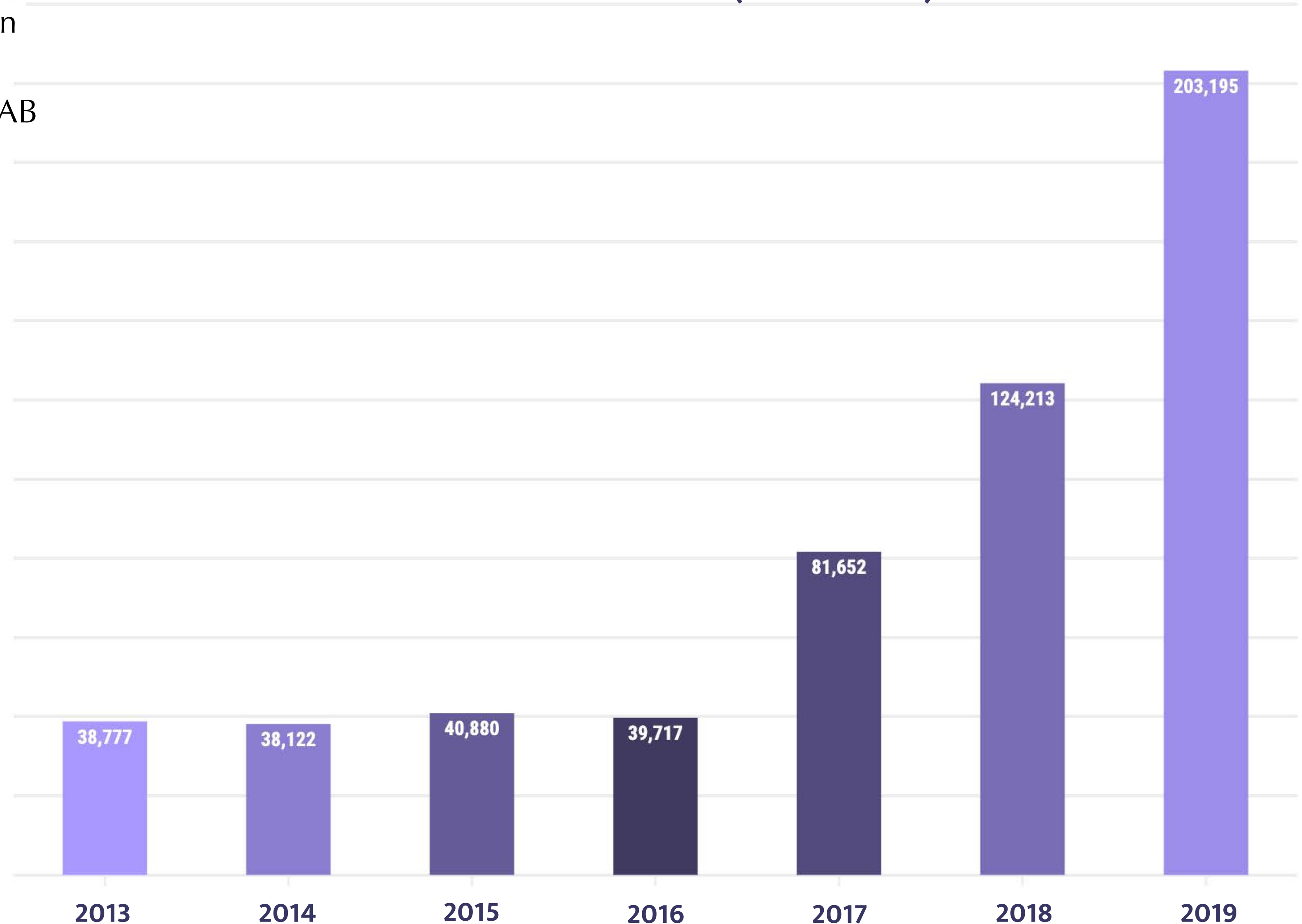
Many actions have been taken through 2019 in order to effectively disseminate the knowledge generated at the Institute and increase the public engagement of society.



The outreach efforts this year represented an increase in our audience. Visitors in our website have increased by 64%, and ICMAB Researchers have been featured in:

- >100 Newspapers and websites
- 16 Press Releases
- 4 R+D CSIC Publications
- 3 Radio Sections
- 3 TV Sections

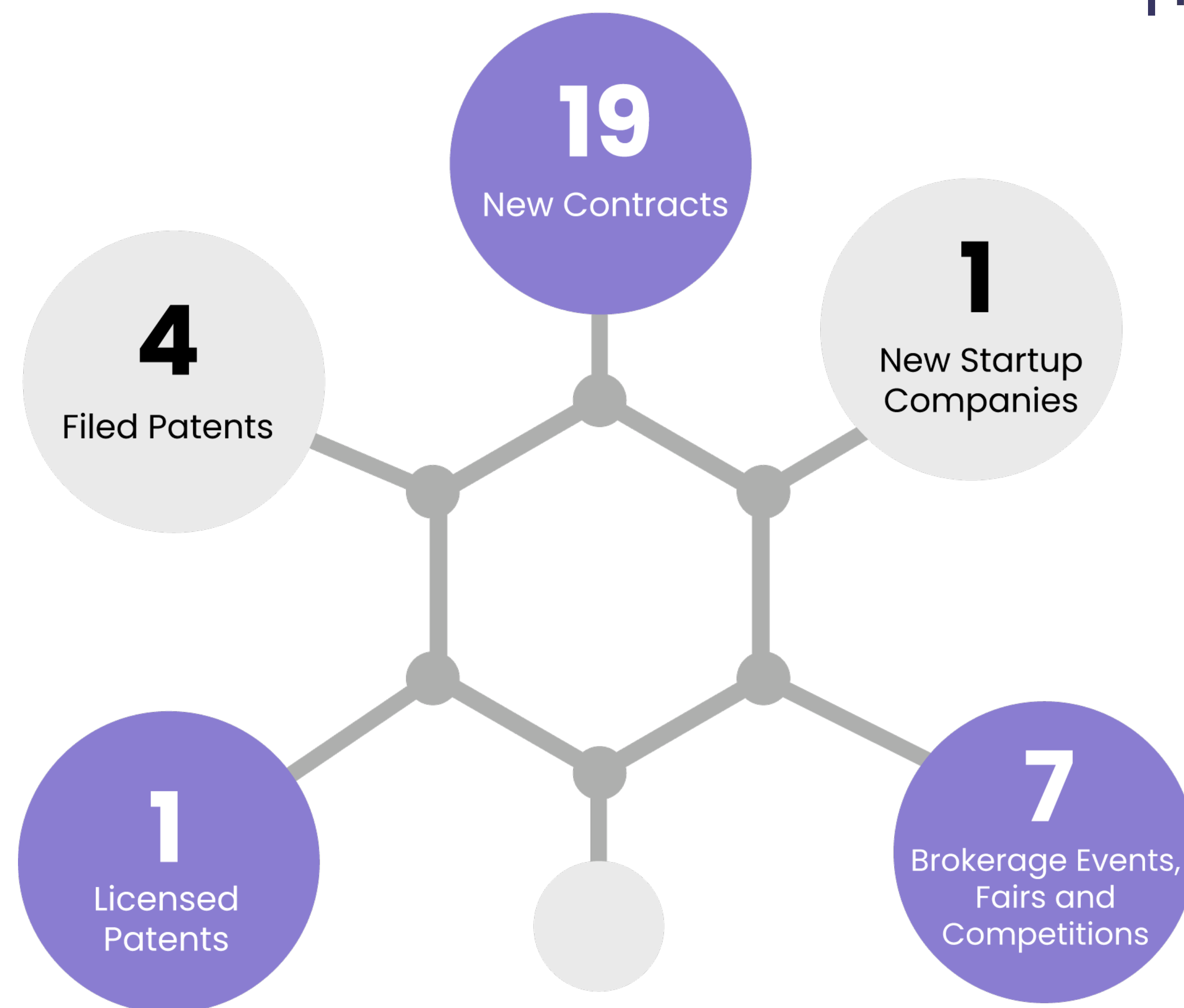
Total Website Visitors (2013-2019)



Following the Knowledge Transfer Unit improvement plan developed in 2018, ICMAB has increased its Human Resources by incorporating new experts with strategic capabilities, especially in IP and Public-Private-Projects and International Technology Transfer issues. This effort has resulted in the following outcomes in 2019:

550.000 € Income New Contracts

49.000 € Income Scientific Services



A scientist wearing a white lab coat, a white face mask, and safety glasses is working with a large, complex piece of scientific equipment. The equipment has various dials, gauges, and a control panel with the text "PRESSURE CONTROL MODULE" and "LIQUID ATMOSPHERE GLOVE BOX" visible. The background is a laboratory setting with shelves and other equipment. The image is overlaid with a dark blue filter and large white geometric shapes (triangles) on the left and right sides.

06

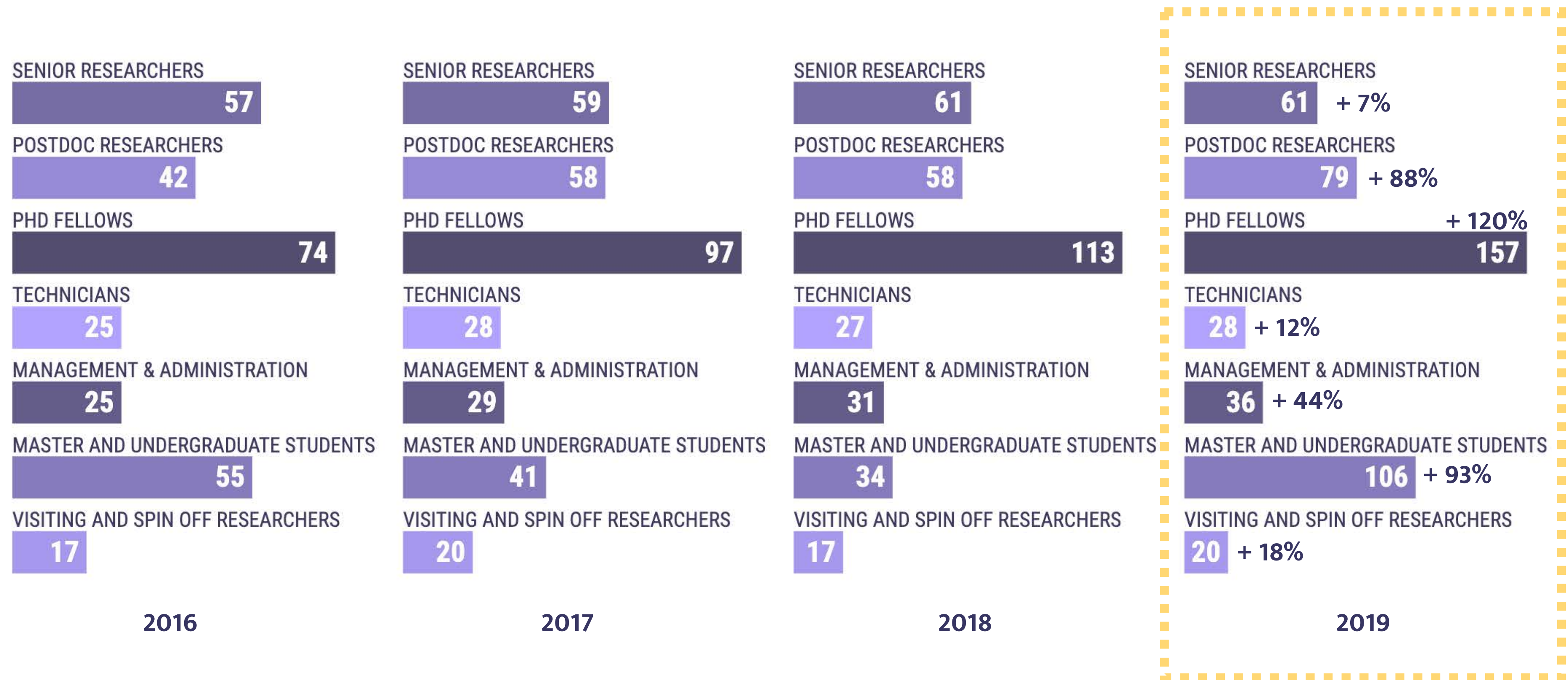
SEVERO OCHOA

2019 has been the fourth and last year of the first Severo Ochoa "Center of Excellence" Certificate of our Institute.

The project “Smart Functional Materials for Social Grand Challenges” (FUNMAT), which started in 2016, has enabled us to become one of the top research centers in Spain in Materials Science.

Personnel by categories (2016 - 2019)

As the last year of the Severo Ochoa program, 2019 showcases the complete growth of the center during these four years. One of the things it has allowed is an increase of our personnel.



Total Staff (2016 - 2019)



ARTICLES



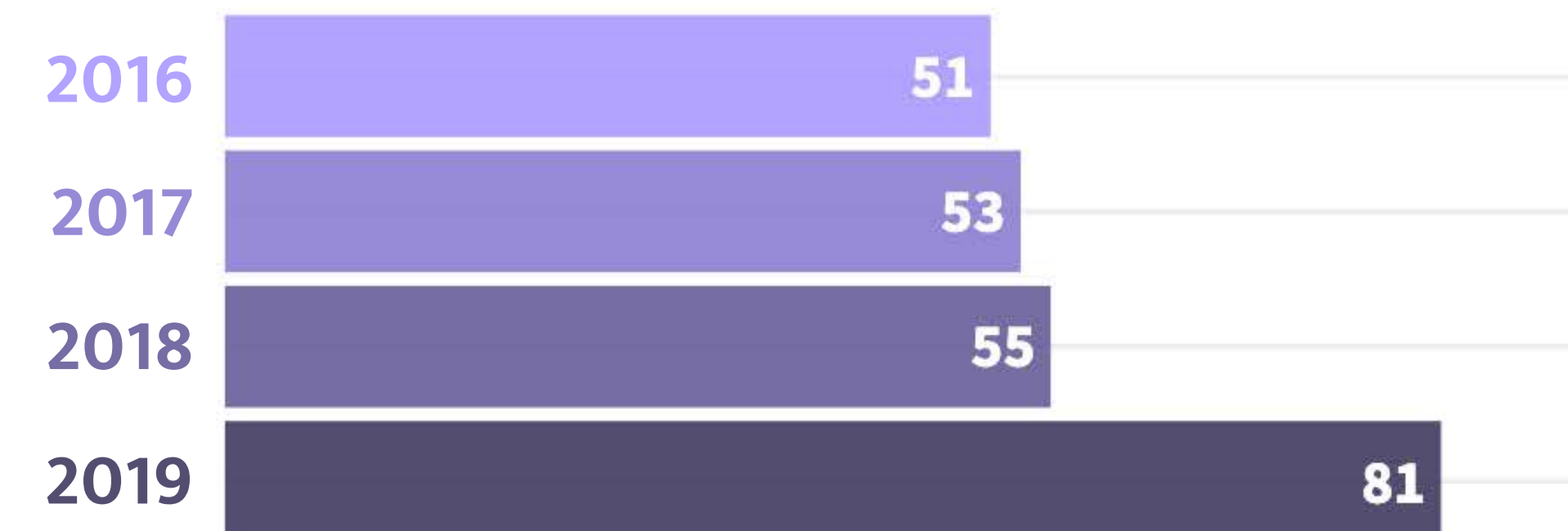
ARTICLES IN Q1 JOURNALS (%)



ARTICLES IN D1 JOURNALS (%)

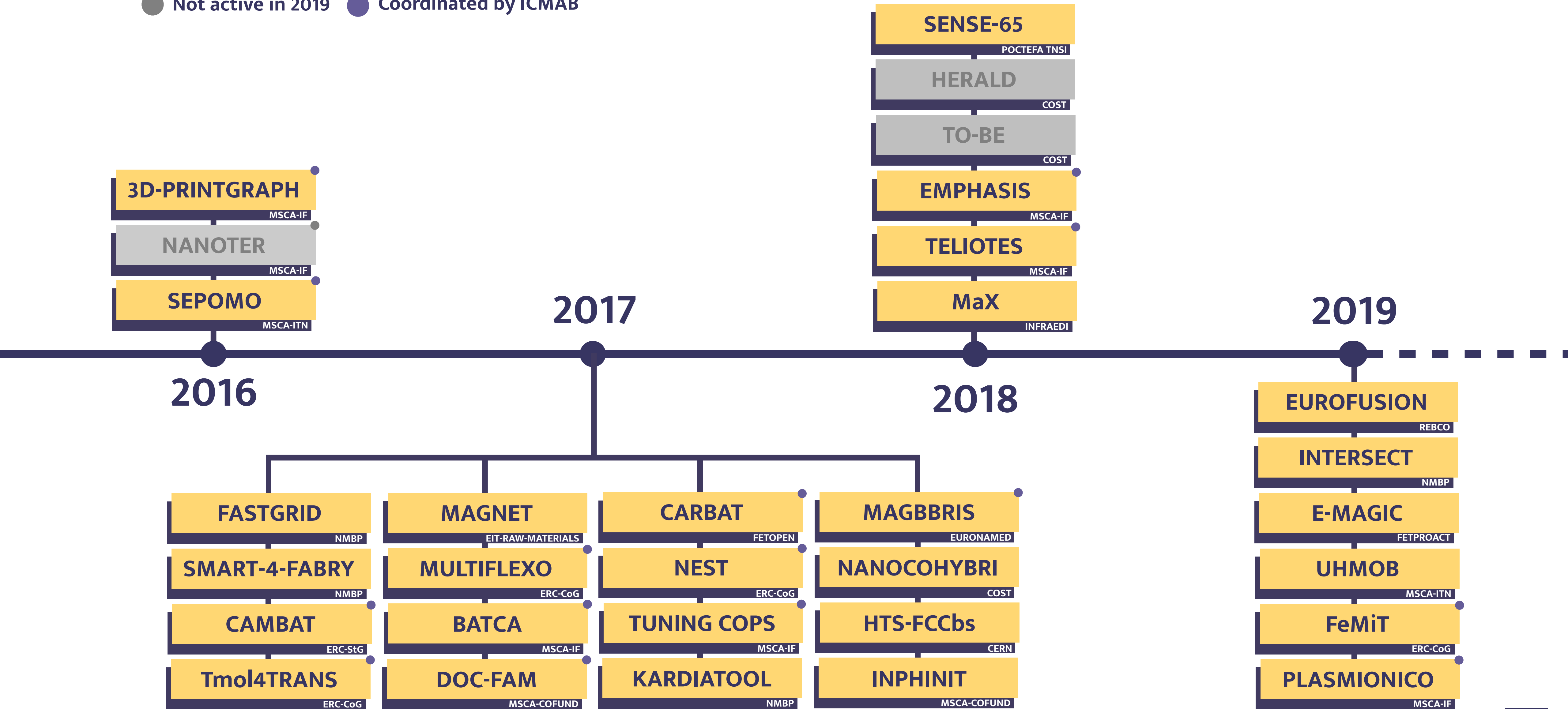


ARTICLES IN GOLD OPEN ACCESS



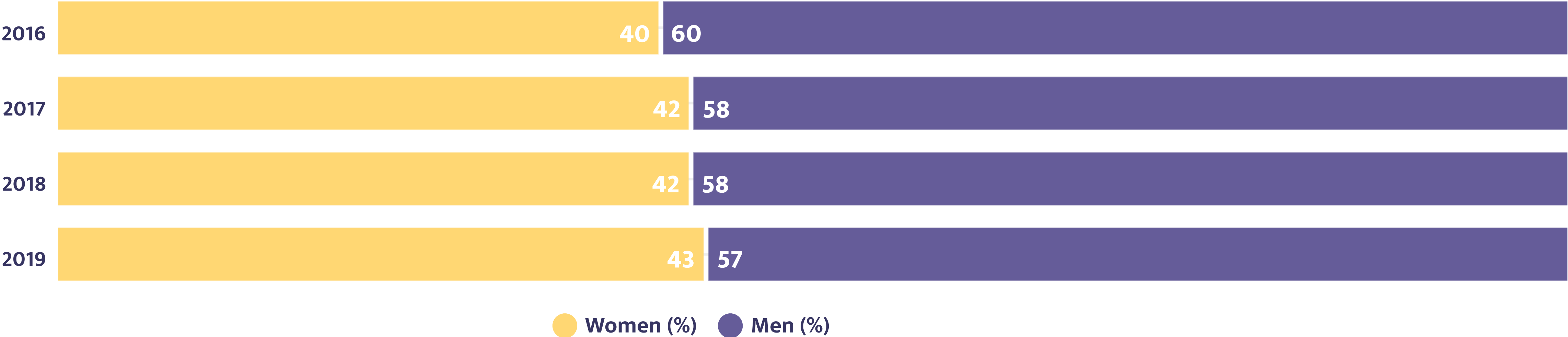
European Research Projects (2016 - 2019)

● Not active in 2019 ● Coordinated by ICMAB



Gender Equality (2016 - 2019)

Part of ICMAB’s growth during the 2016-2019 period required for us to work on improving our gender equality.



Total Budget (2016 - 2019)

The competitive budget has been over 60 % of the total ICMAB budget for the past four years, representing **62 % in 2019**.



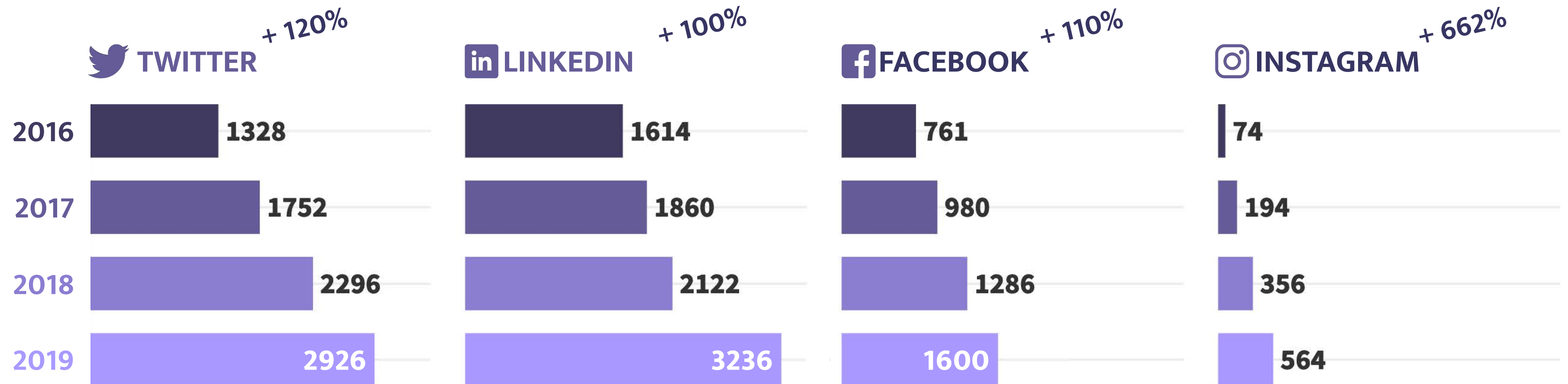
Projects Budget (2016 - 2019)

In 2019, a **56.6 % of the budget** for the research projects is from the European Union, a 35.9 % from the Ministry of Science and Innovation, a 5.1 % are Industry Contracts and a 2,4 % is from the Generalitat de Catalunya.



Social Media (2016 - 2019)

Besides collaboration with classic media channels like TV and Radio, we are committed to scientific divulgation through our social media, which have been showing a **consistent growth** in the 2016 -2019 period.



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 [@icmabCSIC](https://twitter.com/icmabCSIC) 

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