DOI: 10.17803/2542-2472.2021.20.4.093-101

АНАЛИТИЧЕСКАЯ СПРАВКА О РЕЗУЛЬТАТАХ РЕАЛИЗАЦИИ НАУЧНОГО ПРОЕКТА № 18-29-15045 «МОДЕЛИ НАУЧНОГО И НАУЧНО-ТЕХНИЧЕСКОГО СОТРУДНИЧЕСТВА: ОСОБЕННОСТИ И ПЕРСПЕКТИВЫ МЕЖДУНАРОДНО-ПРАВОВОГО РЕГУЛИРОВАНИЯ»[1]

ANALYTICAL NOTE CONCERNING THE RESULTS OF IMPLEMENTATION OF SCIENTIFIC PROJECT NO 18-29-15045 «MODELS OF SCIENTIFIC AND SCIENTIFIC AND TECHNICAL COOPERATION: FEATURES AND PROSPECTS OF THE INTERNATIONAL LEGAL REGULATION»[2]

Natalya A. Sokolova, Dr. Sci. (Law), Head of the Department of International Law,
Kutafin Moscow State Law University (MSAL)
ul. Sadovaya-Kudrinskaya, d. 9, Moscow, Russia, 125993
nasokolova@msal.ru

Elvin S. Teymurov, Cand. Sci. (Law), Associate Professor, Department of International Law,
Kutafin Moscow State Law University (MSAL)
ul. Sadovaya-Kudrinskaya, d. 9, Moscow, Russia, 125993
esteymurov@gmail.com

A complex nature of scientific and scientific and technical cooperation, the importance of the results of cooperation for the whole mankind, the issues of the use of intellectual property products, economic problems, the use of spaces covered by the international legal regime require the States to join their efforts. The creation of an international legal framework that takes into account the interests of all the States, defines competent international organizations in the field of integration, presupposes the formation of high-quality and effective models of scientific cooperation.

The international law regulation in the creation and development of models of scientific cooperation, on the one hand, requires the definition and recognition of general principles that form the ideological basis of such scientific collaboration. On the other hand, it is

[1] Исследование выполнено при финансовой поддержке РФФИ в рамках научного проекта № 18-29-15045.

[2] The research was carried out with the financial support of the RFBR as part of the scientific project No 18-29-15045.

necessary to take into account the standards and features of international scientific and technical cooperation in various fields through the implementation of international scientific projects for the development of nuclear energy and energy efficiency, environmental protection, improving the efficiency of the legal regime of the Arctic, development of space and marine scientific research, *etc*. These areas are promising in the context of implementation of strategic interests of the Russian Federation.

Created models of scientific and technical cooperation should take into account the issues of differentiated responsibility of the States, the exchange of information, the development of technological and other standards.

Foresight in relation to models of scientific and technical cooperation involves not only identifying their key components and system connections. It also requires assessing the prospects for the use of such models, choosing the most appropriate model with due regard to the level of development of the States, ranking scientific and technological challenges, national interests and priorities of the Russian Federation.

As a result of the study, general characteristics of the models of scientific and scientific and technical cooperation are given and the features of its international legal regulation are defined, taking into account the strategic interests of the Russian Federation.

The team of the scientific project:

— has analyzed the proceedings of domestic and foreign studies, judicial practice (mainly of international judicial bodies) concerning the problems of international legal regulation of scientific and scientific and technical cooperation;
— has examined the international law experience of institutional and conventional regulation of scientific and technical cooperation;
— has studied modern problems of the concept of the common heritage of the mankind (on the example of the World Ocean and celestial bodies);
— has examined the legal regime of scientific research in the polar regions of the world;
— has substantiated on the basis of interdisciplinary research the models of scientific and technical cooperation, including optimal models for the Russian Federation, taking into account the priorities of its scientific and technological development.

In accordance with the objectives of the study, close attention was paid to the examination of legal models of international scientific and technical cooperation in the field of nuclear, marine and space research, as well as in the field of environmental protection.

Obtained scientific results have a pronounced interdisciplinary character at the intersection of legal science, political science, oceanography, physics, astronomy and ecology, covering not only the study of scientific activity in the relevant fields, but also the organizational conditions for their implementation and development.

Global technologies generated by scientific and technological progress have required scientific and technical cooperation of States, as a result of which the scope of international legal regulation has significantly expanded. The conventional model of scientific and technical cooperation is implemented in the form of international agreements and treaties, the significance, potential and characteristic features of which must be taken into account to increase the effectiveness of this model:

— the purpose of scientific and technical cooperation consists not only of effective interaction to obtain new knowledge, but it also involves subsequent use, including the use to protect the interests of the State and to solve global problems;
— scientific and technical cooperation is an important element of bilateral and multilateral relations that contributes to their development, enhances good friendly relations between countries and peoples, creates prerequisites for the development of mutually beneficial trade and economic ties and, at the same time, facilitates obtaining advantages in the economic and security fields. On the basis of successful interstate cooperation in the field of scientific and technical cooperation, relations regulated by private international law are subsequently developing more actively;
— taking into account the Russian experience, international scientific and technical cooperation can develop in several directions. Firstly, the coordination direction, as it was within the CIS and resulted in the active development of bilateral relations; secondly,

the development of integration cooperation within the EAEU; and thirdly, a special format of cooperation within the BRICS;

— international scientific and technical cooperation is actively developing attracting the attention of the States, which is expressed in the form of accelerated international legal regulation, the search for optimal models of joint scientific activity, the use of the obtained scientific results, the potential of the principles of international law. International rulemaking in the field of scientific and technical cooperation has a peculiarity caused by the need for proactive legal regulation, *i.e.,* the development of international law rules not in response to adverse situations, but in anticipation of their occurrence in order to prevent harmful consequences;

— cooperation in the scientific and technical sphere is carried out in accordance with special bilateral and multilateral agreements between organizations of partner countries (interstate cooperation), or joint scientific and scientific and technical activities of scientific communities and individual scientists from different States. Indeed, individual contacts between scientists and scientific organizations are important, this has long been clearly recognized at the international level. At the same time, individual contacts between scientists and scientific organizations neither ensure the implementation of the state strategy in this area of cooperation nor form this strategy. Such a function should be implemented by the State. On the contrary, this interaction should be based on the foundation of interstate scientific and technical cooperation;

— the sphere of scientific and technical cooperation is most open to various classical and more flexible formats of interaction. The paradigm of such broad cooperation through the sphere of science and technology is also aimed at achieving certain political goals of cooperation.

The authors have established that the legal models of international scientific and technical cooperation can be understood as an image (description) of the regulation of the interaction among subjects of international law and with other actors who do not have international legal personality reflecting the most significant characteristics of this interaction, including: a conceptual and ideological basis, limits of regulation, a range of legal regulators, a status and activity of the subjects, legal risks and expected results of interaction.

Taking into account the forms of international cooperation, it is proposed to identify conventional and institutional models of international scientific and technical cooperation. Such differentiation encourages better understanding of the legal models of international scientific and technical cooperation and, to a certain extent, it is provisional, since they both are closely related and reflect different aspects of the legal model. The institutional model characterizes the status and activities of the subjects to a greater extent, whereas the conventional model of international scientific and technical cooperation primarily reflects a set of legal regulators of the subjects' interaction. At the same time, the conventional model is not limited exclusively to international treaties and customs, and it also includes instruments containing soft law norms.

MARINE AND SPACE RESEARCH

The formation of the models of scientific and technical cooperation involves the analysis of individual areas of international scientific and scientific and technical cooperation that are carried out in the form of scientific research. Such areas include international legal regulation of scientific research in outer space, Polar Regions, nuclear and energy security.

The conceptual basis of the conventional model of international scientific and technical cooperation in the field of marine scientific research is formed as a result of the interaction between States, international organizations and other actors in order to promote the expansion of knowledge about the essence of phenomena and processes occurring in the marine environment and relationships between them with due regard to the rights and obligations of other States through the conclusion of bilateral and multilateral agreements based on the provisions of the Convention of 1982.

Although the 1982 UN Convention on the Law of the Sea does not contain the concept of marine scientific research, most of the preliminary proposals in one form or another are reflected in the general provisions of Part XIII of the 1982 Convention. At the same time, the issue of distinguishing scientific research from other types of activities has repeatedly become the subject matter of international judicial disputes. The International Court of Justice in the case *Whaling in Antarctic* (Australia v. Japan) in 2014 evaluated the criteria of marine scientific research highlighted by experts. The Court pointed to the three signs of marine scientific research:

1) defined and achievable objectives (questions or hypotheses) that aim to contribute to knowledge important to the conservation and management of stocks;
2) «appropriate methods», including the use of lethal methods only where the objectives of the research cannot be achieved by any other means;
3) the avoidance of adverse effects on stock.

The 1982 Convention establishes that such research should be conducted exclusively for peaceful purposes, using appropriate scientific methods and means, without interfering with the implementation of other legitimate activities.

Cooperation should result in simplification and creation of conditions for joint marine scientific research, ensuring the availability of information about the main scientific programs and their objectives, as well as the knowledge resulting from such research, through their publication and dissemination using appropriate channels.

As a result of the conducted research, it was found that the conventional model of international scientific and technical cooperation in the field of marine scientific research is based on the 1982 UN Convention on the Law of the Sea and includes, depending on the specific situation, bilateral and multilateral international treaties, decisions and resolutions of competent international organizations, as well as numerous acts containing soft law norms aimed at specifying various aspects of interaction.

The identification of conventional and institutional models of international scientific and technical cooperation, their structural elements, as well as the results of the study of conventional models on the example of marine scientific research determined the need for further examination of institutional models of international scientific and technical cooperation and their interrelations, as well as organizational and legal forms for the creation and use of global research infrastructure, identifying their advantages and disadvantages, the possibilities of application and adaptation to projects of the «megasience» class in Russia.

The institutional model of international scientific and technical cooperation characterizes the status and activities of subjects. In the field of marine scientific research, it is mainly expressed in the establishment of international intergovernmental and non-governmental organizations. European research infrastructure consortia act as an independent institutional model.

As a result of the conducted research, it was found that institutional models of international scientific and technical cooperation can be divided into ecosystem and collaboration models. Ecosystem models create the necessary legal, organizational, economic and other conditions for international cooperation and joint marine scientific research without carrying out direct scientific research. Collaboration models are created directly for the implementation of international scientific research. There is no strict separation between them, however, if the former are mainly focused on creating the necessary environment and conditions for simplifying and strengthening international scientific and technical cooperation, then collaborative models mainly adapt the developed mechanisms of interaction to the needs of a specific project.

To determine the characteristic features, the authors examine in detail the most significant models in the field of marine scientific research, namely: the institutional models of international scientific and technical cooperation of ecosystem type (Intergovernmental Oceanographic Commission of UNESCO and Scientific Committee for Ocean Research) and of collaborative type (European Consortium of Research Infrastructure «European Center for Marine Biological Resources» and GRID-Arendal). Ecosystem models make the most noticeable contribution to the formation of regulatory and organizational frameworks

for the implementation of international projects in the field of ocean research and their financing. They attract a significant number of bodies and programs of international intergovernmental and non-governmental organizations, specialized national scientific institutions, concerned structures and individual scientists to participate in them. Institutional collaborative models carry out international research projects and act as a unifying platform for various research institutions and scientists, based largely on the organizational, financial and structural basis developed by ecosystem models.

Conventional and institutional models of international scientific and technical cooperation are also applied in the field of space research. International scientific and technical cooperation in this field, in addition to sharing the burden of financial costs, the formation of multinational research groups and the exchange of data between their participants and the entire scientific community, in some cases is caused by the specifics of the phenomena under study that require participation of various States. For example, the study of the relationship between the solar wind, the magnetosphere and the ionosphere, the physical processes of magnetospheric space storms require a significant number of orbital and ground-based sources located on different parts of the Earth, which predetermines the necessary and mutually beneficial nature of cooperation.

Institutionally, international cooperation in the field of space exploration and use is carried out within the framework of various intergovernmental and non-governmental organizations: COPUOS, WMO, UNESCO, WHO, ITU, ICAO, ESA, COSPAR, *etc*. Despite the fact that the subject matter of agreements on international scientific and technical cooperation in the field of space research in some cases includes national scientific institutions and other organizations, fundamental changes in the structure of relations are not taking place. National institutions, whether academies of sciences or State corporations, when concluding international agreements, perform not private, but public functions delegated to them by the relevant State. Unlike international scientific and technical cooperation in the field of marine research in the space, there is a strong dependence even of non-governmental institutions on the results of the implementation of state space programs.

Currently, there is an active transformation of space exploration associated with the expansion of the individuals' participation in this activity. Enhancing participation of private actors is becoming a priority for a number of national space agencies. Taking into account concerns about the effectiveness and benefits of international cooperation in major international projects and accelerated involvement of the private sector in the implementation of space projects, a departure from the practice of implementing large-scale international scientific projects in space is expected. A striking example of this is the refusal of further operation of the ISS, which was first voiced by the United States. States with strong and independent space programs will determine the further development of international space research, allowing other countries to join them only in certain cases and to their joint interests. In fact, this is now being observed by the example of the Artemis Agreements of 2020, when the United States offered its understanding for the further development of relations concerning space exploration, and other states were given a choice: whether to join, implement their programs or stay «out of the game.»

The biggest part of the scientific and technical cooperation in space research is being transferred to the field of public-private partnerships. States have sufficient regulatory tools to administer these studies for socially significant purposes. And interstate scientific and technical cooperation will continue in the order of relatively short-term interaction on certain issues of space research, whether it is the installation of a certain module on a particular partner mission, the implementation of joint tests or observations on modules, *etc*.

NUCLEAR RESEARCH AND MEGASCIENCE

A leading role in implementation of international scientific and technical cooperation continues to be played by States pursuing national interests and determining the vector of its

development. At the same time, the composition of participants in scientific collaborations includes a significant number of entities who cannot be equated with traditional subjects of international law due to their legal status or they do not fall under the classification of subjects of law, while their participation in international scientific projects is caused by the realities of scientific cooperation and becomes a practical prerequisite for the projects' success and effectiveness.

In this regard, a significant number of models of international scientific and technical cooperation of the Russian Federation, leading European countries and the United States of America in the nuclear field have been studied. Based on the conducted research, it was revealed that there are two key factors identifying the legal aspects that determine the effectiveness and success of legal models of international scientific and technical cooperation: organizational and legal registration (the establishment of a separate independent entity or the use of existing «umbrella» legal structures) and used legal instruments and the law governing the activity.

The study proves that the organizational and legal model of international scientific and technical cooperation both using existing international intergovernmental organizations of the framework type or legal entities under national law, and establishing new special entities, can be schematically represented as a four-level system. The first level includes, depending on the organizational and legal form of international scientific and technical cooperation, the existing legal framework of activities of an international intergovernmental organization or the national legislation of the State where the legal entity is established. The second level is the internal law of an international intergovernmental organization or a local regulatory act issued by an «umbrella» structure. The third level consists of various memoranda of understanding. The fourth level is optional and includes, as a rule, various bilateral agreements of the organization itself.

It should be borne in mind that the great advantage of using umbrella-type organizational and legal models for international scientific and technical cooperation in the creation and operation of a global research infrastructure in the nuclear field is caused by the readiness of most of its tools and mechanisms that have already proven their efficiency in practice. It is only needed to adapt them to the specifics of a certain project. The possibility of implementing a significant number of projects is also necessary. However, if it is necessary to ensure a clear equity participation of partners in the implementation of the project, their financial obligations and a management structure dependent on them. Then, the creation of a special project-type legal entity (international or national) is a more appropriate form.

Based on the «legal environment» within which the models will function, the use of an international intergovernmental organization implies certain benefits, immunities and privileges, withdrawal from the jurisdiction of the host State regarding an agreed range of issues, *etc*. In modern conditions, an important factor is that it is much more difficult to subject international intergovernmental organizations to politically motivated unilateral restrictive measures («sanctions»). At the same time, the use of the construction of a legal entity under national law can provide greater efficiency, flexibility and managerial cheapness of the process, especially due to the fact that exceptions from national law can also be provided for them.

At the same time, according to the results of the analysis, the most successful way is to develop a special organizational and legal entity that is mentioned in the draft federal law «On Scientific, Scientific and Technical and Innovative Activities in the Russian Federation» — an international research organization.

Within the framework of the study, the authors examined the approaches being formed in the Russian doctrine and jurisprudence to understanding what a «unique scientific installation of the megascience class» means from the legal point of view of the legal science. The study examined the correlation of this concept with the internationally recognized term «a global research infrastructure,» analyzed the legal nature of the global research infrastructure, its types and distinctive features, on the basis of which recommendations

were developed regarding the draft federal law «On Scientific, Scientific and Technical and Innovative Activities.»

The peculiarity of Megasience is that its task is to obtain fundamentally new knowledge that significantly complements or even changes our ideas about the world around us, significantly and even abruptly advancing humanity in its cognition of reality. The state of modern science is such that this cannot be achieved without international scientific cooperation, collaboration, providing intellectual exchange both in terms of existing experience and the results obtained. Thus, such a characteristic as a breakthrough nature of the results obtained corresponds primarily to the concept of «megascience» as an activity. On the other hand, «mega-tasks» require a special «mega-infrastructure» for their solution, the distinguishing features of which, in turn, are the scale, labor intensity, the need to attract the maximum possible resources — from intellectual to material and financial — for its creation and operation,.

Within the framework of international institutions devoting their activities to international scientific cooperation for the creation and use of global research infrastructure facilities (the OECD Global Scientific Forum, established by the G8 in 2008, the Group of Senior Officials on Global Research Infrastructures, the European Strategic Forum on Research Infrastructures functioning within the EU), it is customary to distinguish two types of research infrastructures, including global ones: 1) geographically localized infrastructures (installations) located in one place — single-sited research infrastructures (facilities) and 2) international distributed research infrastructures consisting of installations and other equipment located in different countries, combined into one network for the implementation of specific scientific projects.

Based on the results of the study, the following definition of the global research infrastructure was proposed: physically large, expensive, unique in their technical characteristics equipment complexes designed for conducting long-term scientific research aimed at obtaining new breakthrough knowledge, constructed and operated in the order of international cooperation (collaboration) between states, international organizations and other actors that do not have international legal personality (state agencies, scientific institutes, financing institutions), significantly complementing or changing perceptions of reality. Such an infrastructure can be geographically localized in one place in the form of a large installation, or it can be distributed (be a network of interconnected installations within the framework of the implementation of one centrally managed scientific project).

It seems that the domestic term «unique scientific installation of the «megasience» class (international class)» has the greatest overlap with such a type of global research infrastructure as geographically localized (single-sited) large research infrastructures. In order to bring the legal terminology in the field of «megascience» into line with the global one, it is necessary to consider the possibility of including the concept of «a global research infrastructure» in the draft federal law «On Scientific, Scientific and Technical and Innovative Activities» along with the definition of «an infrastructure of scientific, scientific and technical and innovative activities» (Article 2) the concept of «global research infrastructure» («global infrastructure of scientific, scientific and technical and innovative activities»), and in chapter 8 (Scientific and technological equipment, equipment for collective use) articles concerning two types of global research infrastructure — geographically localized and distributed — should also be included.

ENVIRONMENTAL PROTECTION

A complex nature of scientific and technical cooperation presupposes the interaction of States in a variety of areas, which also include environmental protection. The study substantiates the special role of international scientific and technical cooperation in the field of environmental protection. International scientific and technical cooperation can act as an independent subject of regulation to ensure environmental protection, as one of the areas

of cooperation, or act as a means of the most effective implementation of international obligations. On the one hand, environmental protection facilitates scientific and technological development. On the other hand, it encourages international legal regulation of interaction between the States, since environmental problems in principle cannot be solved without cooperation, and, currently, without active cooperation in the field of science and technology.

Bilateral agreements or memoranda of understanding constitute an important form of international scientific and technical cooperation for the purpose of environmental protection. Within the framework of bilateral agreements, States are more interested in substantive issues of scientific and technical cooperation than in just general directions of cooperation. Unlike the practice of previously concluded agreements that provided exclusively for the development of cooperation in mutually agreed areas (priority areas or specific projects), the newly concluded agreements, taking into account mutual relations between specific States in the field of science and technology, rely on the principle of equitable contributions and benefits, the principle of comparable access to scientific and other programs, *etc*. as principles governing relations in the field of science and technology between the two states.

Memoranda of understanding concerning development of science and technology for environmental protection represent a softer form of establishing and developing bilateral relations. However, they regulate the issues of cooperation in the field of science and technology in relation to solving environmental problems in more detail. These issues can be resolved not only between States that border each other. This specificity must be taken into account also by other States.

Any model of international scientific and technical cooperation needs to determine the means by which it will be implemented or it will function. The key means of scientific and technical cooperation in the field of environmental protection is represented by the provision of technical assistance to facilitate the implementation of environmental agreements that can be considered through the obligation to cooperate or through the principle of common but differentiated responsibility. Transfer of technology to developing countries represents another means that has been developed on the basis of multilateral agreements. One of the most developed is the mechanism of scientific and technical cooperation within the framework of the 1992 Convention on Biodiversity. In order to implement international scientific and technical cooperation in the field of conservation and sustainable use of biodiversity, a mediation mechanism was established. The mediation mechanism includes the official website of the Convention, a network of national mediation and coordination mechanisms and various partner institutions. Its main goal is to implement the Strategic Plan for the Conservation and Sustainable Use of Biodiversity 2011–2020. The results of the study of international scientific and technical cooperation in the field of rational use and protection of freshwater resources show that it is carried out within the framework of international organizations and various bilateral and multilateral commissions and it is a necessary condition for developing an appropriate legal framework for rationalizing the use of freshwater and ensuring sustainable development.

Based on the conducted research, promising areas of cooperation concerning environmental protection based on the development of international scientific and technical cooperation have been identified. They include:

— prevention and management of pollution of various environments, such as air, water, soil, with various substances, including hazardous and solid waste, persistent organic pollutants and other toxic substances;
— development of environmental science, emergency response, environmental threats to human health and ecosystems;
— ecosystem restoration;
— environmental policy and management;
— environmental education and public awareness;
— development, implementation, compliance with and enforcement of environmental law.

Artic Cooperation serves as a good example of how scientific and technical cooperation in these areas allows States with different interests, having different political stances, to find common solutions. As a priority, the States seek to develop scientific research and technologies to be used in the Arctic. Science and technology development for the the Arctic exploration is declared as one of the main directions of the Russian Federation state policy implementation in this region. At the same time, understanding the complexity of conditions in this region and being aware of the interest of joint use (shared use) of the Arctic infrastructure, the States seek to use the potential of international cooperation in the field of science and technology.

The Arctic Council plays an important substantive and organizational role in scientific cooperation in many ways. The initiatives proposed by the Arctic Council in various formats, e.g., the working group on sustainable development, the emergency prevention, preparedness and response program, the Arctic monitoring and assessment program, can be assessed as a search for ways of effective cooperation, but only with the use of scientific potential. These initiatives contributed to the gradual development of the idea of concluding the Agreement Enhancing International Arctic Scientific Cooperation in 2017. The Agreement «contains the legal obligations of the parties relating, first of all, to facilitating the activities of career scientists engaged in research related to the problems of the Arctic». The Agreement is framework in nature, since it provides for the resolution of many important issues on the basis of special agreements and arrangements.

The results of the study allow us to conclude that the most important aspects of determining the legal regime of international scientific cooperation in the Arctic include:

— using the experience of international law regulation of scientific cooperation by means of special agreements;
— using the experience of developing scientific cooperation at the non-governmental level;
— regulating marine scientific research on the basis of the 1982 UN Convention on the Law of the Sea;
— comparing the experience of regulating scientific research in other regions, albeit significantly different in terms of their legal regimes from the Arctic region;
— recognizing the importance and necessity of developing international scientific cooperation does not mean that problems may not arise in its implementation, for example, due to the access of scientists from different States, given the strategic importance of the regions of the Arctic for the States that exercise their sovereignty in such regions.