



NARODOWA AGENCJA
WYMIANY AKADEMICKIEJ

ACADEMIC COOPERATION
BETWEEN POLAND AND ITALY



opracowanie

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INTRODUCTION

The aim of this study is to present a picture of academic cooperation between Poland and Italy. Academic cooperation is understood here in a broad sense, including both individual and institutional cooperation.

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

- What is the volume of publications by Polish and Italian 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 Italian counterparts most intensely?
- Which Polish universities host the greatest number of students from Italy?

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.

The study is based on data available in SCOPUS¹, OECD, UNESCO and POLon databases.

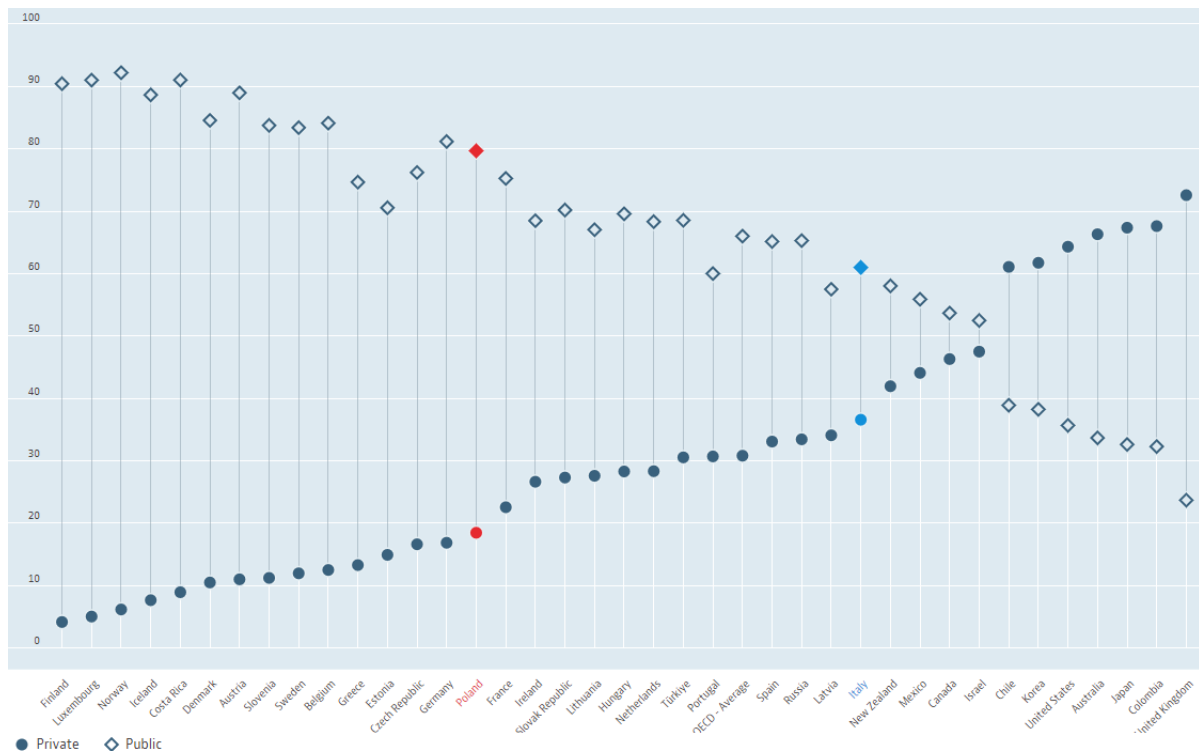
Due to the small size of the groups of Italian students and employees studying or working at Polish universities, this study presents only the data necessary to guarantee the anonymity of these individuals.

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 ITALY – BASIC DATA

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

Graph 1 Higher education expenditure (public and private) as a % of total higher education expenditure (2020)

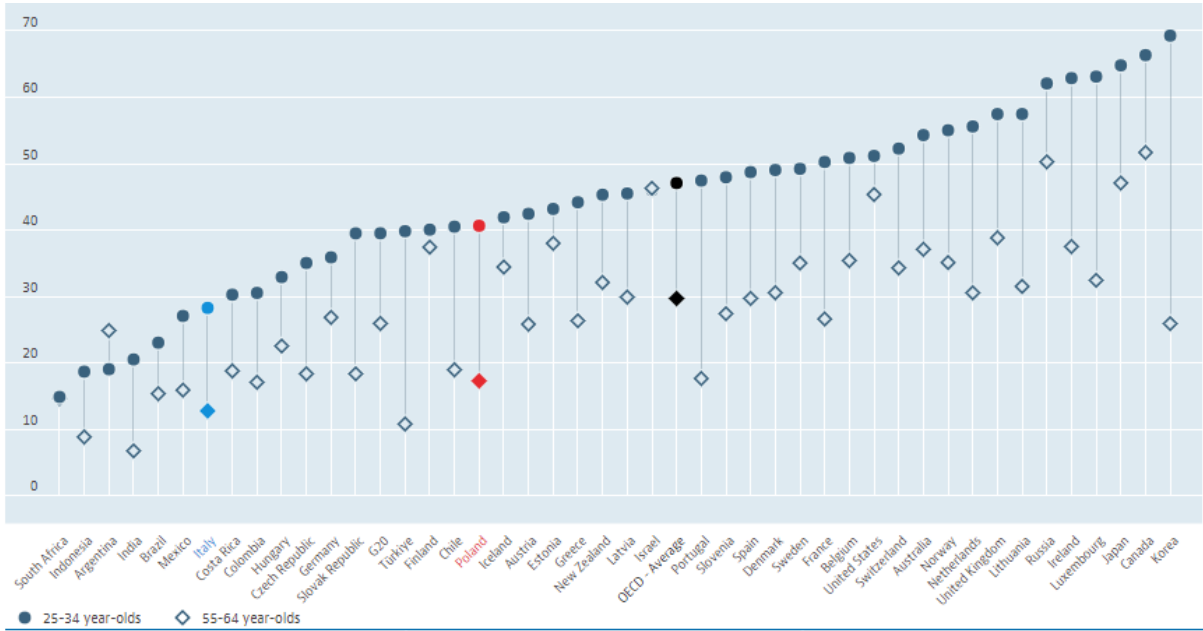


Source: OECD (2023), *Spending on tertiary education (indicator)*. doi: 10.1787/a3523185-en (Accessed on 15 May 2023)

The graph above shows the measure which is a percentage of total education expenditure. As regards tertiary education, educational institutions in OECD countries are mainly publicly funded, although the level of private funding is significant and continues to grow. Among OECD countries, Finland, Luxembourg and Norway have the highest percentage of public outlays on tertiary education. The countries on the opposite end of the extreme are the United Kingdom, Colombia and Japan. It is clear that the lower the level of public funding for higher education, the more funds come from private sources. The average for OECD countries is 66.01% of public funding and 30.82% of private funding.

In the case of Poland, the numbers are: 79.69% and 18.47, and Italy – 61% and 36.59%, respectively.

Graph 2 Percentage of people with higher education by age group (2021)

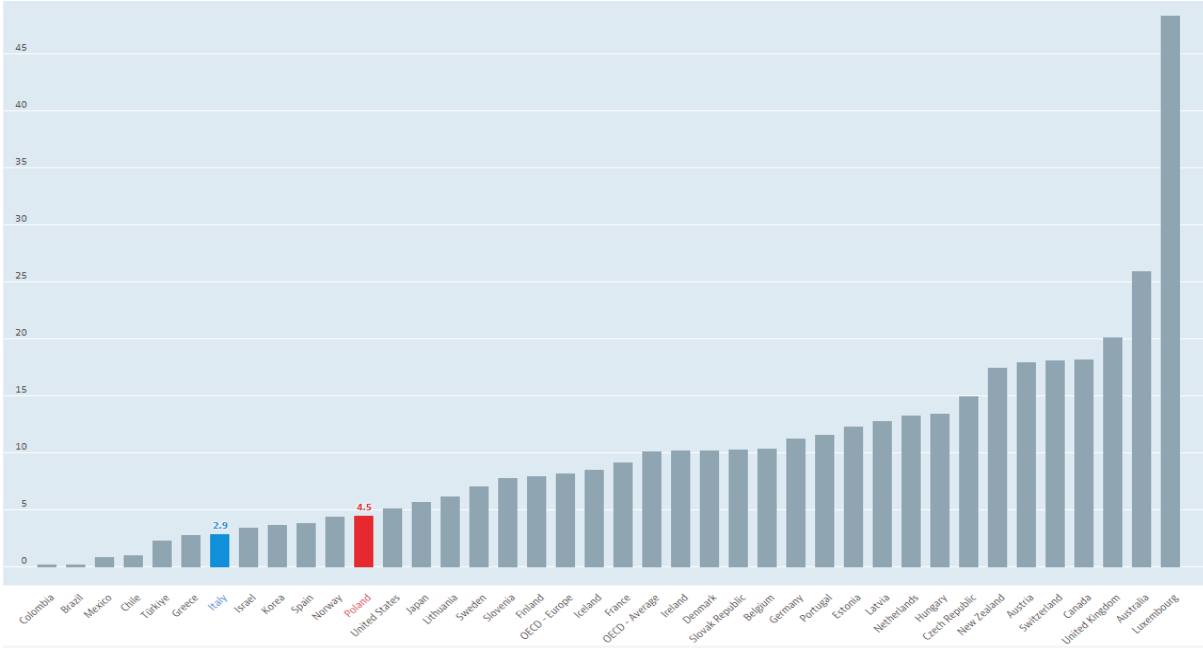


Source: OECD (2023), Population with tertiary education (indicator). doi: 10.1787/0b8f90e9-en (Accessed on 15 May 2023)

The chart above shows indicators describing the highest level of education within different age groups. The level of education of adults is often used to measure the human capital and skills in a given population as a source of labour force.

In the 25–34 age group, the percentage of people with higher education is 40.64% in Poland and 28.27% in Italy. Both countries are below the OECD average of 47.08%. In the age group of people between 55 and 64, enrolment ratios are significantly lower. In this respect, the average for OECD countries is 29.68%, while for Poland it amounts to 17.26% and for Italy – to 12.74%.

Graph 3 Student mobility indicator (2020)



Source: OECD (2023), "International student mobility" (indicator), https://doi.org/10.1787/4bcf6fc3-en (Accessed on 15 May 2023)

The chart above shows the number of international tertiary students enrolled as a proportion of all tertiary students enrolled in the destination (host) country. **International students are those who received their prior education in another country and are not residents of their current country of study.** It can be concluded that both Poland and Italy are below the OECD average in this regard. However, **Polish universities admit more international students than Italian, Spanish or Norwegian ones.** The highest percentage of foreign students was recorded in Luxembourg, Australia and the United Kingdom.

According to [UNESCO](#), the largest group of international students at **Italian universities** come from China (more than 12,000), India (3,750), Iran (2,965) and Turkey (2,149). Poles make up a group of less than 500 students.

In contrast, **Italians** themselves are most likely to choose **British, German and Austrian universities** as the place at which to continue their education. **Poles** also most often choose **the United Kingdom and Germany, but also the United States.**

Polish data from the POLon system show that the group of **Italian students** accounted for less than 0.5% of all foreigners registered at Polish universities in the 2021/22 academic year. Of this group, a total of 108 **Italians** studied either **nursing** or **medicine**. In contrast, academic teachers from **Italy** comprised a group of nearly 150 people, with the predominating areas being **the humanities** and **natural sciences**. These were mainly individuals with **doctoral** degrees.

Another significant measure describing international scientific cooperation are joint publications. In **OECD countries**, one in two of the publications that appeared in resources indexed in the SCOPUS database pertained to the area of Natural Science, one in three to Medical Science, and one in four to Engineering and Technologies. In terms of the number of publications by authors affiliated with institutions grouped by country of affiliation, the top three countries are: the US, the UK and Germany. **Italy is in the top ten countries, and Poland ranks in the second ten.**

Table 1 Comparison of the number of publications by Polish and Italian scientists (2017–2022²)

Publication year	Number of publications	
	Poland	Italy
2022	59,163	153,946
2021	63,167	158,662
2020	59,303	149,361
2019	56,073	133,954
2018	53,182	127,688
2017	50,310	123,199
Total:	341,198	846,810

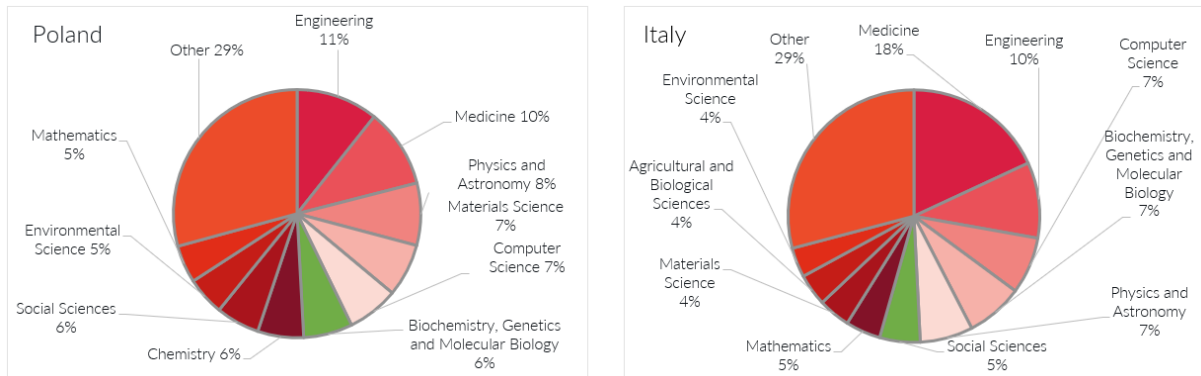
Source: SCOPUS-SciVal [accessed: 16 May 2023]

The pool of indexed publications for 2017–2022 authored by researchers affiliated with Italian institutions was 2.5 times larger than by those affiliated with Polish ones in the same period. However, it is interesting to observe the level of dynamics of change in the number of

² The data for 2022 is being updated on an ongoing basis, so it is expected that the second half of 2023 will see increases in both publications that appeared in 2022 and their citations.

publications within the two countries – in the case of Poland, there was an average increase of 6%, while in Italy an average increase was 7%.

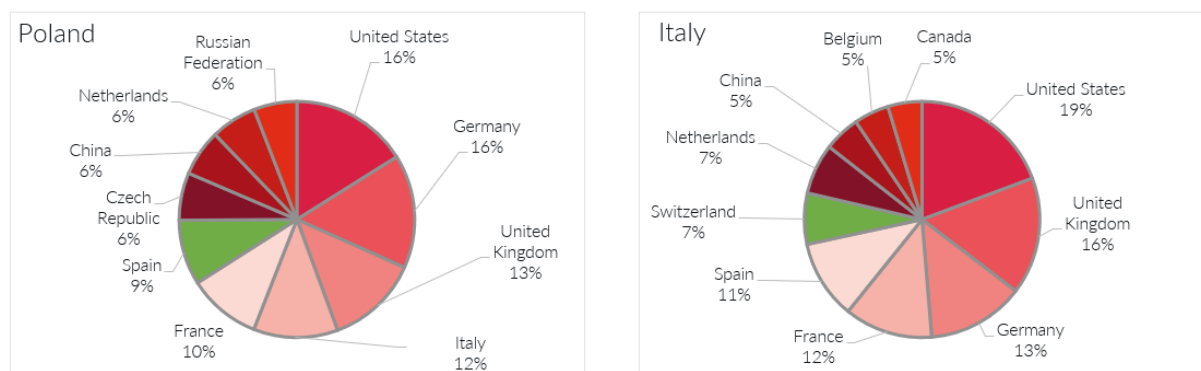
Chart 4 Publications of Polish and Italian scientists by area of knowledge (%) – comparison



Source: SCOPUS-SciVal [accessed: 16 May 2023]

Converging areas of publications forming the three largest thematic fields were observed. Scientists affiliated with Polish institutions most often published in the fields of: engineering; medicine; physics and astronomy. Italians, on the other hand, published mainly in the field of medicine, then engineering, and the third largest group comprised three thematic fields, namely: computer science; biochemistry, genetics and molecular biology; physics and astronomy.

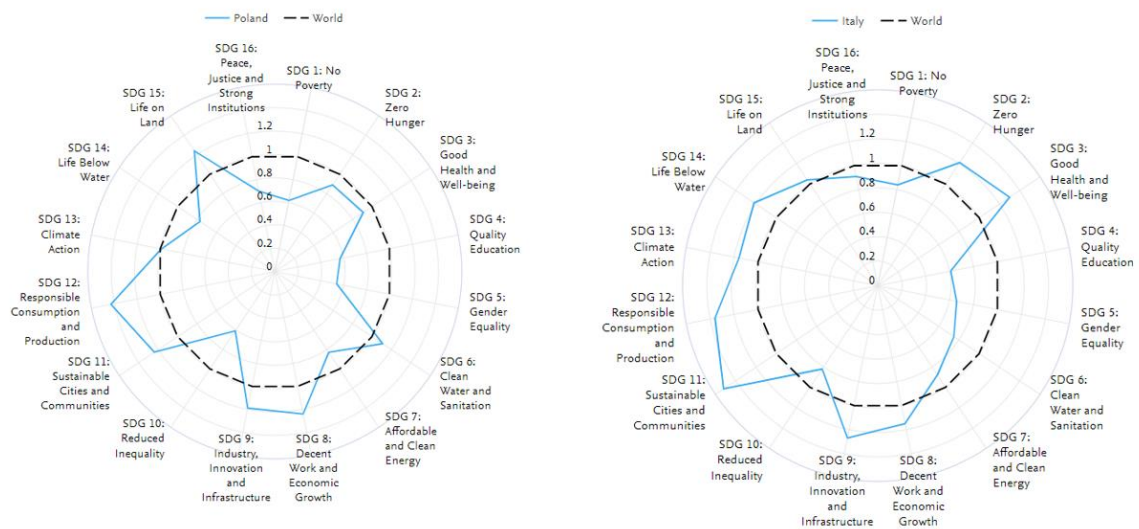
Chart 5 Countries of origin of co-authors of publications by Polish and Italian scientists – comparison (%)



Source: SCOPUS-SciVal [accessed: 16 May 2023]

In most cases, co-authors of both Polish and Italian researchers' publications are their colleagues from the US, the UK and Germany. The top ten countries of co-authors of Polish publications include Italy. In contrast, there are no Poles in a comparable co-authors ranking for Italy.

Chart 6 Sustainable Development Goals (SDGs)³. Relative Activity Index⁴ (RAI) – Poland-Italy comparison (2017–2021)



Source: SCOPUS-SciVal [accessed: 16 May 2023]

Another field that was used to compare Polish and Italian input into the development of global science are publications identified as those responding to one of the UN Sustainable Development Goals (hereafter: SDG). Globally, among publications assigned to SDG 1–16, those pertaining to health and well-being (SDG 3) prevail. The number of publications in the field of sustainable energy access (SDG 7) is eight times lower, although globally it is the second most published goal.

If we look at the share of scientists from both countries in a given field (the field being the SDG) in relation to the global share of publications in the same field (RAI), we see that the largest share of output in Poland concerns the goal focusing on solving problems of ensuring sustainable consumption and production (SDG 12). In Italy, on the other hand, researchers focus on an issue concerning the development of cities and communities (SDG 11).

³ SCOPUS provides indicator values for SDGs 1-16. SDG 17 is not monitored in the database.

⁴ The Relative Activity Index (RAI) is defined as the share of an individual's (here: a country's) publications in a given field compared to the global share of publications in the same field. A value of 1.0 indicates that a unit's research activity in a particular field corresponds exactly to global activity in that field; a value higher than 1.0 indicates greater emphasis; and a value lower than 1.0 suggests less emphasis. In the case of the SDGs, to get a percentage result, the RAI is calculated by looking at the total number of publications by an entity on a given SDG, divided by the total number of publications by the same entity. The same calculations are performed for each global SDG. An index for a unit is calculated by dividing the percentage of the unit by the global percentage.

2 POLISH-ITALIAN SCIENTIFIC COOPERATION (2017–2022)

This section will analyse cooperation in terms of publications of scientists affiliated with Polish and Italian scientific institutions. Only those publications were taken into account in which at least one author indicated that they belonged to Polish and Italian academic community at the same time.

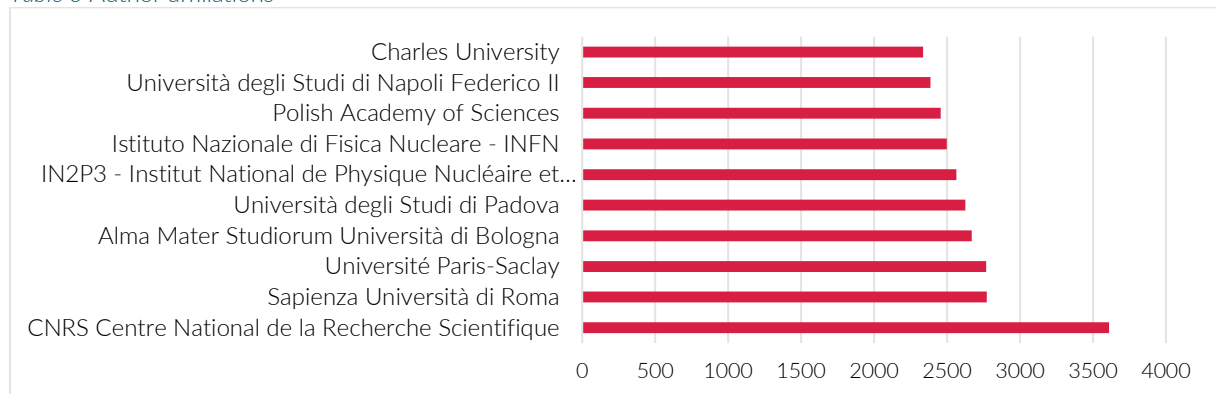
Table 2 Joint Polish-Italian publications in the SCOPUS database

Publication year	Number of publications
2022	4,042
2021	3,826
2020	3,468
2019	2,801
2018	2,796
2017	2,652
Total:	19,585

Source: SCOPUS-SciVal [accessed: 16 May 2023]

Publications under Polish-Italian cooperation in the analysed period accounted for less than 6% of all publications by Polish authors indexed in the SCOPUS database. A change in Polish-Italian publication cooperation during this period is evident, **as it increased by 52%** between 2017 and 2022.

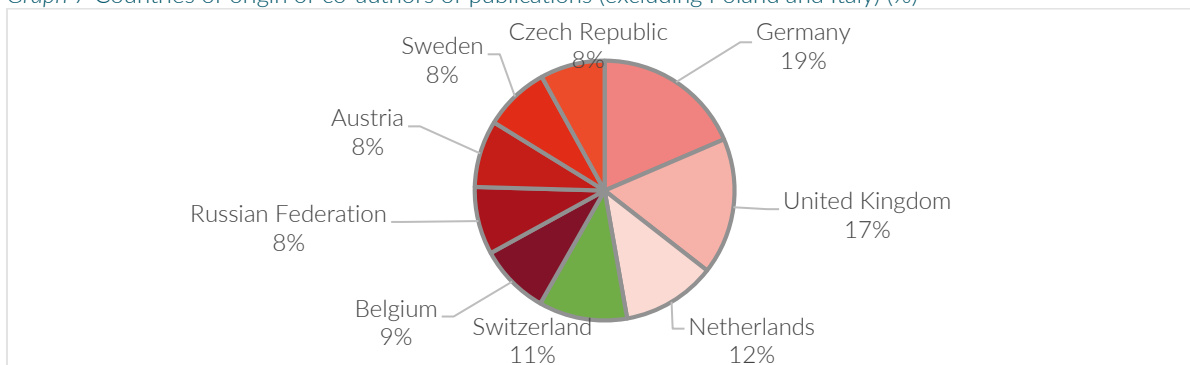
Table 3 Author affiliations



Source: SCOPUS-SciVal [accessed: 16 May 2023]

The ten most popular affiliations, in addition to Italian institutions, include French ones as well as one institution from Poland and one from the Czech Republic.

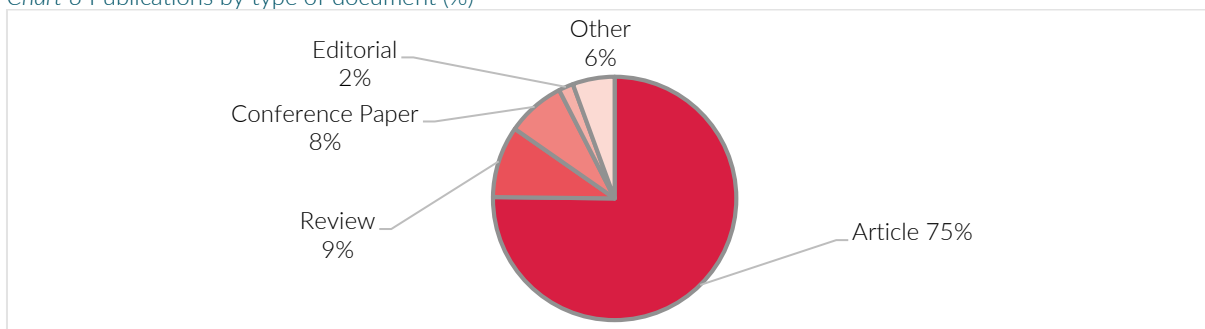
Graph 7 Countries of origin of co-authors of publications (excluding Poland and Italy) (%)



Source: SCOPUS-SciVal [accessed: 16 May 2023]

A far greater geographic diversity than in the case of the most productive institutions in Polish-Italian scientific cooperation is observed if we look at the countries of origin of the co-authors. Poland and Italy were intentionally not included in the graph above, as it is obvious that each of the nearly 20,000 publications must have included at least one Pole and one Italian at the same time. Thus, in addition to the countries that are the subject of this analysis, **the co-authors most often originated from German, British, Dutch and Swiss institutions.** It is worth noting that both **Italian and Polish students most often choose to study precisely in the UK and Germany.**

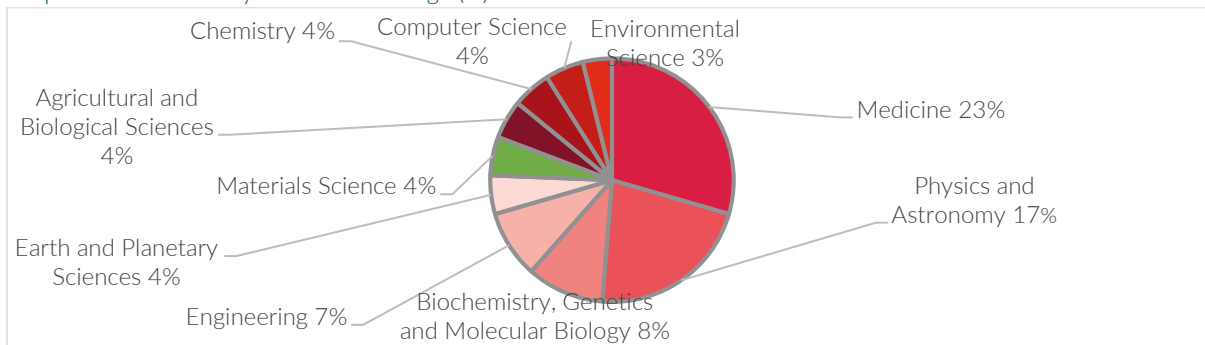
Chart 8 Publications by type of document (%)



Source: SCOPUS-SciVal [accessed: 22/05/2023]

In terms of the type of joint publications, **articles** in scientific journals prevail, accounting for $\frac{3}{4}$ of all joint Polish and Italian publications.

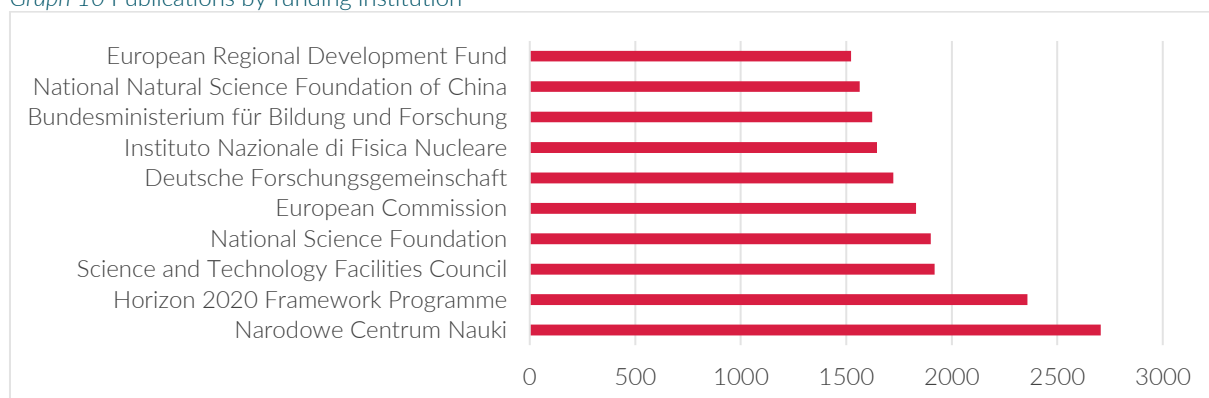
Graph 9 Publications by area of knowledge (%)



Source: SCOPUS-SciVal [accessed: 22/05/2023]

Scientists from Poland and Italy focus in their joint publications primarily on the research areas of **medicine** as well as **physics and astronomy.**

Graph 10 Publications by funding institution

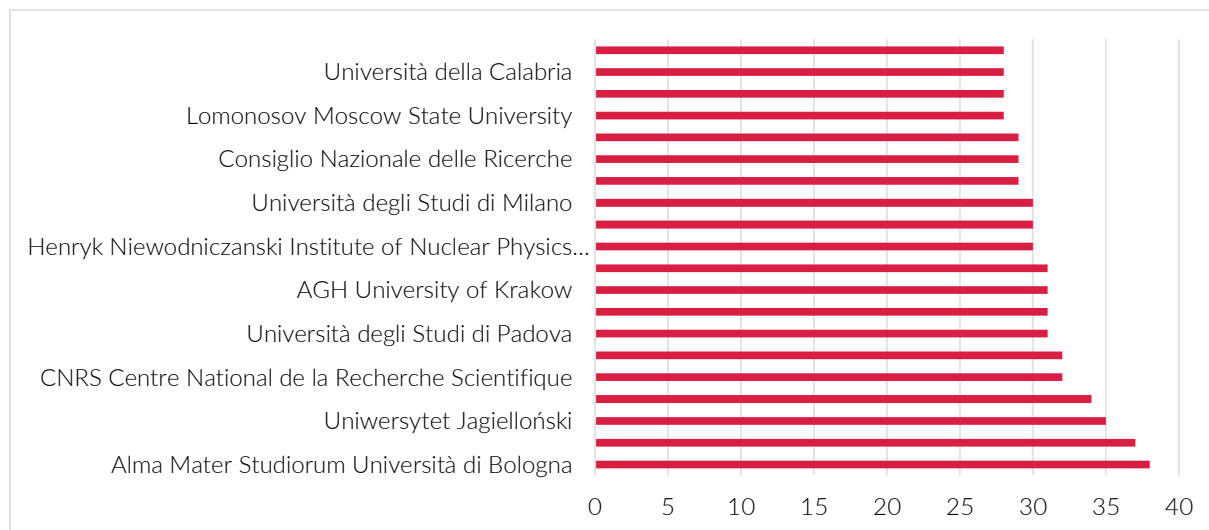


Source: SCOPUS-SciVal [accessed: 22/05/2023]

3 NAWA'S CONTRIBUTION TO POLISH-ITALIAN SCIENTIFIC COOPERATION

Among all publications written in Polish-Italian cooperation, as many as **190 were financed or co-financed by the Polish National Agency for Academic Exchange (NAWA)** in the period 2017–2022. The first publications (chronologically) are those from 2019 (NAWA was established in October 2017). However, the number of publications increased by $\frac{1}{4}$ between 2019 and 2022. The highest rate of change is observed when we compare the last two years, where the increase amounts to 50%.

Chart 11 Affiliations of authors of publications co-funded by NAWA

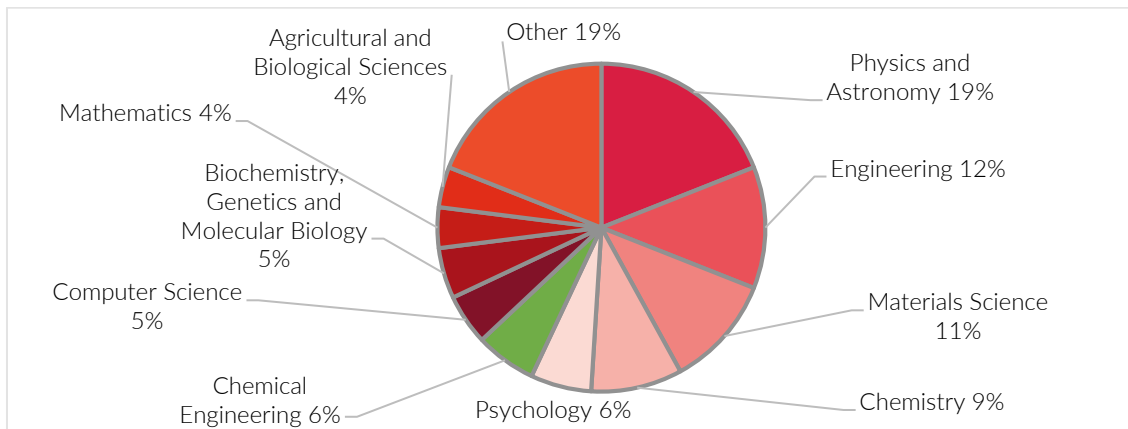


Source: SCOPUS-SciVal [accessed: 16 May 2023]

Leaders in Polish-Italian cooperation in which NAWA participates as a research funding institution are some of Europe's oldest universities, namely those in Bologna and Kraków. Among Polish universities ranked in the top ten are another Kraków-based university, namely AGH University of Science and Technology, and two institutes from that city: the Polish Academy of Sciences as a whole and the Henryk Niewodniczański Institute of Nuclear Physics of the Polish Academy of Sciences.

It should be mentioned that also three other **Polish universities cooperate** with Italian ones, namely the University of Warsaw, Warsaw University of Technology and the Medical University of Warsaw, which are not funded by NAWA in this regard.

Chart 12 Publications co-funded by NAWA by thematic field



Source: SCOPUS-SciVal [accessed: 22/05/2023]

As part of the scientific activities co-funded by NAWA, the **largest number of** publications were published in the **thematic fields** of: physics and astronomy; engineering; and materials science. Physics and astronomy, after medicine, is the thematic field with the most dynamic scientific cooperation between Poland and Italy (see Chart 9). **Underdeveloped** areas comprise such fields as economics, econometrics and finance; neuroscience; veterinary science; arts and humanities; pharmacology, toxicology and pharmaceuticals (*Other* in Figure 12).

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