

International Legal Aspect of Scientific (Scientific and Technical) Activity Regulation

Demian V. Smernytskyi, Vitalii P. Bakal, Mykola P. Budzynskyi, Yevhen V. Samus, Maryna V. Tryhubenko

Abstract: *The article addresses the main aspects and issues of international legal regulation of scientific and technical activities. The basic content of international legal regulation is revealed and its three-level system is singled out. The main deficiencies in the construction of such a system are determined, in particular, the lack of flexibility regarding its international legal regulation. This strips many forms and methods for the implementation of international scientific relations of the adequate legal support level. The major theoretical views on the processes of international legal regulation of scientific and technical activity are reflected. An estimation of the international economic law impact on the formation process of international legal acts system in the field of scientific and technical cooperation is executed. The possibility of differentiating such a bulk of international legal acts into a separate branch of international law is investigated. A special attention is paid to the study of the regional level of international legal regulation of scientific and technical activities. The main deficiencies and advantages of such regulation are highlighted. The necessity of the large-scale involvement of non-governmental international organizations in this process was emphasized. This will provide a new vision on the perspective for the development of international scientific and technical cooperation and its international legal regulation. The existence of a stable viewpoint regarding the necessity of considering international legal acts in the sphere of scientific and technical cooperation as a means of stimulating the competitive advantages of individual states is revealed. The standpoint regarding the opinion that such cooperation can be used as an instrument of pressure from the more developed countries to emerging economies is explored. The necessity of expanding the possibilities of international legal regulation of scientific and technical activity is substantiated.*

Index Terms: *Industrial property, international legal regulation, research and development, scientific and technical activity, scientific and technical cooperation.*

I. INTRODUCTION

The current studies devoted to the state of international legal regulation of scientific and technological activities

mainly address two aspects: the purpose and content of international legal cooperation in the scientific and technical sphere as well as the mechanisms of interstate relations. For instance, researcher [1] emphasizes the fact that there is a need for intensification of bilateral relations, while the global level will remain a basic level at which the fundamental forms and methods for regulating relations will be developed and implemented. According to [2], the key task of international legal regulation in this area is to ensure the balanced development of the innovation system and technology transfer process. Scientists in [3]-[5] emphasize the economic orientation of international cooperation in the sphere of science and technology. However, as noted in [6], one should not disregard the ethical issues of using the results of scientific research and development. That is, regardless of the level of international legal regulation of scientific and technical activities, one should always keep in mind the ethical aspect of the problem of the distributing the results of such cooperation. A noteworthy approach to the analyzed issue can be found in the works [7]-[9], who independently of each other address the scientific and technical cooperation as an instrument of foreign policy in developed countries. Instead, in [10] suggest unification of international legal instruments for regulating scientific cooperation in order to equalize the opportunities for participation in such cooperation in most countries of the world. At the same time in [11] pay much more attention to the regional aspect of cooperation in the scientific and technical sphere. Also, researcher [12] deepens this issue even more, considering the international legal regulation of the EU's scientific and technical activities with other countries. Moreover, as for the EU, the researcher arrives at the conclusion that it is necessary to strengthen protectionist policies in this direction. Scientist [13] goes as far as to conclude in his research the priority of scientific and technical cooperation for the EU in terms of achieving the goals of civilization development. In work [14], by contrast, focuses not on the EU but on scientific and technological cooperation within the OECD. In [15] arrived at the conclusion that scientific and technical cooperation is a separate area of international pressure of the developed countries on the emerging economies, in particular through the introduction of restrictions on technology access. Researchers in [16] hold a similar standpoint, but they point out that due to international legal acts in the sphere of scientific cooperation it is possible to influence other branches of the economy and the level of development of the entire country.

Manuscript published on 30 August 2019.

*Correspondence Author(s)

Demian V. Smernytskyi, State Research Institute of the Ministry of Internal Affairs of Ukraine, Kyiv, Ukraine.

Vitalii P. Bakal, State Research Institute of the Ministry of Internal Affairs of Ukraine, Kyiv, Ukraine.

Mykola P. Budzynskyi, State Research Institute of the Ministry of Internal Affairs of Ukraine, Kyiv, Ukraine.

Yevhen V. Samus, State Research Institute of the Ministry of Internal Affairs of Ukraine, Kyiv, Ukraine.

Maryna V. Tryhubenko, State Research Institute of the Ministry of Internal Affairs of Ukraine, Kyiv, Ukraine.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Incidentally, this is shown in [17], where studied American-Iranian relations and [18] with the example of Sino-American relations in the sphere of scientific and technological cooperation. In spite of the fact that the above-mentioned research on the use of scientific and technical cooperation as a means of intergovernmental confrontation is unbiased, in our opinion, the main emphasis within this study will be placed on addressing the issue of the international legal acts effectiveness and mechanisms of legal regulation they offer. Despite a sufficient number of researches, there remain a number of unaddressed problems today – in particular, in the search for new means of regulating international cooperation in the scientific and technical sphere, which, in terms of mobility, flexibility and efficiency of legal mechanisms, corresponded to the needs for the intensity of development of science and technology. The international research results are linked to the level and profile of contemporary global threats, as science expands the capabilities for state-level opposition, shifting the threat to the information space. With this in mind, it seems expedient to seek the new international legal means to restrict the use of the findings of scientific research in the military sphere, to protect the intellectual and industrial property rights from third-party infringements, especially if they are aimed at using such findings to create global threats in the security sphere. All this enables us to draw up a set of hypotheses that require verification. First, it is believed that the current level of international legal regulation of scientific and technological activities is significantly lagging behind the pace and needs of the scientific and technological development itself. Secondly, the instruments of international legal regulation need unification in order to balance the rights and capabilities of the states to access technology and the results of scientific research that are of the key importance to civilization evolution. Taking into consideration all of the above, the main question that is converted into the purpose of this study is the extent to which the level of international legal regulation of scientific and technological activities must be consistent with the objectives of achieving sustainable development in the world, or is it an additional tool for the protection of industrial property and the findings of scientific research, which forms the competitive advantages of socio-economic and industrial development of the entities under international law.

II. MATERIALS AND METHODS

In order to carry out a comprehensive and thorough study of the content, methods and nature of international legal regulation of scientific as well as scientific and technical activities, we used a considerable volume of relevant international acts, including conventions, declarations, policy papers and other world and national documents.

Firstly, of the scientific interest are the results of the UN Conferences on the Application of Science and Technology for the Benefit of the Less Developed Countries, which in particular adopted the Programme of Action to use the achievements in the field of science and technology to ensure a proportionally balanced and sustainable development of all countries, including the emerging economies and “third world” countries.

Also, the objects of the study are international conventions adopted both within the UN and outside the cooperation in this organization. For example, such a system convention is important as the Paris Convention for the Protection of Industrial Property of March 20, 1883 [19]; General Assembly Resolution 60/45 of 08.12.2005 [20]; General Assembly Resolution 2222 (XXI) [21]; UN Convention on the Law of the Sea [22]; Patent Cooperation Treaty [23]; General Assembly Resolution S-18/3 of May 1, 1990 [24], etc. All the aforementioned international legal acts regulate either the general principles of the implementation of scientific and technological activities, technology transfer, or the implementation of the programmes of scientific and technical cooperation in a particular field or sphere. However, one should also take into consideration the existence of a number of international legal instruments in the field of scientific and technical cooperation, concluded within the framework of one or another international organization, in particular the EU, OECD, CIS. For example, it is necessary to set up the Technological Program of the UES "Eureka", which is aimed at coordinating the cooperation between the states in the scientific sphere; a Scandinavian program of cooperation in the educational sector, according to which unified standards and requirements for curricula and research have been set in countries such as Denmark, Iceland, Norway, Finland, and Sweden. Similar programs are also accessible, but with a wider range of issues within the framework of the African Scientific and Technical Alliance, as well as the 1990 Antigua Declaration concerning the scientific and technological development of the countries of Central America. Within the CIS there is also the Convention on the status of international scientific and research centers and scientific organizations SND [25]; Agreements on Interstate Exchange of Scientific and Technical Information [26], etc. The array of the abovementioned international legal acts and the analysis of the results of the international organizations activities was studied with the help of a wide scope of scientific knowledge, in particular, using the methods of systematic, structural and functional analysis, formal logic, phenomenological, hermeneutic methods, as well as the methods of dialectics, synthesis, incorporation, etc. In itself, the application of a systematic approach made it possible to cover the general principles of the implementation of international activities in the scientific and technical sphere, which for its part reveals not only the essence of processes, but also considers the deficiencies of such cooperation, identifies weaknesses and imbalance of scientific research results distribution, the weakness of some participants in international relations with reference to safeguarding such results, etc.

III. RESULTS

The analysis of the array of international legal acts in the sphere of scientific (scientific and technical) activities regulation, as well as modern research on the issues of their effectiveness and expediency, make it possible to draw a number of indispensable conclusions which in our opinion are utilitarian for Ukraine. The obvious fact is that the entire array of international legal instruments regulating the analyzed sphere is divided as follows (Fig. 1).



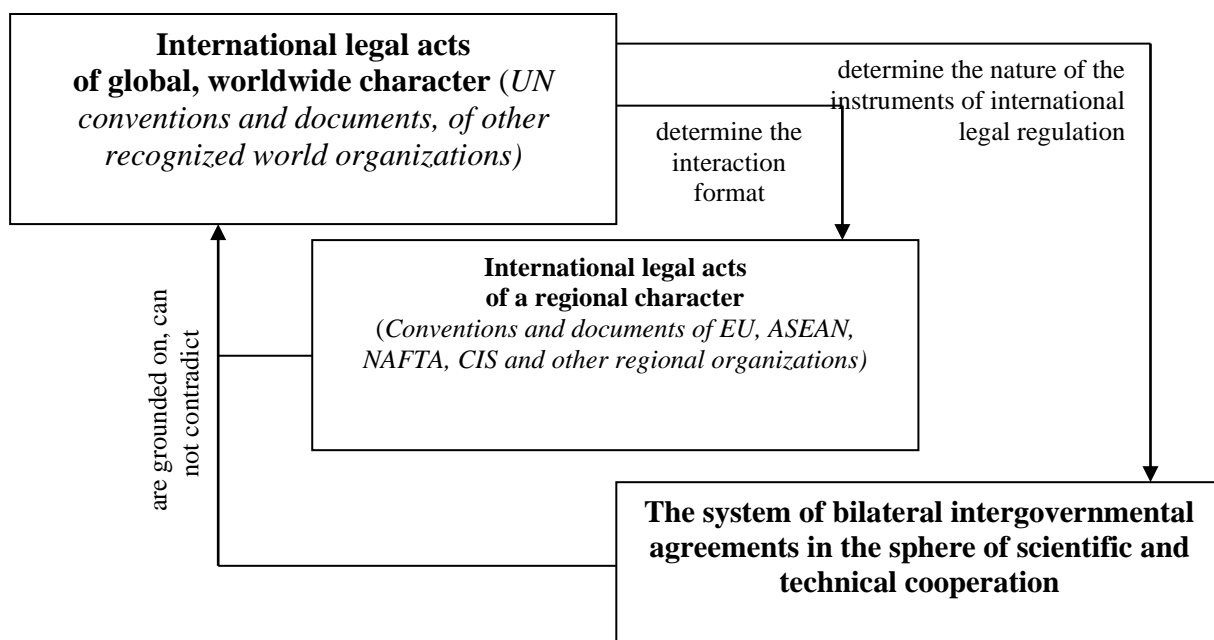


Fig. 1. The system of international legal regulation of scientific as well as scientific and technical activities

The first structural level is the international legal global level of scientific and scientific and technical activities regulation, which is formed by a system of international conventions, declarations and other acts issued or accepted by the global recognized actors of international law of the supranational level. In particular, of such type are the UN bodies, namely: UNIDO, UNESCO, UNDP, etc. Moreover, internationally known are the sources that are significantly older than the UN and organization documents of the international legal regulation activities in the sphere of scientific as well as scientific and technical cooperation. In particular, this is the case of the Paris Convention for the Protection of Industrial Property [19].

The documents of the UN Conference on Science and Technology, as well as within UNDP and the UN Science and Technology Center are also universal in their essence. The latter has in particular achieved the establishment of the global Advanced Technology Alert System (ATAS), as well as the implementation of the UN Action Plan for Promoting and Implementing Technical Cooperation among the Developing Countries. The whole system of instruments for regulating international relations in the sphere of scientific cooperation, which has been created and operates within the UN, is characterized by one more important aspect – it is an element of ensuring the sustainable development of mankind. Therefore, the main emphasis in regulating these relations is directed at expanding the possibilities for cooperation of states in the sphere of science and technology, as well as in the field of exchange and access to scientific achievements. The scientific and technical sphere at the worldwide level is considered by the world community as an environment in which new solutions to global challenges to human development can be created and to overcome the most dangerous risks and challenges of the 20th century. Therefore, the instrument of international legal regulation of the analyzed type of activity at the abovementioned level is

primarily characterized by cooperative and stimulating mechanisms.

Conversely, a more rigid regime for regulating scientific and technological activities is traced at the regional level, in such communities as the EU, NAFTA, CIS, G7, G20, etc., the scientific sector is a highly competitive branch of socio-economic activity. In other words, it serves as an opportunity for the intensification of the states' industrial and economic development level, and therefore the scientific and technical sphere needs an appropriate protective instruments profile and a certain unified approach to regulation. For example, the scientific and technical activities' results safeguarding and the requirements for scientific research and the procedure for legalizing (patenting) their results in the EU legislation has a pronounced protectionist character in relation to the EU member states, such as the EU conventions and regulations, in particular the EU Strategy for EU Research and Innovation, adopted in 2012 by the European Commission.

The ultimate level of international legal regulation is the intergovernmental level, which includes a system of mainly bilateral treaties concluded by the States or strategic or tactical significance within specific programs of scientific development. The purpose of such regulation is to eliminate obstacles in the field of scientific and technical activity by the economic entities of both countries, entering into respective agreements or treaties. Furthermore, such a system of treaties is also formed through agreements on interstate exchanges, cooperation in the scientific sphere or in a specific scientific and technical area (industry), in particular in space, military-industrial, agro-industrial, etc.

In fact, the results of such cooperation become the property of both countries and are used as a basis for further scientific research. Such agreements and treaties include not only the exchange of experience, but also joint financing of research in a specific sphere, with further determination of the distribution and use of results. The interstate level of scientific and technical activities regulation for Ukraine consists of a system of international bilateral agreements amounting to more than 160. It should be noted that most of them are of a purely declarative nature, since they are strategic and do not offer any specific algorithms for the activities of states, drawn up in the form of network charts for the development of scientific as well as in scientific and technical sphere. That said, there are a number of agreements that have a targeted nature and are aimed at achieving absolutely specific tactical goals of scientific development. Such agreements are concluded mainly by the specific subjects of scientific and technical activities and involve joint activities of two or more research institutions of the two states. Thus, the whole system of international legal regulation of scientific and scientific-technical activities can be distributed into three successive levels, each of them having a definite significance for the corresponding sublevel. Thus, the level of global international legal acts creates the framework and limits of international legal regulation, developing the basic principles, principles and requirements for the organization of the abovementioned activities at subregional and interstate levels. Instead, at the level of regional international legal acts there is a unification of rules, procedures and mechanisms for regulating scientific activity for the subjects of international law united into one organizational network (union, association, alliance, etc.). Although it should be noted that this does not mean obligatory subordination of all intergovernmental bilateral agreements to the requirements set by the relevant regional supranational institutions. The bilateral intergovernmental agreements in the sphere of scientific and technical cooperation are predominantly independent in terms of content and subject matter, but they are based on the global principles and mechanisms for regulating the activities on cooperative scientific knowledge, cofinancing research and/or distribution of their findings.

IV. DISCUSSION

The results of the systematic analysis of the array of international legal acts in the sphere regulation of scientific and technological activities obtained in our paper above are not unanimously supported by the scientific community, which assumption can be deduced in view of the present doctrinal and fragmentary studies conducted by the Ukrainian and foreign scholars. The said standpoint is supported in particular by the Russian researcher L.O. Gumerov, who emphasizes the fact that the creation of a new field of international law – that of the international scientific and technical cooperation is underway. However, some foreign experts [2] and [3], refer the set of international legal acts in a given area to the field of international economic law. We don't support this standpoint, because on the one hand it complicates the structural analysis of the array of international legal acts, and the other hand, it introduces this analysis into a limited range of international economic law instruments. In general, in some cases, these forms of scientific activity it can not be applied and can not regulate interstate relations. Researcher [13] focuses on the question

of "the impact of the latest technologies on the national and European legal systems, as well as the risks to the fundamental rights and freedoms of the person and citizen they create, is yet to be investigated and thoroughly examined". The problem of the instruments content of the legal regulation of scientific and technological activities and international relations in this area is only emerging, because the nature of technological changes and innovative transformations gives all grounds to note the unreadiness and inconsistency of the modern legal system to the regulation of social relations, taking into account their digitalization. In this regard, in [1] noted, that there is a need to shift the emphasis of international legal regulation of scientific and technological activities from the global level to the regional and even subregional level. Authors in [11] also pay attention to the regional aspect of regulation of scientific and technical activity. Researchers argue that the main objective of regulating scientific and technological activities at the regional level should be to achieve the objectives of regional development, namely, the objectives of EU development. Thus, the EU's international cooperation strategy for research and innovation in the European Union, introduced in 2012, provides for the openness of international cooperation for the purpose of EU expansion. The document emphasizes the link between scientific cooperation and other EU enlargement policy instruments. This will be achieved by increasing the research and development expenditures of the EU member states and involving in these activities of the third countries which are the potential EU members. At the expense of such an order, they will gain access to the technologies of the EU countries, and it is bound to have a positive effect on the economic growth of the former ones, and the expansion of scientific and technical capabilities of latter ones. Authors in [11] draw attention to the fact that within the framework of the EU, cooperation in the field of science, research and innovation falls under the fourth platform and is predominantly realized through the programs of Maria Sklodowska-Curie, H2020, Erasmus+, e-Twinning. That is, not even at the expense of international legal regulation, but rather due to the arrangement of processes at the institutional level, at the level of the separate subjects of scientific and technical relations, institutes and research centers, which determines the flexibility of implementing the cooperation goals in the scientific and technical sphere. Researchers in [10], in fact, speak of the need to expand the so-called "public diplomacy" in international scientific and technical cooperation, which means expanding the powers of this field of scientific institutions, institutes and ordinary scholars. Author in [7] actually suggests changing the paradigm of international legal regulation of scientific and technical activities by expanding the subjects of the relevant agreements. As a matter of fact, scientists are proposing not so much replacing the states and their institutions (as a party of the international legal agreements), but rather expanding the possibility of concluding the relevant agreements with non-governmental organizations. This is especially true regarding the transfer of technology and management of scientific cooperation results, especially if such an outcome is an investment component that needs to be regulated by economic and legal instruments.

This is demonstrated in [14] on the example of the OECD and the regulation of scientific and technical cooperation among the organization members. Moreover, the scholar explores the role of international scientific organizations in the process of international legal rulemaking, but does not make a final conclusion regarding the need to move the regulation of these processes from the level of governmental organizations to the level of scientific communities [14]. We go along with this standpoint of the researcher's because scientific organizations are unlikely to adequately assess the public benefit and the mechanism of social regulation of the process of using research and development and the findings of international scientific and technical research.

By establishing in international legal instruments the ability to support competition in the scientific as well as scientific and technical spheres, subjects of such state-level relations use the scientific potential as an additional element of the implementation of their own development strategy, regardless of the interests of other actors in international relations. In our opinion, this significantly damages the global goals of science and technology development, and therefore further research needs to address the compatibility of the mechanisms of international legal regulation of scientific and technological activities with the tools for ensuring the implementation of the global concept of sustainable development. In other words, the uniqueness of the question of the role of science and technology in the modern socio-economic dimension of interstate relations is needed. Or they are competitive advantages and require an appropriate level of legal regulation, which will automatically lead to a disproportion in the level of countries' development, or the results and the process of scientific and technological activities are aimed at uniting efforts to solve the global civilization problems.

V. CONCLUSION

Thus, the conclusions regarding the existence of a stable three-tier system of international legal regulation of scientific as well as scientific and technical activity is absolutely justified in view of the emphasis on the development of science that corresponds to general civilization priorities. Moreover, it is concluded that currently the array of the available international legal acts makes it possible to speak of the international right of scientific and technical cooperation as a separate subdivision of the international law. What is more, it is independent in relation to international economic law, and only relates to it at the stage of commercialization of the results of scientific and technical activities. However, it is shown that if international scientific and technical cooperation is aimed at strengthening the competitive advantages of the state, mainly through obtaining an economic effect from making use of such activities results, in such case we can speak about the empowerment of the statist approaches to the international law development. Although, on the other hand, the fact that the present-day international legal regulation of scientific and technological activities does not meet the needs of social relations in this area is also proved, the legal regulation tools lag behind and hinder the development of scientific cooperation and are efficiency-lacking. This enables us to make a compelling conclusion about the need to involve direct participants into

the sphere of scientific and technical cooperation in the process of international law-making, in particular non-governmental international organizations as well as interstate scientific conferences and cooperation platforms.

REFERENCES

1. W. W. Burke-White, "Power Shifts in International Law: Structural Realignment and Substantive Pluralism," *Harvard International Law Journal*, Vol. 56(1), 2015. DOI: 10.2139/ssrn.2378912
2. Y. Zhang, *The Legal and Regulatory Framework for Innovation and Technology Transfer*. Hanoi University, 2011. Available: https://www.wipo.int/edocs/mdocs/aspac/en/wipo_ip_han_11/wipo_ip_han_11_ref_t2.pdf
3. L. Li, and B. Yu, "Pattern of International Sci-Tech Cooperation and Empirical Analysis," *Journal of Service Science and Management*, Vol. 4, 2011, pp. 35–41.
4. T.V. Portnova, "Choreography sketches as a representational system of dance recording: From M. Petipa to M. Fokine," *Indian Journal Of Science And Technology*, Vol. 9(29), 2016, pp. 88740. DOI: 10.17485/ijst/2016/v9i29/88740
5. T.V. Portnova, "Practices and Methods for Actualization of the Scientific Information in Art Excursions (Excursions and Cultural Heritage in the Contemporary World)," *International Journal of Environmental and Science Education*, Vol. 11(14), 2016, pp. 6690-6696.
6. M. Yaneva-Deliverska, and G. Bekiarova, "Legal aspects of regulation on biomedical scientific researches," *Journal of IMAB - Annual Proceeding (Scientific Papers)*, Vol. 16, 2010, pp. 90–94.
7. B. M. Dolan, "Science and Technology Agreements as Tools for Science Diplomacy: A U.S. Case Study," *Science & Diplomacy*, Vol. 1(4), 2012. Available: http://www.sciencediplomacy.org/files/science_and_technology_agreements_as_tools_for_science_diplomacy_science_diplomacy.pdf
8. T.V. Portnova, "Synthesized nature of fine arts and ballet theater: System analysis of genre development," *European Journal of Science and Theology*, Vol. 14(5), 2018, pp. 189-200.
9. R. D. Hormats, "Science Diplomacy and Twenty-First Century Statecraft," *Science & Diplomacy*, Vol. 1(1), 2012. Available: http://www.sciencediplomacy.org/files/science_diplomacy_and_twenty-first_century_statecraft_science_diplomacy.pdf
10. D. J. Fikkers, and M. Horvat, *Basic Principles for effective International Science, Technology and Innovation Agreements*. Luxembourg: Publications Office of the European Union, 2014.
11. T. Chulitskaya, H. Mazepus, Ramasheuskaya I., Toshkov D. *Science Policies and International Cooperation in the Eastern Neighbourhood of the European Union: An Overview*. Available: <http://eu-strat.eu/wp-content/uploads/2017/01/EU-STRAT-Working-Paper-No.-2.pdf>
12. H. Clever, *International scientific cooperation challenges and predicaments options for risk assessment*. Available: <https://www.sapea.info/wp-content/uploads/International-Scientific-Cooperation-Challenges-and-Predicaments-Options-for-Risk-Assessment.pdf>
13. E. Palmerini, "The interplay between law and technology, or the RoboLaw project in context," *Law and technology: the challenge of regulating technological development*, E. Palmerini, and E. Stradella, Eds., Pisa: Pisa university press, 2013, pp. 7–27.
14. K. Abbott, *International Organizations and International Regulatory Cooperation: Exploring the Links*. Available: <https://www1.oecd.org/publications/international-regulatory-cooperation-and-international-organisations-9789264225756-en.htm>
15. A. Radauer, and C. Moody, *Study on the policy of the European Institute of Innovation and Technology (EIT) and its Knowledge and Innovation Communities (KICs) regarding Intellectual Property Rights*. Brussels: European Commission, 2013.
16. S. Schwaag Serger, and S. Remoe, *International Cooperation in Science, Technology and Innovation: Strategies for a Changing World*. Report of the Expert Group established to support the further development of an EU international STI cooperation strategy. European Union.

17. I. A. Jillison, "The United States and Iran," *Science & Diplomacy*, Vol. 2(3), 2013. Available: <http://www.sciencediplomacy.org/article/2013/united-states-and-iran>
18. N. Lundin, *Evaluation of U.S.-China Clean Energy Research Centre (CERC) – Third-Party Consultation Report*. National Center for Science and Technology Evaluation (NCSTE), 2012.
19. *Convention on the Occupation of Industrial Affairs of 20.03.1883*. Available: https://zakon.rada.gov.ua/laws/show/995_123
20. *Resolution 60/45, adopted by the United Nations General Assembly: Advances in the field of information and telecommunications in the context of international security*. Available: URL: https://zakon.rada.gov.ua/laws/show/995_e45
21. *General Assembly resolution 2222 (XXI): Treaty on the Principles of Activities of States for the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*. Available: https://www.un.org/ru/documents/decl_conv/conventions/outer_space_governing.shtml
22. *Convention Organs of National Law from 10.12.1982*. Available: https://zakon.rada.gov.ua/laws/show/995_057
23. *Contract on patent cooperation from 19.06.1970*. Available: https://zakon.rada.gov.ua/laws/show/895_001
24. *General Assembly Resolution S-18/3 of May 1, 1990. Declaration on International Economic Cooperation, in particular the revitalization of economic growth and development in developing countries*. Available: https://www.un.org/ru/documents/decl_conv/declarations/int_economic_coop.shtml
25. *Convention on the status of international scientific and research centers and scientific organizations SND of 25.11.1998*. Available: https://zakon.rada.gov.ua/laws/show/997_745
26. *Agreement on the interstate exchange of scientific and technical information of June 26, 1992*. Available: <http://www.cis.minsk.by/page.php?id=2458>.