



**Barcelona Institute of
Science and Technology**

**Bibliometric report of the scientific production
Barcelona Institute of Science and Technology (BIST)
(2018/4 version)**



Summary

Introduction	3
Materials and methodology	3
1) Activity indicators	4
2) Collaboration indicators	7
3) Impact indicators	10
4) Excellence indicators	11



Introduction

This report analyses, from a bibliometric perspective, the scientific production of the seven centres of the Barcelona Institute of Science and Technology (BIST), with the incorporation of the Institute for Bioengineering of Catalonia (IBEC) in July 2017. Only publications that present the **institutional signature of the BIST** are considered.

The analysis is based on four categories of bibliometric indicators: activity; collaboration; impact; and, finally, excellence.

Materials and methodology

The report analyses BIST scientific publications during the first 39 months of activity, from **October 2015 to December 2018**.

The sources of information are the two international reference databases, **Web of Science Core Collection and Scopus**, and the ranking **Nature Index**. In addition, the latest editions of the *Journal Citation Reports* (JCR 2017) and the *Scimago Journal Rank* (SJR 2017) have been used to calculate the position of the journals, where the BIST centres publish.

The report **does not include publications signed by only one centre, without the institutional signature of BIST**. On the other hand, the following types of documents have also been excluded: books; book chapters; corrections; and, finally, meeting abstracts.



1) Activity indicators

A total of **3,478 BIST publications** indexed in the *Web of Science Core Collection* (3,353 publications) and/or Scopus databases (3,446 publications) have been located. The differences between the two sources derive from the different periods of information processing and the distinct volume of journals indexed.

The **distribution by type of document** is as follows (excluding meeting abstracts, corrections, books and book chapters):

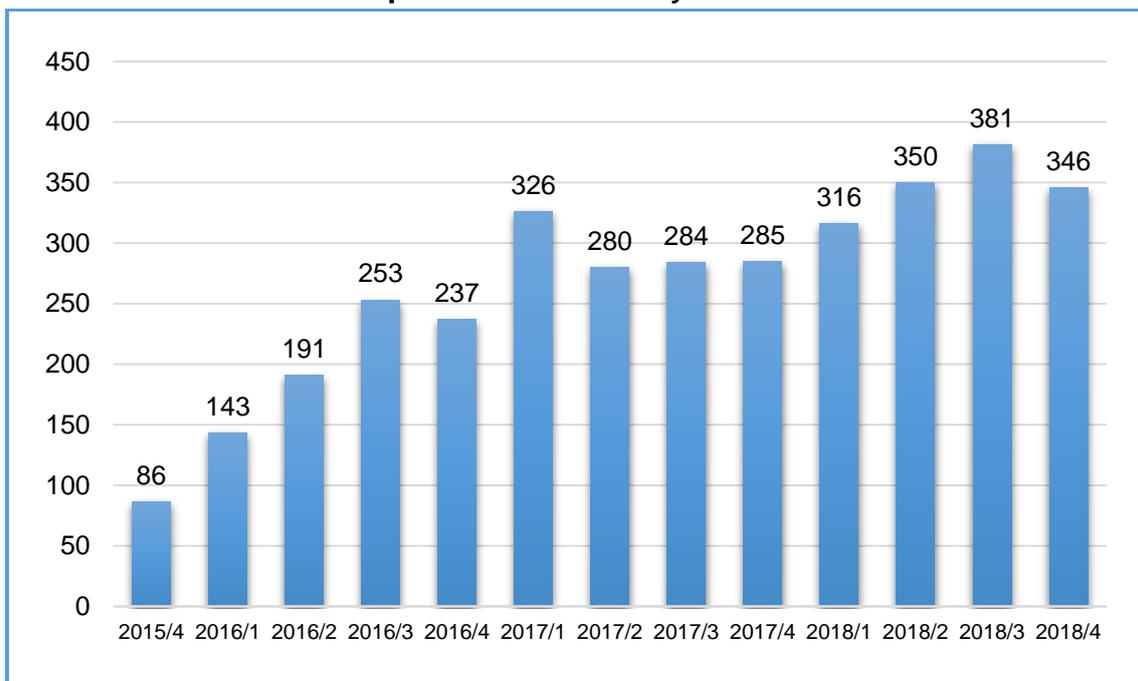
- 3,020 articles (86.8 %)
- 214 *proceedings or conference papers* (6.2 %)
- 168 reviews (4.8 %)
- 76 other types of publications (2.2 %)

Publications in open access journals (gold and green route) account for a total of 1,647, 49.1 % of the total scientific output of BIST in the *Web of Science Core Collection* database.



Graph 1 shows the **distribution of publications by trimester**, which has followed an upward trend. The distribution has been made from the date of indexation in the databases.

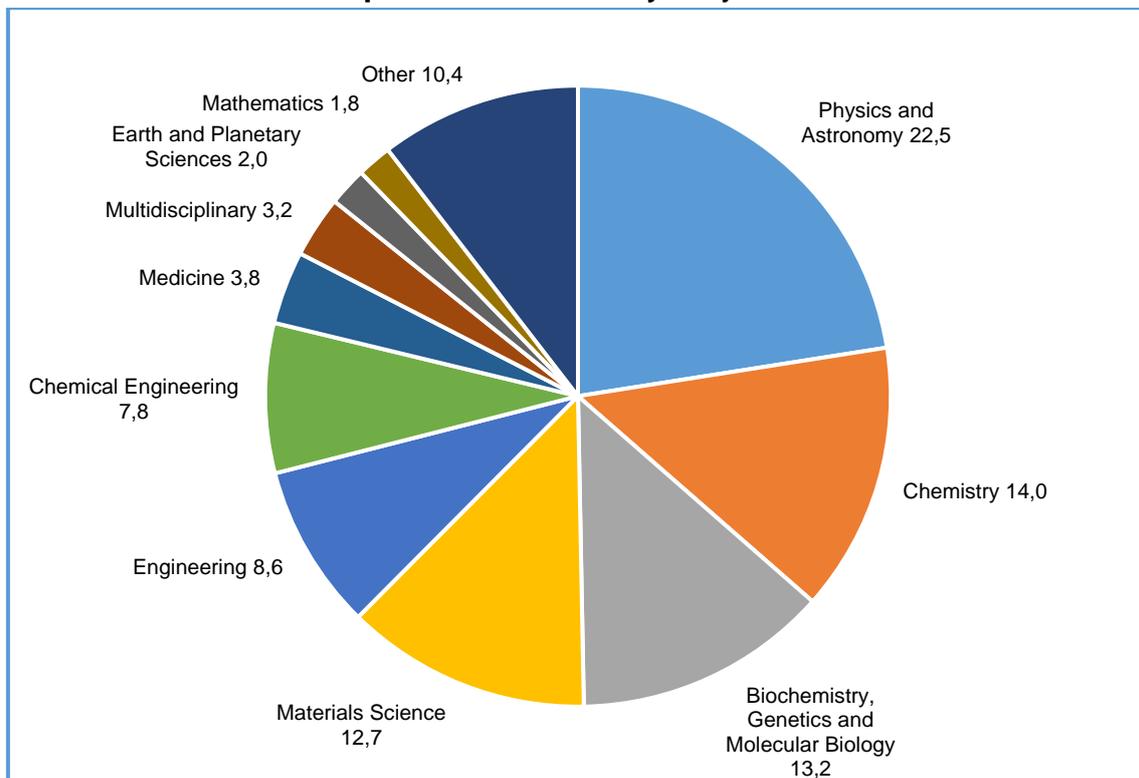
Graph 1. Publications by trimester



Source of information: *Web of Science Core Collection and Scopus.*

Graph 2 shows the **distribution of publications by subject area**. More than half of the publications fall into four areas: Physics and Astronomy; Chemistry; Biochemistry, Genetics and Molecular Biology; and Materials Science. Please note that the same publication can be classified in more than one area.

Graph 2. Publications by subject area



Source of information: *Scopus*.



2) Collaboration indicators

In terms of the **number of authors per publication**, the majority have 6 to 25 authors (1,514 publications, 43.5 %), followed by 1 to 5 authors (1,434 publications, 41.2 %) and, finally, multi-authored publications with more than 25 authors (530 publications, 15.3 %).

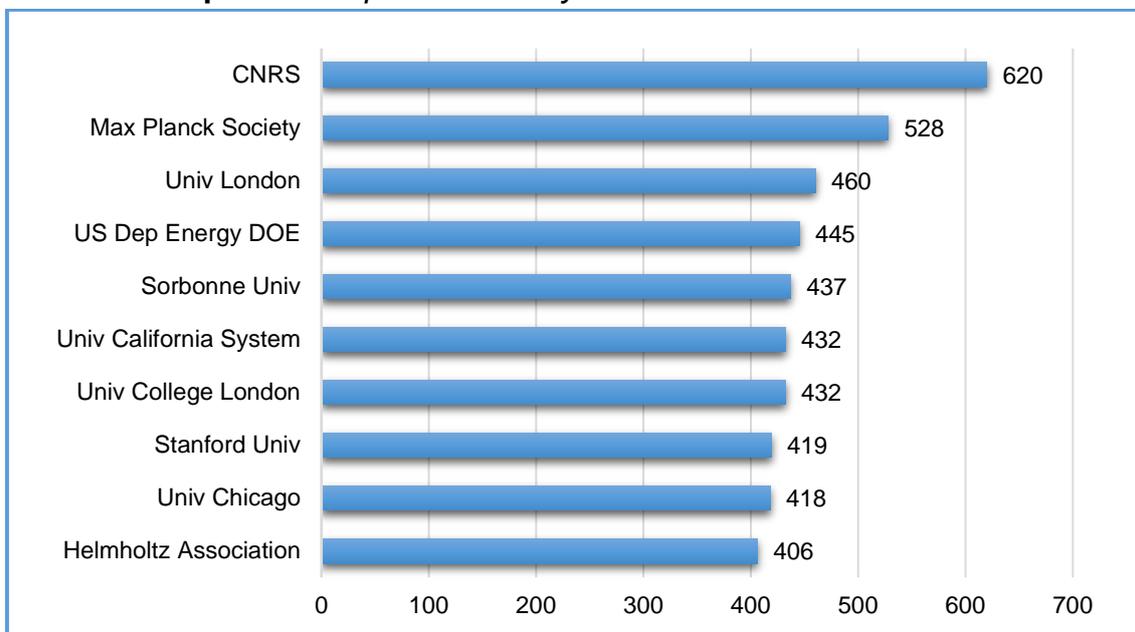
Regarding the **order of signatures**, BIST researchers occupy outstanding positions (first author and/or corresponding author) in 1,800 of the 3,478 documents (51.8 %).

With regard to **BIST's internal collaboration**, 53 publications have been identified in collaboration among six of the seven BIST centres (1.5 % of the total publications).

In relation to **international collaboration**, 2,404 documents (69.1 % of the total) are published jointly with research entities from other countries.

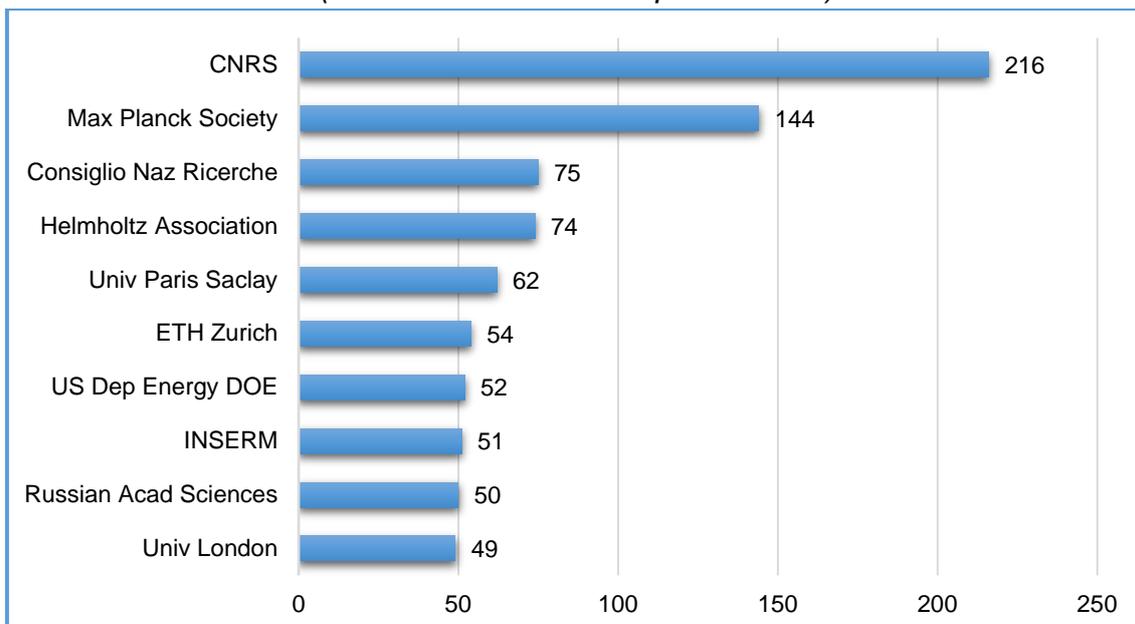
Graphs 3 and 4 show the 10 international research entities with the most joint publications with BIST centres (Graph 4 excludes multi-authored publications because, in full-counting methods, these papers may distort indicators of international collaboration).

Graph 3. Joint publications by international research entities



Source of information: *Web of Science Core Collection.*

**Graph 4. Joint publications by international research entities
(without multi-authored publications)**

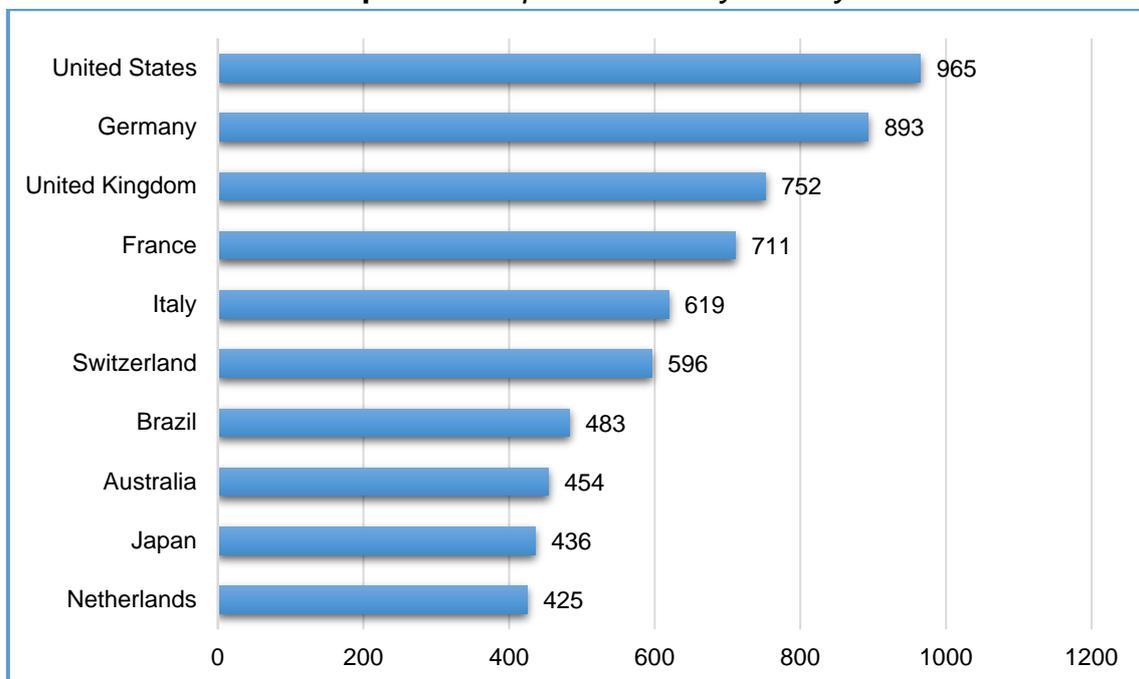


Source of information: *Web of Science Core Collection.*



Graph 5 illustrates the number of **joint publications by country**, with a predominance of collaboration with researchers from the United States (965 joint publications, 27.8 %), Germany (893 publications, 25.7 %) and the United Kingdom (752 publications, 21.6 %).

Graph 5. Joint publications by country



Source of information: *Scopus*.



3) Impact indicators

The impact or visibility of BIST publications has been calculated directly (**citations obtained**) and indirectly (**position of journals in their respective thematic categories**).

In the *Scopus* database, the BIST publications have accumulated **35,060 citations in 39 months**, with an average of 10.17 citations per publication (6 months ago, the average was 9.08). It is worth mentioning that the 25 most cited publications have accumulated 6,482 citations, 18.5 % of the total.

As for indirect impact, the latest editions of the *Journal Citation Reports* (JCR 2017) and the *Scimago Journal Rank* (SJR 2017) have been used as sources of information to calculate the position of the journals published by the BIST centres. Thus, BIST publications in journals of the **first quartile (Q1)** are clearly majority in both databases:

- JCR 2017: 2,706 publications in Q1 journals (77.8 % of the total and 82.9 % without *proceedings papers*)
- SJR 2017: 3,052 publications in Q1 journals (87.8 % of the total and 93.5 % without *proceedings papers*)

In addition, 1,356 BIST publications have been detected in journals of the **first decile (D1)** of JCR 2017, which represents 39 % of the total (41.5 % without *proceedings papers*).



4) Excellence indicators

A good indicator of scientific excellence are **highly cited publications**. Thus, of the 3,353 BIST publications indexed in the *Web of Science* database, 112 articles (3.3 % of the total) are in the most cited 1 % of their category and year of publication (*Highly Cited Papers*). In addition, 16 publications (0.5 % of the total) are in the most cited 0.1 % of their category in the last two years (*Hot Papers*).

Another indicator of excellence is the BIST publications in the **82 journalsⁱ of the Nature Index ranking**, which is updated monthly from the publication data of the last 12 months. Thus, 1,281 of the 3,478 documents (36.8 %) have been published in 65 of the 82 journals.

In the **current edition of the ranking** (December 2018), BIST ranks 121th on the *Article Count (AC)*ⁱⁱ indicator, and 118th on the *Fractional Count (FC)*ⁱⁱⁱ indicator. If academic institutions and universities are excluded, BIST occupies leading positions on a global scale: 16th on AC indicator; and 15th on FC indicator.

Finally, the BIST publications have an average of **8.99 citations per document** (in the *Web of Science Core Collection* database, from 2016 to the present), while the **Weizmann Institute of Science** and the **California Institute of Technology (Caltech)** obtain, respectively, a ratio of 8.95 and 8.9.

ⁱ The Nature Index database has been updated to include author affiliation information from a revised list of journals. The database now indexes 82 high-quality science journals, updated from the previous 68, to provide more even coverage of disciplines (6 June 2018).

ⁱⁱ **Article count (AC)**: where a count of one is assigned to an institution or country if one or more authors of the research article are from that institution or country, regardless of how many co-authors there are from outside that institution or country.

ⁱⁱⁱ **Fractional count (FC)**: that takes into account the percentage of authors from that institution (or country) and the number of affiliated institutions per article. For calculation of the FC, all authors are considered to have contributed equally to the article. The maximum combined FC for any article is 1.0.