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A new stage of Russian-European relations through the lens of science, technology and innovation cooperation

Pavel Kanevskiy

EASI-Hurford Next Generation Fellow

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Introduction

Policy makers and the expert community are predominantly negative on the nature of Russian-European relations today, despite the obvious progress reached in the course of recent decades. The Ukraine crisis unleashed hawkish policies on both sides, reducing the space for rational thinking and predictability.

Ukraine will remain a litmus test for policy makers and public opinion, but if further escalation is avoided and the Minsk II agreements show signs of progress attitudes will likely shift in a search of compromises. Although it may seem a goal too far at the moment, policy makers and expert community should build scenarios which will help to build a series of compromises into a longer term consensus.

In fact, the basic grounds for rapport never disappeared – the EU and Russia are still major trade partners and their economies are highly interdependent. Furthermore, Russia faces unprecedented challenges to its economic stability, caused by an undiversified economy, and for this reason Moscow tries to preserve the currently unstable status-quo in its shattered relations with Europe. At the same time, it is in the EU's core interests to have an economically and institutionally stable neighbor, which can be viewed not only as an energy supplier and exports market, but also as part of the bigger infrastructure and source of innovations.

Having all these vectors in mind, a question should be raised: on what grounds can Russia and Europe continue their search for principles of mutually beneficial cooperation? This paper seeks to explore the potential of science, technology and innovation (STI) relations, which is capable of promoting closer ties and peaceful discourse between the two sides. Interviews with 15 experts from Russia, the European Union and the United States have formed the empirical basis of the research.

Loss of a common vision

The current stage of Russian-European relations is a reflection of not only the rising misunderstanding and mistrust between decision makers in Moscow and in Euro-Atlantic capitals, but also of the continuing inability to find common ground for long-term strategic cooperation. A lasting alliance between the Soviet Union and Western Europe, and later between Russia and the European Union, has constantly resurfaced in the minds and speeches of political leaders on both sides: from Charles de Gaulle's statement on "Europe from the Atlantic to the Urals" in 1962, which was deeply misinterpreted by Nikita Khruschev and the Politburo; to Willy Brandt's momentous *Ostpolitik*, proclaimed in 1969; Mikhail Gorbachev's notion of a "a common European home" in 1987; and, finally, Vladimir Putin's proposal to build an "economic community stretching from Lisbon to Vladivostok" in 2010.

Behind these aspirations for closer *détente* between the USSR/Russia and Europe has always been a broad belief that common security and stability in the whole Euro-Atlantic and Eurasian space are impossible without a convergence between the formerly rival nations. But reaching the ultimate goal of integrating the USSR/Russia and Europe appeared to be a thorny path, because rational economic relations appeared to be insufficient to fill the permanent gap between various visions of regional development and the institutional incompatibilities.

At the same time, the very structure of interdependence appeared to have many pitfalls. Despite the fact that throughout recent decades the volume of trade was booming, the structure of trade remained unequal: EU exports to Russia were dominated by machinery, transport equipment and chemicals, while Russia basically exported oil and gas. When Vladimir Putin came to power, which coincided with a rapid increase in commodity prices, an energy dialogue quickly became the center of a positive interdependence agenda between Russia and the EU. The EU repeatedly stressed common interests in the energy sector, which corresponded to the Russian strategy of building an "energy superpower", an idea popular among the ruling elites. At the same time, according to the EU representatives, there was no sign that Russia would use energy as a political instrument against Europe. The dialogue was considered to have brought positive outcomes in terms

of increasing European investment in the Russian market. Russia was seen as a reliable partner and energy policy was predictable.

Things started to change after disputes over gas transit through Ukraine began in 2005 and after Moscow demonstrated its unwillingness to sign the Energy Charter Treaty, considered by the EU as a step towards a more coordinated energy policy, but met cautiously by many politicians and energy corporations in Russia. The same can be said of the Third Energy Package, which was adopted by the EU in 2009 and which was clearly perceived by Russia as an unfriendly move both towards Russia's energy policy and the whole EU-Russia energy dialogue. Nevertheless, despite fluctuations in the energy interdependence, Russian oil and gas exports to Europe were constantly rising, serving as an engine for gradually growing trade volumes. Revenues from energy exports were used by Russia not only to increase its socially oriented budget spending, but also to import more equipment and goods from the European Union.

There was an obvious contradiction in the new reality of Russian-European relations: while rational economic interests were achieving their goals, discourse on politics and long-term cooperation was becoming less understandable for both sides. One of the principal cores of this growing misunderstanding was that the EU policy makers were slowly changing their attitude towards Russia, arguing that integration should mean not only common economic interests, but also a broader range of shared fundamentals such as rule of law and democratic principles. This vision was based on the assumption that by promoting political, civil and economic reforms Russia would open its market through the creation of a positive business climate and predictable rules. A lack of transparency and the slow pace of change, together with Russia's growing regional ambitions, brought changes to the Western mentality. The integration discourse that had dominated Russian-European and Russian-Western relations since the collapse of the Soviet Union was called into question by the paradigm of negative interdependence. This idea is best summarized by Stuart Gottlieb and Eric Lorber, who wrote that "although economic interdependence may keep states from coming to blows, it may also limit their wherewithal to pressure their partners"[1].

Russian elites became more skeptical towards the idea of closer integration, willing to have an equal partnership rather than becoming part of any European led initiative such as the Eastern Partnership. The situation grew more complicated when the Eurasian Economic Union was established, making the geopolitical and geoeconomic picture more complex, because civil, business and political elites across the post-Soviet space found themselves in the uncomfortable position of being forced to choose between the two models of development, between East and West.

It became clear, perhaps after the EU-Russia summit in 2012, which was designed to foster "positive interdependence", that both sides had lost a common vision and that political mistrust had reached critical levels. The Ukraine crisis revealed the incompatibility of a Russian strategy still dominated by energy policies and an intensified Western willingness to promote common democratic values.

The conclusion may sound simple, but it reflects mindsets in both Russia and the West: if EU-Russia relations continue to be dominated by energy policies and security issues on which there are widely diverging views, a way back to "business as usual" is unlikely to appear. Breaking the deadlock is possible only if new solutions and discourses are found that could have the potential to diversify EU-Russia relations and lead them away from one-dimensional interdependence.

Potential of science, technology and innovation cooperation

The general interdependence discourses framed by such initiatives as the Partnership and Cooperation Agreement (PCA) (1994; entered into force in 1997) and the Four Common Spaces for Economy, Freedom and Justice, Security, Research and Education (FCS) (2003) were unequal in how they contributed to a constructive agenda. Dialogues such as energy, security and the rule of law, despite their huge importance, have been constantly disrupted by geopolitical and geoeconomic disputes.

Still, modernisation, technology and innovation never left the agenda and remained an essential element of Russian strategy, not to mention the European Union, where it successfully became part of the development models. Throughout recent decades, Russian policy makers

[1] Gottlieb S., Lorber E. The Dark Side of Interdependence // Foreign Affairs. August 5, 2014.

considered modernisation as the only tool to catch up with the West and not only to remain a great power but also to become a contemporary, competitive state. Even though official and academic debate mostly focused on modernisation inside Russia, it cannot be viewed separately from Russia's relations with other countries.

Historically, Europe and Western Europe in particular have been the most important source for modernisation in Russia. This linkage existed both in the tsarist era and during the Soviet regime, but became even more evident after the collapse of the USSR. Various modernisation partnerships were established on a political level in the last two decades. This tendency reached its high point when Dmitry Medvedev took presidential office and the Partnership for Modernisation (P4M) was established in 2010. Medvedev considered modernisation a primary challenge for Russia's social, economic and political development: as a way to build a diversified, competitive market and reduce hydrocarbon export dependency. His vision of a Greater Europe included intense economic linkages based on agreed rules in the energy and high-tech spheres.

At the same time, even though Russian-European discourse on modernisation was supported by public policies, its meaning was never clear for both sides. Many scholars in Russia and Europe stated that modernisation didn't achieve its goals and became a word devoid of meaning. The major vulnerability of P4M was that it was a political project facilitated by top decision makers and when the administration changed in the Kremlin and international tensions reached critical levels it was abandoned. Another problem was that, despite Western thinking that modernisation can lead to multifaceted political, economic and societal development, many politicians in Moscow looked at P4M solely through the lens of economic interests, as a tool of getting more investment and technology from Europe.

Hence, this paper argues that modernisation should be viewed not only through the lens of grand political initiatives, but through more complex and multidimensional structure of relations in the spheres of science, technology and innovation (STI), which constitute the core of bigger frameworks such as modernisation. STI is a part of the development strategy of every contemporary nation, and benefits immensely from integration and globalization. The biggest challenge for Russian-European STI cooperation is that it continues to be important for those actors who participate in these relations, but it lacks public visibility and an explanation for policy makers of why international cooperation matters for STI, why STI matters for the long-term basis of Russia's relations with Europe and how STI can contribute to discourse on positive interdependence.

Experts have outlined several important points that describe the potential of STI for Russian-European relations:

1. It is the only layer of cooperation between Russia and Europe that has a fully functioning legal framework. Even though PCA, which expired in 2007, is automatically renewed every year, it is an outdated document which is hardly in rhythm with the changing political and economic environment. A replacement agreement has been discussed since 2008, but negotiations are stuck, victims of the geopolitical turmoil. STI relations, in their turn, are framed by the Agreement on Cooperation in Science and Technology (ACST), first signed in 2000 and later renewed in 2003 and 2009. Unlike P4M, which was a broad political initiative and a roadmap, ACST is an institutionalized agreement that was duly ratified by the relevant Parliaments.
2. Through STI it is possible to bring large segments of civil society together. By establishing joint projects, participation in working groups, conferences etc., people-to-people contacts are evolving. STI is probably the best example of the benefits of engaging the Russian and European civil and professional communities together. For more than a decade Russians have been the most prominent non-EU participants in EU funded projects. At the same time, they have also been involved actively in bilateral STI contacts with individual European countries, especially Germany, France, Italy, Finland and the United Kingdom.
3. Compared to other spheres of interaction, STI remains relatively immune to political tensions. After the Ukraine crisis and the imposition of sanctions, both the European Union and Russia have continued STI cooperation on all levels – from universities and research centers to ministries. Significantly, the bilateral EU-Russia Year of Science 2014, which had been launched with a grand ceremony in Moscow in November 2013, continued to be implemented despite the downturn in overall relations and was concluded as foreseen with a dedicated scientific conference in Brussels in November 2014. The capital of STI cooperation is professional trust and this has not

been diminished by grand politics. European Research Commissioner Carlos Moedas, in his speech in Washington in June 2015, said that "the EU has imposed many sanctions on Russia, but one area where we have endeavoured to maintain our strong connection is in the area of research and innovation"[2]. At the same time, the Russian Ministry of Education and Science and other government organizations are keen to preserve contacts and continue joint projects, despite the rising mistrust between the sides.

4. STI does not recognize borders. It would be hard to imagine STI cooperation in the XXIst century without the intense movement of people and technologies. The more easily this movement is organized for participants, the more benefits they will get – this logic stands behind all the aspirations for, inter alia, closer contacts between representatives of the science and innovation sectors, access to local and supranational STI institutions, and visa liberalization.

5. STI is a long-term priority with a direct connection to development strategies. Such initiatives as the Common Space for Research and Education in 2003, P4M, "Strategy 2020" (adopted in 2011), and the EU Framework Programmes for Research and Technological Development have one general idea behind them: without decent levels of science and innovation development it is impossible to build competitive economies in a globalized world. No country, however advanced its STI sectors may be, can be self-sufficient enough to meet all the scientific and market demands without being part of the global community, without sharing and exchanging scientific ideas, technologies, innovative potential, and management skills.

These positive aspects are hard to argue with, but when it comes to reality, the picture appears to be more complicated. Even though STI is a success story in Russian-European relations, its potential is still largely unused. The biggest challenge for Russian-European STI cooperation is structural. Although people-to-people contacts flourish, academic, economic and normative structures are still very different, and thus it is difficult to achieve the levels of cooperation which could have been achieved if both sides were more open to one another. But if opportunities of further cooperation and integration in STI are missed this vector may lose its capacity both in terms of integration and science diplomacy.

In this sense, even though it's been quarter century since the collapse of the Soviet Union, Soviet models of behavior and management in STI (just like in many other areas) still have great influence. That is why STI relations between Russia and Europe should be considered part of a bigger historical vector, one that started not 25, but more than 50 years ago, when the Soviet Union and Europe started to look for ways of rapprochement in STI. This approach shouldn't be oversimplified; it is obvious that cooperation went through systemic transformations, but many hidden factors are inherited from the previous era.

Understanding the heritage of Russian-European STI relations

In one of his early books Loren Graham found that by the 1920s the Soviet Union was supporting science and technology more than any country in the West, despite the fact that historically, Russia modernized later than leading industrial nations like the United Kingdom, France, Germany and the United States[3]. The early Soviet model proved to be successful in this sector because it combined a vertical, politically dependent and highly subordinate academic system, the Communist Party's ambitious policy to turn the Soviet Union into the leading scientific force in the world, and the unique human capital that was a part of the pre-revolutionary heritage. The combination of these factors brought results, making the Soviet model a historical example of STI development that was later exported to other socialist countries. It included strong research institutes under the control of the Academy of Sciences, the establishment of research and development (R&D) institutes in industrial sectors, and an immense system of closed military R&D for Cold War purposes.

The Soviet STI system was never isolated. In reality it had two uneven vectors of international cooperation that were meant to integrate it into the global scientific and technological space: socialist and Western European. The first vector was part of a military, political and economic

[2] Carlos Moedas' speech at the European Institute in Washington. 1 June 2015. European Commission.
[3] Graham L. The Soviet Academy of Sciences and the Communist Party, 1927—1932. Princeton University Press, 1967. P. 209.

socialist alliance maintained by bilateral and supranational agreements. The major supranational framework was the "Council for Mutual Economic Assistance" (COMECON), with headquarters in Moscow, which coordinated economic and STI relations among socialist regimes throughout the world.

STI cooperation was considered a priority factor in the economic and political integration of the Eastern Bloc and later of the wider socialist community. It started to gain momentum by the 1960s and 1970s in the form of multilateral agreements such as "Interkosmos" and economic-industrial associations like "Interelektro", "Interatomenergo", "Interatominstrument", etc. But while this cooperation was intensified by interaction among COMECON member states, at the same time, due to political, ideological and economic differences, socialist countries were slowly drifting away from the OECD nations, which made all of COMECON more closed and isolated from global STI and R&D standards.

Policy makers inside the Eastern Bloc believed that STI cooperation, facilitated through COMECON, multilateral agreements and structural ties, created a unique system that helped these countries to advance their levels of scientific standards and industrial development. In many ways the USSR and socialist states indeed managed to create strong scientific schools (in physics, mathematics, chemistry, and biology), but they lagged behind the West tremendously when it came to applied technologies (electronics, computing, and miniaturization). The last stage of the Cold War in the 1980s, when military high-tech was more important than ever before, clearly demonstrated that the Soviet Union was not ready to cope with the new realities of the arms race. The central reason for the imbalance between scientific achievements and underdeveloped industry is still relevant for understanding the state of STI in Russia – there was no efficient mechanism for the Soviet Union to transfer scientific breakthroughs into technologies that might have had an impact on industry.

Although Soviet STI models were deeply interconnected, the second vector of STI cooperation, with the Western Europe, had been evolving alongside the socialist vector since the 1950s. The Soviet Union and Western European states started in that decade to conclude scientific exchange agreements which laid the groundwork for comprehensive STI cooperation agreements in the 1960s and 1970s[4]. There were many reasons why the Soviet Union and Western Europe started a process of scientific and technological rapprochement, including ideological, political and rational-economic factors. For the West, STI was a good example of a new approach towards the Eastern Bloc, as it demonstrated that both sides could conduct rational dialogues and find mutual interests. For the Soviet Union, it was a possibility to demonstrate its achievements in science and industry and thus the attractiveness of the Soviet model of development. It is best described in Prime Minister Alexei Kosygin's speech to the Confederation of British Industry in 1967, in which he called for the United Kingdom and the USSR to undertake joint planning[5]. This, in his opinion, would allow the British to avoid chaotic and unpredictable fluctuations in the market economy and interlock the economies. Although these ideas were never implemented, it was a bold attempt to transfer the Soviet STI and economic models to the West.

Throughout the late 1960s and 1970s Alexei Kosygin and General Secretary Leonid Brezhnev were proponents of further structural interconnections between Western and Eastern Europe, willing to move from classic trade relations to more complex industrial and technological interdependencies. Brezhnev believed that such interdependencies would create a new balance between the nations in Europe and make further confrontation meaningless. For this reason, the primary goal for Soviet diplomacy in Western Europe was the conclusion of long-term, comprehensive agreements directed towards the establishment of systemic contacts between the industrial and scientific communities. During the late 1960s and 1970s, such agreements were concluded with France, Italy, West Germany, Austria, Finland, Britain and other countries – some of them still partly in force. By the end of Brezhnev's era the Soviet Union had managed to institutionalize STI ties with almost every nation in Western Europe. This opened doors for a limited but still unprecedented level of scientific mobility between East and West.

[4] Van Oudenaren J. Détente in Europe: The Soviet Union and the West Since 1953. Duke University Press, 1991. P. 271.
[5] Ibid. P. 268.

The Soviet strategy was clear: by establishing new systemic contacts it received some important European industrial technology and promoted the image of the Soviet model by allowing the most prominent (and ideologically reliable) scientists to participate in research activities, conferences and meetings. But the most important strategic goal was still the political one: publicly strengthening bilateral economic and industrial ties, which was supported by many Western policy makers, together with the mood engendered by *Ostpolitik*, created the false vision of a new status quo in Europe. This mood ended in the 1980s, when oil prices fell dramatically, volumes of trade between the Soviet Union and the Western Europe declined and a new stage of military and political confrontation led to further turmoil and mistrust in the region.

The failure of this vision showed that despite the institutionalized frameworks, real structural interdependence between the Soviet Union and Europe was quite primitive, because perhaps as early as the 1960s and certainly by the 1970s, Western partners had begun to consider the USSR primarily as an important oil and gas supplier, while at the same time the failure of Soviet manufactured goods to meet global standards meant that Soviet exports could not diversify beyond such raw materials. Even when Mikhail Gorbachev came to power with his new vision, it was evident that the Soviet STI model was structurally incompatible with the Western one. Gorbachev tried to promote the establishment of European investment funds in USSR, which could have helped the Soviet STI system remain stable. But this attempt failed, because Western investors could not understand the complicated and unpredictable Soviet rules.

Werner Meske writes in his book that the whole Soviet STI system was structured hierarchically, with strict subordination to state-controlled political and economic structures[6]. Overall, science and technology were part of the administrative and planning systems and were coordinated by sectoral ministries and by the Academy of Sciences, which was the major facilitator of relations among science, politics and the economy. Although this was a unique feature of the Soviet model, it appeared to have its natural limits, first of all because there was never an effective linkage with the real economy. The most visible and effective link was that between STI and the military industrial sector, but that was not enough to develop competitive civilian technologies and change the obsolescent structure of the economy. This is equally relevant today, both in terms of internal Russian development and in relation to Russian-European STI cooperation.

Precisely because the Soviet model existed in an understandable environment and actively spread to other countries, it was much easier for the Soviet Union to build long-term predictable relations with partners in the Socialistic Europe or in Cuba, but it never could find its *modus vivendi* with the Western systems, because they were structurally different. Western models were more diversified and dispersed, and had more economic and political freedom, whereas the Soviet model was always hierarchical and strictly subordinated to political considerations.

At the same time, despite structural differences, the initiatives launched by Soviet and European leaders played a major role in the convergence of Soviet and European interests. The younger generation of Communist Party leaders who came to power in the 1980s understood that the Soviet economy and STI had lost competitiveness on a global scale and needed to be reformed. This vision brought shifts in mentality among top policy makers and laid the foundations for new patterns of development strategies. Still, it is important to remember that visions change much faster than behavioral attitudes and structures. Contemporary Russia inherited not only immense human capital and great scientific schools from its Soviet past, but also old structural problems, which still pose many challenges to its model of development.

Forms and vectors of Russian-European STI cooperation

After the Soviet Union's dissolution, science and technology not only remained an integral part of the Russian-European relations, but became one of the most successful areas of cooperation. Open borders, the Russian transition to market economy and the institutionalization of the European Union gave way to new forms of convergence based on STI.

Although major political initiatives in STI appeared only in the XXI century (Common Space for Research and Education in 2003 and P4M in 2010), a new era of STI cooperation had already

[6] Meske W. From System Transformation to European Integration: Science and Technology in Central and Eastern Europe at the Beginning of the 21st Century. LIT Verlag, 2004. P. 16.

started in the early 1990s. Two important organizations were established that shaped the EU-Russia STI common space: The International Association for the Promotion of Cooperation with Scientists from the Newly Independent States of the Former Soviet Union (INTAS) and The International Science and Technology Center (ISTC). INTAS, mostly funded by the European Union, supported ties between scientists from Russia, the post-Soviet states and the EU, while ISTC gave access for scientists in Russia and the post-Soviet states to their peers and research organizations in the EU, Japan, the Republic of Korea, Norway, and the United States[7]. Both organizations were created as a reaction of the West to the disintegration of the Soviet scientific world, the dramatic decrease of public spending on R&D in the newly independent countries and the political willingness on both sides to support the vast scientific community, which was in the process of finding its place in the changing environment. Although INTAS came to an end in 2010 and Russia has withdrawn from most ISTC activities, these initiatives played their role in establishing comprehensive contacts among STI communities.

On the EU-Russia level, STI cooperation is coordinated today by the Joint Science and Technology Cooperation Committee and 11 EU-Russia thematic working groups. The major facilitating actors include the European Commission of the EU, the Russian Ministry of Education and Science, Russian Academy of Sciences, Russian Foundation for Basic Research (RFBR), Fund for Assistance to Small Innovative Enterprises in Science and Technology (FASIE) and several other official organizations from Russia. There is also a trilateral dialogue of Russia, European Commission and the European Space Agency on space technology and space research, which includes continuing cooperation regarding the International Space Station. A separate agreement has been concluded between Russia and Euratom on thermonuclear synthesis, which is coordinated by a joint Euratom-Rosatom committee.

Russia has also been the most prominent non-EU participant in all recent Framework Programmes for Research and Technological Development (FP) – funding programmes facilitated by the European Commission to support research in the European Research Area (ERA). In FP6 and FP7 (from 2002 to 2013), Russia was the highest ranked third-country partner in terms of funding received and number of participants[8]. In FP7 alone it took part in more than 350 projects, most of which were related to the following research areas: people; transport; knowledge based bio-economy; and information and communication technologies[9].

When Horizon 2020 (FP8) was established, it was the biggest research and innovation programme in the European Union history, with a budget of approximately €80 billion over 7 years (2014 – 2020) and nearly the same amount of resources in structural funds for STI purposes. At the same time, Horizon 2020 funding structure is different from all previous Framework Programmes, because Russia, as well as other partner countries that are considered by the EU to be developed (USA, Canada, South Korea, Brazil, Mexico), and that wish to engage in Horizon 2020 joint activities, have to establish national funds to support the participation of their scientists and researchers. This sets certain limits to Russian participation, because there is a declining tendency in federal budget spending for science and research, which dropped from 2,6% in 2013 (a historical maximum) to 1,9% in 2016.

Russian scientists have also participated in projects launched under the European initiatives COST and EUREKA. COST has been oriented towards R&D in socially focused areas of public interest. Among all non-COST member countries, Russia has participated the most in COST activities. However, the situation is different with Russian participation in EUREKA, which is aimed at providing funding for projects proposed and implemented by private industry. Even though Russia is a full member of EUREKA, participation has always been comparatively low, which may be seen to reflect the limited innovation capacities of the country[10].

Russian-European STI cooperation has proven successful and highly effective, especially in megaprojects. The most famous of these is the European Organisation for Nuclear Research

[7] Sokolov A., Haegeman K., Spiesberger M., Boden M. Facilitating EU-Russian Scientific and Societal Engagement: Joint Efforts to Tackle Grand Challenges // Science & Diplomacy. 2014. Vol. 3, No. 4.
[8] Ibid.
[9] Spiesberger M., Schuch K., Marinelli E. Overview of EU-Russia R&D and Innovation Cooperation: ERA.NET RUS Scenario Validation. Joint Research Centre of the European Commission Technical Report. 2013.
[10] Ibid.

(CERN), which includes around a thousand Russian participants. Negotiations are in their final stages for Russia to become a CERN Associate Member. But there are also other important megaprojects, such as the International Thermonuclear Experimental Reactor (ITER), the technological concept of which goes back to a Soviet design and in which Russia is one of the principal investors (€1721 million or 9,09% of total contributions); the X-ray Free-Electron Laser (XFEL, €306.4 million or 26,79%); the Facility for Antiproton and Ion Research (FAIR, €178.05 million or 17,34%); and through the Kurchatov Institute, Russia is a full member of the European Synchrotron Radiation Facility (ESRF, 5.261 million or 6% annually). At the same time, Russia has recently started to facilitate its own megaprojects, such as the Nuclotron Ion Collider Facility (NICA) in Dubna which brings together Russian and European participants.

It is hard to miss the fact that the overwhelming majority of EU-Russia joint megaprojects relate to various areas of physics – a sphere in which Russia is historically strong and has traditional contacts with its European counterparts. Such initiatives as the latest EU funded project, CREMLIN, which is aimed at connecting the European and Russian research agencies, is also primarily targeted at physics communities. One should not undervalue the importance of interdependencies among physicists, or the role of megaprojects, but this vector appears to be relatively narrow for building stronger and more diversified relations in STI.

The overarching goals of all EU-Russia joint activities from the 1990s were seen as a gradual Russian convergence with the European Research Area (ERA) through the ERA Network (ERA.Net), ERA Network Russia (ERA.Net RUS, 2009-2013) and ERA Network Russia Plus (ERA.Net RUS Plus), which will be in force until 2018. ERA is an important tool of European integration, aimed at the creation of a "common market" in research and based on ideas of the free movement of knowledge, researchers and technology. Even though Russia is not an Associated State, ERA.Net RUS and ERA.Net RUS Plus have become an institutional bridge for the Russian STI community and organizations to enhance their coordination with both the EU Member States and Associated States. Currently ERA.Net RUS Plus remains the leading initiative designed to foster closer ties between the Russian and European scientific communities in areas considered important and topical for both sides: nanotechnology; environment and climate change; health; social sciences and humanities; and innovation projects.

Another vector of Russian-European STI integration was established through interconnections between technology platforms. Russia borrowed experience from the EU where technology platforms promote development of long-term agendas shared by R&D centers and the industry. To a great extent, technology platforms are the essential basis of the whole ERA, because they serve as the glue binding science, technology and innovation together, and have direct impact on industrial and economic development. The same idea lay behind the creation of technology platforms in Russia, which should ideally have become not only the foundation for STI development but integration with the European technology platforms as well. For Russia, technology platforms present the possibility to accelerate research, implement more joint projects, and enter the EU market; while the EU gets the opportunity to know Russian STI rules, test technologies in a broader environment and enter Russian markets. Despite the initial optimism, Russian technology platforms are still in the process of development: they are still insufficiently connected to industry, while the level of real cooperation with technology platforms in the EU does not meet initial expectations.

Finally, there is a second level of Russian-European STI relations, the one that exists bilaterally between Russia and individual European states. These relations do not necessarily correlate with relations between Russia and EU institutions, because they are often facilitated by different sets of actors. Such is the case for the flourishing Russian-German STI cooperation. There are many joint research centers and laboratories that function both in Russia and Germany. Russia has established contacts with four major German scientific organizations: the Helmholtz Association, the Max Planck Society, the Fraunhofer Society, and the Leibniz Association. Many organizations such as the German Research Foundation (DFG), German House for Research and Innovation (DWIH), and German Academic Exchange Service (DAAD) are highly active in Russia, setting up multilateral contacts with Russian Academy of Sciences, funds, universities, research centers and individual scientists. Germany is the most vivid example of bilateral STI cooperation, but Russia also has strong STI ties with France, Italy, Finland and other European countries. And yet in the end the structure of these bilateral contacts reflects the general picture of Russia-EU STI

cooperation: it remains limited to certain scientific areas, has much less potential when it comes to the free flow of technologies, and has very little impact on the real economy.

At a March 2016 meeting dedicated to EU-Russia relations at the Russian International Affairs Council, the Head of the EU Delegation to Russia, Vygaudas Usackas, noted that "cooperation in the field of education, science and innovation is developing very actively, but this is not yet enough to reverse the negative trends in Russian-European relations"[11]. This phrase summarizes the general mood among policy makers on both sides. But it raises a further question: why, with such a unique and complex structure in relations between Russia and Europe, unlike any to be found in other spheres, did Russian-European STI relations not become a major discourse for interdependence? The obvious answer would be that science and innovation are always secondary to trade or security. That, however, would be inadequate in the sense that, while STI is indeed dependent on many national and international issues, in a postmodern system of international relations science and technology constitute one of the principal cores of positive interlinks between states. So the question should be rephrased: why has STI cooperation between Russia and Europe failed to become a driving force for the diversification of the Russian economy, and for Russia's deepening technological and industrial integration into European and global markets?

Existing and arising challenges

This section represents the aggregated opinions of experts on the challenges that Russian-European STI relations currently face and will encounter in the longer term.

Structural differences. The biggest challenge is hidden in various structures of Russian and European STI management. As stated previously, Russia inherited the Soviet STI model, with both its advantages and its weaknesses. The Soviet model was not created for the market and was entirely supervised by the government. The Academy of Science structures were responsible for basic research, while the military-industrial sector played a key role in applied science.

In post-Soviet Russia, the situation is changing slowly. The latest available data shows that in 2014, 69.9% of R&D was performed by government organizations, 8.2% by organizations partly owned by the government and 17% by private organizations. The share of government organizations in R&D has remained almost unchanged since 1995, when it was 73.4%, although there has been a noticeable rise (from 4.8%) in the share conducted by private organizations[12].

With regard to volumes of financing for R&D, the private sector share in Russia rises to 27.1%, while the role of the government remains almost the same: 69.2%. Among the CIS, EU, OECD and major developing countries, only in Argentina, Tajikistan and Indonesia is the role of the government in the financial support of R&D higher. In contrast, in the United States the private sector's share is 60.9%; in Germany, 65.2%; and in France, 55.4%. In China, the figure is 74.6%, and South Korea and Taiwan have slightly higher figures than China [13].

Taken together, these factors point not only to the structure of R&D financing, but also different nature of STI governance, and that has a distinct effect on the structure of STI relations between Russia and Europe. For example, in the United Kingdom most R&D institutions are basically independent from the government, and thus when they establish contacts with their Russian counterparts, they must do so through bureaucratized government structures, which makes this process more complicated. Further, once European partners learn the system, they soon find out that bureaucratic rules change fast; it is very difficult to accommodate to unstable environment. The same logic works the other way: when separate Russian organizations wish to build relations with partners in Europe, they have to coordinate this process with vertical bureaucratic structures. That often constrains the possibility of establishing multiple horizontal contacts and maintaining effective and efficient cooperation.

These structural differences show why Russia and Europe are successful in implementing megaprojects – vertical initiatives facilitated by government and large bureaucratic organizations – but do not generally succeed in creating a multidimensional system of horizontal relations among separate actors: universities (including levels of faculties and departments), research centers,

[11] Negative Trends in Russia-EU Relations Can Be Overcome. Russian International Affairs Council. 24 March 2016.
[12] Indikatory nauki (Indicators of science). Statistical digest. Higher School of Economics, 2016. P. 28.
[13] Ibid. P. 257-259.

innovation hubs, etc. Indirectly, that is a reflection of the general Russian diplomatic attitude towards Europe, which concentrates on large-scale top-down initiatives that do not achieve goals on lower levels. That is why P4M, which is a vertical political initiative, ended without creating sustainable interdependencies in STI.

Disparity between science and innovation in Russia. This challenge is closely related to the first one as it also deals with linkages between the government and the private sector. Fundamental sciences remain a core of Russian-European STI relations, but when it comes to technology and innovations, structural barriers come into play. Russia's path to the market economy is a non-linear one, with the government still playing a fundamental role both in creating demand for the industry and in distribution of resources. And although the private sector is growing, its influence on the innovation economy is insignificant.

Moreover, there is a clear imbalance between the public resources invested into the creation of knowledge and the innovative outputs for industry and the economy. Almost every expert underlined that there is no demand for innovation from the Russian economy and low levels of financial support both from the government and business; these factors create a strong barrier between science and innovation both inside Russia and in its relations with Western countries. For this reason, Russia lags behind not only the developed countries, but BRICS as well in indicators such as the level of cooperation between companies and universities, the availability of venture capital, the presence of value chains, and protection of intellectual property rights.

Irina Dezhina is right when she says that the Russian innovation system resembles an unfinished construction "in which all the elements seem to be in place, however they are not assembled in full" [14]. This situation is the result of a government policy that is more situation-based and aimed at immediate results, a policy that does not work in innovative sectors. Initiatives that are government-led and adapted from Western experience, such as Skolkovo Innovation City, technology platforms, clusters, and mega-grants, can be mechanisms for developing the innovation economy, but there are currently structural limits to that process because Russia faces a strong industrial recession and budget cuts for STI.

That raises a rational question of external funds, and there are two possible vectors – Russian and foreign (primarily European) direct investment in STI. Countries of the European Union are the primary source of foreign direct investment in Russia (75%), but very little FDI funds flow to the R&D and innovation sectors. Both Russian and European investors appear to be reluctant to invest significantly in STI, because a) the benefits are not evident in a system which is inefficiently regulated by the government and not by the market, b) there is no predictability in Russia's economy or its investment rules, c) STI investments are long-term in their nature and investors who traditionally operate in Russia prefer to get the quick benefits available from its commodity and finance sectors, and d) in most cases it is the government, not the independent innovation sector, that facilitates and controls investments; everyone wishing to support R&D or innovation must therefore receive approval from various bureaucratic structures; that involves unforeseen costs and significant risk of corruption.

As a result, Russia has hundreds of promising startups, often derived from market oriented R&D, but fails to commercialize and integrate them into the global or even local market. According to Loren Graham, it is also important to see the difference between "invention" and "innovation". Russia has excellent scientists and engineers who are good at invention. Its business economy, however, is in a poor state, and is therefore is bad at innovation. There are certain exceptions, such as the information and communications technology sector (ICT). Being the most deregulated area of innovation in Russia, ICT has proved to be the most successful one, able to attract Russian and foreign investments and integrate itself into the global market.

Different priorities for Russian and European STI. Considering that Russia faces a reduction of public expenditure on STI and has many barriers that hamper external investments, the government has turned to cooperation in areas that are traditionally strong in leading R&D institutions, such as nuclear physics, laser science, particle physics, space technology and biology. European partners expect Russia to diversify its STI development: that was underlined by the

[14] Dezhina I. Technology Platforms in Russia: A Catalyst for Cluster Development? Triple Helix Conference. 2013. P. 7.

structure of ERA.Net RUS and ERA.Net RUS Plus. Russia indeed has big potential in such areas as biology, medicine, and the social sciences, but these areas face an obvious lack of financial support.

In an attempt to transfer R&D from research centers to universities, the Academy of Sciences and the education system, reforms have been initiated by the Russian government to restructure STI and to rebalance the relationship between fundamental and applied research. Still, most of these reforms, well intentioned as they may be, encounter problems of implementation because there is no consensus and clear final vision in the STI community and the government itself, while proponents of the traditional Soviet model form influential opposition blocs inside the scientific and academic community.

As a result, Russian STI often does not overlap with major European Union priorities. For example, development of new energy sources is a long-term vector aimed at decreasing Europe's dependence on oil and gas. Taken together with increased competition for market share from the shale revolution, the opening to Iran, and new supply routes from the Middle East and Northern Africa; and with the easy politicization of energy issues, it will be almost impossible for Russia to preserve its dominant role in the European energy market in the long term. Even though it may be hard for Russia to concentrate on green and renewable energy at the moment, considering its vast reserves of natural resources, if Russian STI does not involve itself in this area it may in coming years lag behind Europe much more than it does at present. The same applies to health and social challenges. Both the European Union and Russia face an aging population, migration issues, demographic changes, negative trends involving cancer and cardiovascular diseases etc. These are the areas in which more common approaches should be taken.

Political uncertainty. Russian-European STI relations are relatively immune to political discrepancies, although this immunity has its limits. It cannot be said that the latest deterioration between Russia and the West has had no effect on STI cooperation. Sanctions imposed by the United States and the European Union have created new uncertainties for international investors. Many European investors and venture funds have very little information on the new situation, and hence they are concerned over whether sanctions mean new limitations and in what particular ways.

In reality the political problems for STI cooperation stretch far beyond sanctions and started before the Ukraine crisis. In Russia the possibility of deepening STI relations with the West is seen differently by different government officials and political groups. The prospect of excessive technological and economic dependence on the West has been met by many with concern if not alarm. With the rise of Eurasian integration together with protectionist rhetoric, it has become evident once again that there is no consensus among Russia's elites on Russia's place in the global economy, and that old East-West differences never went away. In a series of political decisions, including the Foreign Agent Law enacted in 2012 and legal proceedings against Skolkovo in 2013, Russia has demonstrated that there are new red lines to its STI interdependence with the West.

However, political uncertainty should not be seen solely as a Russian-origin problem. For a long time, even during the most optimistic periods of Russian-European relations, there have been similar concerns among many decision makers in the EU who had no clear vision on how far the EU should go in links to Russia in certain STI areas with Russia. When perception of Russia as a strategic partner started to fade away, after tensions caused by the energy security issue followed by the conflict in Abkhazia and South Ossetia, far-reaching splits started to emerge in EU institutions and individual states. An inconsistent approach towards P4M showed that Europe expected Russia to become not only a technologically modernized country but also more democratic and less centralized, while the Russian government regarded P4M solely through the prism of rational economic interests. These political uncertainties were probably among the factors why Russia never became an Associate Country for the Framework Programmes, although negotiations continued for several years and if successful could have opened a new page in Russian-European relations.

Geoeconomic changes and STI. Recent geoeconomic developments such as the Transatlantic Trade and Investment Partnership (TTIP) currently under negotiation between the United States and the European Union and Russia's ambitious "turn to the East" are considered by many experts and policy makers to have the potential for tangible effects on the future of Russian-European interdependencies, including in the field of STI. These conclusions are based on the presumption that Russian-European relations are determined by political differences and sanctions, and that both sides will search for ways to distance themselves from one another.

Currently, multiple scenarios are circulating in Russia which predict that further deterioration of relations with the West will force Russia to reduce its economic and technological dependence on Europe and look for new markets and partners in the East, first and foremost China. The European Union in its turn will participate in the development of a transatlantic FTA and thus can be less interested in sustaining an increasingly burdensome relationship with its unpredictable neighbor to the East and instead go for deeper STI integration with its traditional partner across the Atlantic. According to these scenarios, this could be a positive sum game for both Russian and European STI development, as they will compensate for any loss of mutual dependence by strengthening relations with China and the United States respectively.

In reality, these same developments can lead to a negative sum scenario for Russia, because there are certain limits to its science and innovation cooperation with China and with the other post-Soviet states. First, Russia currently has no major STI links with China, especially with regard to fundamental research. Second, if China is considered a new partner in the innovation economy and a substitute for European investments, the same structural barriers that are currently in place with the European partners will come into play with China. Recent developments show that China is willing to invest in the Russian economy and industrial infrastructure but encounters uncertainty of rules and attitudes. Russian officials talk a lot about attracting Chinese capital, but often oppose it when it comes to real projects. Finally, Europe is much more likely to create a transatlantic STI area as part of TTIP than Russia is to facilitate creation of any effective STI area with China and the post-Soviet states. A transatlantic STI area would mean the merger of the enormous resources and investment potential that the EU and the US possess, while Russia does not have much to offer the Chinese economy. That is proven by the fact that there are no Russian-Chinese agreements on the export/import of technologies. China continues to consider Russia an important energy exporter, but not a partner in science and especially innovation.

On the other hand, when talking about "peaceful divorces" and the reorientation of markets, it is important not to forget that STI today has become part of the globalized world, and therefore neither a single country nor "bloc" of countries can possess enough knowledge and technology to ensure they are competitive on the global stage. It is only through multilateral ties that countries can build effective STI sectors. Russia has to overcome negative tendencies in its STI cooperation with its Western partners, but that should not be considered in itself a reason to shift its interests to the East. It is a false equivalence to conclude that a "turn to the East" can replace Russia's relations with the West. Rather, Russia's unique geographic position gives it chances to build successful and complementary relations in *both* the West and the East. Doing so, however, would require more active participation in globalization and the creation of attractive internal environment for its foreign partners.

Conclusions and policy recommendations

Structural barriers are largely interconnected with political ones; this interconnection leads to a highly negative mix of factors that can have a long-term effect on the nature of Russian-European STI relations. Already, the number of joint activities is shrinking and lack of mutual comprehension between STI communities is growing more evident. The mood can be described as overwhelmingly pessimistic for the future, inasmuch as Russia and Europe did not use their chances over the last 25 years to build stronger STI linkages.

The ideas expressed when Common Spaces and P4M were established have not lost their relevance, but lessons have not yet been learnt from the failure of these initiatives. Therefore, both sides have to continue a wide discussion on STI convergence, which can be a perfect tool to lead the way out of the crisis. Based on experts opinions and major STI discourses in Russia and Europe, this section is dedicated to recommendations that, if implemented, could lead to policy changes and minimization of negative trends. These recommendations are based on the assumption that Russia and Europe will continue to look for new positive vectors of cooperation and try to overcome the negative consequences of the current crisis.

1. Both sides have to increase structural horizontal ties. Even though there have been significant initiatives, successful joint projects and people-to-people contacts, Russian-European

scientific interconnections do not approach those that exist inside the European Union or, for example, between the EU and the United States. Russia has to promote mechanisms that will ease the process of establishing new ties not only between big government organizations (top-down approach) but between concrete universities, research centers, institutions, etc. (bottom-up approach). Reaching this goal will require more mentality shifts among political leaders and decision makers in STI. It means that Russia should not focus on attracting individual outstanding scientists, but should organize more systemic contacts among research centers, institutions and laboratories. Russian scientists abroad generally do not wish to come back to Russia and it is becoming more difficult to attract foreign specialists on a permanent basis as well – both groups see too many risks, political and financial uncertainties. That implies that Russian government, business, scientific organizations, and universities should change their strategy and offer more support to domestic researchers while establishing more horizontal ties between institutions. This is the only way for Russia to minimize such risks as a continuing brain-drain and the decrease of its STI capital.

2. Russia and the EU should create mechanisms that will further facilitate joint activities in R&D and innovation. For example, establishment of a mutual fund should be initiated on an intergovernmental basis to provide additional financial support for joint R&D projects, including those in Horizon 2020 and ERA.Net RUS Plus. Another fund, supported primarily by the private sector, should be aimed at creating an association of Russian and European companies involved in innovation. More initiatives should be undertaken to foster cooperation between European and Russian technology platforms – still, despite many failures, one of the most promising vectors of STI integration. This will entail organizing more events and projects between technology platforms. The European Commission and the Russian government have to realize that technology platforms form one of the most efficient links between research and the real economy and must spend more efforts to overcome the existing risks and barriers. A more diverse joint research infrastructure must be created that will give opportunities not only to famous universities and research centers, but also to smaller institutions, especially in the regions. In this regard, Russia should learn from other successful federative states how to use regional potential, build closer ties among regions and at the same time give regions more freedom to seek cooperation internationally.

3. Stronger links have to be promoted among government, business and R&D in Russia. The problem of financial support remains one of the biggest issues for Russian STI. The government cannot afford to sustain its current dominance in financial support to R&D in Russia; if the economy shrinks further, it would be naïve to think that Western (or Chinese) capital could save Russian STI. The private sector in Russia has to engage more profoundly, and STI must become a priority for entrepreneurs and not just for politicians and civil servants. It is in Russia's corporate and national interests to create more linkages among science, innovation and industry. Big Russian corporations that rely on advanced technologies can be advised to create structural funds to support R&D in their respective technological areas, promote fellowships for outstanding researchers, establish grants, etc. It should not be a model forced on the private sector by the government, as often happens in Russia; rather it should become a profound development policy internalized by the Russian private sector itself. Russia should also adopt the European experience, in which business is obliged to support technology platforms, which therefore do not waste their time and resources to find sponsors.

4. Building an innovation economy in Russia will take time, both Russia and its European partners have to acknowledge that without provoking more turbulence. Compared to developed states in the West and the Asia-Pacific region, modernisation and innovation are new priorities for Russia's industry and economy: an economy based on knowledge and innovation is still secondary to the current economy, based on commodities, while structure of existing economy doesn't create demand for innovation. Decision makers have to acknowledge that scientific potential doesn't necessarily turn into successful innovation: that outcome requires the development of infrastructure. All existing long-term initiatives, including technology platforms, clusters, R&D centers and innovation hubs have to be interconnected with one another, thus creating an integrated STI market. The Russian government must build an investment-friendly environment and understandable rules for both Russian and European investors who are seeking long-term benefits from their investment in STI.

5. Industrial cooperation should foster innovative cooperation. One of the ways for Russia to build an innovation economy is to attract and learn how to use European technologies. Obviously, there are many technologies that are already mature and highly specialized elsewhere; it would be difficult for Russia to catch up quickly enough to compete in the short term. Although industrial cooperation has often been highly politicized, there are many examples in which it has enabled Russia not only to develop its technological sector, but also to adapt its technologies to conform with global standards. For instance, an agreement between European automobile manufacturers and the Russian government stipulates that at least 30% of the vehicles produced in Russia must be equipped with locally manufactured engines. As a result, the Russian automotive industry has acquired the technologies used in European car plants. By attracting more manufacturers Russia would attract new technologies and skills. Furthermore, European industrialists would be interested in supporting Russian R&D potential and thus links between Russian and European research, technology and innovation.

6. Both sides should reduce bureaucratic barriers to scientific mobility. Under the current visa regime, all travel must be prepared in advance, and complex procedures are applied to longer-term exchanges. Many experts, including Dmitry Trenin, have long argued that Europe's most effective way to help Russia in adapting to EU standards, and through that to modernization, would be the removal of visa barriers[15]. Obviously, the dialogue on visa-free travel between Russia and the European Union has been postponed until current crises are resolved, but visa liberalization remains a very significant issue for STI cooperation. Making scientific horizontal mobility less bureaucratized, at least partly, would obviously increase people-to-people contacts and help develop stronger STI ties.

7. Russian and European STI communities must have better communication channels. One of the reasons why Russia and the EU have many initiatives but fail to make them fully effective is that only a relatively small number of participants are involved in cooperation, while a majority of scientists, entrepreneurs, investors and politicians often have limited information on joint activities and on the potential benefits of further interactions. This is especially relevant to Russia, which engages in very few efforts to promote its initiatives or opportunities to participate in its STI programmes and projects. It is almost impossible to get sufficient information from official press releases or websites, which are never or poorly translated into English. Russia must have more official STI representatives in Europe not only from the embassies and cultural centers, but also from universities, organizations, funds, and ministries, who could participate in major meetings at the EU and national levels and inform potential partners. The same applies to the European side, which should be more active in organizing representative offices in Russia, provided that Russia does not create political and bureaucratic barriers.

8. STI relations are based on trust. Russia and Europe should use cooperation in STI to promote wider trust in the region. The potential of Russian-European STI cooperation may be still not have reached its full potential, but it has proven that both sides are able to build long-term frameworks for cooperation. STI is a real example of "soft power", but it doesn't belong to any particular country: it is a global value that should be analyzed, supported and popularized. Experts and policy makers involved in STI relations should more openly demonstrate that this sphere creates more than just social contacts between scientists. Rather, it is an essential core of regional development and integration that requires political stability and predictability, understandable rules and mutual respect. It may not bring the immediate results of trade or finance, but it is a perfect demonstration of the dangers of a potential break in relations and the benefits of strategic cooperation.

[15] Trenin D. Russia's Foreign Policy Reset Has Begun. The Moscow Times. 6 July 2010.

Individuals listed below have been interviewed by the author of the following policy paper. They are not responsible for the contents of this paper. Recommendations reflect the views of the author. Affiliations are provided for identification purposes only.

Vasily Belov, Senior Vice-President, Innovations Development of Skolkovo Foundation

Richard Burger, Research and Innovation Counselor of the Delegation of the European Union to Russia

Irina Dezhina, Head of Research Group on Science and Industrial Policy at Skolkovo Institute of Science and Technology

Viacheslav Duk, National Institute of Nuclear Physics, Perugia

Elena Eremenko, Helmholtz Association, Head Moscow Office

Loren Graham, Professor of the History of Sciences, Massachusetts Institute of Technology

Peter Hiller, Head of the German House of Research and Innovation in Moscow

Martin Krispin, Coordinator of the German House of Research and Innovation in Moscow

Gareth Wynn Owen, Head Science and Innovation, British Embassy in Moscow

Thomas Renard, Senior Research Fellow, Egmont – Royal Institute for International Relations, Brussels

Klaus Schuch, Strategic Research Manager, ZSI - Centre for Social Innovation, Vienna

Sergey Sibiryakov, CERN Theory Division, Geneva; Institut de Théorie des Phenomènes Physiques, EPFL, Lausanne

Manfred Spiesberger, Senior Researcher and Project Manager, ZSI - Centre for Social Innovation, Vienna

Tobias Stüdemann, Freie Universität Berlin, Director Moscow Office

Vasily Vedeneev, Head of the Lab of Experimental Hydrodynamics, Lomonosov Moscow State University

Bibliography

Dezhina I. Technology Platforms in Russia: A Catalyst for Cluster Development? Triple Helix Conference. 2013.

EU-Russia Year of Science 2014: http://eu-russia-yearofscience.eu/ , http://eu-russia-yearofscience.eu/ru

Gottlieb S., Lorber E. The Dark Side of Interdependence // Foreign Affairs. August 5, 2014.

Graham L. The Soviet Academy of Sciences and the Communist Party, 1927—1932. Princeton University Press, 1967.

Indikatory nauki (Indicators of science). Statistical digest. Higher School of Economics, 2016.

Meske W. From System Transformation to European Integration: Science and Technology in Central and Eastern Europe at the Beginning of the 21st Century. LIT Verlag, 2004. P. 16.

Negative Trends in Russia-EU Relations Can Be Overcome. Russian International Affairs Council. 24 March 2016.

Sokolov A., Haegeman K., Spiesberger M., Boden M. Facilitating EU-Russian Scientific and Societal Engagement: Joint Efforts to Tackle Grand Challenges // Science & Diplomacy. 2014. Vol. 3, No. 4.

Spiesberger M., Schuch K., Marinelli E. Overview of EU-Russia R&D and Innovation Cooperation: ERA.NET RUS Scenario Validation. Joint Research Centre of the European Commission Technical Report. 2013.

Trenin D. Russia's Foreign Policy Reset Has Begun. The Moscow Times. 6 July 2010.

Van Oudenaren J. Détente in Europe: The Soviet Union and the West Since 1953. Duke University Press, 1991.

About the author

Pavel Kanevskiy is an associate professor of political science and associate dean at the Lomonosov Moscow State University (MSU) Faculty of Sociology. He is an EASI Hurford Next Generation Fellow at the Carnegie Endowment for International Peace, member of the Younger Generation Leaders Network on Euro-Atlantic Security (YGLN), expert at the Russian International Affairs Council. He holds a doctorate in political science from MSU (2009). He was a member of various working groups at MSU, MGIMO, Russian Academy of Sciences, RIAC. He's an author of more than 30 articles and monographs on Russian politics and social structure, EU-Russia relations, interest groups and lobbying, political elites.

Areas of focus: political and social development in Russia; European politics; European Union – Russia relations; comparative analysis of interest groups and lobbying in contemporary political systems.