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Scientific and Educational Cooperation between Russia and Germany. Results of 2019

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Abstract: The launch of the Russian-Germany interstate project (the Russian-German Year of Scientific and Educational Cooperation 2018-2020) sets new requirements for the agenda formation for interstate cooperation in the field of education and science. The "Russian-German Roadmap for Cooperation in Education, Science, Research and Innovation" (the Roadmap) defines new opportunities for expanding cooperation between states in the educational and research fields, as well as developing economical innovations. The key directions of the cooperation are: "Large research infrastructure", "Priorities", "Young talents", "Innovations, science and society". The expansion of bilateral cooperation on a wide range of topics, the development of large research infrastructures and joint research projects in particular, will be carried out in the areas that are priority for both countries. By means of the Roadmap, young scientists should be supported, and the academic mobility of researchers, students and postgraduate students should be increased. It is also planned to enhance the transfer of research results to the real economy, as well as increase the advanced innovative business involvement in the partnership. One of the tasks that the organizers of the year face, is to create conditions for the public presentation of specialized events, as well as the dissemination of cooperation practices in the academic environment. For this purpose, a special website to gather the information from participants and organizers of events implemented in both countries, was launched (https://russia-germany-cooperation.ru). The inclusion of innovative business in the year's action field will create conditions for the formation of joint teams, both in the academic and professional environment, aimed at tackling new problems of states economies' innovative development.

Keywords: Russia, Germany, Russian-German Year of Scientific and Educational Cooperation 2018–2020, science, education, innovations, universities, scientific projects, educational programs, scientists, students.

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Introduction

Russia and Germany have a rich tradition of cooperation in higher education and science, which forms Russian-German relations. In 2000, Russia and Germany declared a new stage of relations, based on a policy of strategic partnership. Many projects, implemented under this policy, have become historical and have made a significant contribution to the development of relations between countries. As an example, one can name such projects as the German-Russian public forum "Petersburg dialogue", a global partnership program that was launched in 2002 by the G8 initiative. Considering Germany as the leader of the European Union, Russia has always formed a special agenda for the development of political, economic and intercultural dialogue with Germany.

It should be noted that scientists from different subject areas pay great attention to the study of aspects of cooperation between Russia and Germany, highlighting not only the project facts and event statistics, but also the results obtained on the basis of a scientific approach and the application of scientific knowledge methods in

this area [1-7]. As a result, one can observe a diverse cooperation between the two sides, each playing its unique role in the intercultural dialogue [8].

1. Russian-German Year of Scientific and Educational Partnership 2018-2020

In 2018, relations between Russia and Germany moved to the next level, when the Russian-German Year of Scientific and Educational Partnership 2018-2020 (the Cross-Year) was opened on December 6 by a joint statement of the Foreign Minister of Russia Sergey Lavrov and the German Minister of Foreign Affairs Heiko Maas.

The aim of the Cross-Year is to attract more attention to bilateral scientific relations and give them a new impetus, to stimulate further development of cooperation and interaction between universities and representatives of the scientific community, making it more transparent, and to promote international exchange of students, researchers and teaching staff.

In December 2018, the Ministers of Education and Science of Russia and Germany signed the "Russian-German Roadmap for Cooperation in Education, Science, Research and Innovation", the main task of which was to create new opportunities for expanding cooperation between the countries in the educational and research fields, as well as to develop economical innovation [9].

The bilateral Roadmap is designed for 10 years and sets new criteria for German-Russian cooperation in the field of education and research. The Roadmap encompasses 4 directions: "Large research infrastructure", "Priorities", "Young talents", "Innovations, science and society".

This comprehensive document is aimed at expanding bilateral cooperation on a wide range of topics, in particular, in the development of large research infrastructures, joint research projects in in the areas that are priority for both countries. By means of the Roadmap, young scientists should be supported, and the academic mobility of researchers, students and postgraduate students should be increased. It is also planned to enhance the transfer of research results to the real economy, as well as increase the advanced innovative business involvement in the partnership.

2. Role of the academic community in scientific and educational partnership of Russia and Germany. Institutions of self-government

Undoubtedly, the academic community, represented by leading universities and research centers, plays the key role in implementing the roadmap. They have historical experience and big potential in implementing joint projects and establishing international research teams [10-13]. At the same time, the scale and significance of the implemented scientific and educational projects have determined the formation of large funds which coordinate the development of educational and scientific cooperation.

The project cooperation is based on a network of agreements and cooperation projects between key Russian and German centers of science and education, among which the following can be distinguished [13-19]:

1. Scientific cooperation between the German Research Foundation (DFG), the Russian Academy of Sciences (RAS) and the Russian

Foundation for Basic Research (RFBR). DFG, being the main organization of scientific self-government in Germany, provides comprehensive support for research in higher education and has a significant historical experience of interaction with the Russian academic community. For instance, in 2002, more than 500 scientists from Russia and Germany took part in exchange programs with the financial support of the German research community. To a certain extent, DFG demonstrates new mechanisms of public-governmental management of research funding, establishing the practice of scientific self-management, as well as R&D organizational and process management [13, 14].

2. Cooperation of Russian science institutions with the Max Planck Institute for Astrophysics (MPG). MPG is a non-commercial research organization. It includes about 80 research organizations that mainly do fundamental research, and also implement projects aimed at establishing "centers of excellence" [13, 15].

3. Collaboration with the Fraunhofer Society in support of applied research. The Fraunhofer Society is the German leading organization in the field of applied research. Much of this research is innovative. The society unites almost 50 research institutions. The main research areas of the Fraunhofer Society are: materials, production, information, communication, testing, chemical, energy technologies, as well as microelectronics [13, 16].

4. Cooperation with institutions of the Helmholtz Association of German Research Centers (HGF). HGF unites 16 German research institutions. Its activities are mainly funded by the federal and land budgets. The key research directions are: natural, technical, and biomedical sciences. The key areas are: energy, fundamental physics, transport, aviation and space, IT, Earth sciences, biotechnology and medicine, as well as various environmental studies and technologies [13, 17].

5. Cooperation with the German Academic Exchange Service (DAAD). Founded in 1925, DAAD is an association of higher education institutions and students in Germany. The main aim of DAAD is to promote international academic exchange. As a National agency and advisory body, it is included in European ERASMUS/TEMPUS programs. All in all, DAAD implements over 100 different programs, providing support to students and university graduates, teaching staff and scientists from Germany, as well as from several other countries [13, 18].

6. Cooperation with the Alexander von Humboldt Foundation. It was established in 1860, and for a long time was engaged in organizing international trips of German scientists, and then providing scholarships to foreign scientists, including those from Russia. In addition, the Foundation awards world-renown international researchers with grants to support their scientific work directly in Germany [13, 19].

A comparable network of Russian organizations is also quite representative:

1. Rossotrudnichestvo, the Federal Agency for the Commonwealth of Independent States, Compatriots Living Abroad and International Humanitarian Cooperation, founded in 1925. Thanks to a wide network of Russian centers, Rossotrudnichestvo promotes cultural cooperation and the

spread of the Russian language. At the same time, Rossotrudnichestvo is the Russian contact point for independent national friendship societies in these countries.

At the same time, the Agency is represented by 74 Russian centers in Europe, America, Asia and Africa. Russian House of Science and Culture in Berlin is among them.

2. The Russian Science Foundation (RSF) was established on November 2, 2013. RSF promotes fundamental research projects within the concept of the highest achievements in certain areas. RSF is one of the most important institutions promoting development in Russia.

3. The Russian Foundation for Basic Research (RFBR) was established in 1992. The Foundation promotes the development of specific targeted research projects in all areas of fundamental research. Since 2016, RFBR has been promoting projects in the humanities and social sciences.

4. The Foundation for Assistance to Small Innovative Enterprises (FASIE), established in 1994. The main aims are:

- stimulating the development of small innovative enterprises in science and technologies;

- financial and administrative support for small innovative enterprises in research and development projects;

- creation and development of infrastructure to support small innovative enterprises in science and technologies.

University cooperation between Russia and Germany has a long tradition. At the same time, it is constantly expanding due to the active participation of teaching staff, students, managers and university employees. In both countries, university partnerships are seen as a key strategic element in developing scientific cooperation. It is also an effective way to enhance their international attractiveness for learning and research. Thanks to universities cooperation, joint training of specialists also makes a significant contribution to the formation of sustainable partnerships in all spheres of society.

Currently, about 980 joint university partnerships are represented on the Internet platform “International cooperation” of the German Rectors' Conference (HRK). 203 German universities, 233 Russian universities and 33 organizations with other status participate in them. Thus, Russia is at the 9th place in the number of partnerships [20].

The most important areas of international cooperation between Russian and German universities include student and academic mobility, international cooperation in teaching and research, as well as international cooperation in institutional development.

3. Cooperation in the field of the cutting-edge research

Higher education institutions and research organizations in Russia and Germany cooperate in various research fields, achieving international recognition of the scientific community. Cutting-edge research is considered the key to innovation and development in both countries. In Russia, the development of advanced research is part of the

Strategy for Research and Technology Development till 2020, as well as the National Technology Initiative. The Agreement on Scientific and Technical Cooperation (STC) includes establishing partnerships between universities, non-university research institutions and scientific organizations, the intensification of bilateral cooperation in the field of innovation-oriented research between Russian and German enterprises, cooperation in the field of professional education, young scientists exchange, and the promotion of joint research and innovation structures.

Russia and Germany support large-scale research infrastructure, for instance, through international non-governmental organizations such as the Joint Institute for Nuclear Research (JINR) and the European Organization for Nuclear Research (CERN). Cooperation is also being developed within the framework of the European X-Ray Free-Electron Laser Facility (European XFEL) and the Facility for Antiproton and Ion Research (FAIR) projects implemented in Germany. In the near future, cooperation will begin in the framework of the Nuclotron-based Ion Collider Facility and the International Center for Neutron Research based on a high-flow PIK reactor, located on the territory of Russia.

4. Partnership practice of 2019

From the Russian side, the National University of Science and Technology "MISIS" is the operator of the Russian-German Year of Scientific and Educational Cooperation. One of the tasks that the operators of the year face, is to create conditions for the public presentation of specialized events, as well as the dissemination of cooperation practices in the academic environment.

For this purpose, a special website to gather the information from participants and organizers of events implemented in both countries was launched (https://russia-germany-cooperation.ru). The examples of such significant events are:

4.1 The 35th anniversary of cooperation between Peter the Great St. Petersburg Polytechnic University and the Leibniz University Hannover.

In 2019, the Leibniz University Hannover and Peter the Great St. Petersburg Polytechnic University celebrated the 35th anniversary of cooperation and took part in two joint conferences "Cyber-physical systems and management" and "High-speed turbomachines and electric drives", as well as a seminar "Digitalisierung der Hochschulen". Currently, two joint master's programs and a trilateral master's program with the Lappeenranta-Lahti University of Technology LUT (Finland), research projects, and exchange of students, teachers, and researchers are being actively developed.

4.2. The 9th Russian-German Young Scientist Week (September 23-27, 2019, Moscow). Organizers: Lomonosov Moscow State University, DWIH, DFG, DAAD.

The main goal of this event is to promote the network expansion and strengthen the cooperation of young scientists. The event was attended by postgraduate students, young scientists, and professors, invited to present and discuss their research projects in the field of quantum science.

4.3. German-Russian musical dialogue (April 2019, the State Academic Chapel of St. Petersburg, Moika river embankment, 20). Organizer: Choir of the St. Petersburg Rimsky-Korsakov State Conservatory, Europe-Choir of Berlin, Choir of the Freiberg Higher School of Music, symphony orchestra "Youth Ensemble of Berlin".

4.4. Youth concert project "German-Russian Musical Dialogue", which was successfully launched on January 13, 2019 in the Berliner Philharmonie. The second concert of the project was held on the stage of the State Academic Chapel of St. Petersburg, famous for the traditions of the Russian composers. More than 160 young musicians from four Russian and German ensembles played music by Tchaikovsky and Stravinsky, Brahms and Schumann.

4.5. Cooperation in the field of artificial intelligence (May 28, 2019, Lomonosov Moscow State University). Organizers: Ministry of Culture and Science of North Rhine-Westphalia, the German House of Science and Innovation (DWIH) and Lomonosov Moscow State University.

The talk was performed in the National Center for Digital Economy of Lomonosov Moscow State University. The event was organized by the representative office of the Ministry of Culture and Science of North Rhine-Westphalia (NRW), the German House of Science and Innovation (DWIH) and the Center for Digital Economy of Lomonosov Moscow state University. The talk was opened by academician Igor Osipov (Lomonosov Moscow State University), Ekaterina Karpushenkova (NRW) and Mikhail Rusakov (DWIH). After the key reports of Alexander Panov from the Moscow Institute of Physics and Technology and Thomas Gris from RWTH Aachen University, a scientific talk was held. Leading scientists from RWTH Aachen University (German side) and from Lomonosov Moscow State University, the Moscow Institute of Physics and Technology, Bauman Moscow State Technical University and the Russian Academy of Sciences presented their approaches to research and development in the field of artificial intelligence and discussed prospects for cooperation.

Russian and German scientists agreed that the development of artificial intelligence technologies requires an interdisciplinary international approach. Possible areas of cooperation include joint development of artificial intelligence technologies for medicine, production automation, phenomena and processes forecasting, as well as for other artificial intelligence applications.

4.6. Russian-German Forum of University Science (December 2, 2019, Moscow, the National University of Science and Technology "MISIS"). Organizers: the Ministry of Foreign Affairs of the Russian Federation, the Federal Foreign Office of Germany, the Ministry of Science and Education of the Russian Federation, the German Academic Exchange Service (DAAD), German House of Science and Innovations in Moscow, the National University of Science and Technology "MISIS". The forum united representatives of Russian and German university and academic communities. The scientific and educational sector of Germany was represented by both a large delegation of young researchers and world-renown scientists. Among the Russian participants were rectors and representatives of

the innovation sector, the Russian Academy of Sciences, the Kurchatov Institute, and the Joint Institute for Nuclear Research. The forum was attended by scientists, young researchers and experts from both Moscow and regional universities.

At the forum, Russian and German experts discussed the relationship between university and academic science, ways to support international scientific and technical cooperation, and the internationalization of the university research sector. A special session of the forum was devoted to discussing the further implementation of the "Russian-German Roadmap for Cooperation in Education, Science, Research and Innovation".

Conclusion

The development of relations between Russia and Germany is determined by the historical experience of interaction in the field of education and science, which contributes to the intercultural dialogue between the countries. This interstate project – the Russian-German Year of Scientific and Educational Cooperation 2018–2020 – will strengthen cooperation between Russian and German institutes that implement and manage scientific research, as well as between research organizations and universities.

The inclusion of innovative business in the year's action field will create conditions for the formation of joint teams, both in the academic and professional environment, aimed at tackling new problems of states economies' innovative development.

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