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RESOLUTION OF INTERNATIONAL DISPUTES UNDER SPACE LAW: CHALLENGES AND PATHWAYS

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ABSTRACT

As space activities and exploration continue to grow quickly, addressing international conflicts related to space law presents unique challenges.[1] This abstract explores the complex field of international dispute resolution in space law, focusing on the complexities related to jurisdiction, responsibility, and regulatory frameworks. Crucial global agreements and pacts, like as the Liability Convention and the Outer Space Treaty, provide a vital structure for modern space endeavours, but they also pose challenges in terms of interpretation.[2] The article discusses the involvement of arbitration, mediation, and adjudication procedures in resolving issues arising from satellite operations, space debris disposal, and commercial space activities. Furthermore, the techniques employed by various spacefaring nations and international institutions, focus on case studies and recent developments in the field of international space law. By engaging in cooperative efforts, enhancing legal frameworks, and fostering worldwide cooperation, it is possible to surmount these challenges and facilitate the resolution of conflicts in international space law, therefore fostering a stable and sustainable space environment. This provides a foundation for a comprehensive analysis of the legal, procedural, and policy elements required to address disputes in the increasingly congested and competitive realm of space activities.[3]

INTRODUCTION

[1] M Xinmin, *The Development of Space Law: Framework, Objectives and Orientations --Speech at United Nations/China/APSCO Workshop on Space Law*, 2014.
[2] United Nations Office for Outer Space Affairs, "The Outer Space Treaty" *UNOOSA*, 1966*available at*: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.
[3] "Outer Space Increasingly 'Congested, Contested and Competitive', First Committee Told, as Speakers Urge Legally Binding Document to Prevent Its Militarization | UN Press," *press.un.org*, 2013*available at*: https://press.un.org/en/2013/gadis3487.doc.html

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In recent years, the space business has experienced remarkable expansion. However, it is unfortunate that legal progress has not kept pace with technological breakthroughs in other domains, such as cyber security, privacy regulations, and cryptocurrencies. Conflict resolution is consistently necessary, even within the specialised legal framework of space.[4] Space law now follows a decentralised dispute resolution structure, similar to other areas of international law. This framework is chosen by the states involved in the legal system. Arbitration seems to be the most effective approach for resolving space-related disputes since an increasing number of countries are adopting this method to address any international problems. Arbitration offers the main advantage of allowing private groups, in addition to governments, to participate. In order for a settlement to take place, the problem must be valid. According to Merills, J.G., a dispute is defined as a specific disagreement on a fact, law, or policy.[5] It involves one party making a claim or statement, which is then met by a denial, counterclaim, or refusal from the other side. When a dispute may be settled by legal means, it is considered justiciable. Heterogeneity is a significant challenge in international conflict settlement. Several factors, such as dual-use technology, espionage and reconnaissance, global navigation and positioning for defence, and the level of scientific uncertainty, must be reassessed to ensure the enforcement of legal principles and fairness for a fair and appropriate resolution of disputes.[6]

Dispute settlement is a requirement under space law

Currently, international space law is highly coveted in the field of international law. Efficient and effective methods for resolving problems at the international level are crucial to guarantee its development. Implementing a generally acknowledged and legally enforceable method for resolving disputes related to space law would be beneficial to the international community by reducing conflicts between nations. Furthermore, enhancing repute and dependability in this field is crucial as it will enhance countries' motivation to advance and broaden their efforts in this specific domain. Space exploration, once a distant aspiration in the 20th century, has now become imperative to regulate and tackle the challenges faced by the increasing number of government and commercial entities involved, thanks to advancements in science and technology. The need for a legal dispute settlement procedure is increasing as space operations go beyond mere

[4] "Space Law and Arbitration: Dispute resolution mechanisms for space-related disputes: Clyde & Co," *www.clydeco.comavailable at*: https://www.clydeco.com/en/insights/2024/03/overview-of-dispute-resolution-mechanisms-for-spac (last visited July 2, 2024).
[5] Anna Spain and L Introduction, *INTERNATIONAL DISPUTE RESOLUTION in an ERA of GLOBALIZATION*.
[6] Victoria Heath, "The Challenges of Dual-Use Space Technologies: the Non-Peaceful Use of Satellites" *Space Generation Advisory Council*, 2023*available at*: https://spacegeneration.org/the-challenges-of-dual-use-space-technologies-the-non-peaceful-use-of-satellites.

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exploration and become a central focus in the security policies of many governments. NASA, ISRO, SpaceX, and Roscosmos revolutionised the space sector. At the beginning of the decade, the U.S. military redirected its attention largely towards Afghanistan and Iraq as potential adversaries.[7] In 2011, President Obama said that the United States would alter its approach in the Asia Pacific region, which encompasses a large area.[8] This change would involve a greater reliance on space-based communications and monitoring. Simultaneously, leaders in the military and intelligence sector began to express concerns about emerging threats. During that period, China was endeavouring to showcase its capacity to infiltrate land-based networks and carry out satellite assaults in outer space. The 2010 discussion on the Chinese threat in space, as described by Todd Harrison, the director of the Centre for Strategic and International Studies Aerospace Security Project and the main author of the Space Threat Assessment 2019, focused specifically on the dangers posed by China in low Earth orbit and its use of direct ascent weapons.[9] In recent years, China has been consistently improving its anti-satellite capabilities, allowing it to target all orbits and disrupt satellite operations using both physical and non-physical methods of attack.[10] As of March 27, 2019, the United States, Russia, China, and India possess their own anti-satellite missile systems.[11]

United Nations Space Treaties

The core elements of United Nations space law consist of five agreements that were deliberated upon during the 1960s and 1970s. These agreements encompass several mechanisms for settling conflicts. Typically, it involves informal third-party consultation methods that do not have legal obligations. The consultation forums consist of the Outer Space Treaty of 1967, which regulates the actions of governments in space research and utilisation, including the moon and other celestial bodies, as well as the 1972 Convention on International Liability for Damage caused by space objects.[12] The 1979 Moon Agreement, the Rescue Agreement, and the Registration Convention are among the other notable international treaties.[13]

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[7] Ajey Lele, *Asian Space Race: Rhetoric or Reality?* (Springer India, India, 2013).
[8] Carin Zissis, "China's Anti-Satellite Test" *Council on Foreign Relations*, 2007*available at*: https://www.cfr.org/backgrounder/chinas-anti-satellite-test.
[9] Todd Harrison et al., *A REPORT of the CSIS AEROSPACE SECURITY PROJECT*.
[10] Jaganath Sankaran, *Limits of the Chinese Anti-satellite Threat to the United States*.
[11] Ashley J. Tellis, "India's ASAT Test: An Incomplete Success" *carnegieendowment.org*, 2019*available at*: https://carnegieendowment.org/research/2019/04/indias-asat-test-an-incomplete-success?lang=en (last visited July 2, 2024).
[12] United Nations Office for Outer Space Affairs, "The Outer Space Treaty" *UNOOSA*, 1966*available at*: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.
[13] Vladimír Kopal, "United Nations Audiovisual Library of International Law" *legal.un. available at*: https://legal.un.org/avl/ha/tos/tos.html.

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Outer Space Treaty

The 1967 Outer Space Treaty is the fundamental basis for space law. It follows the established protocols specified in the UN charter. Nevertheless, both the Outer Space Treaty and the UN charter lack legally binding mechanisms. According to the ICJ law, governments have the option to voluntarily submit to the Court's compulsory jurisdiction for future disputes. According to Article 36.1, the state has the option to present itself to the court for specific cases.[14] Under Article 36.2, the state has the authority to voluntarily agree to the court's mandatory jurisdiction for all future conflicts.[15] Choosing the second option is restricted to countries that have the capability to travel in space. However, the primary issue lies in the fact that the International Court of Justice (ICJ) at The Hague exclusively deals with issues that involve sovereign states.

Liability Convention

The Liability Convention, signed in 1972, is another agreement that deals with dispute settlement.[16] Based on this information, it is stated that when many states collaborate in launching a spacecraft, they share both joint and main accountability for any potential harm caused by the object. Due to its capacity to allow nations to pursue claims of guilt both on their own behalf and on behalf of their companies or individuals, it is more favourable than the process of the International Court of Justice (ICJ). Harm from space debris is conceivable in two circumstances. In the first scenario, a state is fully responsible for any damage caused by a space object it launches, even if the conditions are beyond its control. This is referred to as the stringent liability standard. Based on this criterion, if many states are responsible for launching the space object in question, they will be collectively and individually liable for any damages. After the RORSAT Cosmos 954 re-entered the Earth's atmosphere and crashed in Canada's northwest area on January 24, 1978, Canada utilised the initial provision of the Liability Convention by means of diplomatic communication.[17] This led to a resolution where the expenditures for the clean-up and damages were compensated. The second scenario enforces a stricter responsibility standard called fault liability. This standard holds a state responsible for damages only if it can be proven that the state, or the state responsible for launching the space object, was at fault for the launch. As of yet, the

[14] International Court of Justice, "Basis of the Court's jurisdiction | INTERNATIONAL COURT OF JUSTICE" *www.icj-cij.orgavailable at*: https://www.icj-cij.org/basis-of-jurisdiction.
[15] *UNIFORM RULES SUPERIOR COURTS of the STATE of GEORGIA COUNCIL of SUPERIOR COURT JUDGES,*.
[16] "Liability Convention," *www.unoosa.org available at*: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introliability-convention.html#:~:text=Elaborating%20on%20Article%207%20of.
[17] Alexander Cohent, *Cosmos 954 and the International Law of Satellite Accidents*.

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second scenario of the Liability Convention has not been used in any instances. The findings of the Claims Commission are disclosed to the public in accordance with the Liability Convention (Article XIX.4), although they are only of an advisory nature unless the parties have agreed otherwise beforehand (Article XIX.2).[18] The frequent criticism of this mechanism stems from its non-binding nature. The procedure used to settle disputes is restricted to conciliation, but only in situations where the parties have not agreed to be bound by the verdict of the Claims Commission, or have only agreed to it after the commission has made its decision. When the parties have achieved a conflicting agreement, a formal agreement is established prior to the commencement of the procedure. The Claims Commission might be seen as an improvised tribunal. It is often referred to as the semi-arbitration court. Consequently, there are some uncertainties regarding the Liability Convention. These factors encompass the potential that not all disputes will be presented in the method, the potential for a prolonged duration, and the potential for unenforceable decisions.

International Telecommunications Union

The ITU is a United Nations-sponsored institution that focuses on guaranteeing continuous telecommunications. Member states can choose to negotiate, use diplomatic channels, follow established procedures outlined in bilateral or multilateral treaties they have entered into, or use any other mutually agreed-upon method to resolve disputes related to the interpretation or application of this Constitution, the Convention, or the Administrative Regulations of the ITU.[19] Consequently, the ITU dispute settlement system grants the parties unrestricted autonomy to employ any method that they have mutually consented to. If any Member State involved in a dispute does not employ any of the options described above, they can resort to arbitration as a last measure, following the method outlined in the Convention. According to Article 41.10, the arbitral decision is conclusive and can be enforced against the parties involved in the dispute.[20] However, there are no effective methods of enforcing it. There exist several specialist international legal instruments beyond the scope of the United Nations system that are applicable to important aspects of space collaboration. These laws govern the activities of operational space organisations, such as the European Space Agency (ESA).[21] The International Space Station (ISS) exemplifies a

[18] Bin Cheng, "The 1972 Convention on International Liability for Damage Caused by Space Objects" *Oxford University Press eBooks* 286–356 (1997).
[19] "Vienna Convention Law Treaties," *Oas.org*, 2019*available at*: https://www.oas.org/legal/english/docs/Vienna%20Convention%20Treaties.htm.
[20] "Challenge of Arbitrators - UNCITRAL Arbitration | ICSID," *icsid.worldbank.org available at*: https://icsid.worldbank.org/procedures/arbitration/uncitral/challenge-arbitrators.
[21] "About space law," *www.esa.intavailable at*: https://www.esa.int/About_Us/ECSL_-_European_Centre_for_Space_Law/About_space_law.

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unique form of collaborative teamwork.[22] States desire to participate in such projects; nevertheless, international cooperation is necessary. The legal instruments of international space agencies offer extensive conflict resolution mechanisms to facilitate smooth collaboration. Usually, they require that conflicts be resolved through arbitration or another legally enforceable third party. Arbitration is often considered a final recourse.[23]

1968 Rescue Agreement

The document delineates the provisions of Article V of the Outer Space Treaty, aiming to streamline the process of astronauts and spacecraft returning to Earth, provide assistance to astronauts, and promptly inform other nations and the UN Secretary-General about any event that poses a threat to the lives or well-being of astronauts. Although astronauts have an obligation to assist their fellow astronauts in space, states are not obligated to do so. Hence, the Agreement explicitly includes the issue of providing aid to astronauts in regions both within and beyond the jurisdiction of space parties. However, it does not address the matter of providing assistance in space or the expenses related to rescuing and bringing back the astronauts. This Agreement establishes procedures for astronaut retrieval in the event of a catastrophe and explicitly guarantees astronaut exemption from liability.

The 1975 Registration Convention

The convention and the Outer Space Treaty have strong connections, especially in relation to Article VIII. This article mandates that the state responsible for launching space objects into Earth orbit or beyond must register them and inform the UN Secretary-General of these registrations. The Convention provides two separate options for registering a space object with specific data: either through a national registration or through a central registry maintained and updated by the UN Secretary-General. The registration of spacecraft serves a dual goal by helping to reduce the deployment of weapons into orbit and promoting peace in outer space, which is otherwise hard to identify.

The Moon Treaty, signed in 1979

The enactment of this international space treaty was based on the notion that Moon utilisation was

[22] "International Space Station Cooperation - NASA," *NASA*, 2023*available at*: https://www.nasa.gov/international-space-station/space-station-international-cooperation/.
[23] Henry Hertzfeld and Timothy Nelson, *Binding Arbitration as an Effective Means of Dispute Settlement for Accidents in Outer Space*.

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imminent after the US lunar landing in 1969. Unlike earlier treaties, this particular one has not received approval from the major nations due to their unwillingness to relinquish their rights or comply with mandatory technology sharing for commercial objectives, as required by the Moon Agreements. The agreement was reached through a compromise between the nations with space exploration capabilities and the nations that are still growing in this area. It recognises the universal right to engage in scientific research, exploration, and use of the moon, as well as the common heritage of all human beings. The majority of the Agreement is non-contentious since it reiterates the core principles and doctrines of the Outer Space Treaty (OST), such as the imperative to assist astronauts, the exclusive use of celestial bodies for peaceful endeavours, and international responsibility.[24] The disputed provision in the agreement pertains directly to the establishment of a global framework for regulating the process of resource extraction.

The Dispute Settlement Processes

Consultation is a very efficient method for resolving differences and averting confrontations. When a party contemplates implementing a policy or engaging in behaviour that might have negative consequences for the other party, this process involves notifying the other party of one's intentions and engaging in a proactive dialogue to address any possible problems. This consultation approach can be conducted in line with Article XI of the Outer Space Treaty, which allows for international consultations in instances when there is a risk of harmful interference with the activities of other State Parties.[25]Furthermore, the most often utilised strategy is negotiations. The International Court of Justice (ICJ) confirmed the fundamental importance of the settlement process in the North Sea Continental Shelf disputes, so upholding the prior decision of the Permanent Court. The predominant, acknowledged, and preferred method is negotiations. When a conflict is sent to adjudication, arbitration, or conciliation as agreed upon beforehand, the conversation is usually a crucial component of the dispute resolution process. Many treaties and international agreements include it as a requirement for other conflict resolution methods, a method of resolving disputes, or an obligation of prior consultation. Also, Inquiry and Task-finding are also some of the best dispute settlements. The primary objective of a commission of inquiry under the Hague Convention is to facilitate the resolution of a matter by conducting a thorough and impartial investigation. However, modern mechanisms now empower inquiry and fact-finding committees with the legal authority to objectively evaluate the facts and offer

[24] United Nations Office for Outer Space Affairs, "The Outer Space Treaty" *UNOOSA*, 1966*available at*: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.
[25] United Nations, *UNITED NATIONS TREATIES and PRINCIPLES on OUTER SPACE*, 2002.

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suggestions. Examples of this may be observed in the 1977 Additional Protocol I to the 1949 Geneva Red Cross Conventions, as well as the 1982 United Nations Convention on the Law of the Sea (UNCLOS).[26] Arbitration involves Both arbitration and judicial settlement have the potential to lead to enforceable agreements. Arbitration, a more conventional approach, offers greater flexibility, and less formality, and is often favoured over judicial settlement. While international commercial arbitration has experienced significant growth for both interstate and mixed matters, there has been a recent decline in interstate arbitration. The primary factor behind the triumph of international commercial arbitration is the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, which effectively resolved the challenge of enforcing arbitral awards.[27]Arbitration is a process where one or more arbitrators, along with an umpire, provide a legal decision to settle a dispute between two or more parties. The arbitration process might address both claims and counterclaims, or it can be centred around a singular issue. Arbitration can be employed either as a formalised procedure or as an improvised approach to resolve a particular dispute.[28] Mediation is an expedited method that is particularly effective when direct negotiations are unlikely to be successful due to significant animosity between the parties. A third party facilitates the resolution of a disagreement by consolidating the claims of the disputants and suggesting a compromise that lies between their positions.[29] Establishing confidence with both parties can be a difficult task for a mediator, and this is generally the situation. An example of this was the dispute between Chile and Argentina on the implementation of the Beagle Channel decision.[30] Several treaties include provisions for mediation and good offices, such as the 1959 Antarctic Treaty, the 1964 Charter of the Organisation of African Unity, the 1948 Pact of Bogota, and the Pact of the League of Arab States.[31] Therefore, discussions that involve a third person and allow for flexibility are comparable to the process of mediation. In addition, a mediator can provide crucial assistance by offering financial resources and other necessary means to implement the agreed-upon resolution. The World Bank effectively resolved the 1951- 1961 Indus water dispute between India and Pakistan

[26] United Nations, *United Nations Convention on the Law of the Sea United Nations* (United Nations, 10 December 1982).
[27] United Nations, "Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1958) (the 'New York Convention') | United Nations Commission on International Trade Law" *Un.org*, 2019 *available at*: https://uncitral.un.org/en/texts/arbitration/conventions/foreign_arbitral_awards.
[28] World Intellectual Property Organization, "What is Arbitration?" *WIPO*, 2019*available at*: https://www.wipo.int/amc/en/arbitration/what-is-arb.html.
[29] Calliope Makedon Sudborough, "Mediation" *European yearbook of international economic law* 67–121 (2023).
[30] *REPORTS of INTERNATIONAL ARBITRAL AWARDS RECUEIL DES SENTENCES ARBITRALES Dispute between Argentina and Chile Concerning the Beagle Channel*, 1977.
[31] Gérardine Meishan Goh, "2 Applicability of International Dispute Settlement Mechanisms to Space Law" *brill.com* 79–136 (Brill Nijhoff, 2007) *available at*: https://brill.com/display/book/9789047419464/Bej.9789004155459.i-408_004.xml(last visited July 3, 2024).

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through negotiations.[32]

Some of the agreements provide the use of legal means to resolve disputes. Consequently, the parties are legally obligated to abide by a decision rendered by a third party. Adjudication is the responsibility of a court that is currently in session. Undoubtedly, the International Court of Justice (ICJ) has the utmost importance among the limited number of permanent international courts and tribunals.[33]

Anticipated Challenges

1. Emerging Trends in Space Exploration and Commercial Human Space Travel

In the 1990s, the private sector's involvement in space significantly grew due to the government's aim to reduce space expenditures and improvements in technology that provided significant benefits and reduced prices.[34] Telecommunications, remote sensing, space tourism, and space navigation have all experienced significant advancements due to the commercial use of space technology. One of the most urgent and challenging topics to address is commercial private human access to space, which refers to any business endeavour that offers clients a direct or indirect experience of space travel. The use of space for commercial purposes has undergone significant transformation, resulting in the emergence of several crucial legal concerns. In order to handle significant matters like launch permits and limits that a state may enforce for reasons of national security, the current scenario necessitates regulation by both the public and private sectors of the legal system. The United States and Australia were pioneers in enacting national legislation to oversee space exploration, and today other nations are actively pursuing the same course of action.

2. Space Law's Environmental Aspects: Space Debris

The rapid progress of the space sector poses a significant threat to the environment, making it crucial to enforce legal restrictions on harmful operations. The proliferation of space debris, consisting of discarded spacecraft and misplaced equipment from extravehicular operations, has been a consequence of the heightened level of space exploration.[35]Space debris is a challenge for

[32] "World Bank Urges Mediation for India, Pakistan over Indus," *World Bank available at*: https://www.worldbank.org/en/news/press-release/2016/11/10/world-bank-urges-mediation-for-india-pakistan-over-indus(last visited July 3, 2024).
[33] International Court of Justice, "How the Court Works | INTERNATIONAL COURT OF JUSTICE" *www.icj-cij.org*, 2023*available at*: https://www.icj-cij.org/how-the-court-works.
[34] Gordon C Rausser, Eui-Hyun Choi and Alexandre M Bayen, "Public–private partnerships in fostering outer space innovations," 120 *Proceedings of the National Academy of Sciences of the United States of America* (2023).
[35] Rajeev Suri, "What's the environmental impact of space debris and how can we solve it?" *World Economic Forum*, 2022*available at*: https://www.weforum.org/agenda/2022/07/environmental-impact-space-debris-how-to-solve-it/.

spacecraft satellites in terms of navigation, especially in the Geostationary Satellite Orbit. It has the potential to deviate from its intended path and raise the likelihood of collisions or interference with transmissions. The proliferation of objects in orbit has led to a significant increase in the problem of space trash.[36] Consequently, as of 2019, there are more than 20,000 artificial objects in the Earth's orbit, thereby raising the likelihood of radioactive contamination and the presence of other hazardous substances.[37] The inaugural collision between two satellites in orbit in 2009 highlighted the pressing nature of the space debris issue. Both the latest Space Law provisions and the UN space treaties fail to adequately tackle the problem of space debris. This deficiency is mostly due to the absence of a legally binding agreement and the ambiguity regarding responsibility for the damage caused by space debris.[38]

3. Anti- Satellite Missile Technology

The emergence of ASAT activities in this region poses a recent threat to several of the leading spacefaring nations.[39] The text has a commentary about the historical testing of these weapons, specifically highlighting the latest provocations by the US in February 2008 and China in January 2007.[40] This text highlights the unsuccessful efforts made over the last thirty years to construct weapons control treaties, as well as the ongoing blockade imposed by the United States on the primary platform for disarmament discussions. In the absence of a new outer space disarmament agreement, the world can successfully rely on customary international law as a viable option to enhance space security and prevent the development and deployment of anti-satellite weapons (ASATS). It is imperative to effectively regulate this in order to sustain global peace.[41]

4. Mars Colonisation

Several corporate groups, like as SpaceX and NASA, are actively pursuing the establishment of a

[36] Jonathan O'Callaghan, "What is Space Junk and why is it a problem?" *Natural History Museum*, 2019 *available at*: https://www.nhm.ac.uk/discover/what-is-space-junk-and-why-is-it-a-problem.html.
[37] Aaron Boley and Michael Byers (eds.), "Mega-constellations" *Cambridge University Press* 46–76 (Cambridge University Press, Cambridge, 2023)*available at*: https://www.cambridge.org/core/books/who-owns-outer-space/megaconstellations/E3988C26ACD64C18797811028A7F1E26.
[38] Yannick Radi , "ESIL Reflection – Clearing up the Space Junk – On the Flaws and Potential of International Space Law to Tackle the Space Debris Problem – European Society of International Law | Société européenne de droit international" *European Society of International Law* , 2023*available at*: https://esil-sedi.eu/esil-reflection-clearing-up-the-space-junk-on-the-flaws-and-potential-of-international-space-law-to-tackle-the-space-debris-problem/.
[39] "ASAT weapons: A real threat to the future of Space," *or online. Org available at*: https://www.orfonline.org/expert-speak/asat-weapons.
[40] Council on Foreign Relations, "Timeline: China's Maritime Disputes" *Council on Foreign Relations*, 2023*available at*: https://www.cfr.org/timeline/chinas-maritime-disputes.
[41] Kenneth W. Thompson, "Arms Control" *Encyclopedia Britannica available at*: https://www.britannica.com/topic/arms-control.

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human colony on Mars.[42] However, when these initiatives are put into action, there will arise several instances of legal uncertainties, therefore requiring the establishment of a well-organized legal system. A primary factor contributing to worldwide legal instability is the territorial dispute about the ownership of land on Mars.

CONCLUSION

In summary, the process of resolving international conflicts within the framework of space law is complex and fraught with challenges, yet it also presents prospects for favourable outcomes. The lack of a comprehensive legal framework has not kept pace with advancements in space activities, leading to ambiguities and divergent interpretations across nations. As a consequence, there has been a rise in tensions around issues such as satellite orbits, resource extraction rights, and accountability for space trash. An optimal approach that places equal importance on international cooperation and the strengthening of legal frameworks is essential for achieving efficient conflict resolution. While international accords such as the Outer Space Treaty are essential instruments, they require updating to effectively tackle present challenges.[43] Moreover, enhancing transparency and communication channels among nations engaged in space exploration might mitigate misconceptions and reduce the likelihood of conflicts escalating into warfare. In addition, the establishment of specialised dispute resolution procedures tailored to space-related issues can expedite the settlement of conflicts in a prompt and unambiguous manner. These methodologies may integrate information from many fields, including law, science, and diplomacy while expanding upon the existing framework for international arbitration.[44] Ultimately, resolving international problems related to space law requires proactive collaboration, innovative legal approaches, and a steadfast commitment to preserving space as a peaceful realm for the collective benefit of humanity. By engaging in cooperative efforts and implementing adaptable legal frameworks, nations may pave the way for a sustainable and equitable future in the realm of space exploration and utilisation. The increasing number of individuals employed in the space industry is leading to a rising need for laws that can be legally enforced. This has implications for both governments and commercial companies. The Outer Space Treaty is crucial in this particular

[42] "Martians Wanted: NASA Opens Call for Simulated Yearlong Mars Mission - NASA," *NASA available at*: https://www.nasa.gov/news-release/martians-wanted-nasa-opens-call-for-simulated-yearlong-mars-mission/.
[43] "Debate on Disarmament Aspects of Outer Space Exposes First Committee Rift over Ways to Sustain Space Security, Prevent Domain's Weaponization | UN Press," *press.un.org*, 2023*available at*: https://press.un.org/en/2023/gadis3723.doc.htm.
[44] Penn Law and Inan Uluc, *Penn State Law Corruption in International Arbitration*, 2016.

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field.[45] It outlines the fundamental principles and rules that the global community has collectively established to govern human actions in outer space. Technological progress has necessitated specific international legal and regulatory modifications to maintain a peaceful global environment for space research and use. As technological advancements in outer space continue, the significance of property rights pertaining to resources will grow. An outcome of the economic utilisation of space is the division of space law into several branches. Establishing a secure environment in the space business necessitates the enactment and synchronisation of national space laws.[46]

[45] Sophie Goguichvili et al., "The Global Legal Landscape of Space: Who Writes the Rules on the Final Frontier? | Wilson Center" *www.wilsoncenter.org*, 2021*available at*: https://www.wilsoncenter.org/article/global-legal-landscape-space-who-writes-rules-final-frontier.

[46] Caroline D. Krass, "Space Law: Promoting the Rules-based Order through Multi-Domain Lawyering" *Default*, 2024*available at*: https://www.lawfaremedia.org/article/space-law-promoting-the-rules-based-order-through-multi-domain-lawyering (last visited July 3, 2024).