NARODOWA AGENCJA
WYMIANY AKADEMICKIEJ

ACADEMIC COOPERATION

# BETWEEN POLAND AND JAPAN


Warsaw 2022

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# INTRODUCTION

The aim of this study is to present a picture of academic cooperation between Poland and Japan and the intensity of student exchange.

The study is exploratory as well as practical and answers the following questions:

- What is the volume of publications by Polish and Japanese co-authors?
- What thematic fields prevail in this regard?
- How intense has this cooperation been over the years?
- What higher education institutions in Poland cooperate with their Japanese counterparts most intensely?
- Which Polish universities host the greatest number of students from Japan?

The study is addressed to the broadly understood academic community and the environment of higher education and scientific institutions as well as to Poland's policy-makers with regard to international academic cooperation.

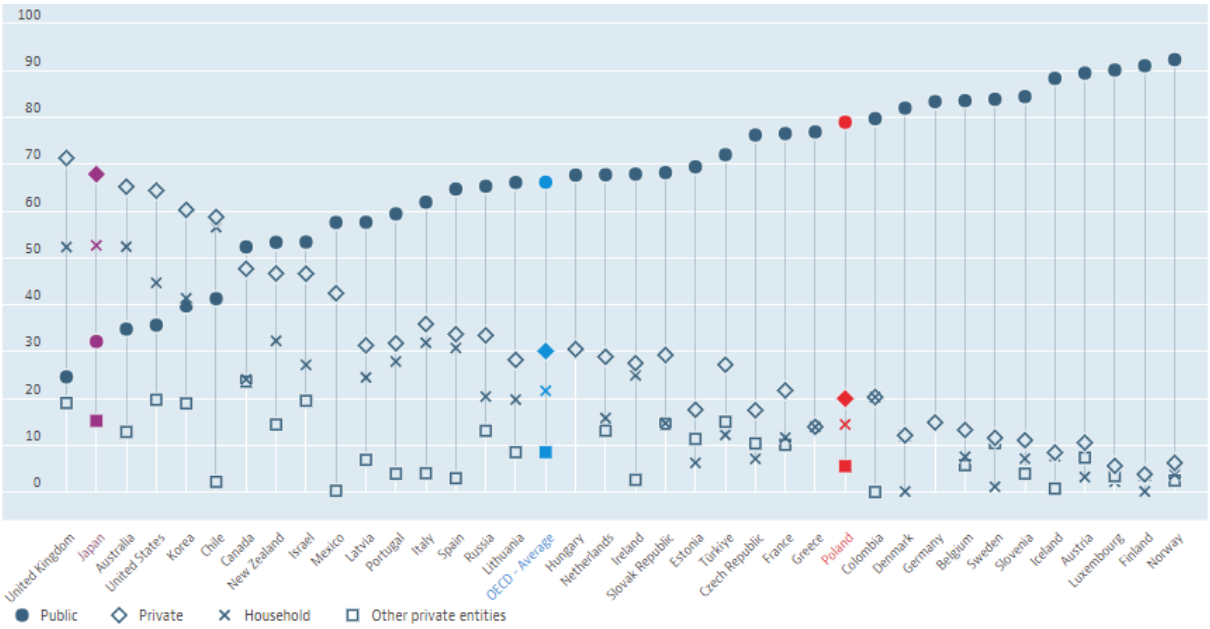
Data from the following databases was used in writing this study: SCOPUS[1], OECD, and POLon.

[1] Access to the SCOPUS database and the SciVal tool under a national licence provided by the Ministry of Education and Science

# 1 POLAND AND JAPAN – BASIC DATA

Below are graphs demonstrating the percentage distribution of higher education expenditure categories and the share of persons with higher education by age group, across OECD countries.

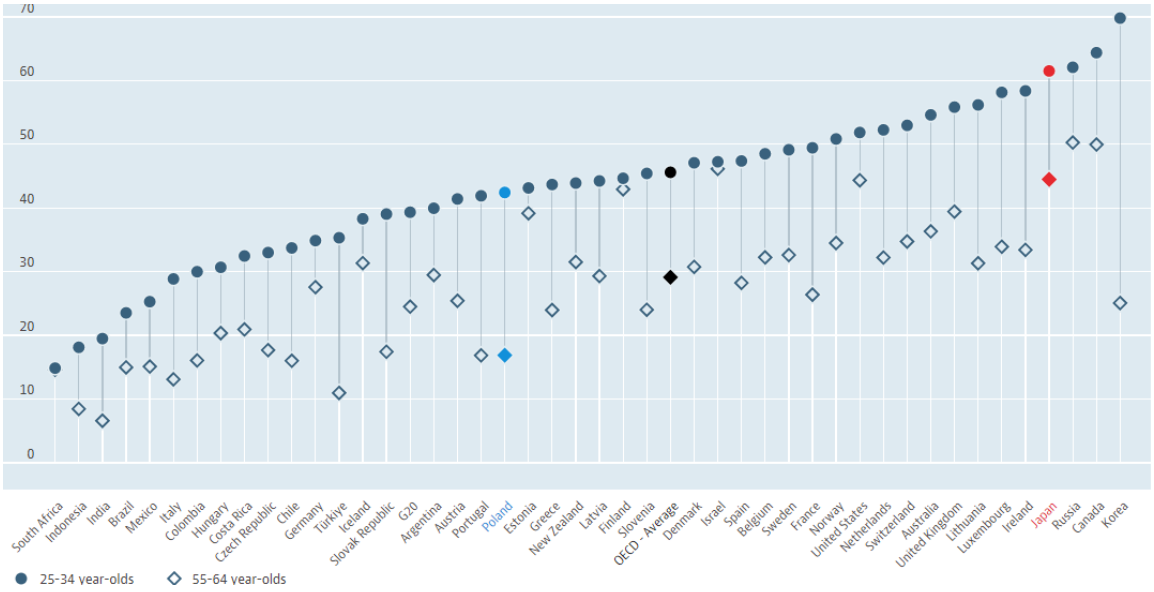
Graph 1: Higher education expenditure (public, private, household, and other) as a % total higher education expenditure (2018)




*Source: OECD (2022), Spending on tertiary education (indicator). doi: 10.1787/a3523185-en (Accessed on 27 June 2022)*

It is quite clear that in OECD countries, the higher the percentage of public spending on higher education, the lower the share of private funds. This is particularly evident in the Scandinavian countries (Norway and Finland). The countries on the opposite end of the extreme are the United Kingdom and Japan. In Japan, the share of private and household expenditure clearly outweighs the rest. In Poland, the proportions of these expenditures are virtually reversed.

Graph 2: Percentage of people with higher education by age group (2020)



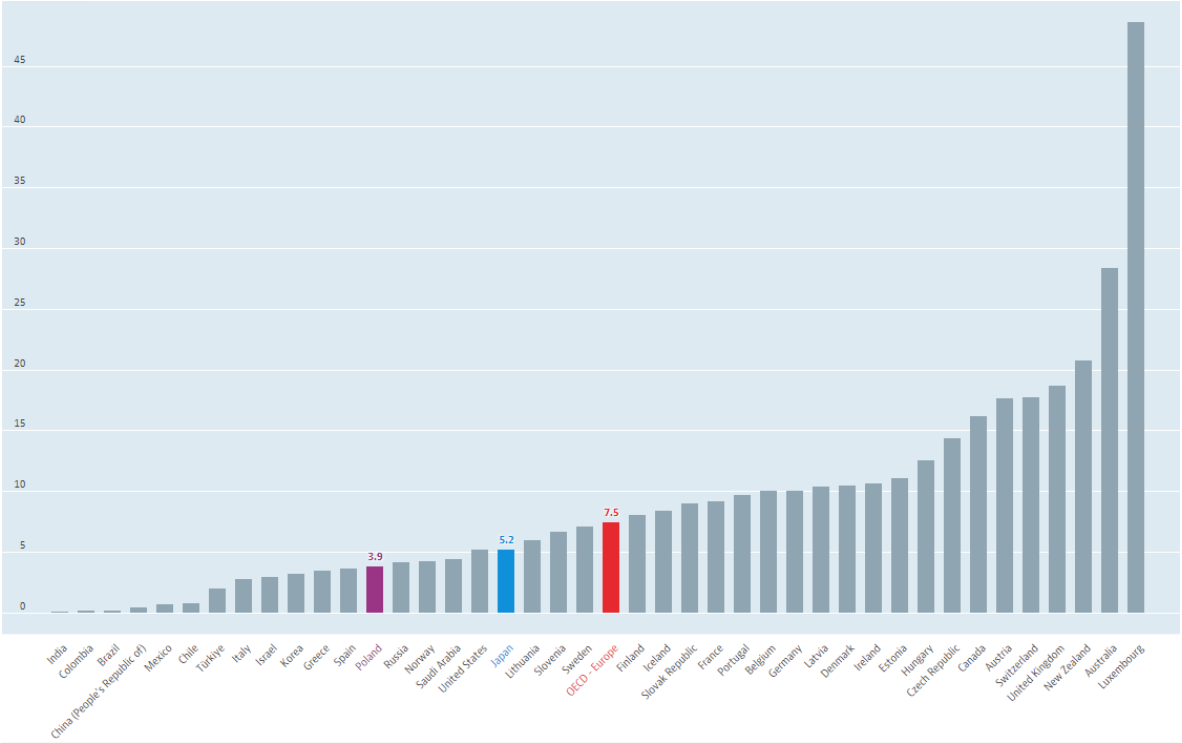

*Source: OECD (2022), Population with tertiary education (indicator). doi: 10.1787/0b8f90e9-en (Accessed on 28 June 2022)*

The population with higher education degree is defined by the OECD as those who have completed the highest level of education in the relevant age groups. Included are both theoretical programmes leading to advanced research or high-skilled occupations such as medicine, as well as vocational programmes, upon completion of which a graduate goes straight into employment. The OECD takes the view that, as globalisation and technological developments continue, the needs of labour markets around the world are changing and there is an increasing demand for people with both broad knowledge and specialised skills.

Across all OECD countries, the number of people with higher education is clearly higher among the population aged 25–34 in comparison to the group aged 55–64. The distances between the percentage levels vary, of course, but of note is the virtually equal level of higher education in the younger and older groups in Finland, Israel, and Estonia. South Africa is an exception, with equal shares of people with higher education in both age groups, albeit the country has the lowest total percentage of people with higher education among OECD countries.

As for Japan, the proportion of people with tertiary education in both age groups is one of the highest in the OECD (it exceeds 60% in the 25–34 age group and 40% in the 55–64 age group). In Poland, the proportion of people with higher education is clearly lower in both age groups and the gap between younger and older people is greater than in Japan.

Graph 3: Student mobility indicator (2019)




*Source: OECD (2022), "International student mobility" (indicator), https://doi.org/10.1787/4bcf6fc3-en (accessed on 27 June 2022).*

The international student mobility indicator used in OECD reports shows the number of hosted international university students as a percentage of all university students hosted in the destination (host) country. Foreign students are those who previously gained education in another country and are not resident in the country where they are currently studying.

The highest proportion of foreign students is in Luxembourg (more than 45% of all students in this country are foreigners). The average for OECD countries is 7.5%. The percentage of foreign students in both Poland and Japan is below this average (3.9% and 5.2%, respectively).

The Japan Association of Overseas Studies indicates that the most popular countries for Japanese to study are: the US (36% of students going abroad to study), Canada (30%), UK (12%), Malta (6%), South Korea (4%), and Australia (3%).

According to data from the POLon system, 78 Japanese studied in Poland in the academic year 2021/22. They studied in many Polish cities, yet mainly in large academic centres, at universities with various educational profiles. Most of the 78 students studied at:

- University of Wrocław (mainly geography, image communication, medical biotechnology, and international relations),
- Warsaw University of Technology (computer science, and mechatronics),
- Jagiellonian University (business and finance management, European studies, international relations and area studies),
- Chopin University of Music in Warsaw (instrumental and dance studies).

In total, the fields of study most frequently chosen by the Japanese were:

- medicine,
- instrumental studies,
- computer science,
- international relations

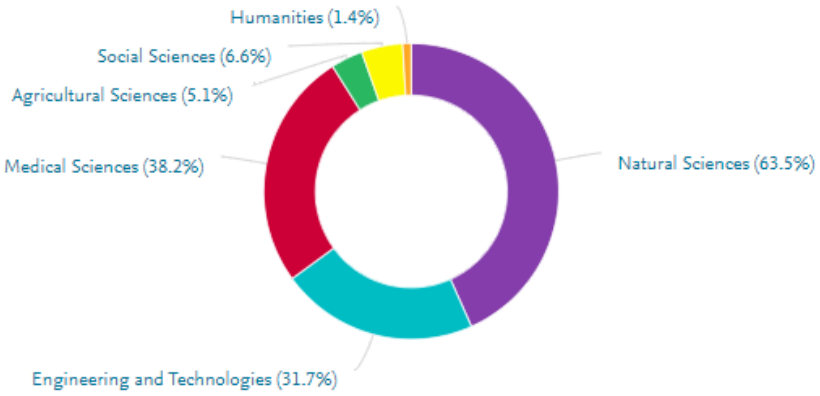
In the 2021/22 academic year, 38 academic teachers were employed at Polish universities. Most of them worked at the University of Warsaw. More than half of them represented the field of exact and natural sciences.

# 2 POLISH-JAPANESE SCIENTIFIC COOPERATION (2019–2021)

In terms of the number of publications in OECD countries, the leaders are the United States, the United Kingdom, and Germany. Poland is ranked 13th and Japan 5th.

The highest percentage of publications in indexed sources in the SCOPUS database in OECD countries was in the field of natural science (53.4%), and one in four in engineering and technologies (25.1%).

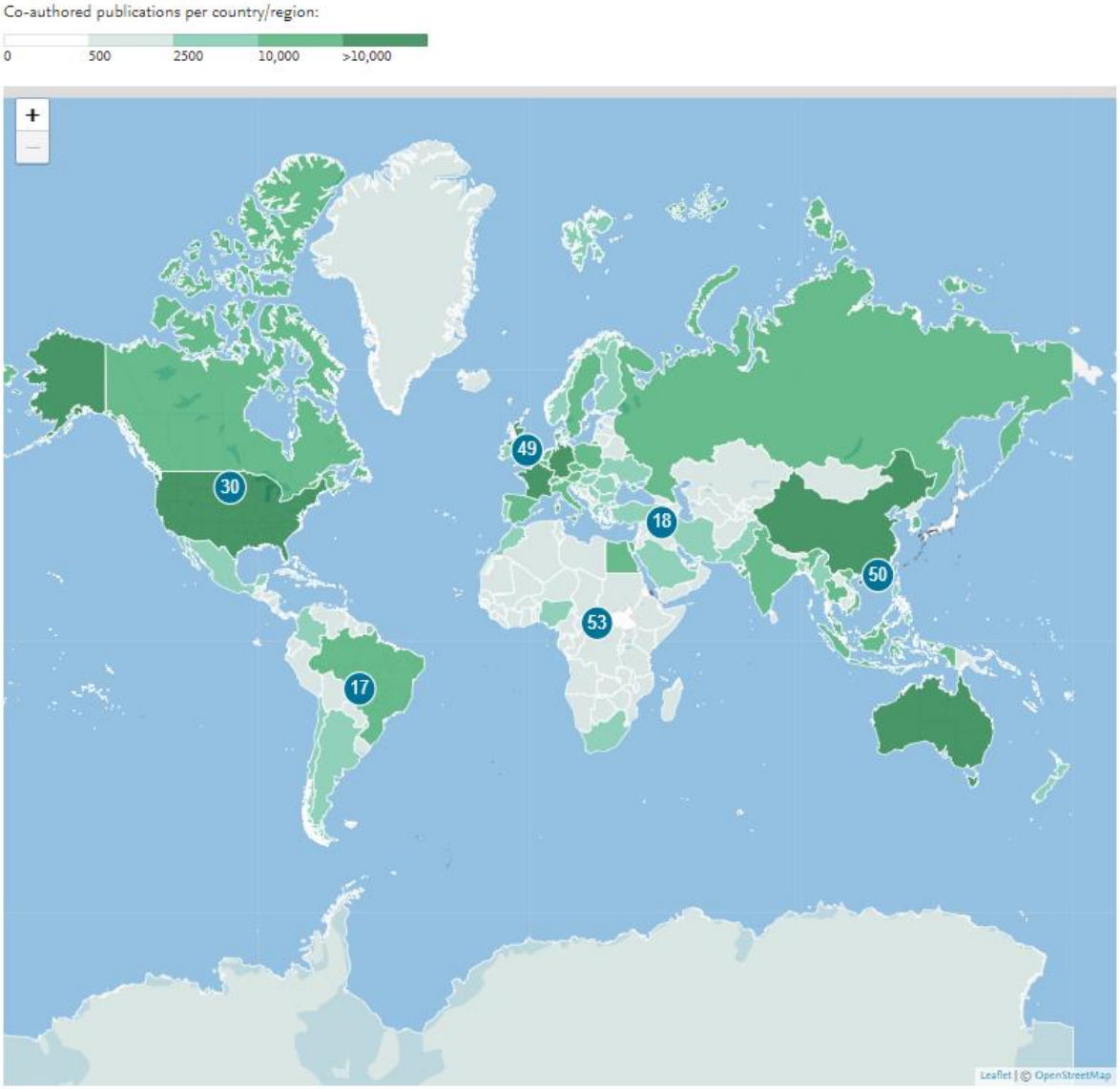
Graph 4: Publications by Japanese scientists by field of knowledge




*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

Japanese scientists publish most extensively in the fields of Natural Science, Medical Science, and Engineering and Technology. The three most productive universities are: the University of Tokyo, Kyoto University, and Osaka University.

## Map 1: Regions of residence of co-authors of publications by Japanese scientists




*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

The largest number of publication co-authors come from the Asia-Pacific region (mainly from China, Australia, and India), Africa (Egypt, South Africa, and Morocco), and Europe (Sweden, Germany, and UK).

As far as Poland is concerned, almost 250 institutions (249) collaborated with Japanese science and higher education institutions on publications between 2019 and 2021. Joint publications were most often in the fields of natural science and medical science.

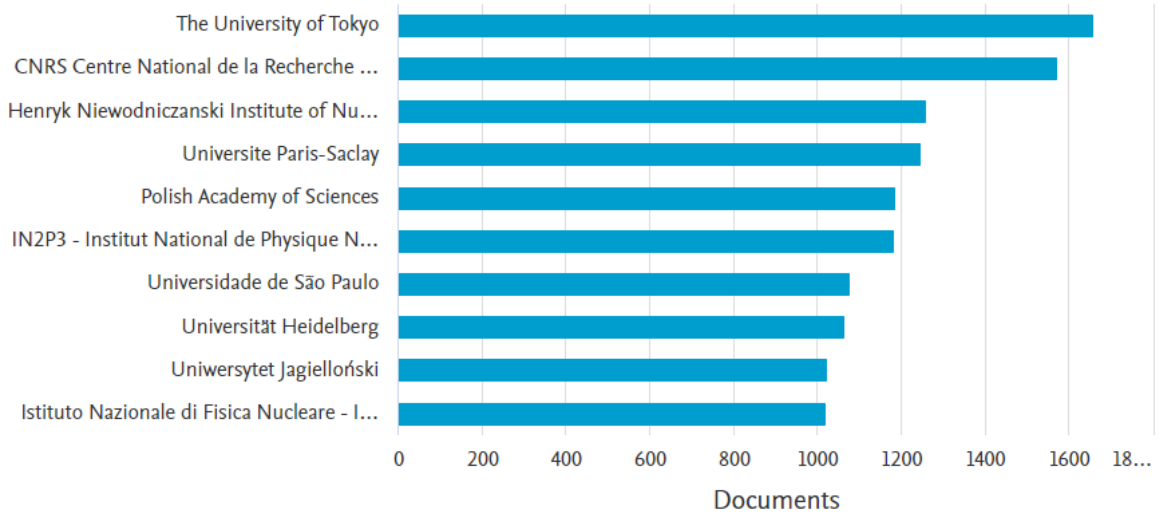
Table 1: Polish-Japanese publications in the SCOPUS database

| Publication year | Number of publications |
|---|---|
| 2023 | 1 |
| 2022 | 535 |
| 2021 | 1,199 |
| 2020 | 1,095 |
| 2019 | 1,048 |
| 2018 | 1,008 |
| 2017 | 916 |
| **Total:** | **5,802** |

*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

Between 2017 and 2023 (some journals publish their issues in advance), 5,802 joint publications appeared where at least one author was affiliated simultaneously with a Polish and a Japanese institution.

Graph 5: Authors' affiliations



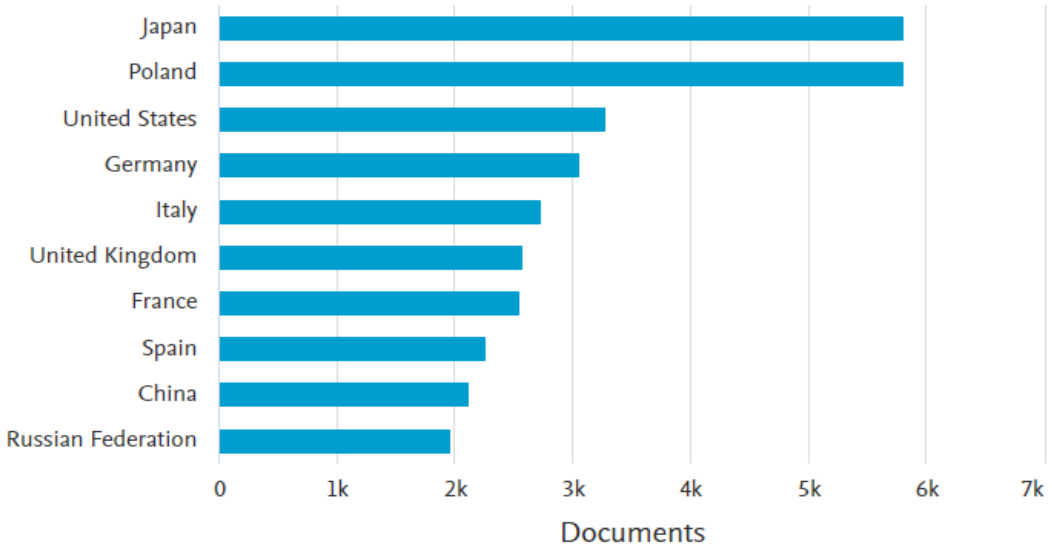

*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

The institutions with most affiliated co-authors are:

- University of Tokyo (1657 publications),
- CNRS Centre National de la Recherche Scientifique (1569),
- Henryk Niewodniczanski Institute of Nuclear Physics of the Polish Academy of Sciences (1259),
- Universite Paris-Saclay (1246),

— Polish Academy of Sciences (1183).

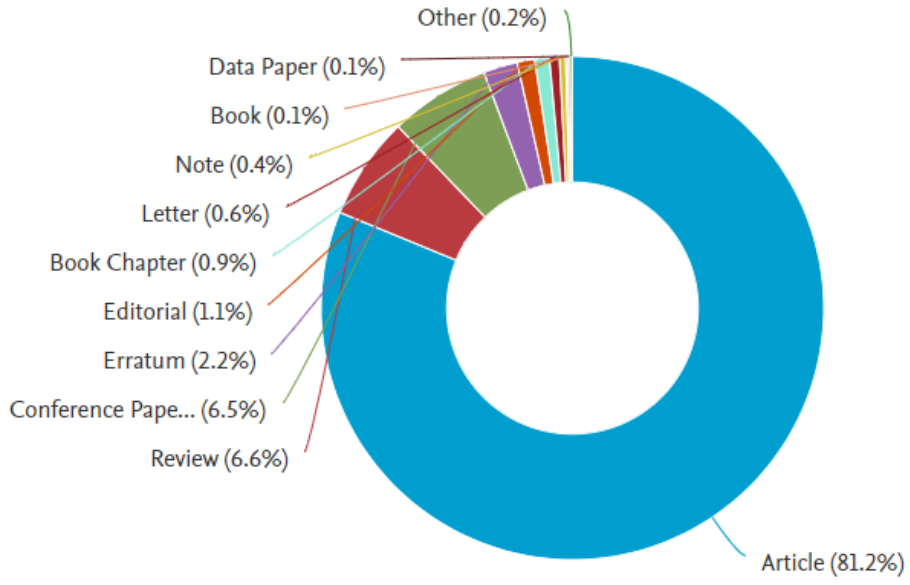
### Graph 6: Countries of origin of co-authors of publications




*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

In addition to Poles and Japanese, the publications are co-authored by Americans, Germans, Italians, and British. In addition to the 15 countries shown in the chart, there are some states that are more exotic from the Polish perspective, e.g. French Guiana, Solomon Islands, or Papua New Guinea.

### Graph 7: Publications by type of document

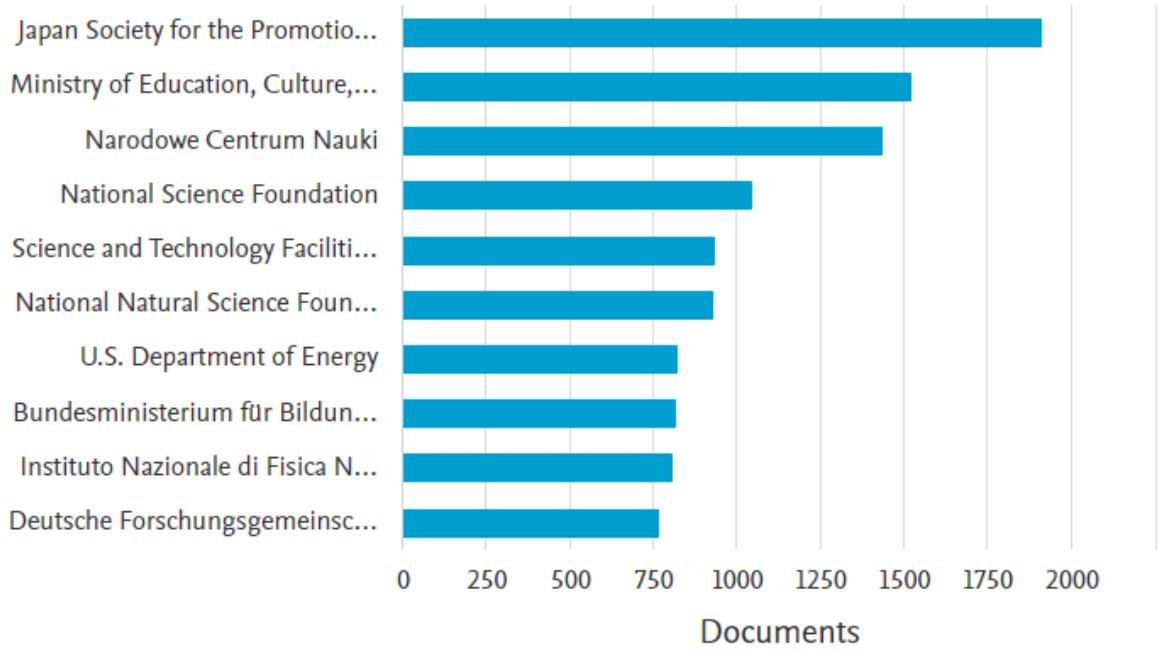



*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

The main types of joint publications are articles (81.2%), reviews (6.6%), and conference proceedings (6.5%). There were 8 joint books, representing 0.1% of all publications. The most common fields were:

- Business, Management and Accounting,
- Economics, Econometrics and Finance,
- Engineering.

Graph 8: Publications by funding institution




*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

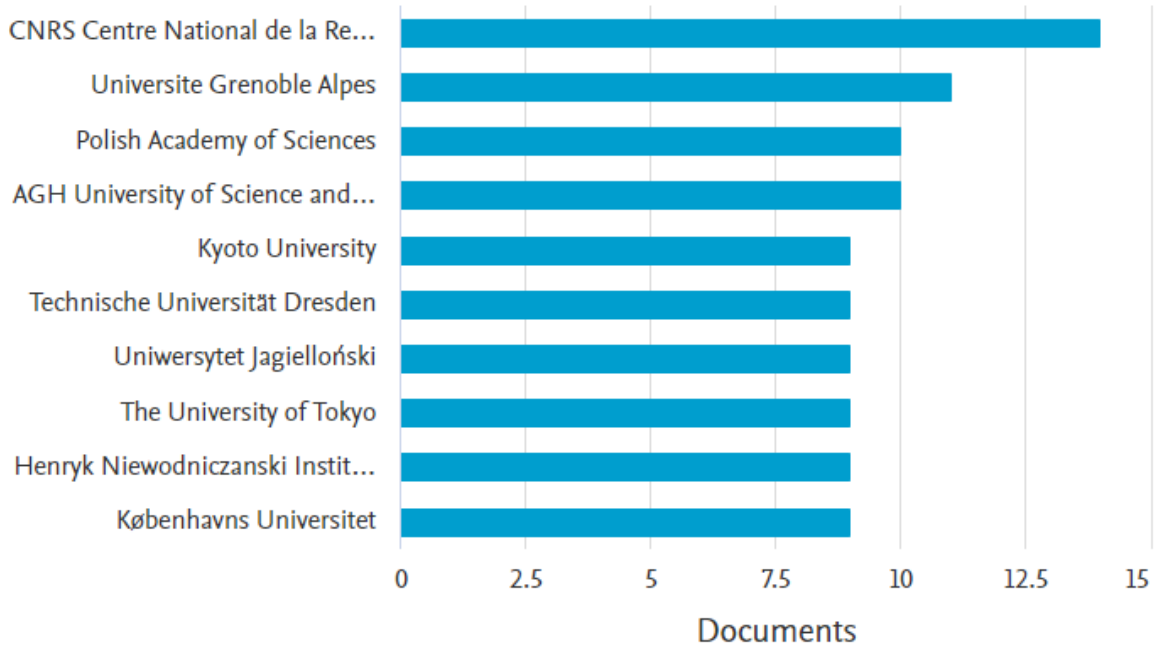
From the point of view of a funding agency offering student and research grants such as NAWA, it is interesting to see what other sources of co-funding for publications were indicated by the authors. The most common were:

- National Science Foundation (1046 publications),
- Science and Technology Facilities Council (932),
- National Natural Science Foundation of China (925),
- U.S. Department of Energy (820),
- Bundesministerium für Bildung und Forschung (818),
- Instituto Nazionale di Fisica Nucleare (808).

# 3 NAWA'S CONTRIBUTION TO POLISH-JAPANESE SCIENTIFIC COLLABORATION

The Polish National Agency for Academic Exchange has contributed to the funding of 39 publications since its inception (including: 12 publications in 2022, 16 in 2021, 10 in 2020, and 1 in 2019).

Graph 9: Affiliations of authors of publications co-financed by NAWA

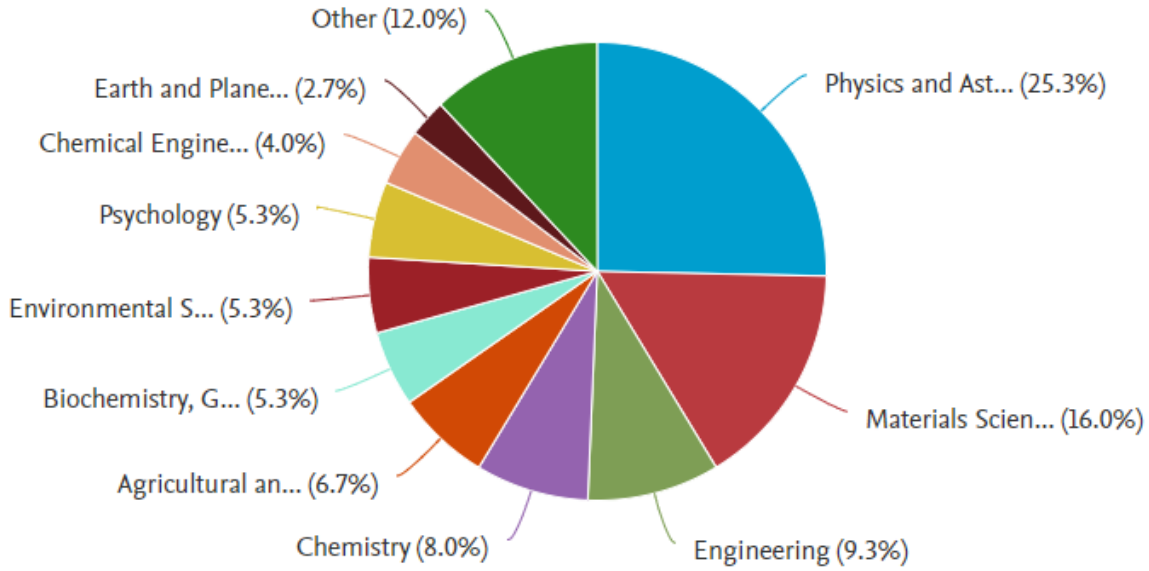



*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

The co-authors of these publications most often indicated as their affiliation:

- CNRS Centre National de la Recherche Scientifique
- Universite Grenoble Alpes,
- Polish Academy of Sciences,
- AGH University of Science and Technology,
- Kyoto University,
- Technische Universität Dresden,
- Jagiellonian University.

Graph 10: Publications co-financed by NAWA by subject field




*Source: SCOPUS-SciVal [accessed: 28/06/2022)*

Publications co-financed by NAWA concerned the following fields:

- Physics and Astronomy (19),
- Materials Science (12),
- Engineering (7),
- Chemistry (6),
- Agricultural and Biological Sciences (5),
- Biochemistry, Genetics and Molecular Biology (4),
- Environmental Science (4),
- Psychology (4),
- Chemical Engineering (3),
- Earth and Planetary Sciences (2),
- Medicine (2),
- Arts and Humanities (1),
- Computer Science (1),
- Energy (1),
- Mathematics (1),
- Multidisciplinary (1),
- Pharmacology, Toxicology and Pharmaceutics (1),
- Social Sciences (1).

# 4 CONCLUSIONS

1. The Japanese are most likely to go to the USA, Canada, the UK, South Korea, and Australia to study.
2. In Poland, the largest number of Japanese study at large academic centres in a wide range of fields of study.
3. Most Japanese scientists working in Poland are employed at the University of Warsaw.
4. Japanese researchers in Poland most often represent the field of exact and natural sciences.
5. Japanese researchers most often publish in the areas of natural sciences and medical sciences.
6. Polish-Japanese co-authorships most often result in publications in the fields of natural sciences and medical sciences.
7. Polish authors are most often affiliated with the Polish Academy of Sciences, while Japanese authors are affiliated with the University of Tokyo.
8. Polish co-authors whose publications have been co-financed by NAWA are most often affiliated with the AGH UST and the Jagiellonian University.

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