

# Space security: An approach from the Copenhagen School

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## Abstract

The concept of space security emerged, with the beginning of access to space. As the competition between the USA and the USSR spread to space, space formed the background of ideological conflict. States' demonstration of power in space raised concerns about space security. However, it is not only the power struggle between states that threatens security in space. Rising satellite debris in Earth orbit is another issue that threatens space security. In addition, the increase in space weapons, especially anti-satellite weapons tested in space, is another reason that endangers space security. As can be understood from this, space is becoming increasingly insecure. This study explores the dynamics underlying the issue of space security by addressing the key questions of what the threats inherent in the space security discourse are; to whom these threats are directed; and which actor(s) propose solutions to these threats. Drawing on the securitization theory of the Copenhagen School, the study examines how space security is framed as an existential threat; and how certain issues are elevated to the status of security concerns by the main actors. According to this approach, security threats in space are not inherent, but are socially constructed through political processes, where specific actors actively define and promote particular issues as security threats that require urgent attention and action.

## Introduction

As can be remembered from Maslow's Hierarchy of Needs, humans need to ensure their safety and live in a safe environment after fulfilling their most basic biological and physiological needs, such as food, shelter, and sleep. Security has always been one of the most delicate matters for human beings. Other elements, such as development and progress, come after security. In Plato's words, states are like people (Plato, 2017, p. 148). Security is also placed at the top among the issues that states prioritize. A state always thinks first of all about the continuity of the state. Where there is security, other issues can be addressed sturdily, and likewise, where there is security, steady progress can be made. It is difficult to talk about development and progress in an insecure environment.

Security has always been very important at both the individual and state levels, and continues to be so. Until the 20<sup>th</sup> century, wars between states were mostly classified as threats to security. However, in the 21<sup>st</sup> century, the scope of security is gradually expanding. It is possible to extend the list with different security problems such as ethnic conflicts, terrorist activities, environmental problems, and cyberattacks. As security vulnerabilities become increasingly diverse, the range of security measures developed by states also varies.

Another type of security that we have started to hear frequently about lately is space security. With the rapid breakthroughs in the field of information and technology and the integration of many activities on Earth with space-based applications, dependence on space has increased. Therefore, some threats and dangers to space have begun to emerge. In this context, this study seeks to understand the dynamics behind the issue of space security by seeking answers to the questions of what the threats underlying the space security discourse are, to whom these threats are directed, and which actor(s) offer solutions to these threats.

The study is organized into four main sections. The first section presents a theoretical framework based on the Copenhagen School's securitization theory. The second section analyses the securitization discourses surrounding space security. The third section examines the actors involved in these discourses and the impact of these discourses on the relevant targets. The fourth section explores the actors who attempt to address and resolve the threats to space security. Finally, the conclusion offers a comprehensive evaluation based on the insights provided throughout the study.

## Methodology

The content analysis process followed in this research consists of the following stages:

*Data Collection and Selection.* The literature on space security within the field of International Relations has been reviewed. Books, academic articles, book chapters, newspaper articles, and opinion pieces related to the topic were examined. In addition to classic texts on space security, priority was also given to the works of theorists from the Copenhagen School, such as Barry Buzan, Ole Wæver, and Jaap de Wilde. This phase allowed for a comprehensive examination of the topic from a wide range of perspectives.

*Theoretical Analysis.* The gathered information was evaluated within the framework of the Copenhagen School theorists' discourse. During this stage, the theory of securitization was analysed in relation to space security, examining how it applies to the subject matter. The theoretical framework facilitated a deeper understanding of security threats in space and how these threats are interpreted through the interactions of various actors.

*Case Study Analysis.* This method is an exceptionally effective approach for examining complex and multidimensional issues such as space security. This method facilitates a deeper understanding of situations that pose threats to space security. For instance, phenomena such as space debris, anti-satellite (ASAT) weapons, and cyberattacks can be concretely analysed through such studies. Consequently, since these threats encompass not only physical, but also political, strategic,

and technological dimensions, the case study method enables a comprehensive understanding of how relevant actors have responded to these threats and the measures taken to address them.

*Coding.* Based on the evaluation, the texts were classified into categories: issues that pose threats to space security; referent objects that may be affected by these security threats; and actors who can develop measures to address these security concerns. The coding process ensured that the data was systematically categorized, allowing for a more nuanced analysis of each category.

*Interpretation.* The findings were interpreted in relation to the security of space. In particular, discussions within the Copenhagen School regarding the concept of securitization highlighted that space security is not merely a military issue, but a multifaceted phenomenon that also involves political, economic, and social dimensions. In this context, space security is shaped by power dynamics in international relations and the strategic interests of various actors.

Through this method, the various threats to space security and the strategies developed to counter these threats have been systematically outlined. Furthermore, the roles and interests of different actors in space security have been more clearly understood.

## Theoretical perspective: Securitisation approach

The Copenhagen School is a group whose pioneers are Barry Buzan, Ole Waever, Jaap de Wilde, Morten Kelstrup, Pierre Lemaitre and Elzbieta Tromer, all of whom are based in Copenhagen and study security at the Centre for Peace and Conflict Research. Bill McSweeney gave this group the name “Copenhagen School”, and it was then adopted by both the members of the group and the academic circles (Baysal and Lüleci, 2015, p. 70). The Copenhagen School has made significant contributions to the literature on security. Securitisation and desecuritisation, sectoral security, and regional security complex are the security approaches that come to mind when the Copenhagen School is mentioned. Thanks to these different approaches, to the literature, the perspective for examining the security issue has broadened. Since this study is based on the securitisation approach, it is important to focus on this approach in order to better understand the course of the study.

The concept of securitisation was first put forward in Ole Waever’s article “Securitisation and Desecuritisation”, published in 1995, and later became a theory that formed the basis for other works of the Copenhagen School authors (Baysal and Lüleci, 2015, p. 63). Barry Buzan, one of these scholars, has discussed many of his works around the securitisation approach. In his own words, Buzan expresses this situation as follows: “I have sustenance on the deck of Waever’s securitisation theory” (Buzan, 2015, p. 6).

The Copenhagen School embarked on a constructivist approach when answering the question of what security requires. It provides a framework for examining the nature and impacts of security issues. The Copenhagen School proposes to expand the study of security beyond the traditional focus on military issues and nation-state actors, to include a variety of threats emerging in a variety of sectors (Fichtner, 2018, p. 3). Along with many others, the Copenhagen School has in recent years found it increasingly necessary to include more than just military-political security in security studies (Buzan and Waever, 2003, p. 70). Securitisation’s constructivist perspective on

security states that nothing is a security issue in itself, rather, issues are constructed as security issues. Constructing something as a security issue is a discursive move that gives the issue a sense of urgency and priority, and can be used to persuade the audience to take action (Fichtner, 2018, p. 4).

Securitisation is the construction of something as a threat to the existence of a subject considered to be valuable, and the use of this construction to support measures taken in response (Buzan, 2008, p. 108). Securitisation refers more precisely to the process of presenting an issue in terms of security (Buzan and Hansen, 2009, p. 214). There are some threat perceptions behind the emergence of a security issue. These threats are directed at certain referent objects, and some actors are needed to protect these referent objects, and eliminate the threat. The referent object created within the framework of the claim of survival is shaped by the speeches and actions of securitizing actors regarding threats (Topcu, 2021, p. 160). Therefore, it is necessary to study the discourses in order to understand which referent object is referred to (Buzan et al., 1998, pp. 39–43).

Studying securitisation is the study of how and when an argument exerts sufficient influence on the audience to make them accept extraordinary measures that they would not accept under normal circumstances. While studying securitisation, the researcher's task is not to find out whether an issue is a real security problem or not, but to reveal how and when the securitisation action takes place, what or who its elements (*securitizing actor*, *referent object*, *audience*) are, and what its consequences are (Baysal and Lüleci, 2015, p. 77).

The securitisation approach opens the door to the dynamics behind the evaluation of an issue as a securitisation element. While performing discourse analysis, threatened elements (*referent object*) and actors trying to ensure the security of the threatened element (*main actor*) are identified. As mentioned at the beginning, this approach focuses on the process that creates the security problem rather than the reality of the securitized issue.

## What is space security?

Before analysing the threats in space, it is important to first understand what is meant by the concept of space security. When something is intended to be securitized, it is necessary to establish how it is intended to be transformed. Therefore, how space security is defined will be discussed first.

Indeed, space security is a relatively new concept. Activities in space began to take place in the mid-20<sup>th</sup> century. Since the beginning of the 21<sup>st</sup> century, space has become a more actively used domain. Subsequently, while discussions about where space begins continued, the concept of space security began to emerge. Since space is a new field and space security is a newly developing security perspective, it is not possible to talk about a consensus definition of space security. Therefore, the main lines of space security will be *outlined through* several definitions.

According to Charlotte Burke (2023, p. 2), "Space security: The measures taken to ensure the safety, stability, and sustainability of space activities. It involves protecting space infrastructure, space assets, and the environment in space from physical and non-physical threats, such as natural hazards, human error, technical malfunctions, intentional attacks, and space debris. Space security also encompasses international cooperation and coordination to prevent conflicts, mitigate risks

and promote responsible behaviour in space.” Emphasis is placed on protecting assets in space and developing cooperation against threats there.

According to Michael Sheehan (2014, p. 7), “Space security relates to guaranteed access to space and the ability to freely exploit space for various purposes.” Sheehan emphasizes that space security is a prerequisite for access to space and the ability to operate in space. In other words, a country or institution must have the right to access space and conduct activities there, while also being able to carry out these activities without any hindrance. This means not only the ability to launch into space, but also the protection of space infrastructure and the secure utilization of space resources.

According to Almudena Azcárate Ortega and Victoria Samson (2023, p. 39), “Space security is concerned with the relationship among space objects and activities, and the maintenance of international peace and security, and disarmament, including the prevention of an arms race in outer space. Space security is also commonly understood to refer to measures designed to prevent deliberate harms to a space system, including its component parts, from intended or intentional threats undertaken by another actor.” Similar to Burke’s definition, the protection of objects in space and the elimination of threats are accentuated.

In the light of these definitions, it is possible to say that space security generally includes 1) the safe and free implementation of activities; 2) taking precautions against possible dangers; 3) preventing weaponization; and 4) the use of space on behalf of humanity. While ensuring these conditions creates space security, threats that may arise against these conditions are an indication that space is becoming an insecure place. In recent years, statements that space security is under threat have become more common. Since space has become an unsafe place, the need for space securitisation has arisen. Within this scope, space securitisation, which is the subject of the study, will be evaluated through discourses, referent objects, and securitizing actors.

## **A new perception of threat: Discourses related to space security**

Under this section, three main discourses will be evaluated regarding the classification of space under threat and its securitisation. As shown in Table 1, these are 1) conflict in outer space; 2) satellites safety 3) an attack on critical infrastructures. These discourses are created by analysing the speeches of state officials and concrete events.

**Table 1.** Three discourses of Space security (adapted by the author)

Discourses	An attack in outer space	Satellite safety	An attack on critical infrastructures
<b>Main actors</b>	–states –intelligence agency –military institutions	–states –private companies –space agencies	–states –intelligence agency –technical measure –internet providers
<b>Main referent object</b>	–satellites –state –individuals	–satellites –state –individuals –trader	–state –individuals –trader –public and political infrastructures –communication infrastructure

## An attack in outer space

Within the framework of the securitisation of space, protecting space against possible attacks is one of the prominent discourses. For now, this is expressed as an attack against space objects rather than a conflict or war. The first reason for the emergence of such a discourse is the anti-satellite (ASAT) and hypersonic weapons developed by states. Although ASAT has various components, ASAT is capable of destroying satellites in certain orbits (Boyer et al., 1987, p. 7). Nowadays, the term “hypersonic weapon” is understood as any combat aerial vehicle capable of developing hypersonic or high hypersonic velocities. Five countries - the USA, France, Russia, India, and China - are currently developing the technology in question (Bielawski, 2019, p. 2).

The development of space-based weapons dates back to the 20<sup>th</sup> century. Following the Soviet launch of ASAT tests in the 1970s and US President Ronald Reagan’s announcement of the Strategic Defence Initiative in 1983, there were periods of increased military friction and competition in space (Krepon, 2013, p. 16). These seeds sown into space marked the beginning of its transformation into a militarized domain. Following China’s ASAT test in 2007, the USA’s ASAT test in Earth orbit in 2008 demonstrated that the use of space-based weapons continues into the 21<sup>st</sup> century. In fact, the number of actors using space-based weapons is increasing today. Space-based weapons are possible for any state with the economic and technological capacity to manufacture and launch ICBMs or rockets capable of placing satellites into orbit and controlling the movements of missiles and/or space objects from the ground. For instance, these states include the USA, Russia, China, the European Union, Japan, India, Ukraine, and Israel (McDougall, Baines, 2002, p. 13). As access to space-based weapons becomes easier, security in space becomes more fragile.

Secondly, the establishment of space commands by states is another factor that strengthens the discourse on the securitisation of space. Space capabilities are central to many military operations, including missile warning, geolocation and navigation, target identification, and monitoring of enemy activity (Defense Intelligence Agency, 2019, p. 7). For this reason, states attach importance to space in defence. States adopting such an approach bring space into a military dimension. To put it from a realistic perspective, the military steps of a few states towards space

create security concerns in other states, causing them to start militarizing space. This cycle leads to the perception of space as unsafe, because only places where there is a security vulnerability should be militarized.

The words of US President Donald Trump in 2018, “We must have American dominance in space” (Johnson-Freese, Burbach, 2019, p. 139) and the establishment of the Space Force Command as the sixth branch of the United States Space Force in 2019 (Congressional Research Service, 2024, p. 1) are examples illustrating the militarization of space. In addition, the renovation of Russia’s military launch site in Plesetsk and the creation of Russian Aerospace Forces in 2015 provide another example (Myers, 2018, p. 91). States’ attempts to take such actions reinforce the discourse surrounding space-based attacks and the potential for future conflict. These initiatives highlight the growing concerns over the militarization of space, as nations increasingly view space as a strategic domain where competition and conflict could arise.

## Satellite safety

Another security discourse is related to satellite safety. The place of satellites is of capital importance in the 21<sup>st</sup> century information and technology age. Satellites play a key role in supporting applications from global communications to financial operations, farming to weather forecasting, and environmental monitoring to navigation, surveillance, and treaty monitoring (West, 2018, p. 4). However, space debris, which increases day by day in space, poses an increasingly substantial problem for satellites.

Space debris is an umbrella term that refers to any human-made object found in orbit that does not serve a useful purpose. Every launch into orbit creates debris – such as defunct or unused satellites, spent rocket stages, detached explosive couplings, a runaway toolkit, flecks of paint, and anything else that does not serve a human-derived purpose in orbit (Bowen, 2014, p. 3). Even tiny pieces of material orbiting in space can cause the destruction of a satellite or numerous satellites, as such debris moves at very high speeds (Hitchens, 2002, p. 30). There are 29,000 pieces larger than 10 cm, 670,000 pieces larger than 1 cm, and more than 170 million pieces larger than 1 mm as space debris in Earth orbit (European Space Agency, 2024). Both active satellites and satellites planned to be sent into space are in danger due to space debris.

A problem that occurs on any satellite has the potential to affect many activities on Earth. As a result of a malfunction in the US communications satellite in 1998, many people could not make payments, hospitals could not communicate with doctors, television channels could not present their programmes, and many other services were disrupted (Defense Intelligence Agency, 2019, p. 11).

Since even a small malfunction in a satellite can lead to significant problems, the potential consequences of damage to the satellites can be carefully predicted. Such malfunctions may result in disruptions to satellite services, the breakdown of critical communication networks and data flow, and, in some cases, even pose national security threats. Therefore, it is crucial to implement effective measures to ensure the security of satellites. Additionally, the security of satellites

operating in space is critical for the uninterrupted functioning of global communication infrastructure and international cooperation. In this context, ensuring the protection of satellites is not only a technical issue, but also a major necessity from a strategic and national security perspective.

## **An attack on critical infrastructures**

It is possible to evaluate threats to critical infrastructures within the scope of securitisation discourses. Unlike the other two discourses, this discourse relies on space-based applications rather than a direct threat to space assets. In this context, cyber-attacks carried out via space are considered. Space systems, comprising satellites, ground segments, and communication links, are complex and can also be vulnerable to cyber-attacks (UK Space, 2014, p. 9). A cyber-attack on critical infrastructures can slow down the development of a country, disrupt social order, cause injuries or deaths (Fichtner, 2018, p. 11).

There are many examples of cyber-attacks. Indeed, many small and large cyber-attacks occur around the world every day. It is very difficult, and sometimes impossible, to determine who carries out cyber-attacks. Some, however, are attributed to particular states through analysis of the conjunctural situation. It is possible to show Russia as an example. Russia conducted cyber-attacks against Estonia in 2007; Georgia and Lithuania in 2008; Kyrgyzstan in 2009; and Ukraine in 2014 to paralyze public services and prevent public access to the internet (Darıcı, 2014, p. 4). Since Russia conflicted with these countries at that time, there was a great perception that Russia was carrying out these cyber-attacks. However, at this point, it is more accurate to focus on the effects of the cyber-attack rather on who did it or not. As a result of these cyber-attacks, many people have been deprived of many services such as payment, access to public services, notifications, and communication.

Space-based systems play a major role in the execution of cyber-attacks. There are people who carry out such attacks, but what gives them this opportunity is space-based systems. Cyber-attacks cause harm such as loss of time, material damage, and service disruption. That is why, there is increasing talk about making space safe.

## **Those under threat: Referent objects**

When securitisation discourses emerge, they are directed towards someone or something. In other words, they highlight fact that someone or something, which is important for people, is under threat. The purpose of this is to legitimize moves to provide the security in the specified area in order to ensure the security of those people. So, who or what is affected by the threats in space? It is essential to answer this question, because this audience must be convinced of the securitisation discourse of space and the main actors to take security measures against threats.

Threats in space generally affect the same referent objects, with satellites being the primary assets targeted in such attacks. When satellites are damaged or rendered nonfunctional, the functioning of numerous systems and services that rely on space infrastructure is disrupted. This can lead to a cascade of problems, impacting critical sectors such as communications, navigation,

and data transmission. As a result, damage to space assets can cause widespread disturbances across global systems. Ensuring the protection of satellites is therefore essential for maintaining the stability and continuity of these vital services.

It causes both states and individuals to be affected by this damage. This damage has far-reaching implications in various capacities. When space assets, such as satellites, are compromised, they disrupt critical communication systems, navigation services, and data flow that are integral to both governmental operations and everyday activities. For states, the consequences can range from impaired national security capabilities to disruptions in economic and diplomatic functions. The loss or degradation of space-based assets, such as communication satellites, can severely hinder military operations, intelligence gathering, and emergency response efforts. Additionally, interruptions in satellite navigation systems and global financial networks can lead to significant economic setbacks, affecting everything from trade to the functioning of global markets.

For individuals, disruptions in daily life create problems. Problems occurring in daily activities – such as people communicating with each other, locating commercial vehicles and ships, navigating flights, farmers planning according to the weather, doing business, and exchanging information – have the potential to turn people’s lives into chaos. A problem with space assets or a space-based application can trigger a chain effect that generates many other problems. Thus, damage to space assets generates a complex web of consequences that ripple across both states and individuals, highlighting the interconnectedness of space security with global stability.

As space is increasingly turning into a commercial domain, businesses and the commercial sector are also highly dependent on space-based applications. A problem in space could undermine commercial activities. This situation may cause companies to experience disruptions in their business and financial losses. Moreover, the perception of space as unsafe also creates challenges for space companies in carrying out their work. The commercial space sector is involved in space launches, communications, space situational awareness, remote sensing, and even human spaceflight (Defense Intelligence Agency, 2019, p. 7). It is crucial that space remain a safe place to carry out such activities.

## Main actors in ensuring space security and their role

Main actors come into play to eliminate or minimize space-based problems and to ensure that referent objects carry out their activities smoothly. First of all, states are the leading securitizing actors. Since states have many powers at their disposal, they have the ability to act faster and in a more coordinated manner. Therefore, states play a crucial role in ensuring national security and combating international threats in strategic areas such as space. Additionally, states can coordinate resources and capabilities, collaborate with other actors, or take unilateral security measures within the framework of international norms. This allows them to play an effective role in solving complex and global issues such as space security.

Secondly, intelligence agencies are among the prominent actors for securitisation. Intelligence agencies are important in detecting and reporting threats in advance, based on, the information

they obtain, and finding the source of the threat if it has emerged. Intelligence agencies play a critical role in shaping the state's security strategies by gathering such information. Additionally, early detection of threats allows for timely intervention, helping to prevent large-scale security risks. Therefore, intelligence agencies are of crucial importance as actors who assess the security environment from a broader perspective and intervene proactively.

Thirdly, military organizations can be mentioned. Military organizations play a role, particularly in countering attacks that occur in space and in developing alternative ways to deter such activities. Military organizations develop defence strategies against threats occurring in space, establish critical infrastructure to ensure space security, and maintain the capacity for rapid intervention when needed. Additionally, to provide deterrence against space threats, they conduct military drills and simulations, developing strategies to prevent potential adversaries from attempting attacks in space. Hence, military organizations stand out in terms of ensuring security in space and predicting threats in advance.

In addition to state institutions and organizations, private companies are also key actors in securitisation. Some private companies use space-based applications, while others profit directly from space-based activities themselves. Therefore, ensuring space security is essential for the private sector. For this reason, the private sector supports the state as an auxiliary institution in solving problems in space. Many private companies undertake critical tasks such as space research, satellite launches, data collection, and the operation of space-based infrastructure. These companies strive to contribute to creating a safer environment in space through technological advancements, innovative solutions, and global collaboration.

Finally, technical measures and internet providers are especially significant in preventing cyber-attacks. They take responsibility for controlling the flow of information and data regarding cyber-attacks. Internet providers protect against cyber threats by using strong encryption techniques, security protocols, and monitoring systems to ensure network security. Additionally, by providing training to their users on detecting and preventing cyber threats, they contribute to creating a more informed digital environment. Technical measures help limit the impact of these attacks and secure critical infrastructure. Therefore, internet providers and technical measures stand out as key elements of cybersecurity strategies.

## Conclusion

Each era brings different security concerns. This situation might emerge as a result of human development and progress. In nomadic societies, there were no concerns about protecting land; but when people transitioned to settled life, such issues emerged. Similarly, while there was no problem like global warming in the past, with industrialization, it became a concern. Over time, security concerns change and diversify. While space security was not an issue before, today it is an important security matter. So why does a situation that previously had no security concerns later raise worries about security?

According to the Copenhagen School, stating that a situation is under threat creates the possibility of presenting it as something that could endanger a state, society, or way of life. The perception that something is under threat and that it will have larger consequences leads to the implementation of measures and efforts to save humanity from the danger. If something is at risk, the door is opened for intervention. This is because the threat is presented as a danger to the existence of the subject, creating a sense of fear, urgency, or crisis. The constructed threat provides a justification for exceptional measures or responses, and intervention becomes a necessity.

Space debris, satellite security, cyberattacks, and weapons like ASAT are being raised to create the perception that space security is under threat. The threat to space is a significant issue because every application in today's world relies on space-based infrastructure. Any malfunction in space could lead to numerous problems, such as communication disruptions, payment failures, interruptions in international flight traffic, and disarray in commercial activities. This situation is catastrophic. Therefore, the main actors in ensuring space security must intervene to address this threat. These main actors include states, intelligence agencies, defence organizations, private companies, technical personnel, and internet providers.

At this point, the following question arises: why are the main actors and the actors causing security issues often the same? It is states and private companies that send satellites into space without control. It is states and defence organizations that develop weapons like ASAT. It is intelligence agencies that have the ability to manipulate the data they obtain from space-based systems and carry out cyberattacks on space-based infrastructure. It is technical personnel and internet providers who make security more vulnerable by integrating many applications into space-based systems. Considering all of this, doubts arise as to whether space security is under threat, or whether space is being made insecure.

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