

DEVELOPMENT OF BILATERAL COOPERATION BETWEEN RUSSIA AND THE UNITED STATES IN SPACE EXPLORATION

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Abstract. The article considers the formation and development of bilateral international cooperation between Russia and the United States in the space sector. Russia and the United States began to cooperate in space exploration at the very beginning of their manned programs, because it was space that turned out to be a very practical area of interaction, far from general political problems. Since both states are susceptible to certain encroachments on their positions in space explorations, outer space is a domain where the concerns of Russia and the United States mirror each other. At the same time, both parties are quite strongly interdependent on each other in this area. The participation of both states is necessary to ensure one of the most high-priority and expensive projects in astronautics - the International Space Station (ISS). However, the ISS is scheduled to be decommissioned in 2031 and no real replacement exists yet (with only the planning stage underway). According to researchers, this is not enough to maintain peaceful relations in space between Russia and the United States. Therefore, any statement affecting this area immediately becomes the object of close political and public attention.

Keywords: outer space, Russia, USA, International Space Station (ISS), bilateral international cooperation.

JEL codes: F50, D74, F02, H56

Аңдатпа. Мақалада Ресей мен АҚШ арасындағы ғарыш саласындағы екіжақты халықаралық ынтымақтастықтың қалыптасуы мен дамуы қарастырылады. Ресей мен Америка Құрама Штаттары ғарышты игеруде өздерінің пилоттық бағдарламалар аясында ынтымақтасуды бастады. Өйткені ғарыш саласы жалпы саяси мәселелерден ада, нақты өзара ынтымақтастыққа ыңғайлы сала болып табылады. Екі мемлекет те ғарышты игерудегі өздері ұстанған позицияларына қол сұғушылыққа бейім болғандықтан, Ресей мен Америка Құрама Штаттарының мүдделері ортақ. Сонымен қатар, аталмыш салада екі тарап та бір-біріне өте қатты тәуелді. Екі мемлекеттің де қатысуы астронавтикадағы ең маңызды және қымбат жобалардың бірі – Халықаралық ғарыш станциясын (ХФС) қамтамасыз ету үшін қажет. Дегенмен, ХФС-ны 2031 жылы пайдаланудан шығару жоспарлануда және балама жоба әлі де жоқ (тек жоспарлау кезеңі жүріп жатыр). Зерттеушілердің пікірінше, бұл Ресей мен АҚШ арасындағы ғарышта бейбіт қарым-қатынасты сақтау үшін жеткіліксіз. Сондықтан да осы салаға қатысты кез келген мәлімдеме саяси қоғамның жіті назарында болады.

Түйін сөздер: ғарыш кеңістігі, Ресей, АҚШ, Халықаралық ғарыш станциясы (ХФС), екіжақты халықаралық ынтымақтастық.

JEL кодтар: F50, D74, F02, H56

Аннотация. Статья рассматривает становление и развитие двустороннего международного сотрудничества между Россией и США в космической сфере. Россия и США начали сотрудничать в освоении космического пространства в самом начале своих пилотируемых программ, потому что именно космос оказался сферой взаимодействия очень практичной, вдали от общеполитических проблем. Поскольку оба государства восприимчиво относятся к тем или иным посягательствам на занимаемые ими позиции в освоении космоса, космическое пространство является сферой, в которой интересы России и США зеркально отражают друг друга. Обе стороны достаточно сильно взаимозависимы друг от друга в этой области. Участие обоих государств

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необходимо для обеспечения одного из самых приоритетных и дорогостоящих проектов в космонавтике – Международной космической станции (МКС). Тем не менее, планируется вывод МКС из эксплуатации в 2031 г. и никакой настоящей замены пока не существует (идет только стадия планирования). По мнению исследователей, этого недостаточно, чтобы сохранить мирные отношения в космосе между Россией и США. Поэтому любое заявление, затрагивающее данную сферу, сразу же становится объектом пристального политического и общественного внимания.

Ключевые слова: космическое пространство, Россия, США, Международная космическая станция (МКС), двустороннее международное сотрудничество.

JEL коды: F50, D74, F02, H56

Introduction

International cooperation in the study and exploration of outer space is especially important. The value of cooperation in this area is obvious and determined by a number of reasons. Firstly, space exploration is a global task; everything related to the study and exploration of outer space should be of interest to the world community because it is possible that the future of mankind is on this path. Second, the huge cost of developing and manufacturing rocket and space technology does not allow most countries to independently engage in this endeavor.

Third, the field of space research is unusually wide and constantly expanding, with new areas emerging, and the number of problems that urgently need to be solved growing. Even such powerful economic states as the USA and Russia find it difficult to cover all areas of space research, solely relying on their own economic resources and scientific technical potential (*Kozyrev, Nikitin, 1985*). Fourth, the specifics of space research typically entail resolving global challenges which demand global coverage for the observation of the phenomenon, and, consequently, the participation of scientists and specialists from many countries.

Fifth, the history of scientific and technological progress testifies to the unevenness of its development in different countries. Each country's space capabilities have developed along unique paths, such that their areas of greatest scientific and technological competence differ from one another. Therefore, weaving the different skill sets of the various countries' scientific schools and industrial sectors together so that their strengths complement each other is essential for conducting space research in the most efficient way possible.

Finally, the political aspects of international cooperation in outer space should not be discounted. Cooperation in this area requires a high degree of trust between states, since this affects, to a certain extent, such a sensitive element as the country's

defense capability. Therefore, the political climate here is of paramount importance. The practice of cooperation in outer space shows that it, in turn, contributes to the improvement of the political climate in the world. In recent years, international cooperation in outer space has become one of the important components of the entire system of modern international relations, actively contributing to the easing of tension in the world, and to a better understanding between countries and peoples.

At the turn of the 21st century, space has opened up new perspectives — new spaces for information exchange, new zones of control, new opportunities to make scientific discoveries, etc. Thus, space exploration is one of the prime political areas, and participation in this process has become an indicator of the country's status as a developed great power. In the 1990s, space was the realm of practical politics. The burning question discussed in the international arena was the following: should new space projects be implemented alone or should states cooperate with each other as a coalition?

Looking back at the history of the intercontinental space partnership between the USSR and the USA, in the 1950s, there was absolutely no prospect for future peaceful international space cooperation. Yet, the Soviet Union and the United States began to cooperate in the exploration of outer space at the very beginning of their manned programs, as space turned out to be a very convenient area of interaction, in contrast to general political problems. It is noteworthy that the peak of joint work fell precisely at the time of aggravated relations between the two powers: the first – in connection with the US war in Vietnam, the second – in connection with the Soviet war in Afghanistan and the development of the Strategic Defense Initiative by Washington.

Moscow and Washington remain the leaders in space research, maintaining a certain gap in technology and scientific

developments from other space powers, primarily the EU countries. The main rival in this sphere is China; it has surpassed Russia, though not yet in manned space flight (*EurAsian Times Desk, 2021*). In the early 2000s, as in the 1960s, only the United States and Russia have the facilities to carry out the full spectrum of space exploration (*Bajkov, et al., 2016*).

The first part of the article discusses the historical aspect of bilateral international cooperation between Russia and the United States, and then the role of the International Space Station in the development of bilateral relations. In the “Results and reasoning” part, some trends in the development of cooperation, advantages and risks, as well as problematic issues are analyzed. The final part sums up the work on the research topic and prospects for further research.

The methodological basis of the study is based on general scientific methods, as well as the principles of a systematic approach, including the comparative historical method, the method of analyzing the decision-making process, the method of theoretical analysis and synthesis, and the method of analogies. The paper also highlights the method of studying and summarizing Russian and American practice. This principle is used to reveal the essential relations between the US and Russia in the process of space exploration, which are typical for the sphere of world politics, as well as in the field of analysis of international cooperation in space exploration.

Historical aspect

The continuous strengthening of competition in the space sphere has become a characteristic feature of international politics since the late 1950s. International space cooperation between the USSR and the USA at that time did not present any particular prospects for future development. “Sputnik 1,” of course, became one of the most important victories of the Soviet Union at the very beginning of the Cold War with the United States. Then a significant figure of the Soviet cosmonautics appeared – Yu. A. Gagarin. Gagarin became a symbol abroad as well, but not in a positive way – he became a symbol of Soviet power. In the United States, Gagarin's flight caused a real

stir due to the fact that it was the first time in history when another country was capable of delivering a critical military strike from space (*Tomashevskij, 2020, p. 137*). American President John F. Kennedy tried to reduce international tension during his inauguration: “Let both sides look for ways to create not horrors, but to create miracles of science. Let's explore the stars together...” (*Transcript of President John F. Kennedy's Inaugural Address, 1961*).

In September 1963, President John F. Kennedy made the first proposals to make a joint space flight at the UN General Assembly, but they were rejected by the Soviets, mainly for reasons of prestige. This is not surprising, given the fierce rivalry for leadership in this area. At that time, the Soviet Union had launched the first artificial satellite of the Earth, and sent the first man into space. Wernher von Braun led the US effort to match the Soviets, and surpass them in the space race. The main goal of the rivalry was a manned flight to the moon, which the US Apollo program accomplished with the first landing in 1969, while the Soviet program ultimately failed, despite significant achievements in robotic spacecraft (*Tomashevskij, 2020, p. 137*).

By the end of the 1960s, the Soviet space program faced a dilemma. Launching spacecraft into low Earth orbit no longer seemed as impressive in the wake of the first lunar landing. Hence, the Soviets shifted towards the creation of orbital stations to study the possibilities of flights beyond Earth's orbit. The Almaz military station formed the basis of the station design called Salyut, which was the logical choice, as only the military industry was able to finance such costly projects. The US responded by creating their own space station using the Saturn launch vehicle and the Apollo lunar spacecraft (*Puzanov, 2010*).

It was during this period of transition that the history of the two superpowers' cooperation in space began, with the “Apollo-Soyuz” project. Docking space vehicles with such different designs posed a difficult challenge that demanded serious improvements. The lessons learned would prove valuable in the future when the two space powers began implementing larger programs. By this time, docking objects in space had already been demonstrated. The first manual docking on March 16, 1966 was

carried out by N. Armstrong and D. Scott aboard the Gemini-8 spacecraft with the Agena rocket. In the Soviet Union, the first automatic docking of two satellites, Kosmos-186 and Kosmos-188, took place on September 30, 1967. The very first docking of two manned spacecraft, Soyuz-4 and Soyuz-5, took place on January 16, 1969 (*Puzanov, 2010*).

The main participants in the implementation of the “Apollo-Soyuz” project were NASA and the USSR Academy of Sciences, which actively cooperated even before the start of direct negotiations held in Moscow on October 26-27, 1970. Such serious programs are doomed without making political decisions, and therefore, in parallel with the elaboration of the technical project, preparations began for a meeting between US President Richard Nixon and Soviet Prime Minister A. Kosygin.

The transition, as President Richard Nixon once said, from “an era of strife to an era of negotiations” at the turn of the 1960s and 1970s, led Washington to the idea of turning space, which had previously been an arena of fierce competition between the two superpowers, into a field for cooperation. Moscow supported this initiative. In the opinion of the American and Soviet leadership, this would be one of the clearest signs of détente.

Complete uncertainty over the inclusion of space on the agenda of the meeting of the two political leaders persisted until the last moment. The State Department and the White House were in no hurry with a decision, and began consultations with the Soviet side on the development of the text of an agreement on cooperation in the exploration of outer space only a week before the summit. On May 20, 1972, the Soviet side presented its version, which contained the provisions of the agreement between J. Lawe (Deputy Administrator of NASA) and M. Keldysh (President of the USSR Academy of Sciences) dated January 21, 1971.

On May 24, 1972, US President R. Nixon and Soviet Prime Minister A. Kosygin signed the Agreement between the USSR and the USA on Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes. A feature of this agreement was a strict time limit for its implementation – flights and docking were to

take place in 1975.

The “Apollo-Soyuz Test Project” (ASTP) under the leadership of G. Lanny (from the American side) and Corresponding Member of the USSR Academy of Sciences K. Bushuev (from the Russian side) began to rapidly develop. Flight directors A. Eliseev and P. Frank were appointed for direct supervision in orbit. For the technical modification of spacecraft, NASA signed a contract with “North American Rockwell”, and in the Soviet Union, work on finalizing the “Soyuz” was carried out at the well-known Rocket and Space Corporation “Energia” named after S. P. Korolev (*Puzanov, 2010*).

After three years of intensive work, both powers reached the finish line, and in May 1975, it was decided to organize a meeting in Moscow to determine the readiness for flight. The American delegation visited Baikonur, where they checked the communication equipment, the aiming system and a number of other systems. True, two weeks before the scheduled launch, some complications arose caused by statements of Senator W. Proxmeyer, who questioned the ability of Soviet specialists to control two space objects simultaneously in orbit (at that time, the Russian “Soyuz-18-Salyut-4”). It is noteworthy that exactly the same concerns were expressed much later by the American side, when the “Mir” orbital station was flying and preparations were underway for the launch of the International Space Station (ISS). This was mainly due to the imperfection of the Soviet communication system and the likelihood of emergency situations at two sites requiring an instantaneous response.

Despite all the difficulties, this flight took place. “Saturn-1B” was launched on July 15, 1975 from the launch pad of the Kennedy Space Center. A little earlier, “Soyuz-19” was launched into orbit from the Baikonur cosmodrome. On July 17, the historic docking took place, and three hours later, the first international space meeting took place. The joint flight ended on July 19. The total flight time, which required so much effort, was 1 day, 23 hours, 7 minutes and 3 seconds (*Puzanov, 2010*).

This flight, according to experts, was paradoxical, but at the same time very logical. What were the motives of the parties to agree on such an unusual project? The

United States had by this time made successful flights to the moon, launched the “Skylab” orbital station, and began building the space shuttle in 1972 when President Nixon asked Congress for funds to build a space transportation system. The Soviet Union, having become the first space power, and refusing the attempt to storm the Moon, successfully followed the path of creating and improving orbital stations, which made it possible to carry out long-term flights in near-Earth orbit. The only logical explanation is that both countries needed a new approach. In America, the euphoria of flying to the moon had passed, and the old technology had been destroyed. During the preparation of the “Saturn,” it was necessary to change some structural elements that were corroded. The “Skylab” program was also coming to an end. It was time to open a new chapter, and this flight was a great conclusion to the first phase of manned flight in the United States, which was paused until 1981, when the first flight of the Space Shuttle “Columbia” took place.

After the completion of the “Apollo-Soyuz Test Project” (ASTP), Russian-American space cooperation was mainly concentrated on biological experiments. Despite some attempts to continue joint space flights, the ASTP did not continue. The time when space would become financially unsustainable for a single country had not yet come, the condition preceding the formation of the mutual interest required for cooperation. This would not begin to emerge until the late 1980s and early 1990s.

At that time, only the Soviet Union had the opportunity to carry out long-term space flights on the “Mir” orbital station. In the United States, plans to create its own station “Freedom” did not receive support from the administration due to the huge costs of its creation. In addition, the “Space Shuttle” program itself required considerable funding. In the USSR, it was decided not to lay the foundation for the construction of the “Mir-2” station, again due to lack of funds. In short, a new situation arose in which both parties could benefit from cooperation: for the United States – the experience of long-term flights and experiments that would allow for the development of the technologies necessary for interplanetary expeditions, and for Russia – additional funding and unique capabilities for delivering cargo on a space shuttle, which

could not only deliver a large payload to space orbit, but also return it to Earth.

The project of shuttle flights to the “Mir” station was called the “first phase”, the International Space Station program became the “second phase” of global space cooperation.

International Space Station (ISS) as the second phase of global space cooperation

The collapse of the Soviet Union led to a very difficult period in history, but the situation gave the international political atmosphere another chance to build new perspectives in future space cooperation. At that time, almost all the attention of the international scientific community, including funding, was directed to a new project – the International Space Station (ISS). The ISS is a manned orbital station used as a multipurpose space research facility. Russia and the United States were the linchpins of its creation.

Initially, the idea of resuming joint flights did not involve such large-scale plans. When, in June 1992, US President George H. W. Bush and Russian President B. Yeltsin signed the Agreement between the Russian Federation and the United States on cooperation in the exploration and use of outer space for peaceful purposes, it was planned that only one American astronaut would visit the Russian orbital station “Mir”, and two Russian cosmonauts will have the opportunity to fly on the American space shuttle (*Puzanov, 2010*).

This idea was developed, and in September 1993, US Vice President A. Gore and Russian Prime Minister V. Chernomyrdin signed an agreement on the creation of the first ISS. It was agreed that the American side, in addition to deploying its segment of the ISS, would take an active part in the operation of the “Mir” station in the first phase. A purely technical project has become a very good element of political interaction, a kind of damping device in a very difficult relationship between the United States and Russia. To implement such a grandiose project, numerous working groups were created, for which the experience of the “Soyuz-Apollo” project was very useful.

On November 1, 1993, NASA and RSA signed the Detailed Work Plan for the International Space Station. In June 1994, a

contract was signed “On supplies and services for the “Mir” and ISS stations.” As a result of further negotiations, it was determined that, in addition to Russia (RKA) and the USA (NASA) – Canada (CSA), Japan (NASDA) and the countries of European cooperation (ESA), a total of 16 countries, would participate in the creation of the station, and that the station would consist of 2 integrated segments (Russian and American) and assembled in orbit gradually from separate modules (*Dal'nevostochnyj Federal'nyj Universitet, 2010*).

Under a separate contract signed in February 1995 between the Khrunichev Center and Boeing for a total of \$215 million, the first module of the ISS, the “Zarya” power unit, was manufactured, which was launched into orbit in November 1998 (*Newsruss, 2008*).

On November 2, 2000, two spacecraft docked, and since that moment, cosmonauts and astronauts have been constantly working on board the ISS. Further, an international decision was made to operate the station from 2009 with a crew of six people; two cosmonauts, one Russian and one American, will have to be on board at all times. This is an official international treaty, literally indicating that Russia and the United States intend and are ready to cooperate peacefully in outer space (*Tomashevskij, 2020, p. 138*).

The ISS, of course, has led to a political rapprochement between Russia and the United States, not only in space, but also on the world arena, on Earth. At a conference dedicated to the 20th anniversary of the ISS in 2018, Dmitry Rogozin, Director General of Roscosmos, said the following: “20 years of the station’s operation have shown that, despite all the contradictions and intrigues of ill-wishers, economic difficulties and social changes, specialists from many states, united by one peaceful task, can work, share experience, overcome difficulties and find compromises” (*Vnevedomstvennyj ekspertnyj sovet po problemam vozdušno-kosmicheskoy sfery, 2018*). Recent events are putting Rogozin’s own words to the test, not least of which whether they will prove true in the end even for himself.

It was also clearly shown that large international joint ideas cannot only bear fruit, but also start building a new future from scratch. Outer space creates the basis for

new areas of international cooperation, striving for existence without politics interfering. International cooperation expert I. Praik clearly describes the overall picture, explaining the reasons for the emergence of international projects. Usually, international cooperation reduces the cost of any project for each participant, although the total cost may increase. The advantage is that the more participants there are in an international project, the more knowledge, experience, stability and redundancy there is, especially in the field of security (*The National Academies Press, 2004*).

The joint program provided both parties with exactly what they needed: NASA received invaluable experience in long-term flights, without which it is impossible to plan expeditions to other planets and asteroids, and Russia received much-needed additional funding and the opportunity to extend the life of the orbital station.

The second phase clearly demonstrated that in modern conditions it is impossible to implement and finance such grandiose projects by one country. Even with the involvement of so many countries (at the beginning there were 16), there is tension in financing this project. An important factor is the rational use of developments carried out in other countries that did not have their own capabilities to carry out their programs of manned space flights. For example, Canada provided the ISS with a manipulator arm, without which the construction would simply have been impossible. Europe and Japan built science modules (“Columbus” and “Kibo”) and cargo transport ships, which were important means of delivering supplies and crews.

Results and reasoning

Space activity in the 21st century continues to be one of the most and curious areas of international cooperation and, at the same time, international competition. To one degree or another, all countries that can claim political, economic and technological leadership, not only at the global, but also at the regional levels, are involved in it. There are a host of other emerging “space powers” with ambitious plans for space exploration, including not only India, Brazil, Japan and the European Space Agency (ESA), but also private actors such as SpaceX, Boeing, Lockheed Martin, and Blue Origin (*Eriksson,*

Privalov, 2021, p. 382). That is, in the global competition, along with states, private corporations-suppliers and consumers of space services, equipment, and technologies, also participate. In fact, a new environment of international space cooperation is being formed that has increased technological possibilities for using space developments, and whose scope has dramatically expanded (*Karash, 2014, p. 58*).

The situation is even more complicated in the case of cooperation between more equal partners such as Russia and the United States. Each of them has to constantly protect its own developments as well as track the other's as much as possible.

In addition, the international political and economic environment of Russian-American bilateral cooperation is largely determined at once by their rivalry and their attempts to cooperate with third countries – China, the EU countries, the states of Latin America and the Asia-Pacific region, and even individual CIS countries. Many third partner countries of both Russia and the United States will be ready to exploit possible Russian-American differences for their own purposes.

The importance of space cooperation is emphasized by its place in the overall system of bilateral Russian-American relations. The failures that have occurred in some of Russia's space projects have had a dual effect on Moscow's position in relations with Washington. On the one hand, they diminished the technological prestige of Russian manufacturers. On the other hand, the failures drew the attention of the authorities to the difficulties that had accumulated in their space program, raising the importance to Russian leaders of state support and control. In the United States, the issue of supporting space projects is not questioned in principle – Congress tends to only cut or freeze appropriations for certain areas of space activities (*Karash, 2014, p. 59*). This behavior tacitly acknowledges that commercial space enterprises as of yet cannot displace government programs. For while they can reduce the cost of space projects, they remain financially dependent on them. That may change with the services prospective massive satellite constellations plan on rendering, such as Starlink, which SpaceX is in the process of completing.

At the same time, Russian-American cooperation in the space field is fraught with considerable risks, as the challenges wrought by present circumstances viscerally attest. Relations between Russia and the United States are sometimes characterized by a high level of conflict. Periods of thaw in bilateral relations and the desire to establish a dialogue are replaced by periods of exacerbation of former unresolved contradictions. The current aggravation has its origins events in Libya and Syria, changes in the deployment of American elements of the missile defense system in Europe, and the events in Ukraine, beginning in 2014, which have now blown up from the annexation of Crimea into a full-scale invasion in 2022. The external manifestation of the contradictions, as usual, was the “war of sanctions”. The sanctions affected entire sectors of the Russian economy, including strategic ones, such as the military-industrial complex and the space sector, but now they have been greatly ratcheted up even more. Russia has been cut off from the global financial system, and its Central Bank has had its overseas assets seized. There is even increasing talk of banning its energy exports, which are the basis of its economy.

One of the first big statements was the news of April 3, 2014 that NASA was suspending cooperation with Russia in the field of space on all projects except the ISS. “Given Russia's violation of Ukrainian sovereignty and territorial integrity, NASA is suspending cooperation in a number of areas with the Russian Federation” – this statement was made by NASA shortly after the beginning of the establishment of Russian sovereignty over the Crimean peninsula (*Karash, 2014*). This news was taken as evidence of the complete divergence of Russia and the United States in one of the few strategic areas where it was possible to establish a mutually beneficial relationship. However, NASA official representative Alexander Koptev said that there was no official notification of the break in cooperation with Russia. This was also confirmed by the head of Roscosmos, Oleg Ostapenko, in an interview with an ITAR-TASS correspondent (*Lebedkova, 2015*).

In August 2015, NASA extended an agreement with Roscosmos on the delivery of American astronauts on Russian “Soyuz” spacecraft to the ISS. According to the US

space agency, the change in the contract provides for the payment of an additional \$490 million to the Russian side (*TASS, 2015*). NASA Director Charles Bolden notified Congress that the need to extend the agreement with the Russian Federal Space Agency arose due to a possible lack of funds for the construction of new American manned spacecraft.

Thus, the United States was still forced to use the services of Russia to transport its astronauts to the ISS. Americans began flying to the station on Russian ships in 2012 after the shuttle operation was discontinued. The United States has decided to continue the ISS program until at least 2024. The leadership of Roscosmos also announced its intention to continue international cooperation on the ISS until 2031 (*Hernandez, 2022*).

Based on the fact that the ISS was the only project excluded from the NASA statement, Russia concluded that the ISS is a project that the American side will try to save at any cost, and reminded partners that cooperation on the ISS is mutually beneficial, but not equally: “The Russian segment can exist independently from the American one, the American segment cannot exist independently from the Russian one. Such is the specificity of the station itself” – said Deputy Prime Minister Dmitry Rogozin (*Lebedkova, 2015*).

It was the ISS that Russia made its main trump card in the “war of sanctions”, having received in June an offer from the United States to extend the operation of the ISS until 2024 and delaying the decision on this issue throughout 2014. Using the only powerful leverage it has, Russia has said it is considering alternative options to the ISS. While NASA has stated it wishes to extend the ISS until 2031 (*Roth, 2022*), that must be considered extremely uncertain as Russia has said it will end suspend participation after 2024 if sanction have not been lifted. Hence, cooperation between Russia and the US and Europe is all but extinguished.

Russia will no longer sell its RD-180 engines to the US, which are used on its Atlas 5 rocket, nor will it service the RD-181 engines used to power Northrop Grumman’s Antares rocket, which lifts the Cygnus cargo ship that resupplies the ISS. In addition, it terminated its launch operations of Soyuz at ESA’s French Guiana site. Not even

commercial space has been immune from the repercussions of this split. OneWeb’s batch of 36 satellites set to launch on March 4, were cancelled the day before when it refused Rogozin’s demand that they never be used for military purposes and that the UK government’s stake in the business be withdrawn (*Skibba, 2022*). On the space science side, Russia deemed NASA’s participation in its Venera-D Venus probe program “inappropriate.” (*David, 2022*), and perhaps most tragically, the long-delayed ExoMars rover, a project 20 years in the making, which was mere months away from launching has been mothballed—likely permanently (*Kruesi, 2022*). It seemed to herald the close of an era, with one space policy researcher remarking, “Basically, I think it’s the end of an illusion that working with your former opponent in space will spill over to better relations on Earth” (*David, 2022*).

In that pessimistic vein, even in the absence of the present rupture, two huge issues currently hinder the realization of the potential of long-term cooperation in space between the United States and Russia – the militarization of space and the use of private capital in its development (*Tomashevskij, 2020*). Military strategic goals in space only negatively affect the very idea of international cooperation and threaten the current space peace treaties. The militarization of space is not exactly a new idea, which has been developing since the 1980s in the USSR and the USA. One of the first space military programs was the American Strategic Defense Initiative, announced in 1983, since during this period of panic spread in the United States about real “star wars” from the USSR.

Decades later, we see a continuation of space-based military threats from both sides. The 2018 US National Defense Strategy firmly states that “outer space and cyberspace are the realm of warfare” (*US National Defense Strategy, 2018*). The same concept is spelled out in the military doctrine of the Russian Federation, developed in 2010. Moreover, in 2015 the Russian army integrated its air force with the military space forces, resulting in the creation of the Aerospace Forces of the Russian Federation. By 2020, the US planned to create an entirely new branch of the military, the Space Force, to participate in this

extreme competition in space. The purpose of this new branch of the military was identified by US Vice President Mike Pence in a speech, highlighting the threat posed by US adversaries: “Their actions make it clear that our adversaries have already turned space into a theater of war, and the US will not shy away from this challenge” (*Pence, 2018*). On December 20, 2019 the United States Space Force (USSF) was established when the National Defense Authorization Act was signed into law, creating the first new branch of the armed services in 73 years. The establishment of the USSF resulted from widespread recognition that Space was a national security imperative. The Mission – USSF is responsible for organizing, training, and equipping Guardians to conduct global space operations that enhance the way of joint and coalition forces fight, while also offering decision makers military options to achieve national objectives (*United States Space Force, 2022*).

International tensions strongly influence this sphere of politics. There is a growing need to find a common language with each other. The only way to have a dialogue in space is through an international treaty that sets out international rules for those involved in space exploration. Such an agreement exists and is valid. In 1966, the Treaty on the Principles of Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, was signed by the USSR, the USA and Great Britain and entered into force the same year. State Parties are prohibited from building and using any nuclear weapons facilities or any other types of weapons of mass destruction in outer space (*United Nations, 1966*). However, this treaty does not specify any prohibitions against the production of conventional weapons or the destruction of satellites. The problem here is that today's public world infrastructure is clearly dependent on satellite communications, and countries are becoming more and more concerned about the safety of their own satellites. How can they legally protect their satellites in space? If the answer is weapons, then a door will inevitably open to a new era of the arms race in space (*Tomashevskij, 2020, p. 142*).

As long as Russia and the US maintain their goals and initiatives in space without paying much attention to mutual space

goals, it will be impossible to get along with each other in the long run. In order to maintain and continue international cooperation in space, both countries must peacefully and closely focus on common interests and mutual problems in outer space, for example: removing space debris that interferes with absolutely everyone, or establishing international satellite control, similar to modern air traffic control. In this way, the future neutral space zone will change for the better and international relations will be able to develop peacefully, not militarily.

The second most pressing and contemporary issue for Russia and America in space is their role in future space exploration plans. It is worth noting that, according to the results of research in 2019, the space industry as a whole was estimated at 350 billion dollars (*Stanley, 2019*) and, of course, today this figure is higher, as each year more and more large enterprises begin to actively participate in space deals.

As for private efforts in the space business, it's no secret that America is leading the way in this matter, while Russia has relatively remained in the shadows. On the one hand, the race for private space exploration appears to be more effective than international cooperation. In the US, the rapid growth of privatization in outer space is positively affecting the entire economic situation of the country, but perhaps reduces the potential benefits of international cooperation with Russia. On the other hand, the Americans officially consider international space cooperation within the framework of commercial interests. According to NASA Policy Paper 1360.2B, “every international collaboration must be of some benefit to NASA and the United States”. As they involve multiple agencies from multiple governments, international projects always require more oversight, more finances and naturally become more complex in all respects. The ISS, whose operations have included cargo resupply by private space enterprises for several years, and more recently, crew deployments, is a very striking example of this problem (*Tomashevskij, 2020, p. 143*).

There are many different successful moments in the history of the space private sector in Russia and in the USA. One of the most successful private sector companies in

the world is the American space company SpaceX, which clearly demonstrates an important moment in space exploration – the influence of private capital on potential future international space projects. On December 21, 2015, SpaceX successfully launched 11 Orbcomm-OG2 private US government communications satellites into Earth orbit (Wall, 2015). On April 8, 2016, as part of the SpaceX CRS-8 mission, the first stage of a Falcon 9 FT rocket successfully landed on an offshore platform for the first time in rocket science history. On March 30, 2017, the same stage, after technical maintenance, was re-launched as part of the SES-10 mission and again successfully landed on the offshore platform. In total, 16 relaunches of first stages were carried out in 2017-2018 (Kopiev, 2018).

For the delivery of cargo to the ISS under the Commercial Resupply Services contract, the company receives from NASA a fixed amount of \$120 million for each mission (Svitak, 2014). On March 8, 2019, SpaceX successfully completed the first test flight of the Crew Dragon manned spacecraft to the ISS without a crew.

According to previous forecasts, by 2022 America was going to no longer buy seats in Russian rockets and Russian rocket engines. For the first time in almost a decade, the United States is no longer dependent on Russia for launching its astronauts to the ISS, which will most likely lead to greater divergence between the two space powers (Tomashevskij, 2020, p. 144). This is especially the case, in the aftermath of Russia's full-scale invasion of Ukraine. Indeed, what may be unfolding is a replay of the Cold War space race, as exemplified in the two separate programs for lunar exploration and settlement. This time around, however, there are a wider array of players in the West in the form of NASA's Artemis Accords, and in the East, China has taken the leading role in its partnership with Russia.

The US commercial space sector's development of capabilities that outpace even NASA's Space Launch System in some regards, let alone Russia or China, moreover, will further reduce the incentives for the US to cooperate with them. In 2022, Elon Musk's SpaceX set itself the ambitious goal of bringing the Falcon 9 rocket launches with Starlink satellites to one space launch

per week. On February 11, Elon Musk declared that the world's largest rocket, designed for missions to the Moon and Mars, is almost ready to fly. The company is awaiting launch clearance from the Federal Aviation Administration in March. SpaceX hopes to launch Starship from the Super Heavy booster into orbit "in a couple of months" (Musk, 2022).

These events clearly demonstrate the huge role of private capital and its impact on future plans for space exploration. To be sure, there is currently a sharp reorientation of power in the space industry from the Russian side to the American side, where the Americans will go further and deeper into space without Russian partners. The United States will not depend on Russia, and without that necessity, international dialogue about the future in space may gradually cease (Tomashevskij, 2020, p. 144).

The end of this dependency will be to Russia's detriment, since space cooperation with the United States has proven to be so advantageous. By collaborating, Russia has gained access to American space capabilities, forcing Russia to keep abreast of its quality standards, which are superior in some areas. The opportunity to learn from US management and marketing experience is similarly beneficial, as it is important both for modernizing Russia's space industry and better positioning Russian companies in the global space market. This gives Russia leverage over other countries, such as China, which has long been annoyed by the US-Russia partnership. China sees it as a political symbol of American and Russian superiority in space, and thus as the center for the "global management of the space sector's development." Russia also accrues monetary benefits from providing NASA astronauts flights on its Soyuz spacecraft to the ISS, and in the form of savings on space expenditures. Both have enabled an influx of funding needed for the development of its space projects (Bajkov, Bogaturov, Fenenko, 2016, p. 60).

In the coming century, the struggle for control over outer space and its unexploited resources will greatly affect interstate competition. Space offers the ultimate high ground from which to strike others, not similarly positioned, with impunity. Moscow and Washington have been leaders in space research for many years, such that they

currently represent the only states that have the facilities to carry out the full spectrum of space research (*Bajkov, Bogaturov, Fenenko, 2016*). Thus, they are in a position to establish a first-mover advantage in this emerging theater of conflict, which they are driven to achieve within the logic of mutual nuclear deterrence. Indeed, they already achieved that advantage with respect to global satellite navigation and communications systems, and have moved to the next step of developing weapons to be used in space. These include anti-missile defense systems and anti-satellite (ASAT) weapons, which have increased the importance of space research.

The prospect that the other will gain an advantage in this theater makes Russia and the US fear a quick breakup in space cooperation. This explains the parallelism of Russian and American space programs, such that emergence of a new program on in Russia spawns a counter response from the US, and vice versa. This fear also makes them suspicious of the other side's space cooperation with third countries. Americans are concerned about the growth of Russian-Chinese cooperation in space, as they believe that access to Russian technologies has enabled the PRC to develop a manned spacecraft and ASAT capability. Russia, in turn, fears that under the guise of space partnership, the United States is trying to draw other countries into cooperation on missile defense. Joint projects of NASA and the European Space Agency (ESA) for the study of deep space can become the technical foundation for the creation of the EuroPRO space echelon. Negotiations on the US rocket and space partnership with the ASEAN countries, which have accelerated since 2010, may create additional tension in the relations of these countries with the PRC, and, indirectly, with Russia (*Bajkov, Bogaturov, Fenenko, 2016, p. 64*). Recently, the Russian political elite have been talking a lot about the need for a reorientation towards China, including in the field of space activities. For China, the Russian experience in the creation and operation of orbital complexes turned out to be useful. As of 2020, China owns and operates the second largest fleet of spacecraft in orbit (after the US and ahead of Russia). China is one of three countries, along with Russia and the United States, which have the ability to

restore satellites and conduct manned space flights (*Facts-worldwide, 2020*).

Thus, the competitive nature of the emerging international space regime is determined by the remaining logic of mutual deterrence and the desire of the parties to preserve their potential for independent space exploration and technological development. This regime includes joint space programs, and has increasingly taken on competitive-cooperative features.

Conclusion

The widely shared desire to explore space, and its attendant high costs, has pushed states towards cooperation. This has long given people hope that it could serve as a strong foundation for peaceful relations. The Outer Space Treaty is an outgrowth of that hope. It states that signatories must be guided by the principle of cooperation and mutual assistance, and that its endeavors be carried out with due regard for the relevant interests of all other states. The most striking example of such cooperation is the "space race" between the United States and Russia, whose legacy is embodied in the ISS to this very day. What makes it so intriguing is that their deep commitment to cooperation in space is driven by the huge potential in this industry, in which they are the main competitors. While the US is currently recognized as the leader in the space sector, their capabilities are comparable, which magnifies the complexity of the partnership. As both execute a number of space programs on which they base their space strategies, they must guard their secrets while acquiring as much of their partner's innovations as possible. This complexity is compounded by the widening array of potential partners that they must also take into account. For international legal, political and diplomatic, financial and economic, scientific and technical, organizational, and marketing support for space activities are becoming the most important branches of state policy and promising areas even for multinational corporations. The key aspect of space activity, though, lies in its direct connection with the national security at the state and interstate levels.

Space cooperation is reaching a higher level, and the two countries are too few to carry out truly revolutionary projects. Now it is difficult to predict in which direction space

cooperation will develop, but we can expect the emergence of completely new configurations with the rapid emergence of a new participant in manned programs – China.

At the end of 2021, China had successfully launched 55 rockets, which is more than any other country. On February 10, 2022, China National Aerospace Science and Technology Corporation announced plans to make more than 50 launches in 2022. This will allow China to gain a foothold in the first place in the world ranking of space powers. By comparison, last year the United States made 43 launches and Russia 25 (Detinich, 2022). Thus, China is firmly establishing itself in space.

In January of this year, Xi Jinping, Head of the People's Republic of China said, "Exploring vast space, developing the space industry, and turning China into a space power is our eternal dream" (Detinich, 2022). He intends for China to break the record this year. In the course of more than 50 launches in 2022, China intends to launch 140 spacecraft into space and complete the construction of the Tiangong orbital space station. For the Chinese astronautics, this will

be a historic event. So ironically, it is likely that the very reluctance of Western countries to cooperate on a large scale with Russia in space after the completion of the ISS has unwittingly led to the enrichment of China with key scientific and technological achievements of Russian cosmonautics, which itself will soon be left in the Chinese space industry's wake. For the Celestial Empire pays much more attention to its space program than Russia.

As international relations experts Eugene Romer and Richard Sokolsky (2019) predict, the Russian-American dialogue should be restored, especially including the topics of arms control, strategic stability, and the regulation of competition in space and cyberspace. Romer and Sokolsky elaborate that without a serious conversation between the US and Russia, international relations will only get worse. Summing up, we can say that international cooperation in space between Russia and the United States has always been a difficult political topic for all circumstances, and that in the study of this cooperation it is now advisable to include China as a peer competitor within a tripolar structure.

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РЕСЕЙ МЕН АҚШ АРАСЫНДАҒЫ ҒАРЫШТЫ ЗЕРТЕУ САЛАСЫНДАҒЫ ЕКІ ЖАҚТЫ ЫНТЫМАҚТАСТЫҚТЫҢ ДАМУЫ

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**РАЗВИТИЕ ДВУСТОРОННЕГО СОТРУДНИЧЕСТВА МЕЖДУ РОССИЕЙ И США В ОСВОЕНИИ
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