EUROPEAN SPACE POLICY IN A GLOBAL CONTEXT

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ZEYNEP TONGA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF EUROPEAN STUDIES

JULY 2022

Approval of the thesis:

EUROPEAN SPACE POLICY IN A GLOBAL CONTEXT

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ABSTRACT

EUROPEAN SPACE POLICY IN A GLOBAL CONTEXT

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July 2022, 103 pages

This study aims to analyse the motivations of the European Union in developing its Space Policy mainly in the Post-Cold War Period. In this context, the European Space Policy has been studied in terms of its civilian and military aspects. The thesis also analyses the history of the space race between the USA and the USSR during the Cold War Period in order to clarify the historical context of the EU's space policy. Furthermore, the thesis also compares and contrasts the contemporary space policies of the USA, the Russian Federation and the People's Republic of China in order to elaborate on the current global context of European Union's Space Policy. Contrary to the views of some scholars who argue that the EU's space policy is being developed for exclusively peaceful and civilian purposes, the thesis argues that the EU's Space Policy promotes military and strategic goals of the EU in order to contribute to the EU's security concerns as well as promoting peaceful and civilian objectives.
The thesis has 5 chapters: Chapter 1 is Introduction, Chapter 2 is Historical Background, Chapter 3 is European Space Policy, Chapter 4 is Space Policies of the USA, the Russia and the China, and Chapter 5 is Conclusion.

Keywords: Space Policy, Space Security, European Union, European Space Policy

ÖZ

KÜRESEL BAĞLAMDA AVRUPA UZAY POLİTİKASI

TONGA, Zeynep
Yüksek Lisans, Avrupa Çalışmaları Bölümü
Tez Yöneticisi: Prof. Dr. Oktay F. TANRISEVER

Temmuz 2022, 103 sayfa

Bu çalışma, ağırlıklı olarak Soğuk Savaş sonrası dönemde Avrupa Birliği'nin, Uzay Politikasını geliştirmedeki motivasyonlarını analiz etmeyi amaçlamaktadır. Bu bağlamda, AB uzay politikası sivil ve askeri yönleriyle incelenmiştir. Tez ayrıca, AB'nin uzay politikasının tarihsel bağlamını açıklığa kavuşturmak için Soğuk Savaş döneminde ABD ve Rusya arasındaki uzay yarışının tarihini de analiz etmektedir. Buna ek olarak, tez ayrıca AB'nin uzay politikasının mevcut küresel bağlamını detaylandırmak için ABD, Rusya ve Çin'in çağdaş uzay politikalarını da kıyaslamakta ve karşılaştırmaktadır. AB'nin uzay politikasının yalnızca barışçıl ve sivil amaçlar için geliştirildiğini öne süren bazı görüşlerin aksine tez, AB uzay politikasının barışçıl ve sivil amaçları teşvik ederken AB'nin güvenlik kaygılarına katkıda bulunmak amacıyla, askeri ve stratejik hedefleri de desteklediğini savunmaktadır.

Tez 5 bölümden oluşmaktadır: 1. Bölüm Giriş, 2. Bölüm Tarihsel Arka Plan, 3. Bölüm Avrupa Uzay Politikası, 4. Bölüm Küresel Bağlam olarak ABD, Rusya ve Çin Uzay Politikaları ve 5. Bölüm Sonuç 'tur.

Anahtar Kelimeler: Uzay Politikası, Uzay Güvenliği, Avrupa Birliği, Avrupa Uzay Politikası

To my mother, father and lovely brother who always supported me to follow my dreams.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to my supervisor Prof. Dr. Oktay F. TANRISEVER for his support, advice, guidance together with his valuable and constructive critiques and encouragement throughout this thesis.

In addition, I would also like to thank the examining committee members; Prof. Dr. Çınar ÖZEN and Prof. Dr. Fırat PURTAŞ for their valuable contributions to this study.

Lastly, I also would like to thank my family and friends for their support, patience, love, caring and understanding during the completion of this work.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AI: Artificial Intelligence

ANS: Air Navigation Services

ATM: Air-Traffic Management Services

CAIB: Columbia Accident Investigation Board

CNSA: China National Space Administration

COPUOS: UN Committee on the Peaceful Uses of Outer Space

DMSP: Defence Meteorological Satellite Program

DSC: Defensive Space Control

DoD: US Department of Defence

EGNOS: European Geostationary Navigation Overlay Service

ESA: European Space Agency

EOS: Earth Observing System

ESPI: The European Space Policy Institute

GNSS: Global Navigation Satellite Systems

GHG: Greenhouse Gases

GPS: The Global Positioning System

ICAO: International Civil Aviation Organisation

ICBM: Intercontinental ballistic missile

ISR: Intelligence, Surveillance Reconnaissance

IT: Information technology

NGO: Non-governmental organizations

NOAA: National Oceanic and Atmospheric Administration

OSC: Offensive Space Control

OST: The Outer Space Treaty

POES: Polar Operational Environmental Satellites

PRC: People's Republic of China

RF: Russian Federation

SSA: Space Situational Awareness

SST: Space Surveillance and Tracking

USA: United States of America

USAF: U.S. Air Force

VHF: Very High Frequency

CHAPTER 1

INTRODUCTION

The Space Politics was a hot topic during the Cold War Period due to the racing technologies of the USSR and the USA. The period marked important technological developments by the USSR and the USA in terms of the historical evaluation of space technologies. However, these developments were not just serving scientific purposes, but they also aimed to win the political advantage on the international environment.

Furthermore, while the Period was being dominated by the USA and the USSR for the case of Europe the situation was different. In that period Europe did not have an independent and autonomous space capability and had to rely on other powers in space related activities.[1]

However, as of 21st century, orbit and space became a playground with many other actors including the USA, the European Union, Russia, and China. In this period, also the concept of threat has changed with the development of more sophisticated technologies. In relation to this, protecting vulnerable space assets has become a security issue which has caused that space has become a strategic issue.[2]

For the case of the European Union, it also started to give space more importance in terms of military aspects as well as civilian. The first time in its history, the EU described space as a strategic field for strengthening its security & defence.[3] Moreover,

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[1]Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',* pp:1, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[2] Evers, Tobias. (2013). The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, pp:5.

[3] European Defence Matters, 2017, A magazine of European Defence Agecny, Issue 13, accessed at: https://eda.europa.eu/webzine/issue13, accessed on 25.01.2022.

it is just recently that the EU realized the strategic value of space and its direct or indirect relation to security.[4] Together with the change in the concept of threat because of the development of more sophisticated space crafts and the complex technologies that affect even the daily life of citizens, the security concerns of the EU, and the role of space technologies in the EU's security and defence policy has now been written explicitly in legal documents.

Therefore, contrary to the arguments of some scholars who thinks that EU's space policy is being developed for exclusively peaceful and civilian purposes, this thesis aims to conduct research on "Does the European Union develop its Space Policy for peaceful purposes? Which civilian and military aspects motivate the EU's space policy?" Moreover, there are findings on this thesis that European Union doesn't have solemnly civilian and peaceful purposes while developing its space technology but also it has purposes for military and security motivations that seem to be aligned with its overall strategic and security priorities.

1.1. Scope and Objective

The Cold War Period was marked with domination of the USA and the USSR in terms of space activities for the purpose of political competition with military motivations. Therefore, the space politics was very hot topic during Cold War Period, and there were important achievements in terms of space technologies. Finally, Space Race ended with the USA's success that the first American set foot on the Moon in 1969, and it became the symbol of the victory of the United States over the USSR.[5]

In this period, Europe was not at the front stage of the space race like the USA and the USSR. Rather, European countries were not independent and autonomous in space related activities and had to rely on other space powers.[6] Only in the aftermath of

[4] Evers,T.,2013.The European Union, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, pp:4.

[5] Sadeh, Eligar., 2004.Introduction. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p: xi

[6]Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',* pp:1, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

WWII, Western European Countries were willing to develop their own launcher that would allow Europe to have autonomous access to space. However, this initiative was limited with the rocket and missile developments by the UK and the USA collaboration in 1950s and couldn't proceed further.[7]

When we came to the 21st century, orbit and space became a playground with many actors. This new field, mainly led by the USA, the European Union, Russia, and China, has also changed the concept of threat, with the space technologies being included in the understanding of security, hence this field has become a strategic issue. [8]

Considering this changing approach to space related activities, the European Union also started to give space more importance in terms of political aspects as well as military. It was the first that European Union identified space also as a strategic asset for strengthening its security & defence;[9] also, it is just recently that the EU has realized the strategic value of space and its direct or indirect relation to security.[10]

Within the scope as mentioned above, the objective of this thesis is to answer if does the European Union develops its Space Policy for peaceful purposes, and which civilian and military aspects motivate the EU's space policy.

In order to answer the question, the thesis analyses the European Space Policy in terms of civilian and military aspects.

1.2. Literature Review

Although space is a scientific term coming from natural sciences, its outcomes such as policy, law, environment, commerce, international cooperation, power, national

[7] Harvey, Brian. 2003. European Space Programme. To Ariane and Beyond. Chichester, UK: Springer, pp:23., as cited in: Al-Ekabi, C., Mastorakis, P., 'The Evolution of Europe's Launcher and Flagship Space Initiatives',pp:3-4, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer

[8] Evers, Tobias. (2013). The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, p:5.

[9] European Defence Matters, 2017, A magazine of European Defence Agecny, Issue 13, accessed at: https://eda.europa.eu/webzine/issue13, accessed on 25.01.2022.

[10] Evers, Tobias. (2013). The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, p:6.

security, and sovereignty[11] are covered under social sciences, and there is a significant amount of literature on space policy from different backgrounds and from different approaches.

When we look at the overall literature specifically about space politics, there are two main approaches by scholars: military or civilian. Especially due to the space race in the Cold War period, there are important amounts of literature about space policies of the USA and the Soviet Russia.

However, following the Cold War and the dissolution of the USSR, according to my findings, there has been a decrease in the number of outputs produced by scholars about space politics, and the topic seems to have lost its importance and popularity.

Within power relations, Everett C. Dolman, as a space theorist, is very popular. He supports the hegemonic power of the USA in space and argues that when the USA becomes unchallenged in space, the international system would reach its stability and a military race in outer space would be prevented.[12] Moreover, he creates a direct relationship between space and military power, and states that space weapons have and offensive character by their existence. According to him, the traditional purpose of military power is an extension of political power in order to be used as an option by political decision makers to achieve their national interests. Therefore, he makes a correlation between space power and navy power; and defines the former as an instrument to protect national interests in space that is very similar what navy power does in the sea.[13]

On the other hand, James Edward Oberg, approaches the topic from a different perspective advocating that it is not possible to make a theory on space power just by comparing with sea or air power because of having different stages of technological developments. Moreover, space power cannot be solemnly effective to manage the

[11] Sadeh, Eligar., 2004.Introduction. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p. xiv.

[12] Dolman, E. C. (2006). A Debate About Weapons in Space: For U.S. Military Transformation and Weapons in Space. SAIS Review of International Affairs, 26(1, Winter-Spring), p:171.

[13] Ibid, p:171.

reflections of terrestrial conflicts or to meet the terrestrial political intentions. He thinks that in the near future space will be a separate environment on its own.[14]

Also, there are opposition arguments to the assumption of the traditional state-run approaches such as by James Clay Moltz. He supports that different conditions may bring new options, and states' complex technologies in space can be convincing for counterparts and be preventive for a rivalry in space.[15] Moreover, He thinks that globalisation and interdependence of the modern world will also be affecting space power; and the power and influential capability of the national powers that share their importance with network of modern world and successes created by innovations. In addition, he argues that traditional state-run programs will be replaced by commercial actors who have capacity and ability to respond faster and meet market conditions providing the newest technologies.[16] Contrary to the Cold War environment where state-run and state-funded programs were dominant, in the future the space strategy of the USA might be separated from Russia's and China's strategy in that sense, and it may be moving space away from being a state centric topic.[17]

Also, in the literature of space policy and space politics, space and power relationships are going forward. Since these terms are the base of this thesis, it is also important to clarify the meanings of different combinations. It is "spacepower" or "space power"?

According to the Aliberti, Cappella, and Hrozensky, there is not commonly agreed definition of space power. These authors are chosen as reference here, as they have successfully done similar work and provided definitions to most of the terms used in space policy concept.[18]

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[14] Oberg, Space Power Theory, 1999, pp. 121–122. As cited in: Aliberti, M., Cappella, M. and Hrozensky, T., 2019. Measuring Space Power: A Theoretical and Empirical Investigation on Europe. Springer Briefs from the European Space Policy Institute, pp:9

[15] Moltz, J.C, *The Changing Dynamics of Twenty-First-Century Space Power*, Strategic Studies Quarterly,Spring 201, p:68.

[16] Ibid, p:69.

[17] Ibid, p:88.

[18] Aliberti, M., Cappella, M. and Hrozensky, T., 2019. Measuring Space Power: A Theoretical and Empirical Investigation on Europe. Springer Briefs from the European Space Policy Institute.pp:5.

In their work, in terms of combination 'space' and 'power', they explain that "spacepower" refers to an actor, and "space power" refers to the capabilities of actors.[19] According to the definition done by Aliberti, Cappella and Hrozensky[20], space power is "the status that a nation reaches once it has mastered the ability to exploit the space environment through the full spectrum of capabilities." These capabilities consist of equipment, technological innovations, information, know-how, policy power, economic power and any means of capability that serves on the purpose of space activities. [21]

There is also another important term within the concept of space politics which is an extension of space power: "space security".

In his article published in *Astropolitics* (2004) Robert Lawson mentions Space Security and highlights that by August 2003, "space security" was still a new concept, therefore there was no commonly accepted definition.[22] However, as a result of the output of the study run by Space Security Working Group gathered under International Security Research and Outreach Programme (ISROP) and Eisenhower Institute between 2002 and 2003, a meaningful definition of space security was defined as: "secure and sustainable access to and use of space; and freedom from space-based threats"; and in line with this, also (initial) 17 indicators of space security in three categories were developed.[23] Those are: the space environment; intention of space security actors; and capabilities of space security actors [24].

[19] Ibid, p:5.

[20] Ibid, p:6-7.

[21] Ibid, p:6-7.

[22] Lawson, R., 2004.The space security index, Astropolitics, 2:2, pp:177.

[23] Ibid, p:177.

[24] As noted in Lawson, R., 2004.The space security index, Astropolitics, 2:2, pp:194: "It is aimed that 'space security actors' or just 'actors', mean states, institutions, firms or agencies which have a direct interest in space, and a potential impact on space security. While states are the most prominent actors among them, the term also includes, civil space agencies, militaries, international organizations and firms."

The first category ‘Space environment’ consists of two main indicators related to space security: ‘Space debris’ and ‘Space resource allocation’ that both have direct effect on the secure access by space actors to and use of space. The second category ‘The intention of space actors’, preciously at international level have a linkage to international law and international institutions dealing with space security issues. There are two main indicators under this second category of ‘the intention of space actors’ which are space security policies of countries and related doctrines, and legal, normative, and institutional developments. The last category of indicators is “the capabilities of space security actors” that consists of eight indicators: space industry, space access, space protection, space surveillance, civil space programs and global utilities, space negation, space and terrestrial military operations, space-based strike weapons.[25]

Furthermore, in the literature, there are two approaches to space security: security from space and security in space. According to Lawson, regarding space access, it is not always good that actors have access to space equally. He argues that there is also the other side of the coin. Because, when there is more actors accessing space, then there is more threat created to space assets which undermines space security in the long run.[26] Moreover, Leissle argues that becoming a serious actor in space is not possible without a military activity. While stating how the EU intents to strengthen its presence in space through legal documents and treaties, He refers to neo-realism that there would be no stability and no generally accepted legal system, if a single nation state would become too powerful in space. Therefore, he advocates that the EU should engaged also in military activities as well as civilian activities if its intention is having a place among other space powers.[27]

Besides space security, there is also another commonly used term in the literature: Space sustainability. ‘Space sustainability’ is a concept that concerns the safety and

[25] Lawson, R., 2004.The space security index, Astropolitics, 2:2, pp:179.

[26] Lawson, R. The space security index, Astropolitics, 2:2, 175-199, 2004. pp: 185.

[27] Leisse, M. 2017, Chapter 6: Power Politics and the Formation of International Law, A Historical Comparison. In: Hoerber T., Sigalas, E., ed., *Theorizing European Space Policy*. London: Lexington, pp:102

security of the space environment, particularly the risks resulting from space debris and its effects in the long term. Since the great importance of the space debris, states deal with the issue from two approaches: monitoring space debris via space situational awareness (SSA) systems, and debris mitigation and removal.[28]

In terms of conceptualisation of space security, the literature is rather rich in terms of conceptualising a security framework due to the space race of the Cold War. However, in terms of the European space security that is not the case. Bolton[29] provides a conceptual analysis of Galileo Program in terms of the balancing theory of neo-realism.

Moreover, the security dilemma is also dominant in terms of the militarisation and weaponization of space. According to Freese[30], the USA's military advantage has a direct relationship with its technical advantages especially after WWII. However, while countries are developing their own technologies, they also tend to deny technology of others especially in military aspects.[31] In the case of the USA, it always prefers not just to be superior but also to be dominant in the case of technology proliferation; although it provides technology to others which can be seen as acquiescence, it also creates concern for the USA in terms of security dilemma due to the risk of exploitation.[32] In that sense, Freese clearly explains the dual use of space technology is also very sensitive for governments due to military value of those globally and commercially available dual-use technology products.[33]

[28] Du, Rong. 2017, *China's Approach to Space Sustainability: Legal and policy Analysis*, Space Policy 42, p:8.

[29] Bolton, I., 2009. Chapter 11: Neo-realism and the Galileo and GPS negotiations. In: M. Sheehan and N. Bormann, ed., *Securing Outer Space*. Simultaneously published in the USA and Canada: Routledge, pp: 186.

[30] Freese, J.J., 2007, The Conundrum of Dual-Use Technology in Space as a Strategic Asset, Columbia University Press, New York, pp: 28-29.

[31] Ibid, p: 50.

[32] Freese, J.J, (2007), The Conundrum of Dual-Use Technology in Space as a Strategic Asset, Columbia University Press, New York, pp:50

[33] Ibid, p:50

According to the literature review, another commonly discussed topic among scholars is the case of "sovereignty".

Outer space has always been the case of 'sovereignty' among nations. As Launius[34] makes very remarkable comparison about sovereignty in outer space saying that the case of the NASA astronauts planted their flag on the Moon in 1969, was very similar to Spanish flag brough by Columbus when he discovered America. According to him, sovereignty is becoming an issue among countries in space, because of that countries develop their own ways to access space. To support his argument, he provides the case of ESA (European Space Agency) rejecting NASA's offer to cooperate in the post-Apollo space program and developing its autonomous *Ariane* space launch vehicle. [35]

In line with the aim of this study which is analysing the motivations behind the EU's Space Policy, the abovementioned concepts and terms are very important to understand the relation and the correlation between the sources of the intentions, actions and developments of countries while developing their space policies.

1.3. Argument

The core of European Space Policy evolves around the aim of peaceful uses of outer space with transparency and trust among states and non-state actors.[36] However, as detailedly explained and studied in this thesis, it is advocated that the EU intends to develop civilian and also military capabilities in the outer space. Especially, when we look at the latest issued regulations, we can clearly see that the EU is not stressing

[34] Launius, R. D., 2004. Historical Dimensions of the Space Age. in: E. Sadeh, ed., *Space Politics and Policy an Evolutionary Perspective*, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p:16-17.

[35] John Krige, "The Politics of European Collaboration in Space," Space Times 36 (September-October 1997): 4-9. And Lorenza Sebesta, "The Politics of Technological Cooperation in Space: US-European Negotiations on the Post-Apollo Programme," History and Technology: An International Journal 11 (1994): 317-341.; And Roger D. Launius, "NASA, the Space Shuttle, and the Quest for Primacy in Space in an Era of Increasing International Competition," in Emmanuel Chadeau ed., L' Ambition Technologique: Naissance dAriane (Paris: Institute d Histoire de L' Industrie, 1995): 35-61., as cited in Launius, R. D., 2004. Historical Dimensions of the Space Age. in: E. Sadeh, ed., *Space Politics and Policy an Evolutionary Perspective*, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p:17.

[36] Robinson, J. and Romancov, M., January 2014. The European Union and Space: Opportunities and Risks. Non-Proliferation Papers, (37), pp.1.

solemnly peaceful uses of space activities anymore, but also highlights the dual uses of space technologies in terms of security and defence concerns.

Therefore, this study aims to analyse the motivations of the European Union in developing its Space Policy mainly in the Post-Cold War Period. In this context, the European Space Policy has been studied in terms of its civilian and military aspects. The thesis also analyses the history of the space race between the USA and the USSR during the Cold War Period in order to clarify the historical context of the EU's space policy. Furthermore, the thesis also compares and contrasts the contemporary space policies of the USA, the Russian Federation and the People's Republic of China in order to elaborate on the current global context of European Union's Space Policy. Contrary to the views of some scholars who argue that the EU's space policy is being developed for exclusively peaceful and civilian purposes, the thesis argues that the EU's Space Policy promotes military and strategic goals of the EU in order to contribute to the EU's security concerns as well as promoting peaceful and civilian objective.

1.4. Theoretical Framework & Research Method

The Theoretical framework of this thesis is based on "neorealism" since it refers to power relations, approaches from a state centric view and focuses mainly on security concept. Neorealism has four main standing points: centres the nation state in its core, discusses the self-interest of nation states, highlights anarchical status of the international system, and refers to international system dominated by power and security.[37] Since the thesis also focuses on states and discusses state-run space activities and space policies, security concept combined with the threat and power relationships, the theoretical framework of this study can be called neorealism. Moreover, there is a part that goes under "neoliberalism" where the section refers to private companies on space activities however it is limitedly mentioned in this thesis.

[37] Wohlforth, 2009, p.132 as cited in Hudson, J James, Feb 10 2022, Neorealism: Internal Debates and Relevance to Space Militarisation, E-International Relations, ISSN 2053-8626, available at https://www.e-ir.info/2022/02/10/neorealism-internal-debates-and-relevance-to-space-militarisation/, accessed on 22.05.2022

When it comes to the Cold War Period and early post-Cold War period, Walter McDougall[38] defines the period as dominated by "Technocracy" meaning that "the institutionalization of technological change for state purposes, that is, the state-funded and -managed R&D explosion of our time." Between 1940s and 1980s '*geopolitics'* was the dominant theory for being imperialistic, racist, environmentally deterministic, also it was working closely with imperial state governments and having geopolitical goals.[39] Therefore, as a reaction to scholars defining Soviet-American militarised competition in strict geographical terms, critical geopolitics had emerged,[40] and called themselves as "anti-geopolitics" focusing on changing structures of international power together with domestic state power through "counter-hegemonic discourse(s)."[41]

Moreover, there is another term "neoclassical geopolitics" which Megoran[42] defines as "the ways of thinking about the effects of geography on international relations with changed social, economic, political and cultural factors". The most prominent scholar of neoclassical geopolitics is Everett C. Dolman with his famous book '*Astropolitik'* in which he explains "classical geopolitics in the space age" [43] , with his famous quote: "Who controls low-earth orbit, controls near-Earth space. Who controls near-Earth space, dominates Terra. Who dominates Terra, determines the destiny of humankind."[44]

[38] McDougall W.A.,1985. The Heavens and the Earth: A Political History of the Space Age. New York: Basic Books. 5. As cited in Moltz, J. Cl., *The Changing Dynamics of Twenty-First-Century Space Power*, Strategic Studies Quarterly, Spring 2019, pp:70-71.

[39] Haverluk, Terrence W. Beauchemin, Kevin M. And Mueller, Brandon A., 2014. The Three Critical Flaws of Critical Geopolitics: Towards a Neo-Classical Geopolitics, Geopolitics, 19:1, pp:19.

[40] Megoran, Nick. 2010, Neoclassical Geopolitics, Political Geography, Volume 29, pp:187.

[41] Haverluk, Terrence W. Beauchemin, Kevin M. And Mueller, Brandon A.,2014. The Three Critical Flaws of Critical Geopolitics: Towards a Neo-Classical Geopolitics, Geopolitics, 19:1, pp:20.

[42] Megoran, Nick. 2010, Neoclassical Geopolitics, Political Geography, Volume 29, pp:187.

[43] Ibid, p:187.

[44] Dolman, Everett C. 2002, Astopolitik, Taylor & Francis,London, Portland p:6-7.

This thesis also may be called as interdisciplinary considering that it is supported by different outputs from different fields including political science, security studies, environmental studies, astronomy, physic, etc.

In terms of research method of this thesis, the research was conducted mainly based on desk study. Main sources that were used in this study are academic writings on space policy in general and space security in specific. Additional to academic publications, state regulations, international and bilateral agreements and declarations in legal sense have also been used in order to support the base of the analysis. Moreover, reports and texts published by state's officials have been utilised. In addition, not just sources from social sciences also sources from natural sciences and engineering documents with technical base have been used in order to support the thesis with scientific facts and to provide background information on every aspect on of space and space technologies.

1.5. Organisation of the Thesis

This Thesis consists of 5 Chapters including Introduction and Conclusion.

The first chapter is Introduction. There are also sub-sections in this chapter such as Scope and objective of the thesis, literature review on the topic, thesis Argument, theoretical framework, research method and lastly organisation of the thesis.

The 2nd Chapter provides the background information on historical analysis of space policy, and legal and organisation framework of international space policies focusing on the space race between the USSR and the USA, and also historical evolution of space policy of the EU and China during the Cold War Period.

The 3rd Chapter discusses the EU space policy in the Post-Cold War Period that has been analysed in line with the significant improvements and developments in space technologies. Especially this section aims to answer the main argument of the thesis. For that purpose, the European Space Policy and space related activities have been analysed from a civilian and military perspective in this section.

The 4th Chapter provides information on the space policies of USA, Russia and China analysing on a wider perspective in order to elaborate motivations that countries may

have while improving their space policies and investing on. Similarities and differentiations with the European space policy and activities help to better analyse the topic from a global context.

The last chapter provides a summary of the thesis while comparing and contrasting the EU space policy and activities with US, Russia and China. In the concluding remarks of the thesis that supporting the argument confirming that the European Union has also military and security motivations while developing its contemporary space policy.

CHAPTER 2

HISTORICAL BACKGROUND

2.1. Introduction

In order to better understand the origins and developments of Space Politics, it is important to look at the historical background and to see what the motivations behind the first space related activities were, and how they were shaped in time. In line with this aim, the major and prominent developments have been highlighted in the following sections. The Chapter focuses on the Cold War period and highlight the space race between USA and USSR. Important developments in history of space policy are listed and detailed. Moreover, evolution of EU space policy and Chinese space policy have been also mentioned. Furthermore, the chapter continues with the legal and organisational framework of international space policies and provides information on the development of international law on outer space, and also elaborates the United Nation's involvement.

2.2. Cold War Period

The roots of space technology go back to the 1940s, and the first steps are found in the German V-2 Programme that was focused mainly on rocketry technology, an output of WWII, and ballistic guidance technology.[45] The rocket technology was one of the key elements of space technology because of their ability to take "satellites" up to the Earth's orbit.[46] It is very obvious that the main motivation behind the creation of the

[45] Shaw, J. E., 1999. The influence of space power upon history 1944-1998. Air Power History, 46(4), 20, p:2.

[46] Millbrooke, Anne. (June 2009), "History of the Space Age", p1-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.2, in edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, p:195-207.

rocket technology was purely military at those times. However, later on scientific motivations also started to be included as detailed in the following paragraphs.

In the mid-1950s, both the Americans and the Soviets were planning to conduct satellite observations from space.[47] Moreover, the Soviet Union succeeded its plan on between 1957-58 "the International Geophysical Year"; and the first time in the history a humanmade satellite "Sputnik" was launched into orbit in October 1957 by the USSR. That event was such a turning point in the history because of having created the very first public awareness on space technologies.[48]

Although just four months later than Sputnik's achievement, the first American satellite 'Explorer' also orbited in January 1958[49]; it was the success of Sputnik that captured all attention and won the first round of "space race."

On the surface, Sputnik success seemed like a scientific success developed for scientific purposes. However, according to Spiller, the Soviet threat especially for the American public that had exploded an atomic bomb, had spread of communism across mainland China and Korean peninsula was getting bigger with this recent incident.[50] Indeed, the successful launch of a rocket to orbit by the Soviet Union, shows its technological advantage and limitations of their own rocket technology that caused American public to fear that the Soviets were to develop intercontinental missiles.[51] The success of Sputnik by the USSR changed the perceptions of the Americans that this new weapon of offensive warfare is far beyond the big oceans and airspaces that

[47] Sadeh, Eligar., 2004.Introduction. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p:xi

[48] Millbrooke, Anne. (June 2009), "History of the Space Age", p1-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.2, in edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, p:195-207.

[49] Sadeh, Eligar., 2004.Introduction. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, pp:xi.

[50] Spiller, J. ed., 2015. Introduction: Polar stars and Stellar Stripes. In: Frontiers for the American Century, Outer Space, Antarctica, and Cold War Nationalism. New York: Palgrave Macmillan, p:6-7.

[51] Millbrooke, Anne. (June 2009), "History of the Space Age", p1-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.3, in edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, p:195-207.

protect the American continent. Therefore, the success of the launch of the first humanmade satellite into the orbit showed that it is a race of military technologies as well as civilian technologies.[52]

In addition to military advantages and technological limits that Sputnik showed, Space as a new field gained more importance and it turned into a new world to be inherited. The Sputnik's success showed to the US that the Space can be occupied by the Soviets and can be turned into a Russian territory. This was a serious fear by Americans.[53] Moreover, this shows us how security concerns were also developed parallelly with the improvements in the space technologies. The more complicated technologies, the more security concern.

What was also observed that even the language used in the official reports was changed after the Sputnik's occasion, and they started mentioning as "the defeat/loss of the US by the Soviets. It became one of the symbols of the Cold War as the Soviet Union's success over the U.S.[54] It is a clear sign that such an important scientific success doesn't have purely peaceful effects, but also it has a symbolic meaning leading to military effects creating security concerns.

Following the first humanmade satellites in the outer space, 'Sputnik' by the USSR in 1957, and 'Explorer' by Americans in 1958, both the USA and the USSR concentrated on developing their own space programs and focused on the human spaceflight programs aiming to send the first human into the space and to return him back to Earth

[52] Shaw, J. E. (1999). The influence of space power upon history 1944-1998. Air Power History, 46(4), 20, p:2.

[53] H. Anderson, The Sixties, Routledge, Oxfordshire, 2011., pp:211, as cited in J. Burwell, Imagining the beyond: The social and political fashioning of outer space, Space Policy, https://doi.org/10.1016/j.spacepol.2018.10.002,p:2

[54] J. Lule, Roots of the space race: Sputnik and the language of U.S. news in 1957,J. Q. 68 (1/2) (1991) 76e86, as cited in J. Burwell, Imagining the beyond: The social and political fashioning of outer space, Space Policy, https://doi.org/10.1016/j.spacepol.2018.10.002, p:2

safely.[55] In line with this aim, the Soviets started the spacecraft program "*Vostok*" (the East) and Americans started the spacecraft program "Mercury". [56]

In line with this aim, the USA established the National Aeronautics and Space Administration (NASA) in October 1958¸ as a single institution to manage America's ongoing civil space programs[57], and to re-establish the US dominance in space and science.[58] Furthermore, the Soviet's also put importance on developing its space program but with a different structure than the USA's. The Soviet's space program was not managed just by a single institution like the Americans' NASA, rather managed by different institutions such as defence industry, military, and academic institutions.[59] With these different approaches to space programs, we may also see how the motivations were different for the USA and the USSR at those times.

With the aim of human spaceflight, 'The Project Mercury' was started in Langley Research Centre in Hampton, the USA, in 1958.[60] Langley Research Centre was established by the National Advisory Committee for Aeronautics (NACA) in 1917. It included the first U.S. civilian aeronautical research facility specialised in advancement of the science of flight. During WWII, upon a request from military, the facility had started research on pilotless aircrafts which led to the first interests in the

[55] Nasa.gov. 1996. NASA - Langley's Role in Project Mercury. [online] Available at: <https://www.nasa.gov/centers/langley/news/factsheets/Mercury.html?0> [Accessed 8 November 2022].

[56] Yu. P Semenov, ed., Raketno-Kosmicheskaya Korporatsiya "Energiya" imeni S. P Koroleua (Korotev: RKK Energiya, named after S. P Korolev, 1996). p. 109 as cited in Siddiqi, 1966, p:250)

[57] Spiller, J. ed., 2015. Introduction: Polar stars and Stellar Stripes. In: Frontiers for the American Century, Outer Space, Antarctica, and Cold War Nationalism. New York: Palgrave Macmillan, p:22

[58] Guthrie, Ruth & Shayo, Conrad. (July-September 2005). The Columbia Disaster: Culture, Communication & Change. Journal of Cases on Information Technology 7(3). p:62.

[59] Golovanov, Korolev; Harford, Korolev; Boris V. Raushenbakh, ed., S.P. Korolev i ego delo: suet i teni v istorii kosmonavtiki (Moscow: Nauka, 1998, as cited in Gerovitch, Slava. (2006). 'Chapter 4: Human-Machine Issues in the Soviet Space Program' in Dick, Steven J. and Launius, Roger D. (ed) Critical Issues in the History of Spaceflight. NASA, Washington, DC, p: 119.

[60] Nasa.gov. 1996. NASA - Langley's Role in Project Mercury. [online] Available at: <https://www.nasa.gov/centers/langley/news/factsheets/Mercury.html?0> [Accessed 8 November 2021].

problems of the space exploration.[61] The main objectives of Project Mercury were to conduct a human spaceflight around the Earth orbit, and also to explore the human's capacity and performance in functioning in space environment, return the spacecraft with its crew back to Earth safely. [62]

Between 1961 – 1963 'The Project Mercury' conducted eight unmanned flights plus six human-flights. Alan Shepard was the first American in Space with its 15 minutes suborbital flight on May 5, 1961, and John Glenn was the first American in space by an orbital flight around the Earth in February 1962. However, his achievement stayed behind the success of Yuri Gagarin, who got the title "the first men in space" with his orbital flight just 3 weeks earlier than the Americans.[63]

Furthermore, we may observe that the pattern was the same with the Sputnik's achievement and also with other space related developments during the Cold War period: They were developed with a scientific and peaceful motivations however they serve also for a military competition.

As well as having different ideologies, Space programs of the Soviets and the Americans also had differentiations between them.

For instance, The Space Program of the United States takes its roots from aviation, and at that time no one knew how to select and to train an astronaut; therefore, the selection criteria easily focused on military test pilots. During the Mercury Project, out of a hundred, seven astronauts were chosen to be trained for the human spaceflights.[64] The first astronauts were selected among the more educated and experienced test pilots by NASA in April 1959, (i.e. having degrees in engineering and having flight experience no less than 3000 flight hours, half of which were logged in jets), between

[61] Ibid.

[62] Arrilucea, Eva, January 2008, Mission-oriented R&I policies: In-depth case studies: Case Study Report, Apollo Project (US), European Commission, Directorate-General for Research and Innovation, Brussels, pp:24.

[63] Nasa.gov. 1996. NASA - Langley's Role in Project Mercury,available at: <https://www.nasa.gov/centers/langley/news/factsheets/Mercury.html?0> ,accessed 8 November 2021.

[64] Nasa.gov. 1996. NASA - Langley's Role in Project Mercury.available at: https://www.nasa.gov/centers/langley/news/factsheets/Mercury.html?0, accessed on 8 November 2022.

35 and 40 years old with excellent physical conditions for the project Mercury.[65] On the other hand, for the Space Program of the Soviet Union, the first cosmonauts were young, dedicated fighter pilots with little engineering background, but with modest flight experience unlike American counterparts.[66]

On 12 April 1961, the Soviets succeeded the first human spaceflight to space, and Yuri Gagarin became the first human in history, completing one-round around Earth in a 108-minutes orbital flight, and returned safely back to Earth.[67] Although, the Americans also sent the first American, Alan Shepard, into space just a few weeks later, it was the Soviets' success that took attention of the whole world as well as the Americans'.[68]

Following Yuri Gagarin's success, on May 25, 1961 the president of the USA John F. Kennedy gave a speech in front the Congress and the American public, declaring that "I believe this Nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish."[69]

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[65] Siddiqi, A. ed., 1966. Gagarin. In: Challenge to Apollo: The Soviet Union and the Space Race 1945-1974. [online] pp:243-298. Available at: <https://history.nasa.gov/SP-4408pt1.pdf> [Accessed 29 December 2020]. pp:243-246; Karpov, Y., 1989. Beginnings. in: V. Mitroshenkov, ed., Pioneers of Space. Moscow: Progress Publisher, pp:16.

[66] Siddiqi, A. ed., 1966. Gagarin. In: Challenge to Apollo: The Soviet Union and the Space Race 1945-1974. [online] pp:243-298. Available at: <https://history.nasa.gov/SP-4408pt1.pdf> [Accessed 29 December 2020]. pp:243-246; Karpov, Y., 1989. Beginnings. in: V. Mitroshenkov, ed., Pioneers of Space. Moscow: Progress Publisher, pp:16.

[67] Yuri Gagarin - First Man in Space, available at: https://www.nasa.gov/mission_pages/shuttle/sts1/gagarin_anniversary.html, accessed on 28.12.2020, 14:17 (GMT +3)

[68] Ibid.

[69] John F. Kennedy, "Urgent National Needs," Congressional Record—House (May 25, 1961), p. 8276; text of speech, speech files, NASA Historical Reference Collection, NASA History Office, Washington, D.C, Available at: https://www.jfklibrary.org/archives/other-resources/john-f-kennedy-speeches/united-states-congress-special-message-19610525, accessed on 03.01.2021, also as quoted in Launius,2003, p:21.

Following the speech of President Kennedy, in 1961, The Apollo Space Program started as a response to the challenge of the Soviet's space activities and dedicated itself to take an American to the Moon and return him safely to the Earth.[70]

Furthermore, 16 July 1969 was a historic moment for the humankind. Apollo 11 was launched from Kennedy Space Centre and landed on the moon surface together with its 3 crews in the space shuttle. About 4 days after the launch that was followed by a successful landing on the Moon surface: on 20 July 1969, the first human Neil Armstrong step on the Moon for the first time in history. It is estimated that 650 million people from all over the world watched Neil Armstrong's image on the television or heard his voice on the radio saying the famous words "one small step for a man, one giant leap for mankind" on 20 July 1969.[71]

Although the most of the firsts are accrued by USSR; such as the first animal (a dog) taken up to the orbit on 3 November 1957; the first human in space - Yuri Gagarin on 12 April 1961; the first woman named Valentina Tereshkova on 16 June 1963; the first human walk in space on 18 March 1965; the first soft landing on the Moon by the Luna 9 probe on 3 February 1966; the first automatic docking in space on 30 October 1967; and the first docking in space of two manned spacecraft on 14-15January 1969;[72] the USA conducted the first human walk on the Moon, Neil A. Armstrong, by Apollo 11 mission on July 20, 1969 which resulted the USA to win the "space race".[73]

After several important successes by the USSR, the USA also needed an accomplishment.[74] In the Cold War era, prestige was also a symbol for "power".[75]

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[70] NASA, 2002, The Apollo Program, available at https://er.jsc.nasa.gov/seh/apollo_program.pdf, Accessed on 14.06.2021

[71] Ibid.

[72] Millbrooke, Anne. (June 2009), "History of the Space Age", p1-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.5-6, edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, p:195-207.

[73] NASA, July 20,2019, accessed at: https://www.nasa.gov/mission_pages/apollo/apollo11.html, accessed on 13.11.2021

[74] McDougall, 1985, the Heavens and the Earth: A Political History of the Space Age, pp:310

[75] Ibid, p:323.

Therefore, during his presidency, Kennedy gave importance to the progress of the space program, and increased the government support to catch the USSR and to secure the USA's "prestige". Later on, the idea "going to the moon" was revealed with Kennedy's support, and NASA came with the Apollo, Moon program. [76]

The Apollo Program was a series of missions consisting of 33 manned & unmanned flights that took place between 1961 – 1972 with a total approximate budget of USD 24.4 billion (according to the inflation rates of those periods)[77] The program included the special occasions for all humankind. For instance, it was the first time that the Earth was photographed letting all humankind to be aware how fragile the Earth was, which supported the green movement.[78] Besides its benefits to several technological and scientific fields expanding from medicine, food, geology to telecommunications, computing, avionics and spaceflight; it also set the foundation of international cooperation on projects like Skylab, Apollo-Soyuz Project, Space Shuttle and the International Space Station. Moreover, it was not just a scientific accomplishment but also a prominent example for management and organisation; having complexities with several sub-projects, schedules, timelines and budgets that all require a well-planned structure.[79] In addition to technological and scientific side of Apollo's success, it also served a competition for international prestige by the two superpowers with different economic and political system.[80]

Therefore, while analysing the space technologies during the Cold War period, it is obvious that scientific successes and developments by countries also had motivations for competing for international prestige. They used science as a tool for power politics.

[76] McDougall, 1985, the Heavens and the Earth: A Political History of the Space Age, pp: 318-320.

[77] Arrilucea, E., January 2008, Mission-oriented R&I policies - In-depth case studies: Case Study Report, Apollo Project (US), European Commission, Directorate-General for Research and Innovation, Brussels, pp:1

[78] Ibid, p:5.

[79] Ibid, p:6.

[80] Launius, R. D. Kennedy's Space Policy Reconsidered: A Post-Cold War Perspective, Air Power History, Vol. 50, No. 4 (Winter 2003), pp: 19, 2003.

During the Cold War Period space programs turned into an exclusive area with high profile and expensive projects for both the USA and the USSR. In order to defeat the Soviet Union and to be a recognised leader in international arena, the USA gave importance to engineering, competition and international prestige rather than science, cooperation and practical applications.[81]

Due to being a political symbol, all necessary resources for Apollo Project were made available by US government under Kennedy administration. It was so important that a failure could not be accepted. Since the main reason behind the creation of such a complicated and highly technical project was to win the Space Race with the USSR during Cold War period, after the achievement by Apollo 11 and placing first human, Neil Armstrong on Moon, the Program lost its attraction by forthcoming political leaders. [82]

However, according to some other resources, President Kennedy was not just competing with the USSR in Apollo program, he also intended to cooperate with the USSR at some stage. As Launius[83] recorded, Kennedy met with Khrushchev at the Vienna summit on June 4th, 1961[84], and offered Khrushchev to conduct the Apollo mission together. Launius reveals that the Soviet Leader rejected the US President's offer, claiming that disarmament was a prerequisite for the American-Russian cooperation in space. However, on 20 September 1963, Kennedy repeated his intention to cooperate in Space in his speech before United Nations saying that "Let us do big things together".[85]

[81] Launius, R. D., 2004. Historical Dimensions of the Space Age. In: E. Sadeh, ed., *Space Politics and Policy an Evolutionary Perspective*, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, pp:11, 2004.

[82] Launius, R.,2003. Kennedy's Space Policy Reconsidered: A Post-Cold War Perspective, Air Power History, Vol. 50, No. 4 (WINTER 2003), p:23

[83] Ibid, p:20

[84] https://en.wikipedia.org/wiki/Vienna_summit, accessed on 01.05.2021

[85] Launius, R.,2003. Kennedy's Space Policy Reconsidered: A Post-Cold War Perspective, Air Power History, Vol. 50, No. 4 (WINTER 2003), p:20

Later on, in 1984, The next President Reagan declared that "America has always been greatest when we dared to be great. We can reach for greatness again. We can follow our dreams to distant stars, living and working in space for peaceful, economic, and scientific gain. Tonight, I am directing NASA to develop a permanently manned space station and to do it within a decade." However, this request of a space station still had essence of competition with the USSR, and it was a new strategy in the second half of the Cold War period. [86]

The overall strategy of the Reagan Administration was to have a USA Foreign Policy that would consist of increasing the US military capabilities, a confrontational approach to foreign policy, supporting the US allies in other parts of the World, developing new technological systems including a navy built of 600-ships and "stealth" aircraft that could escape enemy radar, and sophisticated space-based systems that could be effective on Soviet missiles. In light with these, The Space station project of Reagan Administration was also part of the strategy to exceed the Soviet Union.[87]

2.3. Post-Cold War Period

Contrary to the Cold War's competitive environment, we see a much more cooperative relationship between the USA and Russian the Federation, and also with other countries.

Although the dominant approach of the USA Space policy was to overcome the Soviets during the Cold War Period; after the dissolution of the Soviet Union, the Russian Federation became a possible partner rather than an enemy, and this partnership also important outputs such as the creation of the International Space Station.[88]

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[86] Launius, R., 2004. Historical Dimensions of the Space Age. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, pp:15.

[87] Ibid, p:15.

[88] Holland, D. and Burns, J. The American Space Exploration Narrative from the Cold War Through the Obama Administration. Space Policy, 46, pp.13, 2018.

In the 1970s, the launch of Skylab was the first step towards a settlement in space, which was followed by 1975 - The Apollo-Soyuz Test Project which America and Soviets cooperated for the first time in order to develop a human space flight project.[89],[90]

In 1994, the very first visits to Space started with a visit to Station Mir, and in 1995 Norman Thagard became the first US astronaut to reside in the Mir Space Station. Between 1995-1998, a total of seven American astronauts worked with Russian cosmonauts in the Mir laboratory while orbiting around the Earth. Through this collective experience, International Space Station was created in 1998.[91] Moreover, according to NASA records, the very first crew of the station consisted of the U.S. astronaut Bill Shepherd and Russian cosmonauts Yuri Gidzenko and Sergei Krikalev who were carried by a Russian Soyuz spacecraft to the ISS, and return to Earth on the American Space Shuttle called Discovery in March 2001.[92] This example shows that there is a different international environment in space between the USA and the Russian Federation in the Post-Cold War period, that was driven by much more cooperative rather than competitive motivations.

The first section of The International Space Station (ISS) was taken to the orbit on 20 November 1998 by a Russian rocket called *Zarya* (meaning 'sunrise'). ISS is a platform the size of football field and weight 560-ton, orbiting around 400 km above Earth, with changing staff but permanently crewed. It is about four times bigger than *Mir* (the Russian space station) and five times bigger than the U.S.A.'s Skylab. During 10 years of establishment period, ISS has conducted more than 30 missions, and

[89] Sadeh, Eligar., 2004.Introduction. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, pp.xi

[90] Launius, R. D. Historical Dimensions of the Space Age. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, pp.15, 2004

[91] https://www.nasa.gov/mission_pages/shuttle/sts1/gagarin_anniversary.html, accessed on 28.12.2020, 14.17 (GMT+3)

[92] Ibid.

important scientific and engineering achievements resulted from the cooperation of five space agencies representing 15 countries.[93]

Furthermore, the Post-Cold War era was a period of the USA's technocracy being dominant with achievements such remarkable Space Shuttle Program, captainship on the establishment of International Space Station (ISS), commercialisation of the Global Positioning System (GPS) that was developed for military purposes by origin, but later on it has been turned into a civilian tool.[94]

Therefore, we may clearly see that in the Post-Cold War era was a different and much more cooperative environment in international arena. Although the scientific successes and developments in space related activities were at the highest top in both periods, the underlying motivations changed over time. They were much more militaristic and run by security concerns during the Cold War Period.

Furthermore, the historical evolution of the European Union space policy goes back to 1920s to the initiative of an amateur rocket society development. Precisely it can be said that, the history of European existence in space started on 3 October 1942, by the German rocket developer Dr. Wernher von Braun.[95] However, following the WWII, most of German engineers working on rocket and missile technology were shared between the USA and the USSR including Wernher von Braun.[96] This has a part also in the root of space race between the USA and the USSR as mentioned previously.

In the aftermath of WWII, Western European Countries were willing to develop their own launcher that would allow Europe to have autonomous access to space. However,

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[93] Available at: https://www.issnationallab.org/about/iss-timeline/#:~:text=The%20first%20rudimentary%20station%20was,ever%20developed%3A%20the%20American%20shuttles. , accessed on 14.05.2021

[94] Moltz, James Clay., *The Changing Dynamics of Twenty-First-Century Space Power*, Strategic Studies Quarterly, Spring 2019, pp:71.

[95] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives'.,* pp:2, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[96] Zak, Anatoly. "The Rest of the Rocket Scientists – Some went west. This is the story of the ones who went east." Sept. 2003. Air&Space Smithsonian 29 Dec. 2013, accessed at: https://www.airspacemag.com/space/the-rest-of-the-rocket-scientists-4376617/, accesed on 14.11.2021.

Germany was prohibited to develop rocket technology, or any other work related to missile technology due to the Nazi Army's attempts to develop and use V-2 rockets.[97]

We may also clearly see that the Western European Countries intention for autonomous access to space was motivated by security concerns, leading them to focus on space and rocket technologies.

Moreover, the status of Germany was kept same in the Paris Treaty in May 1955, stating that the development of missiles with guide limit more than 70 km was banned. This situation was an advantage for the UK and France to pay their depts resulting from the war while developing their own launchers and rebuilding their own satellites.[98]

In the early stages of the Space Age, we may see that there was no common goal or approach to space activities yet. Each Western European county was following its own path and conducting its own initiative in terms of space activities.

Under these circumstances, the first missile developed in the post-WWII Europe by the collaboration of UK and the USA in 1950s, that was called 'Blue Streak' and same as all missile technologies, the development of the Blue Streak was also driven by military motivations. It could be classified as "Intermediate Range Ballistic Missile" (IRBM) as a complementary to the USA's Intercontinental Ballistic Missile (ICBM) in the European continent while being an independent British deterrent. However, the program was cancelled in April 1960, since British military experts claimed that the Blue Streak rockets were very much vulnerable to the Soviet missiles. The time needed for the Blue Streak to serve its initial mission against the Soviet missiles would not be sufficient against Soviet missiles launched from Eastern Europe to the UK.[99] With this example, it is very clear that although these was a collaboration between the UK and

[97] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives'.*, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer., pp:3

[98] Ibid, pp:3-4.

[99] Harvey, Brian. 2003. European Space Programme. To Ariane and Beyond. Chichester, UK: Springer,pp:23., as cited in: Al-Ekabi, C., Mastorakis, P., 'The Evolution of Europe's Launcher and Flagship Space Initiatives',pp:3-4, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer

the USA, still there was a common enemy which was the USSR and rocket technology was developed purely for military purposes as in line with the political environment during the Cold War Period.

However, the British government, in order not to waste the investment done for the Blue Streak program, decided to redirect the program to become a satellite launcher program.[100] For supporting costs of such an expensive program, the British government intended to create a European collaboration inviting other European countries to develop a European program on satellite launcher. British government saw this small contribution by Member States also as an advantage for the UK presence in the European Economic Community (EEC) and also to strengthen their political role in world politics.[101] The economic and political situation in the European continent after WWII, led to the Western European countries to cooperate with each other around one common goal that was autonomous access to space.

The response from the Germany to the UK's invitation was affirmative, in which the UK - Germany collaboration could be seen as the first step for the enlargement of European Economic Community. It was also an advantage for Germany because of the option to be involved back in the field which it was banned after WWII.[102] In addition to Germany, France also confirmed to join this collaboration since it was in line with their aim to have technological autonomy.[103]

As a result of these initiatives, 'Eurospace' was created in 1961 as a non-profit organisation in order to support the aerospace activities in Western Europe. Also, in the 1960s, The Commission Préparatoire Européenne pour la Rechereche Spatiale

[100] Sheehan, Michael. 2007.The International Politics of Space. New York: Routledge,: pp:77.

[101] Ibid, p:77.

[102] Sheehan, Michael. 2007. The International Politics of Space. New York: Routledge: pp:78.

[103] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',*pp:5, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

(COPERS), and the European Space Research Organization (ESRO) were established.[104]

On 29 March 1962 the Convention for the Establishment of the European Launcher Development Organisation (ELDO) was signed in London by six European Countries (the UK, Germany, France, Italy, the Netherlands, Belgium) and Australia, and ELDO was established to work on the European satellite programs. [105],[106]. These are very important achievements that also led to the common European Space Policy rather than being Member States separated in space related activities. And finally, in 1973, ESRO and ELDO were merged and European Space Agency (ESA) was established.[107]

The following period of the European Space Policy has been analysed in the following and separate section of this thesis: Chapter 3 – European Space Policy. Before getting into the contemporary period, the historical background of space policy of China has been summarised in the following paragraphs, since China is also one of the rising powers in space activities like the Russian Federation and the USA.

Another power that had interests into space technologies at that time was China.

According to Chen[108], China's space policy can be studied in four historical phases.

First phase is between 1956 – 1966 that was full of disquieting political events such as the anti-Rightist campaign, the Great Leap Forward (Second Five Year Plan), end of

[104] Millbrooke, Anne. (June 2009), "History of the Space Age", pp: 01-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.10; edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, pp:195-207.

[105] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',*p:5-6, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[106] Millbrooke, Anne. (June 2009), "History of the Space Age", pp:01-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.10; edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, pp:195-207.

[107] Ibid, p:195-207.

[108] Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37,pp: 171.

Soviet support to China on science and technology developments [109] – which is a controversial issue because according to some other sources it was China that ended this supportive relationship with the USSR. Until 1960, China had been receiving technical support from the Soviet Union.[110] However, in 1960s, the China ended its cooperation with the USSR by asking all Soviet experts to leave China.[111] Then China focused more on nuclear technology rather than spacecrafts.[112] The second phase is between 1966-1976 which was dominated by Cultural Revolution. Despite the negative situation of the Chinese society, China succeeded to launch its first satellite into the space. [113] The third phase is between 1976 -1986, a period of Chinese re-evaluation of the key economic and social goals which was a threat to Chinese space industry; and lastly, the fourth phase is between 1986 till present which is the glorious times for Chinese space industry.[114]

In 1950s, a Chinese Scientist, Tsien Hsue-Shen (also known as Oian Xuesen[115]) was trained in the US and Canada, and he was working for the US government at that time. Afterwards, He was arrested for 5 years for being a member of Communist Party of China. The Chinese government requested from President Eisenhower's administration during the 1955 Geneva summit at the end of Korean War, that Tsien was to be released and allowed to return to China. Following the affirmative response by Eisenhower, Tsien returned to China and started negotiations with the Soviet Union

[109] Millbrooke, Anne. (June 2009), "History of the Space Age". Handbook of Space Engineering, Archaeology, and Heritage, p.12.

[110] Ibid, p.12.

[111] Rodriguez, Roberto. (2011). The Space Program of the People's Republic of China, p. 6.

[112] Millbrooke, Anne. (June 2009), "History of the Space Age". Handbook of Space Engineering, Archaeology, and Heritage, p.12

[113] Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37,pp: 171.

[114] Ibid, p: 171.

[115]Seedhouse, E., (2010). The New Space Race: China vs. the United States. Chichester, UK: Praxis Publishing Limited, p. 14., as cited in, Rodriguez, Roberto. (2011). The Space Program of the People's Republic of China, p.4.

on the transfer of nuclear and rocket technologies including options for Chinese students to study science in the Soviet Union.[116]

On 4 October 1957, after the successful launch of Soviet satellite 'Sputnik' into orbit, Chinese government, dedicated to put China as same level with the USA and the USSR in space technologies with the goal to launch the first Chinese satellite into orbit until 1959 in order to honor the 10th anniversary of the establishment of the People 's Republic of China (PRC). [117]

The cooperation between the China and the Soviet Russia started by a Chinese delegation's visit to the USSR to sign an agreement on that Soviets accepted to help China on the development of rocket technology, that includes also building three research & development institutions focusing on missile technology and delivery of two Soviet P-2 rockets to China.[118] However, in August 1960 this relationship between the USSR and the China was broken and the USSR withdrew its support from China which led to China deciding itself to build its independent space technology. China focused on developing its own short-and medium-range missiles. Finally, on 27 October 1966 China succeeded the launch of the first successful nuclear missile; and on 26 December 1966, launch of the first fully operational medium-range missile.[119]

On 20 February 1968, an Academy of Space Technology was established, under the coordination of the Committee of Science and Technology for National Defence (COS-TIN) in which all projects were conducted by civilians but were subject to military discipline and were treated as military missions.[120]

In the 1970s, China put more importance on satellite technology establishing the Shanghai Institute of Satellite Engineering, the Shanghai Institute of Launch Vehicles

[116] Rodriguez, Roberto. (2011). The Space Program of the People's Republic of China, p. 5.

[117] Ibid, p.6.

[118] Chen, Yanpng., 2016.China's space policy-a historical review.,Space Policy, Vol:37, pp: 172.

[119] Ibid, p: 172-173.

[120] Ibid, p: 172-174.

and the Heavy Rocket Engine Test Station. [121] However, during this period, there was a decline in support to space programmes due to the political situation in China and all attention was given to strengthening the country's economic situation. [122]

In the late 1980s, the situation in space sector changed. It got back on track and started to improve. It gained the support from leaders again, and China reclaimed its international credibility.[123] Especially, the USA'S Challenger disaster in 1986, and launch failure of European *Ariane*; let China to grow in the international space sector and China's *Long March rocket* was seen as a viable alternative to the services in the space sector. [124]

After a period of neglecting science and technology, in March 1986, a proposal called "863 Proposal" was published by a group of influential scientists advocating that "China must not neglect developing high-technology capabilities." In line with this, seven main topics were identified in the 863 Proposal that were: information technology, space technology, automation technology, biological engineering, laser technology, energy and new materials technology. The 863 Proposal also took the attention of higher-level authorities and long-term goals were identified under 3 titles: to develop a heavy launch vehicle, to build a space station, and to develop a space transportation system.[125]

In line with these improvements, in 1989, China successfully took 25 satellites into orbit, serving for telecommunications, satellite-TV education, weather monitoring,

[121] Ibid, p:174.

[122] Ibid, p:175.

[123] Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37, pp:176.

[124] Euroconsult, 'Space industry e 10-year survey', Space Policy, Vol 6, No 3, August 1990, pp 250e259. Phillip Clark, 'Chinese launch vehicles aim for the commercial market', Space Markets, Winter 1987, pp 178e185; G. Lynwood May, 'New directions for the People's Republic of China space program', Signal, December 1987, pp: 39-46., as cited in Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37, pp:176.

[125]Song,J. 9 December 1988, 'Aerospace will be the central position defined by China high technology development strategy', Renmin Ribao, overseas edition, as cited in Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37, pp:176.

marine navigation, remote sensing of natural resources, biotechnology and materials processing.[126]

On November 1999, China launched an unmanned spacecraft into orbit, and finally on October 15, 2003, its first manned space craft, *Shenzhou 5*, was launched and China's first taikonaut *Yang Liwei* orbited 14 times around the Earth.[127] In a speech record his brother-in-law, said that "We don't worry about his safety because we trust the nation's advanced technology." Moreover, before the launch Mr. Liwei also stated that "I will not disappoint the motherland."[128]

During the Cold War and Post-cold war Period, the patter of Chinese Space Policy was very similar to the others. It also started with the development of rocket and missile technology, and it continued in the same direction that led to the development of autonomous access to space by China. Having become autonomous and invested in space technology, it continued with different satellites technologies that serve also for civilian purposes such as monitoring, telecommunications, remote sensing technologies etc. Therefore, we may say that the origins of the Chinese Space Policy were also motivated with military developments and security concerns but later on it was supported by civilian activities that served for peaceful purposes as well.

In the Chapter 4 of this thesis, the contemporary Chinese Space Policy including Post-Cold War period have been analysed in detail.

In this Section of the thesis, we have observed that the origins of space technology are originated by a military purpose which was rocket technology. However, the following steps had much more scientific purposes, but still serving a military competition between the USA and the USSR in line with the nature of the Cold War Period. At that point, we can observe that although these developments did not have a direct military motivation, they were indirectly related to military aims such as having international

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[126] [126] Chen, Yanpng., 2016.China's space policy-a historical review. *Space Policy*, Vol:37, pp:177.

[127] Hansen, J. R., (ND) Chapter 7: The Taikonaut as Icon: the Cultural and Political Significance of Yang Liwei, China's First Space Traveler, in *Societal Impact of Spaceflight,* .pp:106., available at: https://history.nasa.gov/sp4801-chapter7.pdf

[128] BBC, "Profile: China's first spaceman,"BBC News, October 15,2003, online at http://news.bbc.co.uk/2/hi/asia-pacific/3192844.stm, accessed on 15.05.2021

prestige and winning the space race. Since being able to send a satellite into orbit or a space shuttle with its crew to the Moon not just shows the limits that science can achieve; but also it shows how a country can carry a human, a rocket or even a bomb to the highest altitudes and to far beyond continents.

Having background on the Space Policy in the Cold War and Post-Cold War period, it is also important to analyse what are the legal reflections and outputs of space related activities. In the following section, the historical evolution of International Law on Outer Space has been analysed and specific information on the United Nations have been provided.

2.4. Legal and Organisational Framework of International Space Policies

In order to have the full picture on the development of Space Policy it is also important to analyse the legal background. Since it is very similar to the international environment on Earth, the international environment in space is also anarchical as a reflection of the political situation on Earth. In order to limit and control this anarchical status, there are legal documents, agreements and regulations published for the aim of regulating and controlling the activities in outer space. Among others, the United Nations had the biggest and the most important part of it.

In this section of the thesis, the historical evolution of the international law on outer space have been studied with real-time examples with technical background in order to summarise what it is and how it is important within the concept of this thesis.

To start with, it is important to highlight that Space law has originated from the principles of public international law.[129] Within international law states are the main subjects; therefore, public international law regulates the relationship between the states in very different topics such as: multinational cooperation; communications in general; international crime and multinational corporations; energy and energy distribution; methods of manufacting and the use of raw materials; finance, trade and investment; pollution in all its forms; use of radio frequencies; satellites; the

[129] Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:1.

availability of exploration and exploitation of resources; and many other topics operated by different international organisations.[130]

The very first signs of the writings on the space law goes back to 1955, and it was seen just a "fanciful nonsense" at that time.[131] However, when Sputnik was launched just two years later, the perception on the "law for outer space, and the resources of the moon and other celestial bodies" has changed, as well as the universally accepted rule of sovereignty over airspace; *usque ad caelum*[132]: which means 'up to the heavens', referring to a rule in law that the owner of land also owns the air space upward for an unspecified time and period.[133]

Chronologically speaking, the Partial Test-Ban Treaty (PTBT) was issued on 1963 which was the first international treaty that aims to limit arms in outer space. Although the treaty aimed to ban nuclear tests and explosions, it was not fully restricted placing weapons in outer space. There is another agreement on regulating outer space is commonly known 1967- The Outer Space Treaty (Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies). The Outer Space Treaty aims to keep and use the Moon or other celestial bodies exclusively for peaceful purposes; therefore, it prohibits to have nuclear weapons or any other weapons of mass destruction (WMD) in the outer space. Moreover, there is another important agreement that complements the principle of peaceful purpose while preventing the Moon and other celestial bodies from becoming areas of international conflict, that is the 1979 Moon Agreement.[134]

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[130] Jennings, Sir Robert Y. An International Lawyer Takes Stock, 1 U. Miami Int'l & Comp. L. Rev. 1 (1991), pp:9, Available at: https://repository.law.miami.edu/umiclr/vol1/iss1/3.

[131] Ibid, p:8.

[132] Ibid, p:8.

[133] https://www.merriam-webster.com/dictionary/usque%20ad%20coelum, accessed on 20.06.2021

[134] Rathgeber,W., Remuss,N.-L., and Schrogl, K.-U., (2009), Space security and the European Code of Conduct for Outer Space Activities, Disarmament forum, p:33-41

It is also important to set the boundaries and define the boundaries of international law on outer space. For that reason, it is important to analyse the differentiation between "air space" and "outer space".

Because there is not a common definition of distinguishing air space and outer space, there are differences in practices.[135] For air space, the logic would be the space with air, meaning that the area centred to a state territory that goes up into the space, and also goes down into the Earth's centre in the shape of inverted cone. This logic covers the layers of atmosphere which are: troposphere (10 kilometres up from sea level); the stratosphere (10 to 40 kilometres up from sea level); the ionosphere (from about 40 to 375 kilometres); and the exosphere (from 375 to 20,000 kilometres). These borders of atmosphere also defines the type of flights such as suborbital flight which is about 100 kilometres above the land, just at the edge of ionosphere, therefore can be thought both ways that the aircraft is crossing into outer space, but also not leaving the Earth's atmosphere.[136]

Suborbital flight takes place in a very high altitude; however, it does not mean sending the vehicle into orbit. The definition in the legislation of United States of America is as follows: "The intentional flight path of a launch vehicle, re-entry vehicle, or any portion thereof, whose vacuum instantaneous impact point does not leave the surface of the Earth."[137] For a spaceflight, the spacecraft must go out of a point that is higher from the edge of space which is accepted as 100 km above sea level.[138]

Moreover, in the case of suborbital flights, there are two main theoretical approaches in terms of applicability of air law and space law: spatialist and functionalist. According to 'spatialists', the main focus is on the vertical limits of airspace. However, they are lacking to provide a clear definition on the applicability of either air law or space law when it comes to the issue of suborbital flights. On the other side, according

[135] Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:10.

[136] Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:10.

[137] Ibid, p:12.

[138] Ibid, p:14.

to ‘functionalists’, since the main aim of the suborbital vehicles would be earth-to-earth transportation, air law would be applicable.[139]

The differentiation between air law and space law can be also supported by different practices of transportation via air crafts or space crafts.

To elaborate, an aerospace plane as a transportation vehicle travels from point to point that could be governed by air law and might require bilateral agreements between States. However, when the issue comes to the space tourism it is different because the vehicle takes off from a state’s territories, enters outer space, travels in outer space for passenger to have a view of Earth as a globe, and then returns back to the originated destination of the same state’s territory. Such flight type is called suborbital flight and has started to become more popular. [140] Moreover, to still be eligible to have the “astronaut” title, travelers must reach above the *Kármán Line* (named after the aerospace engineer Theodore von Kármán), which is the altitude 100 km above the Earth’s surface. [141]

For instance, as of 2021 two US private companies are very popular in their work on sending people into space in competitive prices via suborbital flights but having different strategies and different milestones. These companies are *The Virgin Galactic* and *Blue Origin*.[142]

In other words, commercial space flight as suborbital flights are subject to the US municipal law. There are agreements such a 2020 - Non-reimbursable Space Act Agreement between NASA Lyndon B. Johnson Space Center and Virgin Galactic, LLC for Virgin Galactic Private Astronaut Mission Feasibility, to cooperate in order to maximise the productivity, and to increase the benefit of the ISS for scientific,

[139] Ibid, p:10, 12, 14.

[140]Ibid,, p:14.

[141] Wilson, Elizabeth. (2019). Space Tourism Moves Closer to Lift Off. Engineering. 5. 10.1016/j.eng.2019.08.006, pp: 819.

[142] Ibid, p:819.

technological research and development, advancement of space exploration, and international collaboration.[143]

In the case of the European Union, commercial space tourism activities are not that promising. There is only one initiative by the European Union in terms of private space tourism, which is Spaceport Sweden. However, there are very limited sources on it. It is only mentioned in European Commission's website as a collaborative work with the US, as Europe's gateway to space, but the article is dated 28.04.2011.[144] Moreover, their website "www.spaceportsweden.com" is not accessible as of 30.05.2022.

Another important point that is being discussed under International Law on Outer Space is the situation of spacecrafts.

In terms of security studies, the description of threat has also changed and expanded. To elaborate, as well as security of space crafts, space crafts' themselves are also tools of threat. They are not only being threatened due their vulnerability, they also reason of a threat for other space objects in space. For instance, there were cases that the Soviet satellites carrying nuclear reactors caused two accidents in 1978 and in 1983.[145] On January 24, 1978, Cosmos 954 (a five-ton Soviet Ocean surveillance satellite covering the Atlantic and Pacific) was carrying an atomic power plant as an energy source and it exploded in the atmosphere resulting as the size of Australia radioactive debris spread over Canada's Northwest Territory.[146],[147]. Although the incident was taken care of successfully with the collaboration of Canada, the USA and the USSR;

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[143] Available at: https://www.nasa.gov/saa/domestic/31717_Non-Reimbursable_Space_Act_Agreement_between_NASA_Virgin_Galactic_Signed.pdf, accessed on 20.07.2021.

[144] Available at https://ec.europa.eu/regional_policy/en/projects/best-practices/sweden/2105, accessed on 29.05.2022.

[145] Brauch, Hans Günter.(1989) Military Use of Nuclear Energy and of Outer Space, ABC Weapons, Military Use of Nucleer Energy and of Outer Space and Implications of International Law, Palgrave Macmillan.

[146] O'Toole, Thomas.January 25, 1978. Soviet Satellite Burns Up Over Canada. *The Washington Post*. https://www.washingtonpost.com/archive/politics/1978/01/25/soviet-satellite-burns-up-over-canada/fe34aeb3-17d7-4a1e-9e76-e5c81855276c/, accesed on 26.07.2021

[147] Galloway, Eilene (1979) "Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim," Akron Law Review: Vol. 12: Iss. 3, Article 2.pp.401

this incident created a lot of questions to be asked within International Space Law, that was one of the topics discussed under the United Nations Committee on the Peaceful Uses of Outer Space. [148] Although a consensus couldn't be reached at that time, the US submitted a working paper on "Uses of Radio -Active (Nuclear) Materials by the USA for Space Power Generation"[149] to the committee on the Peaceful Uses of Outer Space, stating that nuclear power as satellite energy source is to be used by the US for deep space, interplanetary missions such as to March, Jupiter and Saturn and lunar landing, due to the low quality of solar cells in such remote, hostile and special environment. However, there was one exception in 1969: the US satellite Nimbus III,[150] was the USA's first weather satellite using nuclear power as a source.[151]

Following the historical background on international law on outer space, it is also important to highlight the United Nations and its contribution and importance within the topic. Therefore, in the following paragraphs the United Nations and its contribution and initiative to space politics and space law have been analysed.

United Nations is an umbrella organisation for all 193 member states[152] in the international arena, and due to its nature, it is the primary and forthcoming law maker in the area of outer space and space related activities. Particularly, COPUOS (United Nations Committee on the Peaceful Uses of Outer Space established in 1959) aims to regulate the exploration and use of space for the benefit of all humanity: mainly for peace, security and development.[153]

In 1963, the acceptance of the "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" by the General Assembly was a very first step of the international law to be extended to cover outer

[148] Ibid, p: 402-403.

[149] N. Doe, A/A.C. 105/L, 102 (Mar. 15, 1978) as ctied in Galloway, 1079, pp:404.

[150] Galloway, Eilene (1979) "Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim," Akron Law Review: Vol. 12 : Iss. 3 , Article 2.p: 405.

[151] https://rps.nasa.gov/missions/8/nimbus-iii/, Accessed on 30.05.2022

[152] https://www.un.org/en/about-us/member-states, accessed on 13.12.2021

[153] https://www.unoosa.org/oosa/en/ourwork/copuos/index.html, accessed on 13.12.2021

space and the activities conducted in there; moreover, it was followed by 5 more multilateral treaties plus 5 declarations within UN in different sub-topics, as listed below. [154]

The multilateral treaties:

- The first one is the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies" dated 1967.

- The second one is the "Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space" dated 1968.

- The third one is "the Convention on International Liability for Damage Caused by Space Objects", dated 1972.
- The fourth one is "the Convention on Registration of Objects Launched into Outer Space", dated 1976.
- The fifth and last one is "the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies" dated 1984.

In terms of declarations issued on legal principles are:

- First one is the "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" dated 1963.
- The second one is the "Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting" dated 1982.
– The third one is "the Principles Relating to Remote Sensing of the Earth from Outer Space", dated 1986.
– The fourth one is "the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, dated 1992.
– and the fifth and last one is "the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of

[154] United Nations Treaties and Princples on Outer Space, United Nations Publication,ST/SPACE/11, New York, 2002, pp:v, vi.

All States, Taking into Particular Account the Needs of Developing Countries", dated 1996.

The most important treaty on International Law on outer space is the 1967 Outer Space Treaty (Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies) that was issued on 27 January 1967[155]. It is the most important legal output produced under United Nation in terms of international space law, and it is very essential being the first agreement to clearly sets the main arguments and fundamental principles of activities conducted in Outer Space. Moreover, it puts responsibility to states on international level due to the national activities conducted in outer space which is also very essential.[156] The Treaty also stresses that space is the province of all human beings, excluded from any self-interest, and to be used solemnly for peaceful purposes as clearly stated in Article I:

"The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

There shall be freedom of scientific investigation in outer space, including the Moon and other celestial bodies, and States shall facilitate and encourage international cooperation in such investigation."[157]

In addition to regulations issued by the United Nations, there is also a specific Committee established under the United Nation, Committee on the Peaceful Uses of

[155] Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:56.

[156]Ibid, p:10, p:58.

[157] United Nations Treaties and Principles on Outer Space, 2002, pp:4.

Outer Space (UNCOPUOS) which is a forum that discusses legal and technical aspects of global space activities.[158] Within UNCOPUOS the definition and the limitation of Outer Space as well as vertical limits of airspace are discussed, which are very critical in determining the scopes of air law against to space law. [159]

Moreover, there are also scholars who state that involvement of the International Civil Aviation Organisation (ICAO) in space tourism to be considered; together with UN COPUOS.[160] ICAO was established as an output of Chicago Convention in 1944, in order to ensure air navigation services on an equal and non-discriminatory basis with service providers and airline operations collaboration. [161] Due to modern technology, there are very sophisticated services to provide air-ground data communications by VHF (very high frequency), satellites including inertial and GNSS (global navigation satellite systems) and computer-assisted air traffic systems.[162] However, in the case of the International Civil Aviation Organisation (ICAO) Chicago Convention covers specifically civil aviation and civil aircraft, and there is almost no amendment to cover outer space activities.[163]

Next to agreements within United Nations, bilateral agreements between states and multilateral treaties among different countries are also sources and outputs of space law. For instance, the USA, ESA (European Space Agency), Japan and Canada signed an agreement on 29 September 1988 to cooperate on the design, development, operation and utilisation of a permanent Civil Space Station with its crew, for peaceful purposes in line with the principles of international law. [164]

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[158]Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:12.

[159]Ibid, p:12, 14.

[160] Jakhu R, Battacharya R (2002) Legal aspects of space tourism. In: Proceedings of the forty-fourth colloquium on the law of outer space, McGill: Canada, 112 et seq., as cited in Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., p:51.

[161]Abeyratne, R., 2011. Space Security Law. Springer-Verlag Berlin Heidelberg., pp:56.

[162]Ibid, p:53.

[163]Ibid, p:56.

[164] Ibid, p:63.

However, I have not gone into details in order not to expand the borders of this thesis and keep the limits on space policy within security perspective and focused on the European Union. Above mentioned information has been provided to create background information on a base level in order to understand the limits, coverage and the main concepts while studying the European Space Policy in the following Chapter.

2.5. Conclusion

As elaborated in this chapter, space race between US and USSR in the Cold War Period marked important achievements in the history of space policy. Although it never turned to a military war in classical terms, the scientific achievements had been used to gain international prestige and to over the counterpart. This clearly showed that the dual usage of space technologies was also evident during the Cold war Period. Moreover, EU and China also included in space activities in a later stage but in a comparable less significant amount. Moreover, the importance of running space activities independently and autonomous access to space were also repeated during the chapter. How countries develop their space policies and engage in space activities by security concerns was important to highlight. Furthermore, legal and organisational framework of space policies have been elaborated and important legal documents have been listed in order to analyse the political situation in space in terms of international law.

CHAPTER 3

EUROPEAN SPACE POLICY

3.1. Introduction

The history of the European Space Policy is already elaborated in the first chapter of this study. Therefore, the 3rd Chapter: European Space Policy focuses on the post-Cold War period, particularly after the 2000s in order to provide current practices and technological developments in space related activities in order to reveal and analyse the main motivations behind.

Furthermore, the purpose of calling the chapter "European" is because of the main aim to cover space policy of the European Union itself, while including ESA although it is not an institution within the European Union body but rather it is a separate institution consists of the EU member states, however it is also called as "European" for being an entity that is very important for the existence and creation of overall "European Space Policy."

For that purpose, in this study, the space policy of individual EU member states has been excluded and have not been mentioned. Rather, "European Space Policy" as representing the European Union and prominent programmes and institutions have been evaluated in terms of their characteristics: civilian or military.

3.2. European Space Policy

In order to better understand the European Space Policy, it is important to study the actors involved in the creation and the implementation of space policy and space related activities of the European Union.

The overall European Space Policy consists of EU Member States, ESA and international partnerships.[165] The core of European Space Policy evolves around the aim of peaceful uses of outer space with transparency and trust among state and non-state actors. [166] The very first steps that leads to the creation of an overall European Space Strategy were the result of the complementary decisions of the ESA Council and the EU Council to develop a joint European Strategy for Space by the end of 2000.[167] In line with this, The EU's intention to establish a European Space Policy is clearly stated in the Article 189 of Treaty on the "Functioning of the European Union" (consolidated version is dated 01.03.2020), as seen below:

1. "To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space.
2. To contribute to attaining the objectives referred to in paragraph 1, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the necessary measures, which may take the form of a European space programme, excluding any harmonisation of the laws and regulations of the Member States.

[165] Robinson, J. and Romancov, M., January 2014. The European Union and Space: Opportunities and Risks. Non-Proliferation Papers, (37), pp:1.

[166] Ibid, p:1.

[167] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:5, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

3. The Union shall establish any appropriate relations with the European Space Agency."[168]

On 06.08.2004, the Council Decision dated 29 April 2004 on "Framework Agreement between the European Community and the European Space Agency" (2004/578/EC) was published on the Official Journal of the EU and become effective afterwards.[169] According to the 'Framework Agreement', it is openly stated that closer cooperation between the European Community and the European Space Agency (ESA) is very essential to support the peaceful uses of outer space that will also contribute cohesion within the European Union, support economic growth and also will improvement in other areas such as political, scientific, environmental and social frameworks directly or indirectly.[170]

The purpose of the Framework Agreement is clearly stated in the Article 1, para 2), as seen below:

a) securing Europe's independent and cost-effective access to space and the development of other fields of strategic interest necessary for the independent use and application of space technologies in Europe;
b) ensuring that the overall European Space Policy takes into particular account the general policies pursued by the European Community;
c) supporting Community policies by using space technologies and space infrastructures where appropriate and promoting the use of space systems in support of sustainable development, economic growth and employment;
d) optimising the use of expertise and available resources and contributing to the consolidation of the close cooperation between the European Community and ESA, thereby linking the demand and supply of space systems within a strategic partnership.

[168] Available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02016E/TXT-20200301&from=en, accessed on 09.01.2022.

[169]Framework Agreement between the European Community and the European Space Agency, Available at https://eur-lex.europa.eu/resource.html?uri=cellar:742587dd-44f3-4527-be91-a2eab676330f.0008.02/DOC_1&format=PDF, accessed on 14.08.2021

[170]Ibid.

e) achieving greater coherence and synergy of research and development in order to optimise the use of resources available in Europe, including the network of technical centres.[171]

For the EU, it is important to have a common space policy to limit the dependency on non-European space infrastructure in terms of any commercial and strategic applications related to space systems. In the meanwhile, EU looks also for corporations and partnerships in global issues and international developments, while becoming an alternative to USA for the world, and also looks for creating closer relationships with Russia and strengthening the ties comparing to how it was during the Cold War period.[172]

However, when we overall review the Framework Agreement dated 2004, we don't see such explicit reference to security, defence or any other military usage of space technologies. Rather, it focuses and highlights the cooperation, the fields of cooperation and implementation of the activities that includes technology, science, communication by satellite, navigation, earth observation, human space flight and micro-gravity, launchers, spectrum policy related to space. Therefore, we may clearly say that the framework Agreement between the EU and ESA is solemnly focuses on scientific and civilian usage of space technologies with peaceful purposes.

When we come to the 2020, the approach of EU toward space changes and EU starts to see space as an area for strategic autonomy, and defines that space is a geopolitical area where the dominance of USA, Russia and China is highly visible due to high investments resulting from national security concerns and economic competitiveness.[173] Also, EU describes space as a technological frontier where space sector is also subject to rapid technological developments and crates improvements in

[171]Ibid.

[172] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:6, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

[173] Fiotht, D.The European space sector as an enabler of EU strategic autonomy, European Parliament, Policy Department, Directorate-General for External Policies, December 2020.p:5.Available at https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/653620/EXPO_IDA(2020)653620_EN.pdf, accessed on 30.12.2021.

other areas of science such as developments in quantum computing, developments in communication technologies, nano technologies, advance manufacturing and robotics and Artificial Intelligence (AI). [174]

Lately on 28.04.2021, European Union issued another regulation that "establishing the Union Space Programme and the European Union Agency for the Space Programme", that was published on the Official Journal of European Union on 12.05.2021, leading the official establishment of "European Union Agency for the Space Programme".[175] That is really an important and big step for the EU to create a common space policy.

As clearly stated in the Regulation, there are 3 main programmes that the EU has initiated within its space activities: European Geostationary Navigation Overlay Service (EGNOS), Galileo and Copernicus. Those are very important programs in terms of meeting the needs of users in line with the latest technological improvements and developments, while ensuring the digital and technological transformations, and also prioritising political topics such as climate change (including monitoring the changes in polar region), transportation, security and defence.[176]

Moreover, the details of the Regulation are also very important. For instance in the Paragraph 15 of the Regulation, it is obvious that how European Space Policy is aimed to be coherent and consistent with other Union programmes and shares similar objectives that differs from scientific Programmes, to financial Funds, or the European Defence Fund, and even other Funds such as the Internal Security Fund, Asylum, Migration and Integration Fund and the Instrument for Financial Support for Border Management and Visa Policy."[177]

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[174] Ibid, p:5.

[175]Official Journal Of European Union, L170/69 Volume 64, 12.05.2021, Regulation (Eu) 2021/696 Of The European Parliament And Of The Council Of 28 April 2021, *"Establishing The Union Space Programme And The European Union Agency For The Space Programme And Repealing Regulations (Eu) No 912/2010, (Eu) No 1285/2013 And (Eu) No 377/2014 And Decision No 541/2014/Eu",* Para:(3), P: L 170/69, Available At Https://Eur-Lex.Europa.Eu/Eli/Reg/2021/696/Oj, Accessed On 08.08.2021.

[176] Ibid.

[177] Ibid.

Moreover, as stated in the Paragraph (62), the EU doesn't hesitate to mention the linkage between space activities and the security and defence of the Union, and specifically emphasis the aim of guaranteeing the Union's technological independence, securing infrastructure equipment, and ensuring the strategic autonomy of space."[178]

As seen from the main focus of the Regulation, while European Union is concentrating strongly on policy areas concerning global environmental issues that is evidently depended on space-based Earth observations, but it is also create a tie to European Security and Defence Policy (ESDP) mentioning space is an important component for the completion of ESDP.[179]

Therefore, with the publication of the regulation that "establishing the Union Space Programme and the European Union Agency for the Space Programme" in 2021, we may clearly see the change in the EU's motivation behind developing its space related activities not just particularly focused on civilian purposes but it is also driven by security and defence concerns.

Therefore, in order to support the argument of this thesis, in the following sections concrete cases have been provided and categorised as: 'civilian' and 'military' in terms of the characteristics of the programmes and the purposes they serve.

3.3. Space related Activities in terms of Civilian &Military Purposes

As elaborated in the previous section, the EU's focus was mostly on scientific and civilian space activities with peaceful purposes until the time being. Therefore, in the following paragraphs main institutions, programmes and activities have been analysed in order to reveal what kind of activities that serves for civilian and peaceful purposes.

European Space Agency (ESA)

[178] Ibid.

[179] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:9, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

European Space Agency, although it is named as "European", it is an independent institution not being part of Union's body, and also it is not subject to Union's law.[180] However, it can be counted as one of the main bodies for the European Union Space Policy and space activities. As slightly mentioned, in the Chapter 2, European Space Agency (ESA) established in 1973.[181]

ESA and its stance within the EU Space Policy, which is limited by its agreement stating that the institution should serve "for exclusively peaceful purposes". However, there is not a clear cut between the military and the civilian purposes of space related activities when technological developments are on the agenda.[182] ESA has been reading the word 'peaceful' as 'non-offensive' rather than 'non-military,' thus it leaves the door open for dual-use activities and took the discussion to a much more military basis.[183]

Moreover, Same as NASA, European Space Agency (ESA) is an important body to provide satellite and remote sensing data for climate change monitoring and mitigation studies which can be important examples for the use of the space technologies for civilian purposes.

According to the definition of Climate, it is a complex and interactive system that consists of land surface, the atmosphere, snow and ice, oceans and other water bodies, and living creatures.[184] Furthermore, Among the parts of Earth's climate, the

[180] Official Journal Of European Union, L170/69 Volume 64, 12.05.2021,Regulation (Eu) 2021/696 Of The European Parliament And Of The Council Of 28 April 2021, *"Establishing The Union Space Programme And The European Union Agency For The Space Programme And Repealing Regulations (Eu) No 912/2010, (Eu) No 1285/2013 And (Eu) No 377/2014 And Decision No 541/2014/Eu"*, Para:(3), Available At Https://Eur-Lex.Europa.Eu/Legal Content/En/Txt/Pdf/?Uri=Oj:L:2021:170:Full&From=En, Accessed On 14.08.2021.

[181] Millbrooke, Anne. (June 2009), "History of the Space Age", p1-17 in Handbook of Space Engineering, Archaeology, and Heritage, p.10; edited by Ann Garrison Darrin and Beth Laura O'Leary, London: CRC Press of Taylor & Francis Group, p:195-207.

[182] Mutschler, Max M. Venet C. (2012), The European Union as an emerging actor in space security?, Space Policy 28, p:118.

[183] Mutschler, Max M. Venet C. (2012), The European Union as an emerging actor in space security?, Space Policy 28, p:118.

[184] Adedeji, O., Reuben, O. and Olatoye, O., 2014. Global Climate Change. Journal of Geoscience and Environment Protection, 2, p:115.

composition of the atmosphere is very significant. Greenhouse gases (GHGs), including carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), are currently exist in the Earth atmosphere naturally; and they have been contributing to Earth's habitability for billions of years. Moreover, the radiation from the sun first reaches Earth's outer atmosphere and then pass through these complex compositions of gases to Earth's surface. In the meanwhile, they keep some part of this radiation from getting out resulting the Earth's system warmer than it would be without them. There is a serious concern that anthropogenic (human) activities, especially since the starting of the industrialization period are increasing, the concentration of these gases in the Earth's atmosphere have been increasing resulting additional warming which is also damaging the Earth's natural habitability.[185]

According to the Report of the UN Intergovernmental Panel on Climate Change (IPPC Report,2007)[186] global GHG emissions have grown since pre-industrial times, with an increase of 70% between 1970 and 2004, as a result of industrial activities that use carbon intensive methods for energy production and release additional CO2 to the atmosphere.[187]

As a result of this accelerated global climate change in the Earth's system, many severe disasters such as draught, flooding, storms etc, has begun to happen more frequently than natural periods.[188] Since the Earth's climate is global not just regional, it is a global problem which cannot be solved just by regional solutions on regional levels. Therefore, in order to identify the relationship between climate change and its negative effects on the earth's nature, space technologies that can provide data in global sense is highly crucial to be benefited. [189]

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[185] Parkinson, Claire L., (September 2017). "Satellite Contributions to Climate Change Studies", Proceedings of The American Philosophical Society Vol. 161, No. 3., pp:209-210.

[186] https://www.ipcc.ch/report/ar4/syr/ (Accessed on 17.05.2020)

[187] Axon, S., 2010. Addressing Climate Change and The Role of Technological Solutions. *Journal of Studies and Research in Human Geography*, 44, 4.1, pp.43-52.

[188] Rustamov, Rustam & Salahova, Saida & Hasanova, Sabina & Zeynalova, Hamida. (2011). Space Technology as the Tool in Climate Change Monitoring System, p:120.

[189] Ibid, p:121.

Space-based technologies are very unique for their capabilities to observe and monitor the entire Earth system as a globe in order to understand processes that are central to Earth's climate. [190] According to the definition by Kansakar and Hossain, (2016)[191], the remote sensing is the science of obtaining information without physically being in contact with it. There are various remote sensing platforms such as satellites and aircrafts. These technologies known as Earth Observation (EO) enable to measure, monitor and map Earth's surface and subsurface. Through EO, information and data on Earth's physical, chemical, and biological systems can be obtained. [192] Furthermore, space technologies enable to collect data via remote sensing tools in global and regional scales quickly and repeating periods, which is very vital to experiment the effects of Climate Change. Via these technologies, the current situation of the disaster, the situation before the disaster and also the situation after the disaster can be monitored, necessary data can be obtained and be analysed. [193] The earth observation satellites play an important role in major disasters by ensuring a rapid response and by providing timely delivery of images and geospatial information of the affected area.[194] Through satellite and remote sensing technologies, it is possible to measure larger areas and make analysis in global scales such as Greenhouse Gases, Atmospheric Temperatures, Polar Sea Ice, Land Ice, Sea Level, Stratospheric Ozone. [195].

Many countries already develop and operate Earth Observation satellites that works for monitoring the Earth environment, in order to monitor the causes and effects of climate change and also to combat against it. However, not all the countries have the technology of remote sensing and satellite. As of November 2015, it is only 74

[190] Ibid, p:121.

[191] Kansakar, P. and Hossain, F.2016. A review of applications of satellite earth observation data for global societal benefit and stewardship of planet earth. Space Policy, 36, pp.46-54, 2016.

[192] Ibid, p:46-54

[193] Rustamov, Rustam & Salahova, Saida & Hasanova, Sabina & Zeynalova, Hamida. (2011). Space Technology as the Tool in Climate Change Monitoring System, p:121.

[194] Denis, G., de Boissezon, H., Hosford, S., Pasco, X., Montfort, B. and Ranera, F. (2016). The evolution of Earth Observation satellites in Europe and its impact on the performance of emergency response services. Acta Astronautica, 127, p:619.

[195] Parkinson, Claire L., (September 2017). "Satellite Contributions to Climate Change Studies", Proceedings of The American Philosophical Society Vol. 161, No. 3., pp:213.

countries that can conduct independent satellite launches without need of any help from others.[196] The United States, the Russian Federation, Germany, Italy and France are leading countries in terms of EO satellite launches. In addition to those, also Canada, China, India, Argentina, Brazil, Australia, South Africa and Nigeria. Moreover, the availability of open-source data has also helped developing countries to access remote sensing technology and data that are needed to solve their problems. [197]

Furthermore, the ESA with its various and complex satellite technology contributes to the international agreements and protocols on climate change by monitoring greenhouse gas monitoring applications and ensured 1997 Kyoto Protocol have been followed, and remote sensing technologies confirmed the drastic international cuts in carbon emissions.[198]

The "Kyoto Protocol" was issued on 11 December 1997 with the commitment of countries to restrict their greenhouse gas emissions, and the importance of Copernicus Program was the most obvious in the case of Kyoto Protocol. Followingly, the European Commission proposed to develop, a "post-Kyoto strategy" to ensure the targets of the protocol, including the progress of the Member States. [199] In line with this aim, several meetings were organized in Italy, in May 1998 with the participation of the Director General of the Joint Research Centre of the European Commission, also working as the coordinator for space matters within the European Commission, and other high-level participations from ESA, EUMETSAT, space agencies on national level, and the European space industry. As a result of the meeting, it is agreed to develop a space-based environmental monitoring services, focusing especially on the aspects needed for the Kyoto Protocol and advantaging from the skills and technologies based in Europe.[200] This event lead to development of independent space

[196] Kansakar, P. and Hossain, F.2016.A review of applications of satellite earth observation data for global societal benefit and stewardship of planet earth. Space Policy, 36, pp.46-54, 2016.

[197] Ibid, p.46-54

[198] https://www.esa.int/Applications/Observing_the_Earth/Climate_change, accessed on 03.06.2020.

[199] Al-Ekabi , C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',*pp:21-22, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[200] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',*pp:21-22, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

technologies for Europe that enables to collect, analyse and disseminate data in order to support environmental and security policies[201], and to guarantee European autonomy in the field of Earth Observation. [202]

In line with this aim, the Copernicus Program is an important contribution of the EU to build the Global Earth Observation System of Systems (GEOSS).[203] Since the primary aim of The Copernicus programme is the exploitation of space with an inward look towards Earth, rather than a scientific understanding of outer space, the programme is functioning mainly to satisfy needs of a society that is increasingly dependent on Earth-related information.[204]

Furthermore, the Programme has been mentioned detailedly in the regulation on Establishing the Union Space Programme and the European Union Agency for the Space Programme. The aim and focus of Copernicus Programme have been detailed in the Paragraph (71) stating that the Programme should ensure an autonomous access to environmental knowledge and key technologies for Earth observation and geo-information services, thereby supporting the Union to achieve independent decision-making and actions in the fields of, inter alia, the environment, maritime, marine, climate change, land and infrastructure monitoring, agriculture and rural development, preservation of cultural heritage, civil protection, security, as well as the digital economy."[205]

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[201] ESA/ Commission of the European Communities. Joint ESA/EC Document on a European Strategy for Space: 14-16. As cited in Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',* pp:22, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[202] Al-Ekabi, C., Mastorakis, P., '*The Evolution of Europe's Launcher and Flagship Space Initiatives',*pp:21-22, in Al-Ekabi, C., 2015. European autonomy in space. Switzerland: Springer.

[203] Ibid, p:28.

[204] Ibid, p:29.

[205] Official Journal Of European Union, L170/69 Volume 64, 12.05.2021, Regulation (EU) 2021/696 Of The European Parliament And Of The Council Of 28 April 2021*, "Establishing The Union Space Programme And The European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU",* para:(3), available at https://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=OJ:L:2021:170:FULL&from=EN, accessed on 18.08.2021.

However, the Program also has dual purpose and dual function. In the same Regulation it is also explicitly mentioned that Programme serves the EU has autonomous access to space, independent actions in space related activities and security, which is an important sign that the European Union motivates its space related activities not just from purely peaceful purposes but also from security and defence purposes for possible threats. In addition to those, there is also another reference to security concerns in the regulation that highlights the cooperation with Member States to support the development of the EU's security dimension with an efficient governance mechanisms, for the purpose of responding to changing user needs in line with the security domain."[206] Moreover, the Space Strategy for Europe is also mentioned in the Regulation referring that Copernicus is a very important programme for EU for having free, full and open data policy that is essential for the implementation of the programme and establishing Copernicus as one of the largest Earth observation data providers in the world. It is also stressed that there is a clear need to guarantee the long-term and secure continuity of the services, in order to realise goals for the Space Strategy for Europe.[207]

Therefore, all those aforementioned references to security dimension of space technologies and to independency and autonomy in space support that the EU motivates its space technologies not just from civilian purposes but also military purposes.

Another dual used space Programme is European Geostationary Navigation Overlay Service (EGNOS). EGNOS is a satellite programme, together with Galileo programme, complementing the US GPS satellite navigation system. They are very critical especially for aircrafts and ships that require navigations.[208] In terms of programmes initiated with a partnership with ESA, as mentioned in the above, European Geostationary Navigation Overlay Service (EGNOS) has been initiated together with the European Commission and Eurocontrol and the European

[206] Ibid.

[207] Ibid.

[208] European Space Agency website, accessed at https://www.esa.int/Applications/Navigation/EGNOS/What_is_EGNOS, accessed on 11.01.2022.

Organisation for the Safety of Air Navigation. [209] According to Paragraph (64) of the "Regulation on Establishing the Union Space Programme and the European Union Agency for the Space Programme", the aim of the programme is explicitly defined, and also there are important references to the security dimension of the program. For instance, it mentions the coverage of the programme that extends to the Member States' in European continent, including Cyprus, the Canary Islands, the Azores and Madeira. Moreover, it also adds that the geographical coverage of the services provided by EGNOS especially for the aviation domain could be extended to other regions of the world depending on the international agreements. The target date for the completion of the programme and to be ready as full capacity is set as the end of 2026. And it is clearly stated that all the services will be provided in compliance with applicable standards of the International Civil Aviation Organisation ('ICAO standards')".[210]

As of 1st April 2009, the ownership of EGNOS was transferred to the European Commission, after completing its development successfully. Currently, EGNOS activities are coordinated by the European Commission through an agreement with an operator based in France, the European Satellite Services Provider; and also, the system is freely available to public with EGNOS-enabled GPS receiver equipment.[211]

Galileo Programme:

Another space program that is very essential for the European Space Policy is Galileo Programme. Galileo is a global navigation satellite system under European autonomy, enabling Europe and European citizens to have accurate and reliable information in

[209] Ibid.

[210] Official Journal Of European Union, L170/69 Volume 64, 12.05.2021, Regulation (EU) 2021/696 Of The European Parliament And Of The Council Of 28 April 2021, *"Establishing The Union Space Programme And The European Union Agency For The Space Programme And Repealing Regulations (Eu) No 912/2010, (Eu) No 1285/2013 And (Eu) No 377/2014 And Decision No 541/2014/Eu",* Para:(3), Available At https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0696&from=EN, Accessed On 14.08.2021.

[211] European Space Agency Website, Accessed At Https://Www.Esa.Int/Applications/Navigation/Egnos/What_Is_Egnos, Accessed On 11.01.2022.

terms of positioning and timing, and allowing users to know their exact position with preciseness.[212]

Same as EGNOS, the aim of the Galileo Program was explicitly defined in the Paragraph (63) of the Regulation on the "Establishing the Union Space Programme and the European Union Agency for the Space Programme"; and also there are important references to civilian and security dimension of the programme. For instance, it clearly states that Galileo is the Europe's first global satellite navigation and positioning infrastructure particularly produced for civilian purposes, which can be benefited by different public and private actors in Europe and also in worldwide. The Programme runs independent from any other existing or potential systems, while supporting the strategic autonomy of the Union. The targeted date for the second generation of Galileo programme is set to 2030, but it will be active initially with reduced operational capacity."[213] Thanks to these programmes space have been integrated in society through communication services, critical infrastructure, monitoring and response for emergency, financial systems and transportation activities this also means that space extends to many civilian activities in different areas.[214]

However, Galileo program has also a security dimension as well as civilian dimension.[215] The main reason of the creation of Galileo program was rather political, also a distrust to US's GPS.[216] Around 2004, even there was a conflict between the

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[212] Official Website Of European Union, Eu Space Policy, Galileo, Accessed At https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0696&from=EN, Accessed On 12.01.2022

[213] Official Journal of European Union, L170/69 Volume 64, 12.05.2021, REGULATION (EU) 2021/696 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 April 2021, *"Establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU",* para:(63), available at https://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=OJ:L:2021:170:FULL&from=EN, accessed on 14.08.2021.

[214] Evers, Tobias. (2013). The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18. pp:7

[215] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:9, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

[216] Lewis, James Andrew. From Competition to Cooperation, Center for Strategic and International Sudies, June 2004.pp:1.

EU and the US over Galileo spectrum allocation due to the increasing demand for bandwidth for multiple applications.[217] According to some resources, USA sees space activities as instrument for political, scientific and economic leadership, which creates a correlation between "space dominance" and "information dominance" which are also related to the level of investment in space activities. [218]

As previously mentioned, for EU it is important to have space infrastructure that are entirely European for all means of strategic and commercial activities related to space systems, in order to keep and maintain its independence in terms of security and defence.[219] Therefore, as well as EGNOS programme, Galileo Programme also has a dual purpose and serves for European security and defence concerns, which supports the argument of this thesis.

International Cospas-Sarsat Programme:

Another programme that uses satellite technology for civilian purposes is the International Cospas-Sarsat Programme.

The International Cospas-Sarsat Programme is uses satellite technology for search and rescue including alert detection and information distribution system, that finds and locates emergency guidance activated by aircraft, ships and backcountry hikers in distress. [220] In 1979, it has been created with the partnership of US, the former Soviet Union, France and Canada, and it became official intergovernmental organisation in 1988.[221] Currently, The Programme has 43 countries and 2 organisations as members that are actively participating in the management and the operation of the

[217] Lawson, R., 2004.The space security index, Astropolitics, 2:2,pp:181.

[218] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:9, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

[219] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency p:6, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

[220] Available at:https://www.cospas-sarsat.int/en/about-us/about-the-programme,accessed on 10.08.2021

[221]Ibid.

Programme.[222] Approach is available freely to all countries on a non-discriminatory basis and the system has users from maritime and aviation in distress situations. According to the information provided in their official website, on average, 5 persons are rescued every day with the help of alert and location data that is provided by the Cospas-Sarsat System. [223]

Moreover, the benefits are satellite technologies are not limited with the aforementioned cases. As stated by Dr. Annette Froehlich, space data and technologies are used also for monitoring large scale human right violations and migration. The International Court of Justice (ICJ) and International Criminal Court (ICC) are giving huge importance and trust to satellite data and images obtained via space technologies on the cases such as human right violations. Also, wide range of relevant human rights issues such as migration, refugees, water distribution and quality, housing and settlement monitoring are also benefited by space data and technologies. [224]

These are just a few examples in order to reveal how space technologies are used and benefited for the civilian and peaceful purposes. However, similar to any other technological development, also space technologies have dual use ability and purpose. For that reason, in the following paragraphs the cases that space technologies serving to military and security purposes have been analysed.

Furthermore, in the previous sections, the space activities that has civilian purposes including scientific, peaceful, environmental, humanitarian activities have been analysed. However, in line with the argument of the thesis, the EU doesn't follow only peaceful purposes while developing its space policy and space strategy. It also motivates its space activities by military purposes. In order to support that, the space

[222] Ibid.

[223]Ibid.

[224] Froehlich, Annette & Tăiatu, Claudiu. (2020). Abstract, Space in Support of Human Rights. 10.1007/978-3-030-35426-8,available at:

https://www.researchgate.net/publication/338351277_Space_in_Support_of_Human_Rights,accesed on 10.08.2021.

related activities and dual-purpose space technologies have been studied and revealed in this sub-section as seen below.

As already mentioned in the 2nd Chapter, although space related activities conducted by Europe was a bit delayed compared to the USA and the USSR during Cold war Period, Europe's approach to space was different than others as well. Europe have been neglecting the strategic and security aspects of space but focusing more on scientific, technological and research dimensions of space for a long time. It is just recently that EU realized the strategic value of space and its direct or indirect relation to security.[225] In October 2016, the EU announced its Space Strategy and that was the first time in its history that space is accepted as a core element to EU's strategic autonomy in security and defence context. Moreover, this shows that space has military aspects as well as civilian.[226]

In terms of the military purposes of space related activities, satellites are used in various areas such as communication, navigation, targeting, mission planning, meteorology and geodesy. It is not necessarily that satellite technologies to function offensive, but they serve as force enhancement.[227] Moreover, because of the strategic nature of space assets and their vulnerable situation, they created additional burden on state in terms of security and defence, as because space assets are essential tools for the military and the economic power. In the case of European Union, although it issued the European Space Policy in 2007, it does not have a completed coherent space security strategy, although it could be part of a broader context of Common Foreign and Security Policy (CFSP), in relation with the Common Security and Defence Policy (CSDP).[228]

[225] Evers,T.2013. The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, p:4-5.

[226] European Defence Agency, *Europe Defense Matters*, 2017, Issue 13, Catalogue number QU-AC-17-001-EN-N, ISSN (2443-5511), EUROSAM, pp:10

[227] Evers,T.2013. The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18, p:6.

[228] Mutschler,Max M.Venet C.2012, The European Union as an emerging actor in space security?,Space Policy 28, pp:118.

Another evidence for the military purpose of space related activities of the European Union is the creation of the Space Situational Awareness System (SSA) that can serve both civilian and military needs. According to definition by ESA, Space Situation Awareness is the understanding and maintained awareness of the Earth orbital population, the space environment, and threats to/by the orbit population.[229] The data provided by the SSA system can be used by military purposes as well as civilian. Since there are enormous dependency on space crafts in wide range of activities, the protection of this vital space infrastructure also very critical and requires a security and defence strategy.[230] In addition, the Paragraph (88) of the Regulation on 'Establishing the Union Space Programme and the European Union Agency' explicitly states that Space debris is becoming a serious threat to the safety, security and sustainability of space activities. Therefore, The Space Situational Tracking is very essential to preserve the continuity of the space activities under Programme's components and their contributions to Union policies.[231]

Furthermore, it is a very clear proof that the European Union's security concerns have also changed accordingly with the emerging of new type of threats and their changing nature. These concerns resulting from new types of threats are now being written explicitly on the legal document which is an important support to the argument of the thesis.

Another example on the how the European Union stresses the security and military concerns in relation with the space related activities is stated in the Paragraph (98) of the Regulation. According to the statement that, "the Union has a major role to play in ensuring a safe, secure and resilient Europe that is capable of addressing

[229] Donath, T., Schildknecht, T., Martinot, V., and Monte, Luca Del. (2010), "Possible European Systems for Space Situational Awareness," Acta Astronautica 66, pp: 1378-1387.

[230] McCormick, P., (2015) Space Situational Awareness in Europe: The Fractures and the Federative Aspects of European Space Efforts, Astropolitics, 13:1, 43-64, DOI: 10.1080/14777622.2015.1012002, pp: 43-44.

[231] Official Journal of European Union, L170/69 Volume 64, 12.05.2021, REGULATION (EU) 2021/696 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 April 2021, *"Establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU",* para:(3), available at:https://eur-lex.europa.eu/legal content/EN/TXT/PDF/?uri=OJ:L:2021:170:FULL&from=EN,accessed on 18.08.2021

challenges such as regional conflicts, terrorism, cyber threats, and growing migration pressures. Secure and guaranteed access to satellite communications is an indispensable tool for security actors, and pooling and sharing of that key security resource at Union level strengthens a Union that protects its citizens."[232] Communication satellites are important parts of security and defence dimension since they transmit and distribute enormous amounts of data respectively quicker.[233] However, although government-base space actors are more sensitive to protect their own space assets; they don't give same importance and efforts to protect commercial space systems. Since protection measures such as advanced information assurance measures, increased encryption usage, electronic protection measures, and enhanced radiation hardening are all additional costs which commercial providers hesitate to pay in a competitive marketplace.[234]

Moreover, one another example is from Paragraph (6) of the Regulation that "the autonomous access to space and using it safely is essential for European Union in order to a give its objectives of freedom of action, independence and security".[235] This article also includes important reference to security by highlighting the autonomous status of Union's space policy. Lastly, as stated in the Paragraph (55), "The cybersecurity of European space infrastructures, both ground and space, is key to ensuring the continuity of the operations of the systems and service continuity. The need to protect the systems and their services against cyber- attacks, including by making use of new technologies, should therefore be duly taken into account when

[232]Ibid.

[233] Bildt, C., Peyrelevade,J., Späth, L., Towards A Space Agency For The European Union, European Space Agency P:9, Available At Https://Esamultimedia.Esa.Int/Docs/Annex2_Wisemen.Pdf, Accessed On 30.12.2021.

[234] Lawson, 2004, Pp:190.

[235] Official Journal Of European Union, L170/69 Volume 64, 12.05.2021, Regulation (Eu) 2021/696 Of The European Parliament And Of The Council Of 28 April 2021, *"Establishing The Union Space Programme And The European Union Agency For The Space Programme And Repealing Regulations (Eu) No 912/2010, (Eu) No 1285/2013 And (Eu) No 377/2014 And Decision No 541/2014/Eu",* Para:(3), Available At Https://Eur-Lex.Europa.Eu/Legal Content/En/Txt/Pdf/?Uri=Oj:L:2021:170:Full&From=En, Accessed On 08.08.2021.

establishing security requirements."[236] Same as other articles, this article is also critical for having stressed to continuity of space activities.

Therefore, any reference to security of space crafts, threat in and from space, autonomous, uninterrupted, independence access to space and or any concern related defence and security strengthens the argument that the European Union develops its space policy not just with peaceful and civilian purposes but also with security concerns in relation to military motivations. Moreover, stressing these references in the legal and policy documents reveals that the European Union has changed its approach to space and space related activities, and started value them not just as scientific purposes but also as an important tool for security and defence policy. [237]

Furthermore, The European Union aims to cover all aspects relating to its security under the Common Security and Defence Policy, which strengthens the Union's civilian and military capacity for international crisis management, thus helping to the EU to maintain international peace and security.[238] Therefore, also in relation with the CSDP, European Space Policy has an importance in the political agenda. To be more specific, since space systems key for collecting, transmitting and distributing data at a global scale, space component is very critical for the completion of the European Security and Defence Policy (ESDP).[239]

3.4. Conclusion

In conclusion, the chapter clearly explains and reveals how the EU has increased the focus on space and the volume of space related activities. As the areas that space technologies are integrated and contributed have been expanded, also the security concerns have increased in parallel. The very clear proof of that can be found in policy documents. The Treaty on the "Functioning of the European Union, to Framework

[236] Ibid.

[237] Ibid.

[238] Kolovos, Alexandros (September 2009), The European Space Policy: Its Impact and Challenges for the European Security and Defence Policy, ESPI Perspectives No: 27, pp:2

[239] Bildt, C., Peyrelevade,J., Späth, L., Towards a Space Agency for the European Union, European Space Agency pp:9, available at https://esamultimedia.esa.int/docs/annex2_wisemen.pdf, accessed on 30.12.2021.

Agreement between the European Community and the European Space Agency and lately 28.04.2021 - establishing the Union Space Programme and the European Union Agency for the Space Programme" reveals how the EU gives importance to space and its strategic values, and it also highlights how this importance to space has been evolved during the time. Moreover, having detected references to security and defence in relation to space activities shows that the European Union has started to include space in its security and defence agenda as well.

In terms of space policy, the EU always aimed to have a common space policy which is autonomous and independent in space related activities, while also engaging in partnerships with other countries. In line with this, the EU develops space technologies that has dual purposes and serves military as well as civilian aims. Especially ESA is key for scientific and civilian activities, however even it has security concerns as slightly mentioned in policy documents. Since satellite technologies are key for management and monitoring services in several areas, ranging from climate change and emergency responses to daily life of public the security of space crafts changes also the concept of threat, and put additional pressure on security and defence policies.

Furthermore, The EU also gives importance for a creation of common European space policy specifically under the Common Security and Defence Policy, in order to cover all aspects related to security and defence holistically. Therefore, The 3rd Chapter of this thesis is important to understand and analyse how the European Space Policy, space related activities and respective policy documents have expanded and evolved in the direction of military purposes motivated by security and defence concerns.

CHAPTER 4

SPACE POLICIES OF THE USA, RUSSIA, AND CHINA

4.1. Introduction

In the previous chapters, the history and evolution of space policy and space activities and the European Space Policy have been elaborated. As a complementary to those information and analyses, this chapter provides selective examples for space related activities conducted by the USA, Russia and China in terms of civilian and military purposes. Through those, how space technology is used for military purposes or how they are used for civilian purposes will be cleared. The chapter includes separate sub-section for US, Russia and China, three most important space powers in the current age. Furthermore, it creates a base to make also a comparison with the European Space Policy and space activities.

4.2. Space Policy of The United States of America

The historical background of USA Space Policy that was dominant in Cold War Period and post-Cold War Period have been already mentioned in the Chapter 2. Therefore, in order to provide a comparison and similarities in terms of civilian and military purposes of space activities, there are several case studies and important space programmse have been studied in the following paragraphs.

In the case of the USA, NASA is the most well-known institution for development and coordination of space activities. Since its establishment NASA has a mission dedicated to Earth including using space to better observe Earth, predict climate and weather and

to enable worldwide communication. Besides its popular role to explore deep space, NASA uses space technology also for monitoring the effects of Climate Change. [240]

In terms of historical evolution of satellite and remote sensing technologies in the USA, the use of meteorological and communication satellites goes back to the 1960s, starts with the launch of Landsat – monitoring satellite in 1972 by NASA. At the same time, the environmental movement spread throughout the United Sates as well as other industrialized countries in the late 1960s and early 1970s, and the government started to pay much more attention to environmental issues. Mitigating environmental pollution became a predominant objective for many agencies as well as NASA. In 1980s, NASA established a new environmental effort that evolved to the Earth Observing System (EOS), and in the later stages the Agency focused on atmospheric monitoring, specifically ozone depletion. Especially with the 1987 - Montreal Protocol, it was an important policy stimulus in many respects. As a global environmental problem, ozone depletion emphasized the importance of NASA's ability to observe Earth from space.[241] Satellites have been used to monitor also the sea ice since the 1970s. The members of the British Antarctic Survey discovered the ozone hole for the first time through research data obtained by Antarctic station. Although satellite data were not used within the researched data used in the discovery, it immediately turned out that data obtained by satellites are the providers of the best means of mapping of the full extent of the ozone hole and monitoring the changes in time. Those data was largely based on ultraviolet radiation measurements that provided also a clear picture of the size, spatial distribution, and variability of the ozone hole.[242]

In 1990s, Earth Observing System (EOS) received a strong impetus and used for very wide range of civilian purposes. It was designed to serve data to the list of critical variables defined by the EOS Investigators Working Group (IWG), which includes

[240] Lambright,W.NASA and The Environment: The Case of Ozone Depletion. Monographs in Aerospace History No. 38. Washington, D.C.: NASA, 2005.pp:1

[241] Ibid, p:1

[242] Parkinson, Claire L., (September 2017). "Satellite Contributions to Climate Change Studies", Proceedings of The American Philosophical Society Vol. 161, No. 3., pp:220

seven major areas: 1) Radiation, Clouds, Water Vapor, and Precipitation, 2) Oceans, 3) Greenhouse Gases, 4) Land-Surface Hydrology and Ecosystem Processes (including land cover change), 5) Glaciers, Sea Ice, and Ice Sheets, 6) Ozone and Stratospheric Chemistry, and 7) Volcanoes and Climate Effects of Aerosols.[243]

In addition to NASA and US Department of Defence (DoD), There are also other institutions that are involved in space activities, such as the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce that operates US civil weather satellites. Historically, the NOAA has conducted studies via Polar Operational Environmental Satellites (POES), while DoD has a separate military system called the Defence Meteorological Satellite Program (DMSP). However, in 1994, President Clinton agreed that it would be more cost-effective to have a single, converged system; that leads to creation of the "National Polar-orbiting Operational Environmental Satellite System" (NPOESS) program that weather satellite system serves both for military and civil purposes.[244] In order to ensure that the globe is fully covered, weather satellites are deployed in three different polar orbits: an early morning orbit, a mid-morning orbit, and an afternoon orbit. As mid-morning orbit satellites is being already provided by Europe, NPOESS satellites to fill the other two orbits.[245]

Moreover, there also other institutions or companies involved in space activities one way or another; either they use satellite data or engaged in policy aspects of space, or they have their own satellite program. As detailly mentioned above, satellite technologies and space activities are very essential for environmental and earth science systems and also many other scientific areas.

To continue with the space related activities in terms of military & security purposes, The Global Positioning System (GPS) will be a good example. The Global Positioning System (GPS) is a U.S.-owned system that provides positioning, navigation, and

[243] Chuvieco, E. Earth Observation of Global Change. [Place of publication not identified]: Springer, 2014.

[244] Smith, M., 2011. President Obama's National Space Policy: A change in tone and a focus on space sustainability. Space Policy, 27(1), pp.22.

[245] Ibid, p.22.

timing services[246], in any weather conditions, anywhere in the world, and for 24 hours a day.[247] Although GPS is an important part of our daily life today, it was originally developed by US Department of Defence solemnly for military purposes to navigate ballistic missile submarines in the Cold War Period. However, US President Clinton later announced GPS that free, public good without signal restrictions.[248] This system consists of three segments: the space segment, the control segment, and the user segment. Space and control segments are under control of The U.S. Space Force; and user segment is comprised of civilian and military users. For civilian users they can benefit from the system freely and continuously on the worldwide basis; for military users the services are limited just to U.S. and allied armed forces as well as approved Government agencies.[249] However, in the 1990s, there had been an increasing dependence on space assets to support terrestrial military operations at that time.[250]

During the Gulf War between August 1990 – February 1991, space technologies and instruments played an important role and created a real difference in the battleground for the first time.[251] Benefiting the advantages of high-tech instruments and weapons by computers, satellites, and other new technologies, US forces destroyed the world's fourth largest military in just ten-days.[252] As recorded by some scholars, it was four-times bigger of usage of operational satellite communication to support much smaller human force, and the support of satellite technology in communication and navigation

[246] Official U.S. government information about the Global Positioning System (GPS) and related topics, accessed at https://www.gps.gov/systems/gps/, accessed on 12.01.2022.

[247] Ershad, Ali. (2020). Global Positioning System (GPS): Definition, Principles, Errors, Applications & DGPS, pp:1.

[248] Hampton, Jesse. Space Technology Trends and Implications for National Security. Harvard Kennedy School Review, Volume XV, pp: 12-16, (n.d.), p:13.

[249] Official U.S. government information about the Global Positioning System (GPS) and related topics, accessed at https://www.gps.gov/systems/gps/, accessed on 12.01.2022

[250]Lawson, R. (2004), The space security index, Astropolitics, 2:2, 17., pp:188.

[251] Aliberti, M., Cappella, M. and Hrozensky, T., 2019. Measuring Space Power. Cham: Springer International Publishing, pp:7

[252] Dolman, E., 2006. A Debate About Weapons in Space: For U.S. Military Transformation and Weapons in Space. SAIS Review of International Affairs, 26(1, Winter-Spring), pp.164.

of vehicles was confirmed during the Gulf War".[253] Also, in 2003, the US started an important military campaign in Iraq that supported heavily by space-based capabilities for the aim of force enforcement.[254]

As Brachet and Pasco (2011) highlighted that historical goal of the USA in outer space is establishing and maintaining its leadership in all means of space related activities from science to industry. Therefore, as a sign of its historical protectionist policy that launch vehicles for any US mission to space must be only USA made. [255]

As a summary, those are just a few and concrete examples to show how the USA uses space technologies for civilian and military purposes.

4.3. Space Policy of the Russian Federation

The Space Policy of Russia is a combination of modern Russia and former USSR.[256] Following the end of Cold War, space activities of Russia in terms of both space exploration and space science has been in decline.[257] On 24 February 1992, the Russian Space Agency (Russian abbreviation RKA, Rossiiskoe Kosmicheskoe Agentstvo) was founded by the Act of the Russian Government No. 85, "On structure of management of space activity in the Russian Federation", specializing on the development of a national space program. In 1999, the Russian Space Agency combined with the field of aviation and become "Russian Aviation and Space Agency (RAKA). Later on, in 2004, the field of aviation was separated, and the Federal Space Agency (*Roscosmos*) was created. [258] However, in 2015, the Federal Space Agency was again abolished by

[253] Ibid, p.164.

[254] Lawson, R. (2004), The space security index, Astropolitics, 2:2, 17., pp:188.

[255] Brachet, G. and Pasco, X., 2011. The 2010 US space policy: A view from Europe. Space Policy, 27(1), pp.12.

[256] Zhdanovich, Olga. (2010), *Russian national space safety standards and related laws,* Chapter 5, Space Safety Regulations and Standards, Elsevier, p:51.

[257] Vidal, F., (January 2021) "Russia's Space Policy: The Path of Decline?", Études de l'Ifri, Ifri., available at: https://www.ifri.org/sites/default/files/atoms/files/vidal_russia_space_policy_2021_.pdf, accessed on .04.05.2022.

[258] Zhdanovich, Olga. (2010), *Russian national space safety standards and related laws,* Chapter 5, Space Safety Regulations and Standars, Elsevier, p:53.

Vladimir Putin, the President of Russian Federation, and in return, the "*Roscosmos* State Corporation" has been established that also includes the responsibilities of United Rocket and Space Corporation, and through this merge, *Roscosmos* became the sole and only agency responsible for research, development and use of outer space.[259]

Similar to the USA, Russia also uses space technology and space activities for dual purposes: civilian and military. In order to support the argument, in the following section examples on space related activities have been provided in terms of civilian and military purposes.

According to the Law of The Russian Federation No. 5663-1 Of August 20, 1993 On Space Activities, the meaning of 'space activity', the 'goals of space activity', 'Principles of space activity', are mentioned clearly in separate articles. Within all in these sections, while mentioning the use of space technology for civilian purposes such as scientific space explorations for communication, television or broadcasting, ecological monitoring and methodology or for improving scientific knowledge of the earth, space and other celestial bodies; it is also mentioned for military and security purposes such as using space equipment and materials and technology in the interest of defence and security of the Russian Federation, or ensuring and assisting international security, ensuring the safety of space activity and protecting the environment. [260]

There is another example that reveals Russian Federation uses satellite technologies for civilian and peaceful purposes. For instance, there is a scientific term from environmental studies that "land cover and land-use-change (LCLUC) is one of the

[259]"*Vladimir Putin abolishes Russian space agency Roscosmos"*, https://web.archive.org/web/20160101123217/http://www.financialexpress.com/article/lifestyle/science/vladimir-putin-abolishes-russian-space-agency-roscosmos/184669/, Financial Express, December 28, 2015, accessed on: 10.10.2021

[260] The Law of The Russian Federation No. 5663-1 Of August 20, 1993 On Space Activities (With The Amendments And Addenda Of November 29, 1996, January 10, 2003, March 5, August 22, 2004, February 2, December 18, 2006), https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjok9HG3MH3AhWxRfEDHfyWBAUQFnoECAoQAQ&url=https%3A%2F%2Fwww.wto.org%2Fenglish%2Fthewto_e%2Facc_e%2Frus_e%2Fwtaccrus58_leg_375.pdf&usg=AOvVaw3bgaZGu9D0d85DrixVQEAl, accessed on 03.05.2022.

most important components of global environmental change. [261] Via Landsat Program, a remote sensing and satellite program under NASA, that enable to collect data on forests, farms, urban areas, and fresh waters from Earth and generates data as the longest continuous records.[262] In the case of Russia, especially after dissolution of Soviet Union and entering an open market, there is a remarkable change in the land use of in these areas.[263] Therefore, remote sensing technologies are very essential to detect and analyse the changes in the land cover and the purpose on their use of these areas. According to the findings, the available data provided by the Landsat satellites for a specific time period, makes it possible to study changes in forest cover across a large area over a long time period and to highlight strong spatial-temporal variations in the change of forest cover.[264] For instance, through remote sensing technology, it is identified that there is a decrease in forest cover land after 1991, but then there is an increase in forest cover especially after 2005.[265]

There are also areas that Russia cooperates with other countries in space activities and programmes. The very prominent one is the cooperation on International Space Station. As a more specific example, Russia carries US astronauts to International Space Station, and also produces the main engine used in the United States' Atlas V rocket.[266] Moreover, as being part of BRICS Countries (Brazil, Russia, India, China and South Africa), in 2013 Russian "*Roscosmos*" (Federal Space Agency of Russian Federation) and South African Space Agency signed an agreement on cooperation for

[261] Foley, J. A., DeFries, R., Asner, G. P., Barford, C., Bonan, G., Carpenter, S. R., et al. (2005). Global consequences of land use. Science, 309, 570–574.

[262] https://www.nasa.gov/mission_pages/landsat/overview/index.html, accessed 0n 04.05.2022

[263]Esipova, E., Baumann M., Ozdogan M., Kuemmerle T., Wendland K., Radeloff V., (2012), Using the Landsat record to detect forest-cover changes during and after the collapse of the Soviet Union in the temperate zone of European Russia, Remote Sensing Environment, 124, 174-184.

[264] Ibid, p:174-184.

[265] Ibid, p:174-184.

[266]Moltz, James Clay., *The Changing Dynamics of Twennty-First-Century Space Power*, Strategic Studies Quarterly, Spring 2019, p:67.

development of "Radioastron" – a project on astrophysical research which data will be collected from a Russian satellite by the space center in South Africa.[267]

Furthermore, Russia benefits space activities for civilian purposes also in other areas such as disaster prevention and management. On 9th July 2015, UFA Declaration of the VII BRICKS Summit, Russia stated that "the international community increasingly faces grave natural and human-made disasters, we strongly believe that there is a need to promote cooperation in preventing and developing responses to emergency situations." In the following meetings, it is discussed that actions towards humanitarian aid, emergency services, disaster management, services for fast exchange information on emergency situations including the ones received by space systems to be implemented.[268]

In terms of military & security purposes, after the dissolution of Soviet Union, Russia has adopted a hybrid set of standards in its space program compliant with international principles and foundations of Soviet space culture.[269] Contrary to the American's NASA and the European's ESA, Russia's *Roscosmos* includes also military elements within its activities; and Russia's space strategy is controlled cooperatively by *Roscosmos* and Ministry of Defence (*Minoborony).* According to Russian political structure Air force, Space Forces, and Aerospace Defence Forces are covered under of the Ministry of Defence.[270] It shows that, Russian Space Policy is integrated also in the military structure.

Furthermore, Russian Space Policy in terms of military aspects are evolved around two main principles:1) the possibilities of jamming and radio interference, and 2)

[267] Vladimirovna K. A., Andreevich G.D., Andreevich K. D., Mikhailovich S. A., Alekseevna C. I., (2018), Some Issues Of Cooperation Of The BRICS Member States In The Field Of The Outer Space Exploration And The Use Of Space Technology, 5th International Multidisciplinary Scientific Conference on Social Sciences & Arts SGEM, Section Law, p:788.

[268] Ibid, p:791.

[269] Zhdanovich, O., "Russian national space safety standards and related laws", Chapter 5 in Joseph N. Pelton and Ram S. Jakhu (eds.), Space Sefty Regulations and Standards, (2010), Elsevier, p:51-81.

[270] https://eng.mil.ru/en/structure/forces/type/vks.htm, accessed on .05.05.2022

offensive capabilities against ground-based space infrastructure.[271] As a very clear example for the use of space technologies for military purpose that Russia has an spaceport in Mirny, Arkhangelsk Oblast, based in the Arctic Region that is used solemnly for launching military satellites.[272] Moreover, as of 2018, the Ministry of Défense announced that the Russia has 150 orbital assets, out of nine are military satellites just launched at the same year.[273] Moreover, Russia also benefits from space technologies in the latest conflicts (Syria, annexation of Crimea and proxy war in Eastern Ukraine as of 2019) highly. Space is complementary to traditional battlefields on land, sea and air, and satellite technologies are critical to provide reconnaissance, communications, and navigation services. [274]

To summarise, the examples that Russia uses space technology for the civilian or military purposes are limitedly provided just to support the main argument of the thesis. According to the findings, Russian also benefits from space technologies in terms of both civilian and peaceful purposes and there are similarities both to Europe's initiative and also USA's initiatives for developing its space policy. However, it also differs from Europe and USA that *Roscosmos* included also in the includes military elements in its activities. Comparing to Europe, Russia benefits space technologies highly for military purposes and much more openly.

4.4. Space Policy of the People's Republic of China

Another important space power is China which have entered in space activities highly and continue to improve. In 2003, the first time in its history, China successfully launched a manned spacecraft called *Shenzhou* into space and become the third country to send a craft 'Yang Liwei' into space independently. Since the first manned

[271] Vidal, F., (January 2021) "Russia's Space Policy: The Path of Decline?", Études de l'Ifri, Ifri., available at: https://www.ifri.org/sites/default/files/atoms/files/vidal_russia_space_policy_2021_.pdf, accessed on .04.05.2022.

[272] Ibid, p:15.

[273] Russian Ministry of Defense, https://itogi2018.mil.ru/. As cited in Zak, Anatoly,. (June 2019), Russian Military and Dual-Purpose Spacecraft: Latest Status and Operational Overview, CNA Occasional Paper, CNA Analysis & Solutions.

[274] Zak, Anatoly., June 2019, Russian Military and Dual-Purpose Spacecraft: Latest Status and Operational Overview, CNA Analysis & Solutions, pp:1

launched, China has been investing on space exploration significantly and increasing its presence in space more and more. [275]

China's Space Policy run by China National Space Administration (CNSA) which was formerly part of Ministry of Aerospace Industry. CNSA is a completely government organisation and it is like a counterpart to American's NASA. CNSA can sign governmental agreements regarding space related issues on behalf of organisations, can conduct inter-governmental scientific and technical exchanges, as being in charge of implementing and managing national space policies, science, technology and industry.[276]

In 2006 and 2011, two white papers were issued on developments in space industry that include the principles of scientific, peaceful, innovative independent, and open development". Moreover, there is another paper published in 2016 which highlights the importance of "unity, solidarity, and international cooperation" in conducting outer space activities. [277]

In terms of Space Law, China did not have any law regulating the space activities until recently. In 2013, China's National People's Congress included Space Law into 5-year legislation plan.[278] Although China's space activities go back to 1950s, they were mostly conducted by government and military bodies, therefore, there were not needed any authorisation or monitoring on space activities. However, around 2000s, there were two provisional regulations on space object registration and permits to launch were issued.[279] Also, in Russia, there were not any law on space activities until the launch of Sputnik. Also, it was same case for France that the general civil,

[275] J. Burwell, Imagining the beyond: The social and political fashioning of outer space, Space Policy,https://doi.org/10.1016/j.spacepol.2018.10.002, p:6

[276] Gordon, Kayleigh Elizabeth. (2018), 'Analysis of Chinese Cryogenic Long March Launch Vehicles and YF-100 Liquid Rocket Engine', Degree Master of Science Thesis, The Ohio State University, Ohio, p:3.

[277] Du, Rong. (2017), China's Approach to Space Sustainability: Legal and policy Analysis, Space Policy 42, p:8.

[278] Wu, Xiaodan . (2018), 'China's Space Law: Rushing to the Finish Line of its Marathon', Space Policy 46, p:38.

[279]Ibid, p:39.

administrative and criminal law and specific laws regulated space activities, and applicable to telecommunication and broadcasting activities.[280]

As of 2019, China has been strengthening its satellite navigation system with total of 44 operational *BeiDou-2* and *BeiDou-3* satellites which are regional satellite navigation system. By mid-2020, China plans to have full operating 30 additional satellites, that provide mass communication capabilities in worldwide constellation to its users and also provide additional command and control for the PLA, reducing or removing China's dependence on American's GPS. Moreover, China intends to develop a worldwide short message service, satellite-based augmentation services, and internationally recognized search and rescue capabilities. [281]

This also shows that how China benefits space technologies interchangeable for both civilian and military purposes.

Another scientifically purposed space activity that China conducts is Lunar Exploration. In January 2019, China successfully soft-landed its Chang'e-4 lunar lander on the far side of the Moon and it became the first country for a soft-land on that side of the Moon. In the next stages, China intends to have a lunar sample return mission in the late 2020s, establish a lunar research station around 2025, and establish a crewed lunar research and development stage around 2050. [282] China initiated also an enhancing data relay activity. For this purpose, it successfully launched the first of its second-generation *Tianlian-2* data relay satellites in March 2020, in order to provide faster data transmission and more advanced connectivity between ground control stations and spacecraft in low Earth orbit. Also, *Tianlian-2* satellite constellation helps to maintain communications with future human spaceflight missions, including missions to space station.[283]

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[280]Ibid, p:39.

[281] *Military and Security Developments Involving the People's Republic of China*, 2020, Annual Report to Congress, Office of the Secretary of Defence, USA, pp: 64, available at: https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF

[282] Ibid, p:65.

[283] Ibid, p:65.

However, China is not interested in just civilian and scientific purposes within its space related activities. Same as USA and Russia it also runs its space activities with dual purpose and conducts activities both for civilian and military purposes as elaborated in the following paragraphs.

According to a Report (2020) published by USA Department of Defence, China aims to have "the great rejuvenation of the Chinese nation" by 2049. In line with this purpose China also follows a strategy on "Military-Civil Fusion (MCF) Development Strategy".[284] According to the Report, "the Military - Civil Fusion (MCF) Development Strategy" is defined as:

- "The China pursues its MCF Development Strategy to "fuse" its economic and social development strategies with its security strategies to build an integrated national strategic system and capabilities in support of China's national rejuvenation goals.
- MCF encompasses six interrelated efforts: (1) fusing the China's defence industrial base and its civilian technology and industrial base; (2) integrating and leveraging science and technology innovations across military and civilian sectors; (3) cultivating talent and blending military and civilian expertise and knowledge; (4) building military requirements into civilian infrastructure and leveraging civilian construction for military purposes; (5) leveraging civilian service and logistics capabilities for military purposes; and, (6) expanding and deepening China's national defence mobilization system to include all relevant aspects of its society and economy for use in competition and war.
- While MCF has broader purposes than acquiring foreign technology, in practice, MCF means there is not a clear line between the China's civilian and military economies, raising due diligence costs for U.S. and global entities that do not desire to contribute to the China's military modernization."[285]

In terms of military use of space technologies, China also develops 'counterspace' systems such as orbiting space robots, kinetic-kill missiles, and ground-based lasers

[284] Ibid, p:V

[285] Ibid, p: V-VI

and; expended space surveillance capabilities, which enable to monitor objects in space within specific fields and provides counterspace actions; electronic warfare capabilities such as directed-energy weapons, satellite jammers and offensive cyber capabilities. In addition, China has an operational ground-based Anti-Satellite (ASAT) missile that targets low-Earth orbit satellites, that has a potential to destroy satellites up to geosynchronous Earth orbit. China is developing more sophisticated satellite operations and testing dual-use technologies in space that also serves to counterspace missions. [286] It is recorded that on 11th January 2007, an ASAT ballistic missile was launched from Xicheng Space Launch Centre, and completely destroyed a non-operational Chinese weather satellite the *Fengyun-1C* (FY-1C), at an altitude of 863 km. The effects of the space debris created by the test is observed and recorder that there is a big cloud of space debris emerged, and the cloud started to spread around the satellite's original orbit within minutes after the collision; then ten days after the test the debris spread throughout the Erath's entire orbit and created a 'ring', still after the three years of the test, the debris spread all over the LEO (Low Earth Orbit). Moreover, it is the largest space debris cloud ever resulted by a single event, which is huge threat to other spacecrafts in the orbit.[287]

Therefore, it can be analysed that China is openly conducting activities in space with military purposes in different complexities, which is completely different that the EU.

4.5. Conclusion

In conclusion, the Chapter provided selective examples for space related activities conducted by the USA, Russia and China in terms of civilian and military purposes. While US has much more separation between civilian purposes (since NASA is the most well-known institution for space activities in terms of civilian and scientific) and military purposes, in the case of Russia and China it is not the same. Different than US and EU, Russia and China prefer to conduct its space activities as a much more combined way. Since Russian structure of defence forces includes Air force, Space Forces, and Aerospace Defence Forces, it shows that, Russia puts huge important to

[286] Ibid, p:65.

[287] Weeden,Brian.(November 23, 2010).2007 Chinese Anti-Satellite Test Fact Sheet. Secure World Foundation.

space aspects within its defence policy with military purposes. Furthermore, it is also the same case for China, since China also follows a combined way as stated in its Military-Civil Fusion (MCF) Development Strategy. Moreover, China can be seen much more aggressive in its space activities compared to others, and Chinese counterspace systems are very clear evidence of that.

Through this Chapter, how space technology is used for military purposes or how they are used for civilian purposes have been cleared with specific examples and through them, a base to make to a comparison with the European Space Policy and space activities have been developed.

CHAPTER 5

CONCLUSION

This thesis advocates that there are other motivations originated from security concerns for the European Union while developing its space policy other than civilian purposes. In line with this, there are concrete cases that supports the argument. In order to create a base for the topic and support the main argument, the thesis continues (Chapter 2 - Historical Background) with the historical evolution of space policy focusing on the Cold War Period and Post-Cold Period, and analyses the space policies of the USA, the USSR, the prominent European countries and China while referring to the various space related activities conducted in those periods. By doing so, how space related activities emerged, from which motivations and initiatives, what were the effects and reflections of those activities in the international environment and also how these activities and motivations behind them have been evolved over time have been analysed and elaborated.

The 2nd Chapter – Historical Background, is important for highlighting the developments in space activities and milestones in the history during Cold War and Post-Cold War period, and also elaborating what kind of motivations and initiatives that countries might have while initiating their space related activities. Especially different international environments of Cold War Period and Post Cold Period reveals that there were significant scientific achievements conducted with different motivations. The Competitive international environment of Cold War Period led the creation of very important scientific achievements in space technologies from the first humanmade satellite into orbit to first human on Moon. Furthermore, the developments in space technologies also continued the Post-Cold War period different motivations, cooperative rather than competitive such as initiatives for the creation of Skylab, Mir Space Station, and International Space Station. It is clearly seen that the

motivations of involved parties have been changed from becoming just military to including also civilian purposes.

For the European countries, just in the second half of the Cold War, there are initiates to create organisations and institutions for space related activities that leads to establishment of European Space Agency (ESA) in 1973, for peaceful and scientific purposes.

The Cold War environment also led the People's Republic of China to start space activities in the 1905s, as being affected by the competition between the USA and the USSR. In the post-Cold War Period, after having a break in space activities, China returned back to the scene more powerful and active in space related activities.

Furthermore, in order to better understand the military motivations in space related activities, it is important to refer also to security concept. As well as space power, space security is also a very essential term that two cannot be separated. Space crafts and other space related materials are extension of power of the owner country on Earth. At that point, the aim of this thesis gets clearer. Even the aim of a space activity is solemnly for civilian purposes, the security of the respective space craft and ensuring the continuity of the related service creates a topic for security and defence concept. It is very essential that new terms such as space access, use of space, security of space craft's such as satellites, autonomous access to space have also changed the concept of threat, security, sovereignty, independence. Since these terms have a direct relation with power and security studies, for the case of the EU even for ESA's activities that supposed to be serving purely for peaceful purposes, an argument can be that the ESA has also security motivations for some of space related activities. For instance, ESA rejected NASA's offer to cooperate in post-Apollo space program and developed autonomous *Ariane* space launch vehicle, in order to secure its autonomy to accessing to space[288].

Furthermore, as having mentioned in the 3rd and 4th Chapters there is not always a clear cut between a motivation of development of space technologies, if it is for civilian or

[288] Launius, R. D. Historical Dimensions of the Space Age. In: E. Sadeh, ed., Space Politics and Policy an Evolutionary Perspective, 2nd ed. New York, Boston, Dordrecht, London, Moscow: Kluwer Academic Publishers, p:16-17, 2004.

military purposes. Due to the dual use nature of technology, there are grey areas in the main motivation of space related activities and developments, such as American's GPS, which was originally developed for military purposes, however currently it serves to civilian people and to public open and free services.

Lately, the EU is doesn't hide its intention resulting from security concerns, as the EU approaches to space as an area for strategic autonomy, and defines that space is a geopolitical area where the dominance of the USA, Russia and China is highly visible due to high investments resulting from national security concerns and economic competitiveness.[289] Therefore, EU also develops important programmes such as Galileo and EGNOS, Copernicus just to lesser the dominance on foreign technologies such as the USA's, and to have an independent and autonomous space technologies. All these programmes serve both military and civilian purposes in terms of their functions for communication services, critical infrastructure, monitoring and response for emergency, financial systems and transportation activities.[290] Moreover, European Union also provide direct reference to the Common Foreign and Security Policy within the main policy documents related to European Space Policy and Strategy, and therefore it shows that the EU sees space also as part of its Common Security and Defence Policy. Another evidence for the military purpose of space related activities of the EU is the development of Space Situational Awareness System (SSA) that can serve both civilian and military needs. In 2008, at the ESA Ministerial Council, it was agreed to develop an independent European SSA system which is enables to space surveillance and tracking of space objects, near Earth objects and survey space

[289] Fiotht, Daniel. The European space sector as an enabler of EU strategic autonomy, European Parliament, Policy Department, Directorate-General for External Policies, December 2020.p:5.Available at https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/653620/EXPO_IDA(2020)653620_EN.pdf, accessed on 30.12.2021.

[290] Evers, Tobias. (2013). The EU, Space Security and a European Global Strategy, Swedish Institute of International Affairs (UI), No:18.p:7

weather.[291] The data provided by the system can be used by military purposes as well as civilian.

Moreover, concrete examples from the USA and Russia who were the dominant powers of Cold War and also the examples from the China as rising power in the contemporary world, are also important to understand how space technologies are used for military and security purposes, enabling to make a comparison with the EU, and also provide a proof for how EU has directed its space policy not purely civilian purposes but also military dimension supported by security and defence concerns.

In conclusion, having already mentioned previously, since there is not a clear cut between technological developments, space technology is also commonly used for dual purposes which is the case also for the European Union. Besides rockets, missiles, or such commonly known and traditional military tools; also monitoring and communication satellites, or any data obtained by any space technology can be used for military purposes when it is aimed. Different than the USA, the Russia and the China, as they have more combined and cartelised structure in terms of security and defence, for the case of the European Union, space policy is conducted first by national strategies and structures of member states, then the European Union also developed "Common Security and Défense Policy" that require to benefit from all means of technology and assets that Europe has in line with security concerns.

Moreover, in this thesis I willingly provided background information from different approaches and different fields such as international relations, legal, technical, political, security and power relationships in terms of outer space and space related activities. Therefore, I believe this thesis can be a starting point for further studies based on each specific sub-topic. In other words, the base information provided in this thesis can lead further studies and each specific sub-topic can be studied separately as

[291] Johnson, C. 2014. Draft International Code of Conduct for Outer Space Activities Fact Sheet, Secure World Foundation,p:24. Available at:

https://swfound.org/media/166384/swf_draft_international_code_of_conduct_for_outer_space_activities_fact_sheet_february_2014.pdf, accessed on 25.01.2022.

having increased the curiosity and attention of future scholars who might be reading this thesis.

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APPENDICES

A. CURRICULUM VITAE

1. **Family name: TONGA**
2. **First names: Zeynep**
3. **Date of birth: 04.04.1988**
4. **Nationality: Turkish**
5. **Education:**

Institution **[Date from - Date to]**	**Degree(s) or Diploma(s) obtained:**
2018 – 2022	Middle East Technical University, Institute of Social Sciences, Centre of European Union (**Master's Degree)**
2008 – 2014	Middle East Technical University, Faculty of Economics and Administrative Sciences, Department of International Relations **(BS)**
2001 – 2006	Nermin Mehmet Çekiç Anatolian High School

6. **Language skills:** Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)

Language	**Reading**	**Speaking**	**Writing**
Turkish	Mother tongue		
English	1	1	1

7. **Membership of professional bodies:**

Date from - Date to	**Institution**
2008 - 2013	METU Amateur Astronomy Club
2008 – 2010	METU Foreign Politics and International Relations Club
2011 - 2012	Ankara -GençTEMA (Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats)

8. **Other skills:** (e.g. Computer literacy, etc.)
   - MS Office Applications (Word, Excel, PowerPoint, Etc.), Windows 10 and applications

9. **Present position:** Project Manager in EU Technical Assistance Projects
10. **Years within the firm:** 7 years in DAI Global Austria
11. **Key qualifications:**
    - Experience in implementation of EU Technical Assistance Projects
    - Experience in EU IPA Funds to Turkey
    - Knowledge on EU Acquis and related chapters and policy documents
    - Knowledge on EU Space Policy and related programmes
    - Experience in Financial procedures and budgeting
    - Experience in coordination and management

C. TURKISH SUMMARY / TÜRKÇE ÖZET

Uzay Politikası Soğuk Savaş Dönemi'nin önde gelen konularından biridir. Bu dönemde Amerika Birleşik Devletleri ve Sovyet Sosyalist Cumhuriyetler Birliği teknolojik bir yarışa girerek uzay çalışmalarında tarihin en önemli gelişmelerini ortaya koymuş ve teknolojik anlamda birçok ilke imza atmışlardır. Bu gelişmeler, bilimsel bir katkı sağlamanın yanı sıra uluslararası alanda da bir prestij yarışına dönüşmüştür. SSCB'nin uzay teknolojileri alanında birçok ilke imza atmasına rağmen aya ayak basan ilk insanın Amerikalı bir astronot olması sebebiyle bu dönemde ABD ve SSCB arasındaki uzay yarışını, uluslararası çerçevede Amerika Birleşik Devletleri'nin kazandığı kabul görmüştür.

Bu dönemde uzay çalışmalarına çok yoğunluk vermeyen, daha çok sivil ve bilimsel çalışmalarla yetinen ve de bu yarışa doğrudan dahil olmayan Avrupalı Devletler 2000'li yılara geldiğimizde bu önceliklerini değiştirmişlerdir. Özellikle Soğuk Savaş sonrası dönem diye atfedeceğimiz dönemde Avrupa Birliği'nin uzay politikasını geliştirirken benimsediği motivasyonlarda da bir farklılık görülmektedir. Avrupa Birliği'nin uzay politikasını sadece sivil ve barışçıl amaçlar çerçevesinde geliştirmediği güvenlik kaygıları sebebiyle askeri yönde de eğilim gösteren çalışmalar yaptığı söylenebilir. Bu doğrultuda tez, Avrupa Uzay Politikasını sivil ve askeri yönleriyle incelemektedir. Tez 5 bölümden oluşmaktadır.

1. Bölüm Giriş kısmı olarak tezin kapsam ve amacı ile literatür taraması, argüman, teorik çerçeve ve araştırma yöntemini içermektedir. Literatür taramasında, uzay politikası alanında önde gelen yazar ve akademisyenlerden bahsedilirken, uzay teknolojilerinin gelişmesiyle ortaya çıkan yeni kavramlardan da bahsedilmekte olup bu kavramlar tanımlanmaktadır. Örneğin, uzay ve güç ilişkisi, uzay güvenliği, uzay ortamı, uzay çöpü, uzaya erişim, Uzay sürdürülebilirliği. Yine giriş bölümünde, tezin argümanı yinelenmekte olup, Avrupa Birliği'nin uzay politikasını geliştirirken sadece sivil amaçlarla hareket etmediği, aynı zamanda güvenlik kaygılarından kaynaklanarak

askeri amaçlara da hizmet edecek şekilde uzay politikasını geliştirdiği vurgulanmaktadır. Tezin kavramsal çerçevesine bakıldığında neo-realizm öne çıkmaktadır. Tezin ana argümanında devletleri merkeze alarak genel tartışmayı, güç ve güvenlik alanında çerçevelemektedir. Bunun yanı sıra, tezde kısıtlı da olsa özel firmaların uzay çalışmalarından da örnekler verilmesi sebebiyle neo-liberalizme de atıfta bulunulabilir.

2. Bölüm- Tarihsel Arka Plan, uzay politikasının tarihsel gelişimi hakkında bilgiler vermekte olup, özellikle Soğuk Savaş Dönemi'nde ABD ve SSCB'nin uzay politikalarını, uzay yarışını, bilimsel gelişmeleri ve bu gelişmelerin sivil ve askeri açıdan analizini içermektedir. Yörüngeye fırlatılan ilk insan yapımı cisim olması özelliğiyle, 1957'de Sputnik'in SSCB tarafından başarılı bir şekilde yörüngeye yerleştirilmesiyle birlikte uzay yarışının başlaması, böylesine bilimsel ve teknolojik bir gelişmenin askeri ve güvenlik kaygıları yaratarak ülkelerin bu alana bakış açılarının nasıl değiştiği analiz edilmiştir. Sputnik'in başarısını takip eden süreçte, uzay çalışmaları alanında tarihe ilk olarak geçecek birçok girişim ve çalışma daha olduğu vurgulanarak örnekler sıralanmıştır. Uzaya çıkan ilk insan bir Rus olurken, Ay'a ayak basan ilk insanın bir Amerikan olması sebebiyle uzay yarışını uluslararası çevrede ABD'nin kazandığı şeklinde kabul görmüş ve Soğuk Savaş'ın bu dönemi böylece son bulmuştur. Yine bu bölümde, ABD ve SSCB'nin Soğuk Savaş Dönemi uzay politikalarına ek olarak, Avrupa ülkelerinin bu dönemde kısıtlı da olsa uzay alanındaki çalışmalarını ve yine günümüzün bir başka uzay gücü olan Çin'in yine bu donemde gerçekleştirdiği uzay aktiviteleri hakkında da tarihsel bilgi sunulmaktadır. Bölümün devamında, tezin ana argümanı hakkındaki kavramsal bilgiyi tamamlamak amacıyla, uluslararası uzay hukukunun tarihsel gelişimi hakkında bilgi verilmekte olup, bu konuda önemli bir yasa yapıcı olan Birlemiş Milletler ile uzay politikası alanında üretilen belli başlı hukuksal metinler ile ilgili de bir genel çerçeve sunulmaktadır.

3. Bölüm Avrupa Uzay Politikası olarak adlandırılmış olup tezin ana argümanına bir giriş sağlamaktadır. Bu bağlamda, Avrupa Uzay Politikasının sadece sivil amaçlara hizmet edecek şekilde gelişmediği, bunun yanında güvenlik kaygısıyla askeri amaçlara da hizmet edecek şekilde şekillenmeye başladığı vurgulanmaktadır. Tezin argümanını desteklemek amacıyla Avrupa Birliği'nin bu alanda yaptığı girişimler ile yayınlanan hukuki ve politika dokümanlarında satır aralarına vurgu yapılarak, askeri ve güvenlik

alanlarına atıflar incelenmiştir. Verilen örneklerden de açıkça görülmüştür ki Avrupa Birliğe uzay politikasını şekillendirirken sadece sivil amaçlar gütmemekte, bunun yanında güvenlik kaygısıyla birlikte askeri amaçlara da hizmet edecek girişimlerde bulunmaktadır. Avrupa Uzay Politikası konu olduğunda, üye devletlerin yanı sıra AB yapısı içerisindeki kurumlar ve AB yapısından ayrı ve özerk bir yapı olan Avrupa Uzay Ajansı'nı da kapsamaktadır. Avrupa Uzay Politikasına yapılan ilk referanslar Avrupa Birliği'nin İşleyişi Hakkında Anlaşmada görülmekte olup, 2004 Avrupa Topluluğu ve Avrupa Uzay Ajansı Arasındaki Çerçeve Anlaşması'nda daha somut bir hal almıştır.

Uzay politikasını geliştirirken Avrupa Birliği için asıl amaç ve unsur, diğer güçlere bağımlı kalmadan uzaya bağımsız ve kesintisiz erişimdir. Bu amaç doğrultusunda, AB tarafından üretilen hukuki ve politika metinlerinde de bu durum açıkça belirtilmiştir. Bu durum ise AB'nin güvenlik endişesine vurgu yaparak uzay çalışmalarının yalnızca sivil ve barışçıl amaçlarla değil bunun yanında askeri yönleriyle de geliştirildiğini ortaya koymaktadır. Özellikle 12.05.2021 tarihinde yayınlanan Birlik Uzay Programı ve Avrupa Birliği Uzay Programı Ajansı'nın kurulması üzerine regülasyon, Avrupa'nın ortak uzay politikası geliştirmesi açısından çok önemli ve somut bir adımdır. Buna ek olarak, regülasyonda açıkça uzay çalışmaları ile güvenlik ve savunma arasındaki ilişki ve karşılıklı fayda regülasyonun maddelerinde açıkça bahsedilmiştir. Bu doğrultuda, özellikle 3 programa dikkat çekilmiştir: Avrupa Geostationary Navigasyon Yer Paylaşımı Hizmeti (EGNOS), Galileo ve Kopernik Programları. Bu programlarla birlikte Avrupa, uzay politikasının Avrupa üvenlik ve Savunma Politikasının tamamlanmasında ve bütüncüllüğe kavuşmasında önemli bir parçası olduğu kabul edilmektedir.

Bunlara ek olarak, Avrupa Uzay Ajansı'nın, Avrupa Birliği yapısına ve hukukuna doğrudan bağlı olmasa da Avrupa Uzay Politikası ve uzay aktiviteleri açısından yeri ve varlığı tartışılmazdır. Avrupa Uzay Ajansı kurulumu itibariyle sadece sivil ve barışçıl uzay aktiviteleri gerçekleştirmekte olup bu alana yönelik hizmetler sunmaktadır. Ancak, söz konusu olan teknolojik gelişmeler olduğunda sivil ya da askeri diye keskin bir ayrım yapmak ne yazık ki mümkün değildir. Teknolojik gelişmeler çift yönlü fayda sağlayabilmekte, bilimsel amaçlarla üretilen gelişmeler askeri faydalar için de kullanılabilmektedir. Bu durum Avrupa Uzay Ajansı'nın da

kurulum amacından kaynaklanan ve geçerli olan tamamen barışçıl aktivitelerde bulunma durumuna da soru işareti getirmektedir.

Yine bu bölümde, bunların yanı sıra, uzay teknolojilerinin sivil birçok amaca daha hizmet ettiği ve fayda sağladığından bahsedilmektedir. Özellikle küresel iklim değişikliğinin tespiti ve takibi açısında yine küresel ve sürekli veri akışı sağlanmasına imkân yaratan uydu teknolojileri çok kritiktir. Bunun yanı sıra acil durum ve felaket yönetiminde yine uydu teknolojilerinden oldukça fayda sağlanmaktadır. Kasım 2015 itibariyle dünya üzerinde 74 ülke, yörüngede yerleşik olan bu ve benzeri uydu teknolojilerinden yararlanmaktadır. Özellikle ABD, Rusya, Fransa, İtalya ve Almanya bu tarz izleme ve takip uydularında önde gelen ülkelerden olup, bu ülkeleri Çin, Hindistan, Kanada, Brezilya, Arjantin, Güney Afrika, Nijerya ve Avustralya takip etmektedir. Açık kaynak kodlu olması sebebiyle, yörüngeye uydu fırlatma ve yerleştirme teknolojisi olmayan ülkeler de bu tarz verilerden yararlanabilmektedir. Özellikle 1997 Kyoto Protokol'ünde alınan kararların başarıya ulaşması ve takibinin yapılmasında uydu teknolojilerinin somut faydası vardır.

Bir diğer alt başlık olan, Askeri yönden Uzay aktiviteleri bölümünde Avrupa Birliği Uzay Politikasının askeri yönleri incelenmekte olup Ekim 2016'da yayınlanan Uzay Stratejisi dokümanında Uzayın politik olduğu kadar askeri anlamdan da gittikçe daha önem kazandığı görülmektedir. Bu doğrultuda, Avrupa Birliği ilk defa uzayı Avrupa Güvenlik ve Savunma Politikası açısından ve Avrupa'nın stratejik özerliği açısından stratejik bir varlık olarak tanımlamıştır. Buna ek olarak, uzay aktivitelerinin askeri amaçları açısından güvenlik kaygısı söz konusu olduğunda yine uydu teknolojileri öne çıkmaktadır. Sundukları hizmetlerin yanı sıra bu hizmetleri sunan uzay araçlarının güvenliği ve korunması da güvenlik ve tehdit çalışmalarında yeni bir başlık haline gelmektedir. Böylece, tehdit ve güvenlik kavramları değiştikçe yeni tehdit unsurları ya da durumları ortaya çıkmakta, Avrupa Birliği'nin, uzay politikasına yaklaşımı da bu paralelde değişmektedir. Dahası Avrupa Birliği artık bu kaygılarını saklamamakta, uzay çalışmalarının askeri ve güvenlik alanlarıyla ilişkisi üretilen politika dokümanlarında açıkça yazmaktadır. Dolayısıyla güvenlik, tehdit, özerk erişim, bağımsızlık ve savunma vb. konulara yapılan her atıf, Avrupa Birliği'nin uzay politikasını sadece barışçıl ve sivil amaçlarla değil, aynı zamanda güvenlik kaygılarıyla geliştirdiğini ve u bu gelişmelerin keri amaçlara da hizmet ettiğini ortaya

koymaktadır. Ayrıca yasal belgelerde bu terimlerin yer alması, Avrupa Birliği'nin uzay faaliyetlerine yaklaşımının da değiştiğini, bu çalışmalara sadece bilimsel amaçlarla değil, aynı zamanda yönetmelikte de açıkça belirtildiği gibi güvenlik ve savunma politikası için önemli bir araç olarak da değer verdiğini göstermektedir.

Bir sonraki ana bölüm olan 4. Bölüm, küresel bir bağlam olarak Amerika Birleşik Devletleri, Rusya ve Çin'in uzay politikalarını incelemektedir. Avrupa Uzay Politikası ile benzerlik ve ayrılık gözlenebilmesi amacıyla bu ülkelerin ne tür aktiveleri sivil amaçlarla ne tür aktiviteleri askeri amaçlarla ya da her iki amaca da hizmet eden ne tür aktiveler olabileceği somut örneklerle sunulmuştur.

Bölüm öncelikle ABD Uzay Politikası hakkında bilgi vermektedir. Bu bölümde özellikle NASA sivil ve barışçıl çalışmalar yürütmekte olup ABD Uzay Politikasının önemli bir parçasıdır. AB ile benzer şekilde, küresel iklim değişikliği, bilimsel çalışmalar, afet yönetimi, iletişim ve telekomünikasyon hizmetleri gibi birçok alana fayda ve hizmet sağlayan çalışmalara katkı sağlamaktadır. Bunun yanı sıra, uzay teknolojileri ve uzay aktivitelerinin askeri alana da hizmet ettiği birçok durum vardır. Bunun en somut ve önde gelen örneği 2 Ağustos 1990 – 28 Şubat 1991 Körfez Savaşı'dır. Savaş esnasında ABD, uzay teknolojilerinden faydalanarak savaşın seyrini değiştirmiş ve o zaman için dünyanın en büyük 4. ordusunu sadece 10 gün içerisinde alt etmiştir.

ABD'nin yanı sıra yine bu bölümde, Rusya'nın uzay politikasından bahsedilmekte olup, sivil ve askeri alanda çeşitli uzay aktiviteleri örneklendirilmiştir. Özellikle SSCB'nin dağılmasını takip eden dönemde Rusya Uzay Politikasında düşüş gözlemlenmektedir. Ancak, 2004'te *Roskosmos*'un kurulmasıyla uzay faaliyetlerinde yeniden bir yükseliş vardır. ABD ve AB ile benzer olarak Rusya Federasyonu da uzay teknolojilerinden çift amaçlı olarak faydalanmaktadır. Hem iletişim, telekomünikasyon, yer izleme ve kontrol, afet yönetimi gibi sivil amaçlardan faydalanırken, askeri fayda da sağlamaktadır. Rusya, NASA ve Avrupa Uzay Ajansı'ndan farklı olarak *Roscosmos*'un faaliyetlerinde askeri unsurlara da yer vermesi ile ABD ve AB'den ayrılmaktadır.

ABD ve Rusya'ya ek olarak güncel dönemin bir başka uzay gücü olan Çin uzay politikasına da yer verilmiştir. Uzay faaliyetlerinde yükselen ülkelerden biri olan Çin,

2003 yılında, tarihinde ilk kez Çin, insanlı bir uzay aracını başarıyla uzaya fırlatmış olup ve uzaya bağımsız bir insanlı uzay aracı gönderen üçüncü ülke olmuştur. Bu gelişmeyi takip eden süreçte, uzay çalışmalarına yoğunluk veren Çin, bu alandaki varlığını da gittikçe artırmaktadır. Ayrıca, devam eden bölümlerde detaylandırıldığı üzere, Çin'in sivil ve askerî açıdan uzay politikasını geliştirme konusunda da farklı motivasyonları vardır. 2019 yılı itibarıyla, bölgesel uydu navigasyon sistemi olan toplam 44 operasyonel uydusu ile Çin, uydu navigasyon sistemini güçlendirmekte ve bunlara ek ABD'nin GPS sistemine bağımlılığı azaltacak olan bir dizi yeni 30'a yakın ek uyduyu daha fırlatmayı planlamaktadır. Bu gelişmeler, aynı zamanda Çin'in hem sivil hem de askeri amaçlara çift yönlü hizmet eden uzay teknolojilerinden nasıl yararlandığını da göstermektedir. Ancak Çin'in, uzayla ilgili faaliyetlerinde sadece sivil ve bilimsel amaçlarla ilgilenmediği görülmektedir. Uzay teknolojilerinin askeri kullanımı açısından, kinetik öldürücü füzeler gibi 'karşı uzay' sistemleri geliştirmekte olup, yer tabanlı lazerler, yörüngeye yerleşik uzay robotları, uzaydaki nesneleri kendi görüş alanları içinde izleyebilen ve karşı-uzay eylemlerini mümkün kılan uzay gözetleme araçları; uydu bozucular, saldırgan siber yetenekler ve yönlendirilmiş enerji silahları gibi elektronik savaş yetenekleri çalışmaları yürütmektedir. Ayrıca, alçak yörüngedeki uyduları hedef alan kara tabanlı Anti-Uydu (ASAT) füzesine de sahiptir. Çin'in bu doğrultuda askeri amaçlara doğrudan hizmet eden daha sofistike uydu operasyonları geliştirmesi, uzayda bu teknolojileri test etmesi ve uygulaması Çin'in diğerlerinden farklı olarak askeri motivasyonlarının nasıl daha ağır bastığı göstermektedir. Bu bilgiler ışığında, Çin'in AB, ABD ve Rusya federasyonundan farklı olarak farklı teknolojik seviyelerde, askeri amaçlarla uzayda açıkça faaliyetler yürüttüğü analiz edilebilir.

Tezin son bölümü olarak 5. Bölüm Sonuç bölümüdür. Çalışmanın tamamında verilen bilgiler ışığında analiz gerçekleştirilmiş olup, Avrupa Birliğinin uzay politikasını geliştirirken yalnızca sivil motivasyonlar değil bunun yanında güvenlik kaygısıyla oluşan askeri motivasyonların da yer aldığı tekrar vurgulanmıştır. Özellikle bu bölümde, AB'nin uzay politikası ile ABD, Rusya ve Çin uzay politikaları arasındaki benzerlikler ve farklılıklara vurgu yapılmış olup, uzay faaliyetlerin geliştirirken sivil ve askeri motivasyonların analizi gerçekleştirilmiştir.

Bu tez, Avrupa Birliği'nin uzay politikasını barışçıl amaçlar dışında geliştirirken güvenlik kaygılarından kaynaklanan başka motivasyonların da olduğunu savunmaktadır. Buna paralel olarak, argümanı destekleyen somut durumlar ve çeşitli örnekler tezin takip eden bölümlerinde belirtilmiştir. Konuya bir temel oluşturmak ve ana argümanı desteklemek için, Soğuk Savaş Dönemi ve Soğuk Savaş Sonrası Döneme odaklanarak uzay politikasının tarihsel evrimi ABD, SSCB, önde gelen Avrupa ülkeleri ve Çin'in bu dönemlerde uzayla ilgili çeşitli faaliyetlere atıfta bulunulmuştur. Böylece uzayla ilgili faaliyetlerin nasıl ortaya çıktığı, hangi motivasyon ve girişimlerle geliştirildiği, uluslararası ortamda etkilerinin ve yansımalarının neler olduğu ile bu faaliyetlerin ve arkasındaki motivasyonların zaman içinde nasıl evirildiği analiz edilmiş ve detaylandırılmıştır. Soğuk Savaş dönemi uzay faaliyetlerindeki gelişmelere ve tarihteki dönüm noktalarına ışık tutması açısından önemlidir. Ülkelerin tarihteki ilk uzay çalışmalarına başlarken ne tür motivasyon ve inisiyatiflere sahip olabilecekleri örneklerle açıklanmıştır. Özellikle hem Soğuk Savaş Dönemi'nde hem de Soğuk Savaş Sonrası Dönemde farklı uluslararası ortamlara sahip olunması nedeniyle arkasında yatan nedenler farklı olsa da bu dönemde gerçekleşen birçok önemli bilimsel başarılarının da olduğunu ortaya koymaktadır. Rekabetçi uluslararası ortam ve Sovyetler Birliği ile Amerika Birleşik Devletleri arasındaki yarış, uzay teknolojilerinde çok önemli bilimsel başarıların gerçekleşmesine sebep olmuştur. Uzay teknolojilerindeki gelişmeler, farklı motivasyonlara sahip olmasına rağmen, rekabetten ziyade iş birliğine dayalı olarak Soğuk Savaş Sonrası dönemde de devam etmiştir. Soğuk Savaş dönemi sona ererken, uzayda Skylab, Mir Uzay İstasyonu ve Uluslararası Uzay İstasyonu gibi ortak girişimlerde bulunulmasıyla, ilgili tarafların motivasyonunun tamamen askeri olmaktan çıkıp sivil ve barışçıl amaçlara dönüştüğü görülmektedir.

Daha önce bahsedildiği üzere, Soğuk Savaş ortamı Çin'i de etkilemiş ve 1950'lerde ABD ve SSCB arasındaki rekabetten etkilenerek uzay faaliyetlerine başlamasına neden olmuştur. Soğuk Savaş sonrası dönemde uzay faaliyetlerine ara veren Çin, uzayla ilgili faaliyetlerde daha güçlü ve aktif olarak sahneye geri dönmüştür. 1989'dan itibaren Çin, çeşitli uzay faaliyetleri yürütmekte olup ve ayrıca hava durumu izleme, telekomünikasyon, doğal kaynakların uzaktan algılanması, deniz navigasyonu, uydu-TV eğitimi, malzeme işleme ve biyoteknolojiye kadar farklı amaçlara hizmet eden uyduları başarıyla yörüngeye fırlatmıştır. Ancak askeri ve güvenlik motivasyonu

açısından Çin'in niyetini gizlemediği ve askeri uzay faaliyetlerini daha açık yürüttüğü sonucuna varılmaktadır.

Ancak 3. ve 4. Bölümlerde açıkça gözlemlediğimiz gibi, uzay teknolojilerini geliştirirken sivil veya askeri motivasyon arasında her zaman net bir ayrım yoktur. Teknolojinin ikili kullanımının doğası gereği, uzayla ilgili faaliyetlerin ve gelişmelerin ana motivasyonunda, Amerika'nın GPS teknolojini sadece askeri amaçlarla geliştirmesi ve sonrasında sivil halın kullanımına tamamen açık ve ücretsiz olarak sunulması gibi gri alanlar da vardır.

Uzay gücünün yanı sıra uzay güvenliği de birbirinden ayrılamayan çok önemli bir terimdir. Uzay araçları ve uzayla ilgili diğer malzemeler, sahibi ülkenin Dünya üzerindeki gücünün uzantısıdır. Dolayısıyla uzaya erişim, uzay kullanımı, uydu gibi uzay araçlarının güvenliği, uzaya otonom erişim gibi yeni terimlerin tehdit, güvenlik, egemenlik, bağımsızlık kavramlarını da değiştirmiş olması oldukça önemlidir. Bu terimlerin güç ve güvenlik çalışmaları ile doğrudan bir ilişkisi olduğundan, tamamen barışçıl amaçlara hizmet ettiği varsayılan faaliyetleri için bile, ESA'nın uzayla ilgili yürüttüğü bazı faaliyetlerde güvenlik motivasyonunun da olduğunu gösteren bir ilişki oluşturabiliriz. Örneğin, ESA, NASA'nın Apollo sonrası uzay programında iş birliği teklifini reddetmiştir ve uzaya erişim özerkliğini güvence altına almak için özerk *Ariane* uzay fırlatma aracı geliştirmiştir. Bu örnek, ESA'nın bile güvenlik kaygısı taşıdığını göstermektedir.

2020'li yıllara geldiğimizde, AB uzaya stratejik özerklik alanı olarak yaklaştığından, AB güvenlik kaygılarından kaynaklanan niyetini gizlememekte ve uzayı ABD'nin egemenliğinin sürdüğü jeopolitik bir alan olarak tanımlamaktadır. ABD'nin yanında Rusya ve Çin'in de ulusal güvenlik kaygıları ve ekonomik rekabet gücünden kaynaklanan yüksek yatırımlar nedeniyle bu alanda oldukça görünür durumdadır. Bu nedenle AB, Galileo ve EGNOS, Kopernik gibi önemli programları da sırf ABD gibi yabancı teknolojiler üzerindeki hakimiyetini azaltmak, bağımsız ve otonom uzay teknolojilerine sahip olmak için geliştirmektedir. Tüm bu programlar, iletişim hizmetleri, altyapı, acil durum izleme ve müdahale, finansal sistemler ile ulaşım faaliyetleri gibi işlevleri açısından hem askeri hem de sivil amaçlara hizmet etmektedir.

Ancak elbette konu iklim değişikliği veya insan hakları konusuna geldiğinde, tüm ülkeler, insanlığın ve çevrenin faydası açısından uzay ve uzay teknolojilerinin barışçıl kullanımları yönünde aynı motivasyonu paylaşmaktadır.

Ayrıca Avrupa Birliği, Avrupa Uzay Politikası ve Stratejisi ile ilgili ana politika belgelerinde Ortak Dış ve Güvenlik Politikasına da doğrudan atıfta bulunmakta ve bu nedenle AB'nin uzayı da Ortak Güvenlik ve Savunma Politikasının bir parçası olarak gördüğünü göstermektedir. AB'nin uzayla ilgili faaliyetlerinin askeri amaçlarla da geliştirildiğinin bir başka kanıtı da hem sivil hem de askeri ihtiyaçlara hizmet edebilecek Uzay Durumsal Farkındalık Sistemi'nin (SSA) geliştirilmesidir. 2008 yılında, ESA bünyesinde, uzay nesnelerinin, Dünya'nın yakınındaki nesnelerin ve uzay çevresinin araştırılmasına olanak tanıyan bağımsız bir Avrupa SSA sistemi geliştirilmesine karar verilmiştir. Bu bilgi ışığında, kurulan bu sistemin sağladığı veriler sivil olduğu kadar askeri amaçlarla da kullanılabilir. Benzeri alanda, önceki bölümlerde Çin'in oldukça açık örnekler sunduğu görülmüştür.

Ortaya sunulan bu veriler ışığında, Soğuk Savaş'ın egemen güçleri olan ABD ve Rusya'dan ile çağdaş dünyada yükselen güç olarak Çin'in geliştirdikleri uzay aktivitelerinden ortaya konulan somut örnekler, uzay teknolojilerinin sivil ve askeri amaçlar için çift yönlü olarak nasıl kullanıldığını anlamak için çok açıktır. Avrupa Birliği'nin uzay politikasını salt barışçıl amaçlarla değil, aynı zamanda güvenlik ve savunma kaygılarıyla desteklenen askeri boyutunu da nasıl yönlendirdiğinin bir kanıtıdır.

Sonuç olarak, daha önce de belirtildiği gibi, teknolojik gelişmeler ve bu gelişmelerin kullanımı konusunda kesin bir ayrım olmasının mümkün olmaması sebebiyle, uzay teknolojisi ve uzay araçları da ikili amaçlar için yaygın olarak kullanılmaktadır. Bu durum Avrupa Birliği için de söz konusudur. Roketler, füzeler veya yaygın olarak bilinen ve geleneksel askeri araçların yanı sıra; izleme ve iletişim uyduları veya başka herhangi bir uzay teknolojisi, hedeflendiğinde askeri amaçlar için de kullanılabilir. ABD, Rusya ve Çin, Avrupa Birliği'nden farklı olarak, güvenlik ve savunma açısından daha merkezi bir yapıya sahip oldukları için, Avrupa Birliği örneğinde, uzay politikası öncelikle üye devletlerin ulusal stratejileri ve yapıları ile yürütülmekte olup, aynı zamanda Avrupa Birliği güvenlik kaygıları doğrultusunda sahip olduğu tüm teknoloji

ve varlıklardan yararlanmasını gerektiren “Ortak Güvenlik ve Savunma Politikası” geliştirmekte olup ve uzayı da bu politikanın bir parçası olarak görmektedir.

Ayrıca bu tez ile, uzay ve uzayla ilgili faaliyetler açısından uluslararası ilişkiler, hukuk, teknik, siyasi, güvenlik ve güç ilişkileri gibi farklı yaklaşımlardan ve alanlardan, argümana temel oluşturabilmek amacıyla olabildiğince arka plan bilgisi sağlanmıştır. Bu vesileyle, tez içerisinde yer alan her bir alt konu başlığı için daha ileri çalışmalar yapılabilmesine olanak sağlaması amacıyla tezin bir öncü görevi görmesi hedeflenmiştir. Başka bir deyişle, bu tezde sağlanan temel bilgiler daha ileri çalışmalara öncülük edebilir ve her bir spesifik alt konu, bu tezi okuyacak olan geleceğin bilim insanlarını motive ederek uzay politikası ve uzay çalışmaları alanında ayrı bireysel çalışmaların oluşumuna ön ayak olabilir.

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