

National Space Policy of Ukraine: Changing Challenges and Threats

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The authors examine the fundamentals of the national space policy of Ukraine. The paper is devoted to studying the potential of the space industry in Ukraine and the current challenges and threats associated with space activities. The methods of comparative analysis, deduction, and modelling were used. The novelty of the research lies in the approval of the national space policy as a fundamental and priority document, on the basis of which the national space law, space activities and industry are developed. The key conclusion of the study is the need to build the national space policy based on the Ukrainian national idea. The authors formulated three basic principles of Ukraine's space policy based on the Ukrainian national idea in the following formulation, "Ukraine – Keeper; the Ukrainians – the guardians of peace and a thousand years culture in the western part of the Eurasian continent." These are (1) safety, stability, security, and long-term sustainability of space activities; (2) creation of an innovative and competitive commercial space sector, which should become a source of progress and sustainable development of Ukraine; (3) the use of space for national security activities, including those for exercising of the inherent right of self-defense.

Keywords: space policy, national space policy of Ukraine, space force, Ukrainian space activities, space industry, Ukrainian national idea

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Introduction

On December 9, 2020, U.S. President Donald Trump presented the National Space Policy of the United States of America (National Space Policy directive). The directive determines the direction for all United States space activities and promotes four key messages (National Space Policy, 2020):

1. The leading role of the United States and its allies in space exploration and development.
2. Promoting a robust commercial space industry.
3. The return of the Americans to the Moon and preparation for the exploration of Mars.
4. Protecting the U.S. interests in outer space.

National Space Policy focuses on developing a sustainable, innovative, and competitive commercial space sector, which is regarded as the foundation of economic development, continuous progress, and sustainable U.S. leadership in outer space. The directive commits the United States government to foster the growth of the American Commercial space sector that supports the country's interests, is globally competitive, and promotes America's leadership in creating new markets and innovation-driven entrepreneurship (National Space Policy, 2020).

The study of the discourse that accompanied the presentation deserves special attention of the National Space Policy. On December 9, 2020, President Donald Trump claimed, "The new National Space Policy is my plan for how the executive branch will advance United States interests in space for the benefit of the American people." "By charting a clear course for United States space activities, this policy reaffirms our leadership in the space domain and our status as the world's foremost spacefaring nation" (Strout, 2020).

In remarks to the National Space Council, Vice President Mike Pence earlier outlined the U.S. "enemies": "Russia demonstrated a space-based anti-satellite weapon earlier this year. China is developing a new manned space station, and its robotic spacecraft will return samples from the Moon in just a matter of weeks" (Strout, 2020).

Scott Pace, the Executive Secretary of the National Space Council, claimed "that space does not exist for its own sake, but to serve the interests of the nation. Therefore, alignment is needed among national security, economic growth, scientific advancement, and stable international relationships and that is what the updated policy intends to ensure" (Smith, 2020).

Director of National Intelligence John Ratcliffe was even more specific. "America's vital interests are increasingly at risk as China and Russia develop and field destructive weapons to threaten U.S. and allied space capabilities," said Ratcliffe. "Russia, in particular, has recently demonstrated provocative behavior creating a potentially dangerous situation in space" (Smith, 2020).

It can be emphasized that the presentation of the National Space Policy of the United States of America took place a few days before the first anniversary of the U.S. Space Force (SPD-4, 2019), and the discourse of the U.S. officials points to the prevailing political reality. Namely, the U.S. government views the national policy as a confrontation between the United States (and its allies), China and Russia. The United States admits the unification of China and Russia. However, the National Space Policy aims to decouple competitors and reduce their role in the exploration of outer space.

The authors study the challenges and threats for Ukraine in the current three-sided confrontation. The authors are convinced that the National Space Policy of Ukraine should

be based on the results of comprehending the current reality in space activities and a clear understanding of Ukraine's prospects in space exploration.

Ukrainian Space Activities and Industry

Before considering the formation of the national space policy and Ukraine's choice of a strategic partner in space policy, it is necessary to assess the potential of Ukrainian space activities and industry.

In 1992, Ukraine inherited a third of the industrial space potential of the former Soviet Union (Krawec, 1995). More than thirty institutions are directly related to space activities, including the industry, offices, military facilities, research institutes, and other organizations. Ukrainian researchers, designers and specialists invented and developed four generations of strategic missile systems, including the SS-18 (Satan) and SS-24 (Scalpel). By 1992, the Ukrainian space industry produced more than 10 thousand ballistic launch vehicles, about 300 spacecraft, and more than 400 artificial satellites for military and civil purposes (Ukraine's R&D Capacity, 2010).

Between 1992 and 2010, 118 launches of made-in-Ukraine launch vehicles Cyclone, Zenit, and Dnipro were successfully performed from four launch sites located in other countries, and more than 200 spacecraft were placed into orbit under contracts with 10 countries (Ukraine's R&D Capacity, 2010). Until 2018, 20% of space launches in the world were carried out using Ukrainian-made rockets, such as Zenit, Cyclone and Dnepr (Laffaiteur et al., 2011).

Until 2014, Russia was Ukraine's strategic partner in space activities. Most of the components and equipment used by Ukraine in space activities were of Russian origin. Ukraine has not had its own spaceport after the "Sea Launch" bankruptcy at the end of 2009. Until 2014, Ukraine considered the issue of participating in the creation of the Russian Vostochny cosmodrome, but the possibility of participating in the project was ruled out after the beginning of Russian aggression.

Ukraine was one of the first post-Soviet states to establish the Space Agency and develop a comprehensive space policy. At the institutional level, the importance of space activities in Ukraine is enshrined in the comprehensive national space legislation (Semenyaka, 2019; Soroka, 2019). The basic laws are:

1. Decree of the President of Ukraine on NSAU Establishment, February 29, 1992 (Decree, 1992).
2. The Law of Ukraine on Space Activities, November 15, 1996 (The Law, 1996).
3. The Law of Ukraine on State Support of Space Activities, March 16, 2000 (The Law, 2000).

On their basis, the laws and regulations have been developed that regulates the registration, licensing and certification procedure for all space-related products and services that are provided in Ukraine or under Ukrainian jurisdiction abroad. Ukraine has been developing cooperation in the space industry with Russia (Baturin, 2020), China (Ma & Soroka, 2020), the European Union (Utko-Maslianyk, 2018), Kazakhstan (Drozd, 2020), and others. (Semenyaka, 2019).

Thus, we can draw the first intermediate conclusions of the research:

1. Ukraine is a space state with its own intellectual, technological and production potential.
2. Ukraine develops and manufactures its own space industry products, which are in demand in the space services market.

3. Ukraine pursues a balanced space policy consistent with national interests.
4. The space policy of Ukraine is based on international space law and the space law of Ukraine.

Changing Challenges and Threats for Ukraine

Over the past 30 years, Ukrainian space activities and industry have undergone significant changes.

First, the lack of resources, the aggravated economic crisis and political corruption have significantly limited the intellectual, technological and production capabilities of Ukraine in space exploration. Leading experts in the space industry have changed their citizenship or changed their activity profile. The equipment and technologies of space enterprises are outdated. Ukraine has lost its status as a “leader” in space exploration and has lost the competition to France, Japan, India, Israel, South Korea and some other countries. At the same time, South Africa, Indonesia, Argentina, Turkey, Kazakhstan, Pakistan and others are imposing competition on Ukraine.

Second, the geopolitical structure of the world has changed. In 2014, Ukraine was forced to radically change its national space policy. Anatolii Frantsuz revealed the place of Ukraine on the geopolitical map of the modern world (Frantsuz, 2020). Frantsuz noted that in 2014 Ukraine changed its strategic partner. In February 2019, in the preamble to the Constitution of Ukraine, three articles and transitional provisions, the norms of the new strategic course of Ukraine were enshrined. Ukraine aspires to acquire membership in the European Union and NATO. Ukraine strives for full integration and accession to the European Union.

However, the reality turned out to be more complicated. The policies of President Trump and the United States began to differ significantly from those of the European Union. The United States has become a strategic ally of Ukraine in the war with Russia, while the European Union is pursuing a more balanced policy towards Russia. In addition, cooperation with China has taken an important place in the economic development of Ukraine. In 2019, for the first time in the history of Ukraine’s independence, China became the country’s main trading partner, bypassing Russia and European countries. Ukraine exported goods to China for \$3,59 billion and imported – for \$9,19 billion. Therefore, Ukraine’s modern foreign policy is developing in four mutually exclusive directions. This is the development of relations with China, the USA, the European Union and the war with Russia (Frantsuz, 2020).

Third, modern international space law has become much more complex. The basic law “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies” (it entered into force in October 1967) defined the following principles (Treaty, 1967):

- a) the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind;
- b) outer space shall be free for exploration and use by all States;
- c) outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- d) States shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
- e) the Moon and other celestial bodies shall be used exclusively for peaceful purposes.

These are the principles, on which the space law of Ukraine has been developed. However, the United States laws, passed over the past three years and defining the U.S. space policy,

contradict the principles of the basic law of the international space law. Namely,

1. The document “President Donald J. Trump is Unveiling an America First National Space Strategy” (March 23, 2018) determines that “The new strategy ensures that international agreements put the interests of American people, workers, and businesses first. The National Space Strategy prioritizes regulatory reforms that will unshackle American industry and ensure we remain the leading global provider of space services and technology” (President Donald J. Trump, 2018).
2. “Establishing a U.S. Space Force” (February 19, 2019) predetermines the Establishment of the United States Space Command as a Unified Combatant Command, thereby establishing that U.S. officials will lead any future space military operations (Establishing, 2019). According to the document, the U.S. Space Force must ensure unhindered access and freedom of action of the United States and its allies in space during peacetime and across the entire spectrum of conflicts (Establishing, 2019).
3. “Executive Order on Encouraging International Support for the Recovery and Use of Space Resources” (April 6, 2020). The document indicates that the United States does not recognize The Moon Agreement (Agreement, 1979). The USA will be guided by its own policy and internal laws regarding the extraction of resources on the Moon and other places in the solar system, especially concerning commercial exploration, recovery and use of such resources (Executive Order, 2020).
4. “Memorandum on the National Strategy for Space Nuclear Power and Propulsion (Space Policy Directive-6)” (December 16, 2020). The Memorandum states the following: (a) “Develop uranium fuel processing capabilities that enable production of fuel that is suitable to the lunar and planetary surface and in-space power, nuclear electric propulsion (NEP), and nuclear thermal propulsion (NTP) applications, as needed”; (b) “Establish the technical foundations and capabilities – including through identification and resolution of the key technical challenges – that will enable options for NTP to meet future Department of Defense (DoD) and National Aeronautics and Space Administration (NASA) mission requirements” (Memorandum, 2020).
5. Finally, “National Space Policy of the United States of America” (December 9, 2020). It is worth paying attention to two principles (a) “In this resurgent era of space exploration, the United States will expand its leadership alongside nations that share its democratic values, respect for human rights, and economic freedom. Those values will extend with us to all space destinations as the United States once again steps beyond Earth, starting with the Moon and continuing to Mars.” (b) “...the United States will seek to deter, counter, and defeat threats in the space domain that are hostile to the national interests of the United States and its allies” (National Space Policy, 2020).

Fourth, the United States, China and Russia have created and are actively developing space forces. The mission of the U.S. Space Force is to “provide freedom of operation for the United States in, from, and to space” (Establishing, 2019). The Fiscal Year 2021 budget for the Space Force is over \$15 billion. (b) After formally recognizing space as a warfighting domain for the first time in a 2015 white paper, China took a significant step toward reorganizing its Space Force in creating the People’s Liberation Army (PLA) Strategic Support Force

(SSF). The SSF will handle both military space and cyber and electronic warfare (E.W.) (Grant & Neil, 2020). (c) The last reorganization of the Russian Space Forces took place on August 1, 2015. The Russian Space Forces' mission is to inform about missile attacks and defend against ballistic missiles, as well as creation, deployment, maintenance and control of spacecraft in orbit.

Thus, the second intermediate conclusion of our study is the following fact. Ukraine has lost its status of a "leader" in space exploration and, moreover, found itself in a difficult situation. In 2014, it was forced to change its strategic partner in the space industry, so at present, it only offers itself and its potential as a partner of the European Space Agency, which in turn is an ally of NASA (Taftay, 2021).

National Space Policy of Ukraine

An indicator of the quality of the modern space policy of Ukraine is the fact that the search query "National Space Policy of Ukraine" in Google does not give a single result. The only article "Ukrainian space policy – contributing to national economic development" dates from May 1995. It was published in the specialized authoritative journal "Space Policy" (Krawec, 1995). It was during this period that Ukraine was one of the leading space states in the world and its space activities were able to influence international space policy. Another proof of the international community's recognition of Ukraine's authority in the field of space activities dates back to this period. In addition, "Selected Examples of National Laws Governing Space Activities: Ukraine," posted on the United Nations Office for Outer Space Affairs website, dates back to 1997. The document cites the space law of Ukraine as a model for the development of space law regulating state-space activities (Selected Examples, 1997).

Unfortunately, all these examples refer to the glorious past of the Ukrainian space industry. Currently, the space law of Ukraine has ceased to be an example for other states and no longer corresponds to European and world standards. Vasyl Semenyaka pointed out a number of key inconsistencies that require urgent legislative resolution. Semenyaka proved non-compliance with the basic principles of the expediency and adequacy of the state regulatory policy of the procedure for licensing space activities (Semenyaka, 2019). Larysa Soroka studied state regulation and administration of space activities and outlined the main tools of organizational activity of the state in the space industry (Soroka, 2019). Analysis of the studies published in the journal "Advanced Space Law"¹ indicates deep concern of Ukrainian researchers about the current situation in the space industry. Various solutions have been proposed that open up new perspectives for the Ukrainian space industry.

The revival of the space industry in Ukraine should be determined by the national space policy of Ukraine, which formulates the principles, goals, cross-sector guidelines and sector guidelines (in three distinct but interdependent sectors: commercial, civil, and national security).

The national space policy of Ukraine is based on the analysis of changing challenges and threats. The authors point out the following.

First, on the one hand, it is obvious that Ukraine has chosen a strategic ally in the person of the United States and the European Union. Ukraine is trying to prioritize cooperation with the European Union and the European Space Agency, including the programs GMES, Galileo and Vega. However, an interview with Volodymyr Taftay, new Head of the State Space Agency of Ukraine, is worth our attention. Taftay stated four obvious facts (Volodymyr Taftay, 2021):

¹ <http://asljjournal.org/>

1. The State Space Agency, like the rest of Ukraine, is oriented towards Europe and its activities. However, the State Space Agency of Ukraine will join the European Space Agency only in 2024.
2. The State Space Agency of Ukraine has no valid contracts with NASA. Only in 2020, a memorandum was signed on Ukraine's participation in the NASA Artemis program for lunar exploration.
3. Only in 2019, amendments were made to the law "On space activities," according to which private companies are allowed to work in the space sector. In 2020, the law came into force.
4. In December 2021, the Ukrainian spacecraft Sich-2-30, the first Ukrainian satellite launched over the last ten years, will be launched from the SpaceX launch pad.

Thus, the choice of a new strategic partner did not give Ukraine any new contracts and access to new technologies in the space industry. The European Space Agency and NASA see Ukraine's participation in their projects more as a political will of the top leadership, rather than mutually beneficial cooperation. The space exploration programs of the European Space Agency and NASA have a level of complexity that exceeds the capabilities of the Ukrainian space industry.

Second, Ukraine has valid and mutually beneficial contracts with China, in contrast to new strategic partners. The article by Bo Ma and Larysa Soroka, which analyzes China-Ukraine relations in space exploration, is of particular interest in this regard. Ma and Soroka highlight the following areas of cooperation (Ma & Soroka, 2020):

1. The exchange of information on the technical parameters of the Chinese Environment-1B project and the Ukrainian Sich-2 project to establish mutually beneficial cooperation in the field of space data exchange.
2. Delivering to China a laboratory facility (including the transfer of production technology) for manufacturing non-plasma engines for spacecraft.
3. According to the Agreement between Ukraine and China, Kharkiv Military University has started training of Chinese air defense specialists in the military town "Rogan-1" near Kharkiv.
4. In 2016, the Chinese company Beijing Skyrizon Aviation Industry Investment acquired a controlling stake in Motor Sich, taking advantage of the dire financial situation of the Ukrainian company after the termination of contracts with Russia in 2014. However, in 2017, the Security Service of Ukraine terminated the deal, initiating a criminal case on the fact of "sabotage and destruction of the enterprise." The situation remained in limbo until, on January 14, 2021, the U.S. Department of Commerce added the Chinese company Skyrizon to the list of military end-users due to its ties with China and People's Liberation Army. According to Washington, "Skyrizon is actively seeking to acquire intellectual property and technology to advance key military capabilities that threaten the U.S. national security, including the capability to develop, produce, or maintain military items, such as aircraft engines, satellites, and cruise missiles" (Poita, 2021).

However, Yurii Poita drew attention to the other side of cooperation with China. Poita stated that all key contracts between Ukraine and China in the military field prescribe the transfer of technology to the Chinese side. Subsequently, these technologies were introduced into production and used by China at its own discretion. This applies to the Ukrainian

aircraft carrier Varyag, purchased in 1998. The Chinese industry built the first aircraft carrier “Shandong” on its basis. In early 2000, China acquired from Ukraine 10 UGT 25000 gas turbine engines along with full technical documentation. On the basis of the UGT 25000 gas turbine, Chinese gas turbines QC 280 were developed, which are equipped with new destroyers of the Type 055 (Nanchan-class) with a displacement of up to 12 thousand tons (Poita, 2021).

Thus, cooperation with China is beneficial for Ukraine, but political corruption and the “human” factor demean Ukraine’s position in the negotiation processes and leads to ignorance of national interests, strategic miscalculations in partnership with China and negative consequences for national security.

Third, the Ukrainian space industry has become the subject of a growing confrontation between the United States and China. On the one hand, the United States does not plan to invest and buy products manufactured by the Ukrainian space industry. On the other hand, they are putting political pressure on Ukraine to hinder the development of partnerships with China. The first such precedent was cancelling the acquisition of 80 % of the stock of the Ukrainian Motor Sich plant by Beijing Skyrizon Aviation Industry Investment. The main role in the cancellation was played by the open pressure of the U.S. government on the government of Ukraine. Motor Sich is the only enterprise in Ukraine that manufactures engines for aircraft and helicopters, as well as industrial gas turbines. The Ivchenko Progress D-36/Ivchenko Progress D-436 series remains the highest production-rate engine in the CIS (Motor Sich, 2021).

The Ukrainian space industry found itself in a difficult situation. On the one hand, it is forced to abandon Russian investments and the Russian market. On the other hand, the products of the Ukrainian space industry are not of interest to markets controlled by the United States and its allies. On the third hand, China is interested in cooperation with the Ukrainian space industry, but there are two key obstacles. First, China only needs Ukrainian technology to close its gap in this industry. China is not interested in the investment and development of the Ukrainian industry. This position is contrary to the national interests and national security of Ukraine. Second, the United States is putting political pressure on the Ukrainian government to avoid selling Ukrainian technology to China.

The only way out of this situation and the main principle of the national space policy of Ukraine should be to follow the national idea of Ukraine. It is worth noting that “National Space Policy of the United States of America” begins with a quote from President Donald J. Trump’s speech. “We are a nation of pioneers. We are the people who crossed the ocean, carved out a foothold on a vast continent, settled a great wilderness, and then set our eyes upon the stars. This is our history, and this is our destiny” (National Space Policy, 2020).

A clear understanding of the national idea has not been formulated, but the discourse is active. The following quotation can be cited as an example “Ukraine – Keeper, the Ukrainians – the guardians of peace and a thousand years culture in the western part of the Eurasian continent” (Bazaluk & Blazhevych, 2016). Ukrainian national idea orients national space policy of Ukraine towards independent development of domestic potential. It is a tough choice. However, in the current situation, this is the only way, thanks to which Ukraine is able to revive the competitiveness of the space industry. Thus, the first principle of the national space policy of Ukraine is the safety, stability, security, and long-term sustainability of space activities.

Ukrainian national idea, as the basis for the national space policy of Ukraine, also actualizes the second principle: the creation of an innovative and competitive commercial

space sector, which should become a source of progress and sustainable development of Ukraine.

Finally, the third principle of the national space policy of Ukraine, which follows from the formulated national idea, is the use of outer space for national security activities, including those for exercising the inherent right of self-defense. The space policy of Ukraine should become an integral part of the national security strategy.

Conclusions

The national space policy of Ukraine is the basic document that defines the political, economic, social and scientific development of Ukraine. The basis of the national space policy is formed by the national idea, which unites the nation and focuses on the fulfillment of tasks on the global, national and regional scale. The lack of the national space policy of Ukraine ultimately led to a decrease in the competitive opportunities of Ukraine and to the current challenges and threats that the space industry of Ukraine is facing.

References

- Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* (1979) General Assembly, resolution 34/68. Available online: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>
- Baturin, Yuri (2020) The Astronaut's Legal Status. *Advanced Space Law*, Volume 5, 4-13. <https://doi.org/10.29202/asl/2020/5/1>
- Bazaluk, Oleg, and Tamara Blazhevych. The Image of an Ideal Ukrainian Politician. Ukrainian National Idea. *Future Human Image*. Volume 6, 2016: 24-30.
- Decree of the President of Ukraine on NSAU Establishment* (1992) Decree of the President of Ukraine, February 29, 1992. Available online: <https://www.nkau.gov.ua/en/spacelaw/958-decree-of-the-president-of-ukraine-on-nsau-establishment-ukrainian-text-only>
- Drozd, Olexiy (2020) Cooperation between Ukraine and Kazakhstan in the Space Sector: Background, Regulatory Framework, and Further Development. *Advanced Space Law*, Volume 5, 25-33. <https://doi.org/10.29202/asl/2020/5/3>
- Establishing a U.S. Space Force (2019) *Space Policy Directive-4*, February 19, 2019. Available online: <https://spacepolicyonline.com/news/text-of-space-policy-directive4-spd-4-establishing-a-u-s-space-force/>
- Executive Order on Encouraging International Support for the Recovery and Use of Space Resources (2020) *Infrastructure & Technology*, Issued on: April 6, 2020. Available online: <https://www.whitehouse.gov/presidential-actions/executive-orderencouraging-international-support-recovery-use-space-resources/>
- Frantsuz, Anatolii (2020) Central and Eastern Europe – the Globalization Process, Hybrid Threats: Political and Legal Aspects. *Ukrainian Policymaker*, Volume 6, 24-31. <https://doi.org/10.29202/up/6/3>
- Grant, Dustin L. and Matthew J. Neil (2020) *The Case for Space: A Legislative Framework for an Independent United States Space Force*. Available online: <https://apps.dtic.mil/sti/pdfs/AD1103332.pdf>
- Krawec, Roman (1995) Ukrainian space policy – contributing to national economic development. *Space Policy*, Volume 11, Issue 2, 105-114. [https://doi.org/10.1016/0265-9646\(95\)00004-V](https://doi.org/10.1016/0265-9646(95)00004-V)

-
- Laffaiteur, Michel, Oleg Fedorov, and Sergey Gerasymchuk (2011) Space Activities: Ukraine Looking for New Developments. *ESPI Perspectives*, No. 51, August 2011. Available online: https://www.files.ethz.ch/isn/132799/ESPI_Perspectives_51.pdf
- Ma, Bo, and Larysa Soroka (2020) The Cooperation between China and Ukraine in Space Exploration: Genesis and Development. *Advanced Space Law*, Volume 5, 58-70. <https://doi.org/10.29202/asl/2020/5/6>
- Memorandum on the National Strategy for Space Nuclear Power and Propulsion (Space Policy Directive-6) (2020) *Infrastructure & Technology*, Issued on: December 16, 2020. Available online: <https://trumpwhitehouse.archives.gov/presidential-actions/memorandum-national-strategy-space-nuclear-power-propulsion-space-policy-directive-6/>
- Motor Sich* (2021) Available online: <http://www.motorsich.com/eng/>
- National Space Policy of the United States of America* (2020) Available online: <https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/12/National-Space-Policy.pdf>
- Poita, Yurii (2021) Why Ukraine is Reassessing its Defense Cooperation with China. *ChinaObservers*, May 6, 2021. Available online: <https://chinaobservers.eu/why-ukraine-is-reassessing-its-defense-cooperation-with-china/>
- President Donald J. Trump is Unveiling an America First National Space Strategy (2018) *Infrastructure & Technology*, Issued on: March 23, 2018. Available online: <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unveiling-america-first-national-space-strategy/>
- Selected Examples of National Laws Governing Space Activities: Ukraine* (1997) United Nations Office for Outer Space Affairs. Available online: https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/ukraine/ordinance_on_space_activity_1996E.html
- Semenyaka, Vasyl (2019) The Current State of Deregulation of Space Activities in Ukraine. *Advanced Space Law*, Volume 3, 108-119. <https://doi.org/10.29202/asl/2019/3/9>
- Smith, Marcia (2020) *Trump Administration Issues New National Space Policy*. Available online: <https://spacepolicyonline.com/news/trump-administration-issues-new-national-space-policy/>
- Soroka, Larysa (2019) Public Regulation of Space Activities in Ukraine. *Advanced Space Law*, Volume 4, 68-79. <https://doi.org/10.29202/asl/2019/4/7>
- SPD-4 Establishment of the United States Space Force* (2019) Available online: <https://trumpwhitehouse.archives.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/>
- Strout, Nathan (2020) *Trump Administration Releases National Space Policy*. Available online: <https://www.c4isrnet.com/battlefield-tech/space/2020/12/10/trump-administration-releases-national-space-policy/>
- The Law of Ukraine on Space Activities* (1996) Law of Ukraine, November 15, 1996. Available online: <https://www.nkau.gov.ua/en/space-law/968-the-law-of-ukraine-on-space-activities>
- The Law of Ukraine on State Support of Space Activities* (2000) Law of Ukraine, March 16, 2000. Available online: <https://www.nkau.gov.ua/en/space-law/970-the-law-of-ukraine-on-state-support-of-space-activities-ukrainian-text-only>
- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (1967) Available online: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>
-

- Ukraine's R&D Capacity in Space Industry (2010) Available online: <http://www.fp6-nip.kiev.ua/assets/JSO/Brochure-Ukraines-RD-Capacity-in-Space-Industry.pdf>
- Utko-Maslianyk, Julia (2018) Legal Basis of Cooperation between Ukraine and the European Union in the Space Sector. *Advanced Space Law*, Volume 2, 96-111. <https://doi.org/10.29202/asl/2018/2/11>
- Volodymyr Taftay, Head of the State Space Agency of Ukraine (2021) *Ukrinform*, 13.04.2021 09:38. Available online: <https://www.ukrinform.net/rubric-economy/3226510-volodymyr-taftay-head-of-the-state-space-agency-of-ukraine.html>