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# The Menace of Space Terrorism

## INTRODUCTION

As we delve further into the cosmos, propelled by technological advancements and an insatiable curiosity, we face an intriguing yet sobering prospect: the possibility of terrorism in space. While our exploration of the final frontier has thus been characterised by wonder, scientific discovery and international cooperation, we must acknowledge that the vastness of outer space also presents unique security challenges.

The use of violence and intimidation in the pursuit of political, religious, or ideological aims knows no bounds when it comes to its potential theatre of operations. Just as we have seen terrestrial acts of terrorism target critical infrastructure, civilian populations and political entities, so too must we consider the implications of such actions extending beyond our atmosphere. The allure of space, with its strategic importance, valuable assets and potential for disruption, makes it a possible target for those with malicious intent. From satellites vital for communications, navigation and weather forecasting to space stations serving as hubs for scientific research and international cooperation, the potential targets are numerous and significant.

Moreover, the democratisation of space exploration has lowered barriers to entry, allowing both state and non-state actors to access space with relative ease. The decreasing launch cost and the increasing capability of relatively cheap, small satellites make it easier for governments, corporations and academics to access space. The risk of interference, sabotage, or outright attacks grows commensurately as space becomes increasingly crowded with satellites, spacecraft and future habitats. While the prospect of terrorism in space may seem like science fiction to some, we must confront it with the same seriousness

and foresight that we apply to terrestrial security challenges. This necessitates robust technological safeguards, international collaboration, and a deeper understanding of the socio-political dynamics driving such threats. As scholars and practitioners in science, technology and international relations, we must explore these issues with nuance, foresight, and a commitment to safeguarding the peaceful exploration and utilisation of space for the betterment of humanity.

The paper contains five sections: Introduction; Methodology; Literature review about terrorism and space terrorism; Review of historical space terrorism cases; and Conclusions. This structure provides information about historical trends and cases that can constitute the frame for systematic research on space terrorism.

The third section presents proposed definitions of terrorism to expand the notion of what can be considered space terrorism. The following section describes various cases and incidents reported as space terrorism. The goal is to present how non-state groups and organisations attacked the space sector for political reasons. The exact section presents how some states use the space industry to counterterrorism. Consequently, since the state uses the space industry for counterterrorism, it becomes a target for non-state actors to protect themselves.

## THE CONCEPT OF TERRORISM

For this article, it is essential to understand terrorism as the use of violence aimed at political goals and executed by either a state or a non-state actor.

It has been widely discussed by the academic community dealing with the subject of terrorism that there is no commonly accepted definition of terrorism. Also, a few of those who have been labelled as terrorists describe themselves as such. Despite this fact, however, it is typical for adversaries in a violent conflict to describe each other as terrorists or to characterise their actions as an exercise in terrorism. This is partly because the term is politically and emotionally

charged, “a word with an inherently negative connotation, in modern times, which one generally applies to one’s enemies and opponents”.<sup>1</sup>

Scholars of terrorism, mainly in the 1970s, 1980s and 1990s, preferred their definition, but no one was widely accepted. Here are indicative views of some academics on the subject: Paul Wilkinson notes that in the literature, the terror practiced by the state is referred to as “terror”, while the terror practiced by para-state actors is referred to as “terrorism”. He uses this distinction in his analyses, pointing out that state terror has been far more massive and deadly than terrorism. According to him, terrorism is not a philosophy or a movement but a method.<sup>2</sup> Martha Crenshaw considers that terrorism becomes transnational when it relates to people of different ethnicities and when its goals do not affect the government of just one state.<sup>3</sup> The American historian David Rapoport developed the wave theory and, in doing so, summarised the evolution of modern democracy. According to Rapoport, starting from the end of the 19<sup>th</sup> century, four waves were described as “anarchist”, “anti-colonial”, “new left” and “religious”. Rapoport does not treat terrorism independently of political ideas but as a result of them.<sup>4</sup> Noel O’Sullivan argues that political terrorism exists when a group, whether it owns or does not hold a government position, decides to pursue a series of ideological goals by methods that not only subvert or ignore the demands of domestic and international law but also rely primarily on the threat or use of force for their success.<sup>5</sup> Walter Laqueur points out that in the 1970s, it was common for “terrorism” to be attributed almost exclusively to left-wing and revolutionary groups, as at that time, these types of organisations had priority. This targeting led to errors and misunderstandings, as it ignored the history of terrorism at the global level.<sup>6</sup> Louise Richardson, seeking to define the difference between insurgents and

<sup>1</sup> HOFFMAN 1998: 32.

<sup>2</sup> WILKINSON 2001: 21.

<sup>3</sup> CRENSHAW 1975: 20.

<sup>4</sup> RAPOPORT 2002.

<sup>5</sup> O’SULLIVAN 1986: 5.

<sup>6</sup> LAQUEUR 2004: 1.

terrorists, states: “Insurgents are a rogue army fighting the regular forces of the state. They follow military methods and usually have many followers, allowing them to engage in quasi-military operations. The purpose to them is the military defeat of the enemy. In contrast, terrorists rarely have any illusions about their ability to coerce to military defeat the enemy.”<sup>7</sup> Alex P. Schmid proposed the following definition in 1992 in the United Nations Crime Branch: “Act of Terrorism = Peacetime Equivalent of War Crime.”<sup>8</sup>

According to Professor Wilkinson, to understand modern terrorism, “it is useful to employ a basic typology of contemporary perpetrators of terrorism based on their underlying cause of political motivation”.<sup>9</sup>

Wilkinson’s typology is as follows:

- *Nationalist terrorists are groups seeking political self-determination.* Their struggle focuses mainly on the area they want to liberate, but they may be active both in their homeland and abroad.
- *Ideological terrorists.* These groups seek to change their entire political, social and economic system either to an extreme left or extreme suitable model.
- *Religiopolitical terrorists.* Examples of this type of terrorism are groups such as Hamas or Hezbollah. Violent groups from other religions can also be found among Sikhs, Hindus, Hebrews and Christians.
- *Single issue terrorists.* These groups focus their activities exclusively on changing a specific policy or practice, such as environmental issues, animal rights and anti-abortion.
- *State-sponsored and state-supported terrorists.* States use this type of terrorism both as a tool of domestic and foreign policy.<sup>10</sup> Consequently, and following Wilkinson’s typology, we cannot limit terrorism, and hence space terrorism, to being carried out only by non-state actors. So-called “state terrorism” cannot be excluded from this study.

<sup>7</sup> RICHARDSON 2007: 37.

<sup>8</sup> SCHMID–JONGMAN 1988: 5–6.

<sup>9</sup> WILKINSON 2001: 20.

<sup>10</sup> WILKINSON 2001: 21.

In addition to the lack of a commonly accepted definition of terrorism, the meanings attributed to the term change according to the historical and social frame. After the French Revolution, in which terrorism was considered a virtue, anarchist organisations and later members of the Russian organisation Narodnaya Volya did not hesitate to call themselves terrorists and present their actions as terrorists.<sup>11</sup>

Recently, several terms, such as extremism, terrorism, insurgents, anti-government struggle, liberators and militants, have been used to describe the same or a similar situation. Further, “extremist” or “extremism” may refer to political ideologies opposing a society’s fundamental values and principles. In the context of liberal democracies, this could apply to any ideology that advocates racial or religious supremacy and disagrees with the basic principles of democracy and universal human rights. The term can also describe the methods by which political actors try to realise their goals, that is, by using means that “show indifference to life, liberty and human rights of others”.<sup>12</sup>

Today, the diversity of the situations and activities described as “terrorism” shows that this word is used as a technical term by the official authority of each state either to define a domestic threat (for example, a minority group, a different political expression, immigrants) or identify a threat from abroad, depending on interests. This practice is inconsistent, as it is applied differently in similar cases. For example, al-Qaeda in Afghanistan was treated quite differently by the Western allies than al-Qaeda in Libya or Syria. Also, far-right violence was not, until recently, labelled as terrorism, as is usually the case with far-left violence and Islamist violence.<sup>13</sup>

For all the above reasons, the writer argues in his book<sup>14</sup> that instead of trying to interpret the definitions of “extremism”, “guerrilla”, “terrorism” and other terms, it should first be seen that in all cases, the violence used by these groups or organisations has a political purpose and, secondly, to give an interpretation

<sup>11</sup> MOST 1987: 100–109.

<sup>12</sup> NEUMANN 2010: 21.

<sup>13</sup> CHARALAMPOPOULOS 2019: 157.

<sup>14</sup> CHARALAMPOPOULOS 2019: 158.

of the reason why a specific characterisation will be given to these groups by the respective subject (governments, international organisations, official authorities). This practice will allow those interested in it to examine political violence against official institutions of power as a timeless phenomenon that existed from ancient Greece, with the assassination of tyrants, to the French Revolution, the anti-colonial struggles and the terror activities of our days.

### THE SHIFTING DOMAINS OF TERRORISM

For this article and to understand the main argument, it is essential to present the development of violence from the land to the sea and further to the air. This will help us realise that forms of political violence follow wherever human activity develops. This applies not only to the territory of states where a state's essential human, social and political functions are carried out but also to the areas of the Earth, such as sea and air, where man mainly develops business, research and war activities.

Historically, terrorism has predominately been associated with acts of violence perpetrated on land, targeting government institutions, government personnel, properties, infrastructure, and, recently, civilian populations. However, the changing dynamics of global security have led to a paradigm shift, prompting terrorist organisations to explore new theatres of operations.

One such theatre is the sea, which has also become a fertile ground for terrorist activities. Maritime terrorism encompasses a range of illicit activities, including piracy, smuggling and attacks on maritime infrastructure. The vastness and complexity of maritime domains, coupled with limited surveillance and enforcement capabilities, create ample opportunities for terrorist organisations to operate with relative impunity.

Notable examples of maritime terrorism include the 2008 Mumbai attacks, where terrorists arrived by sea to launch coordinated assaults on multiple targets along the Indian coastline, showcasing the adaptability and resourcefulness of terrorist groups in exploiting maritime vulnerabilities.

Possible problems with shipping, especially oil tankers, pose significant problems for Western economies and could prove a potential parameter of extremist movements. During the last decade, the activities of piracy have increased the likelihood of terrorists being involved in such operations. The possibility of a terrorist attack at sea, as it is an area without clear boundaries and rules, has preoccupied researchers of violence.<sup>15</sup>

The Houthis exemplify this phenomenon. As a rebel group active in Yemen, they have recently engaged in assaults against maritime vessels within the region. Specifically, their targets often include ships navigating strategic maritime passages like the Bab el-Mandeb Strait and the Red Sea. The tactics employed by the Houthis encompass missile strikes, deployment of sea mines and utilisation of explosive-laden watercraft. These aggressive actions pose a substantial menace to maritime security, jeopardising both trade routes and the safety of individuals aboard targeted vessels.<sup>16</sup> The global community vigilantly monitors such occurrences and endeavours to mitigate the underlying conflicts and tensions exacerbating maritime instability in the area.<sup>17</sup>

Some scholars identify pirates with terrorists as “enemies of humanity” as they operate outside the bounds of legal behaviour.<sup>18</sup> However, in the conclusion of their research, they do not suggest an absolute identification of the pirate with the terrorist, as the two acts – piracy and terrorism – are not identified mainly due to the perpetrators’ intentions behind each act. That is, while piracy was originally a form of private use of force, it could be part of general terrorism as a means for financing activities. Moreover, the sea has not historically been a central area of terrorist activities.<sup>19</sup> Moreover, there have also been reports of suicide attacks on Western-interest shipping in the Mediterranean using small supertanker boats in the Strait of Gibraltar and yachts carrying tourists from Israel to Turkey.<sup>20</sup>

<sup>15</sup> MURPHY 2007: 11–44.

<sup>16</sup> CHARALAMPOPOULOS 2024.

<sup>17</sup> KRANE 2024.

<sup>18</sup> THORUP 2009: 401–411.

<sup>19</sup> JENKINS et al. 1989: 3.

<sup>20</sup> PERCIVAL 2005: 9.

Further, the kidnappings of EU citizens and the deaths of some of them have identified piracy with terrorism, leading to the British Government's view that "ransom is not paid to terrorists".<sup>21</sup> Sharing the same view, French President Nikolas Sarkozy authorised the French Special Forces to attack pirates inside Somali territory after the abduction of the ship "Le Ponant" in April 2008.

Moreover, on 6 October 2002, the suicide bombers' attack against the French oil tanker "M/V Limbur" in the Gulf of Aden caused a short-term collapse of navigation in the Gulf, an oil price rise of 40 cents per barrel and a cost of 3.8 million to the economy of Yemen.<sup>22</sup> This is an example that causes worries as to the capabilities of extremist groups to cause extensive damage to specific countries' economies. Also, on 12 October 2002, an al-Qaeda attack against the U.S.S. Cole in the port of Aden killed 17 U.S. Marines. Finally, the sea attacks coming from Tamil Tigers against the authorities in Sri Lanka, as well as the sea attacks of the Free Aceh Movement in Indonesia, contribute, in some cases, to the further identification of piracy with terrorism.<sup>23</sup>

In addition to maritime environments, the airspace has emerged as a fertile ground for terrorist activities. The emergence of aviation has heralded a paradigm shift in modes of transportation and commerce, offering a potent means for inflicting mass casualties and instilling widespread fear. Regrettably, instances such as the 11 September attacks exemplify the devastating consequences when commercial airliners are weaponised, thereby underscoring the vulnerability of the aviation sector to exploitation by terrorist entities. Furthermore, the proliferation of uncrewed aerial vehicles (UAVs), colloquially known as drones, has introduced novel complexities in airspace security. While drones offer multifaceted advantages across diverse sectors such as agriculture, filmmaking and surveillance, their deployment also poses a potential threat, as they could be utilised by malevolent actors to perpetrate aerial assaults or to conduct reconnaissance in preparation for future terrorist activities.

<sup>21</sup> BBC News 2008.

<sup>22</sup> SHEPPARD 2003.

<sup>23</sup> CHARALAMPOPOULOS 2020: 24.



Air piracy, also referred to as aircraft hijacking, has been a persistent challenge throughout the history of commercial aviation. While its roots trace back to the early days of flight, recorded instances began gaining prominence notably in 1931, exemplified by Peruvian revolutionaries' hijacking of a commercial airliner.<sup>24</sup> During the post-World War II period, the initial wave of hijackings essentially involved refugees seeking asylum from communist regimes.<sup>25</sup> However, hijacking emerged as a widespread phenomenon during the tumultuous decades of the 1960s and 1970s.

Motivated primarily by political objectives, hijackers during this era often aimed to draw attention to various causes or secure the release of political prisoners. Prominent examples include the 1968 hijacking of El Al Flight 426 by members of the Popular Front for the Liberation of Palestine and multiple instances of aircraft hijacked to Cuba by individuals seeking asylum or refuge from political persecution.<sup>26</sup> Palestinians employed airplane hijackings as a political tactic to internationalise their cause and pressure Israel and its allies into releasing Palestinian prisoners. The same year, U.S. criminals began hijacking flights to Havana to evade law enforcement.<sup>27</sup>

In response to the escalating threat of air piracy, governments worldwide implemented various security measures. These measures included the deployment of metal detectors and armed air marshals on flights. Additionally, international agreements such as the Hague Hijacking Convention of 1970<sup>28</sup> were established to define protocols for addressing hijackings and prosecuting perpetrators. Despite these initiatives, further shifts occurred with the introduction of sabotage bombings, exemplified by the Air India bombing in 1985 and the PanAm bombing over Lockerbie in 1988. Following the 9/11 attacks, hijackings decreased, yet the threat has not vanished entirely.

<sup>24</sup> VEILLEUX-LEPAGE 2020: 58.

<sup>25</sup> SCOTT 2019: 213–245.

<sup>26</sup> PORAT 2024.

<sup>27</sup> PORAT 2024.

<sup>28</sup> NOVEMBER 1972: 642–656.

Despite significant advancements in aviation security and international cooperation, hijackings have persisted, albeit less frequently, in recent decades. Incidents are often motivated by criminal or terrorist agendas, underscoring the enduring relevance of aviation security as a paramount concern for governments and aviation authorities globally.<sup>29</sup> Paul Wilkinson underscores the utility of hijacking for terrorist groups as a means to symbolise enmity towards designated “enemy” nations and to acquire hostages, often including prominent individuals from various countries, thus accentuating the potential significance of airspace hijackings in this context.<sup>30</sup>

The expansion of terrorism into airspace and the sea underscores the need for a comprehensive and multi-dimensional approach to security. This includes bolstering aviation security measures, enhancing maritime domain awareness, and fostering international cooperation to address space security threats effectively.

### EXAMPLES OF SPACE TERRORISM

In continuation with all the above, we observe that just as with the term “terrorism”, the same applies to “space terrorism”: specific definitions that emerge from the literature are debatable, and none have become widely accepted. However, these efforts highlight the growing significance of space terrorism as a subject of study. Below are two of these definitions:

According to Cain, space terrorism is “an act of violence perpetrated by one or more individuals or groups to obstruct the establishment or objectives of a space settlement(s), spacecraft, or space station during humanity’s space exploration”.<sup>31</sup>

<sup>29</sup> WILKINSON 2001: 162.

<sup>30</sup> WILKINSON 2001: 162.

<sup>31</sup> CAIN 2016: 98.

According to Bernat and Pośluszná, space terrorism can be defined as a “deliberate act of destruction targeting human and/or material assets within the space industry, perpetrated by individuals or groups driven by ideological motives. The term ‘space industry’ encompasses the sector of human endeavour focused on manufacturing components destined for Earth’s orbit or beyond, transportation to these regions, and providing associated services”.<sup>32</sup>

In any case, the author argues that as for space terrorism, one should follow the dialogue of classical terrorism. From the moment an act is characterised as terrorist, it is of secondary importance whether it occurred on land, at sea, in the air, or in space.

As we explore the intersection of terrorism and outer space, it is crucial to examine real-world examples that illustrate the potential threats faced by the space industry and personnel. While incidents involving space-related terrorism remain relatively rare, several noteworthy events underscore the vulnerability of this domain to malicious actors. In this section, we will examine instances of space terrorism, which we categorise into three distinct classifications based on the source of the threat.

In their article entitled “Space Terrorism: A Historical Study”, Cyprian Aleksander Kożera and Paweł Bernat<sup>33</sup> endeavour to investigate the feasibility of hostile actions perpetrated by non-state entities, potentially involving individuals as young as adolescents, within the context of space exploration and exploitation. Subsequently, the ensuing discourse aims to provide an anticipatory exposition of their thesis.

Echoing their arguments within the broader context of terrorism, Kożera and Bernat may expound upon how technological advancements have facilitated greater accessibility to space-related capabilities for non-state actors, including individuals with limited resources or expertise. The dissemination of knowledge and the availability of off-the-shelf components necessary for space-related activities diminish the entry barriers for potential space terrorists. Among other examples, they mentioned:

<sup>32</sup> BERNAT–POŚLUSZNA 2019: 32.

<sup>33</sup> KOŻERA–BERNAT 2023.

- The first ever recorded act of “satellite terrorism”, or politically motivated space sabotage, occurred back in April 1986. Surprisingly, a disenchanted Home Box Office (HBO) subscriber, John R. MacDougall, perpetrated it. MacDougall was frustrated with the rate of his monthly subscription (USD 12.95) for the satellite TV and wanted to protest that. Being a satellite dish dealer and knowledgeable electronics engineer, he decided to override the HBO satellite signal with a protest message. He ran a successful test on the night of 20 April, and then a week later, at 12:32 AM on 27 April, MacDougall superimposed a specific message for four and half minutes over the HBO signal.<sup>34</sup>
- The case of the 15-year-old Jonathan J. James from Miami broke into 13 NASA computers at the Marshall Space Flight Center in Huntsville, Alabama. The U.S. Department of Justice claims that he “downloaded proprietary software from NASA valued at approximately \$1.7 million”, including the software that “supported the International Space Station’s (I.S.S.) physical environment, including control of the temperature and humidity within the living space”. Furthermore, “[a]s a result of the intrusions and data theft, the NASA computer systems were shut down for 21 days in July 1999”.<sup>35</sup>

The above-mentioned cases underscore that such malicious attacks can be performed by a non-state actor, even a mere teenage individual. This shows the vulnerability of the space sector and paves the way for possible terrorist attacks against satellites and space systems in the future. Space systems have become more affordable, available, disseminated and easier to manage, but they are also more vulnerable to being targeted.

Moving forward from individual cases to terrorist activities, the existing examples show that the space industry and sector are already targets for this kind of violence.

<sup>34</sup> KOZERA-BERNAT 2023.

<sup>35</sup> KOZERA-BERNAT 2023; Department of Justice 2000.

The reasons why the space sector would be an attractive target for terrorist groups are as follows:

- extensive media coverage
- symbolic meaning – by attacking the industry, terrorists attack the state where the agency or the company is registered
- relative easiness of carrying out such an attack
- severe economic consequences

Possible targets:

- Measures against satellites. The most direct way to eliminate a satellite is to destroy it. However, suppose the objective is to stop an operator from benefiting from its satellite access. In that case, there are several options: disruption, denial, degradation and deception of the space system. The simplest possibility of interference with a satellite is electronic interference (jamming).
- Attacks on launch facilities and ground stations. The biggest space targets for terrorists who want to disrupt satellite operations are here on Earth in the form of ground stations, industrial sites and critical individuals. Instead of destroying the communication link between the satellite and the ground station, one could simply damage or destroy the ground station.
- Attacks on the user/service equipment.

In 1984, six people were injured after a bomb exploded outside the headquarters of the European Space Agency (ESA) in Paris. The left-wing terrorist group “Action Directe” took responsibility for the attack. A member of the group called ESA a “practical base to apply the imperialist strategy of domination of NATO and its enfeoffed flunkies, the French state”.<sup>36</sup>

Moreover, in 2005, Tamil Tigers in Sri Lanka took over a U.S. commercial satellite and, through it, broadcasted Tamil’s messages over the Indian

<sup>36</sup> MILLER 2019: 41.

periphery. This satellite piracy lasted for two years until the American-based company Intelsat shut down the transporter in 2007.<sup>37</sup> In addition, in 2012 and 2014, Hamas hijacked the Israeli channel and broadcasted its message.<sup>38</sup> In 2022, a hacker group linked with the Anonymous movement claimed to have shut down the Control Center of the Russian Agency “Roscosmos” causing interference with Russia’s vehicle monitoring system.<sup>39</sup>

In 2003, NASA increased security for the Columbia shuttle launch out of concern that al-Qaeda would attack the launch pad because of the Israeli astronaut on the flight.<sup>40</sup>

Finally, in 2002, activists affiliated with the Falun Gong spiritual movement executed a notable cyber intrusion into a state television station in China. This incident underscored the movement’s innovative strategies for disseminating its message and challenging state authority. By infiltrating the broadcasting infrastructure, Falun Gong activists aimed to convey their grievances and promote their cause to a broader audience, defying the stringent media censorship prevalent in China. This event exemplifies the evolving tactics employed by non-state actors to circumvent traditional channels of communication and exert influence in contentious socio-political environments.<sup>41</sup>

Moving forward to states’ reaction to the issue of space terrorism, we see, lately, states like Nigeria, Pakistan, Syria and Egypt using the space industry as a weapon for counterterrorism and competition, while in Israel, officials claim that the first-ever combat in space has already occurred between Israeli forces and the Houthi terrorist groups.<sup>42</sup>

On 31 October 2023, Houthi forces, operating from Yemen, launched ballistic missiles toward Israel. These missiles were intercepted and destroyed by Israel’s Arrow missile defence system. The significance of this event lies in

<sup>37</sup> KWOK 2021.

<sup>38</sup> LEYDEN 2014.

<sup>39</sup> PITRELLI 2022.

<sup>40</sup> STEIN 2010.

<sup>41</sup> CALDWELL 2002.

<sup>42</sup> BLINKEN 2024.

the claim made by Israeli officials that it marked the first-ever combat to occur in space.<sup>43</sup> Israeli officials claimed that the interception of the Houthi missiles by the Arrow system occurred at an altitude that technically qualifies as space. While the exact altitude at which this interception occurred is not specified, it likely exceeded the Kármán line, commonly considered the boundary between Earth's atmosphere and outer space, at approximately 100 kilometres (62 miles) above sea level. If the Israeli claim is accurate, this event would mark the first recorded instance of combat occurring in space. This outcome, combined with the accusations that Iran supports the Houthis, presents the first recorded example of state-supported terrorist activity in outer space.<sup>44</sup> While space has historically been viewed as a domain primarily associated with peaceful exploration and scientific endeavours, the increasing militarisation of space and the development of anti-ballistic missile systems capable of intercepting targets in space have raised concerns about the potential for conflict beyond Earth's atmosphere. Overall, the events of 31 October, involving the interception of Houthi missiles by Israel's Arrow missile defence system, represent a significant milestone in the intersection of military technology and space security, with potential implications for future conflicts and the broader geopolitics of space exploration and utilisation.

Moreover, and since states continue to use their space capability to target terrorist groups, then we should expect space assets to become one of the main targets of these groups.

For example, in the 2010s, Nigeria demonstrated a heightened commitment to addressing security challenges, particularly in response to the insurgency led by Boko Haram in the northeastern region.<sup>45</sup> This strategic recalibration involved a deliberate emphasis on harnessing satellite technology for counter-terrorism endeavours. In 2011, Nigeria launched the NigComSat-1R satellite, succeeding the defunct NigComSat-1 and significantly augmenting the nation's satellite communication and remote sensing capabilities. This development

<sup>43</sup> The Economist 2023.

<sup>44</sup> ROBINSON 2024; TABAAR 2024; NAKHOUL–HAFEZI 2024.

<sup>45</sup> TELLA 2002.

facilitated the establishment of robust communication infrastructure, particularly beneficial for security forces operating in remote and conflict-prone areas, enhancing their coordination and response capabilities. Throughout the 2010s, Nigeria increasingly integrated satellite-derived intelligence into its counterterrorism operations.<sup>46</sup> Satellite imagery signals intelligence and geospatial data emerged as pivotal surveillance, reconnaissance and target identification tools. These resources enabled security agencies to monitor terrorist movements, identify clandestine training facilities and effectively preempt potential attacks. Furthermore, advancements in satellite technology, characterised by higher-resolution imagery and real-time monitoring capabilities, significantly bolstered Nigeria's situational awareness and operational efficacy in combating terrorism.<sup>47</sup>

Additionally, Pakistan, confronted with enduring security challenges emanating from terrorist organisations, has increasingly turned to remote sensing applications to bolster its counterterrorism endeavours. In response to these persistent challenges, Pakistan has strategically employed remote sensing technology to fortify its counterterrorism capabilities.<sup>48</sup> Remote sensing, encompassing satellite imagery, aerial surveillance and various geospatial techniques, offers inherent advantages in the monitoring, tracking and analysing terrorist activities across diverse terrains and operational contexts. Leveraging satellite-based reconnaissance, Pakistani security agencies can effectively surveil terrorist training camps, border regions and areas of heightened risk, thereby facilitating early threat detection and preemptive measures.<sup>49</sup> Moreover, using geospatial analysis techniques in conjunction with remote sensing data, Pakistani security forces are empowered to execute precise targeting and strategic planning against terrorist elements. Through the adept utilisation of satellite imagery, aerial surveillance and geospatial analysis, Pakistan has markedly

<sup>46</sup> TELLA 2002.

<sup>47</sup> TELLA 2002.

<sup>48</sup> ASMAT 2010.

<sup>49</sup> ASMAT 2010.



enhanced its intelligence-gathering capabilities, situational awareness and operational effectiveness in confronting terrorist threats.<sup>50</sup>

Finally, Egypt, with support from Syria, has submitted a proposition advocating for an extensive dialogue concerning the utilisation of satellite technology in counterterrorism efforts within the United Nations' Committee on the Peaceful Uses of Outer Space (COPUOS). This initiative embodies a proactive stance by Egypt and Syria towards addressing the escalating menace of terrorism through innovative technological means. By orchestrating discussions within COPUOS, these nations endeavour to harness the collective expertise and resources of the international community to explore the prospective applications of satellite technology in bolstering global counterterrorism endeavours. Such deliberations promise to foster collaboration, facilitate knowledge dissemination and facilitate the formulation of best practices to optimise the utilisation of satellite assets for intelligence gathering, surveillance and coordination of response efforts in the global anti-terrorism campaign.<sup>51</sup>

## CONCLUSION

The examples mentioned in this paper serve as reminders of the multifaceted challenges posed by terrorism in the context of space exploration. While the likelihood of a catastrophic space-related terrorist attack remains relatively low, the potential consequences demand continued vigilance, cooperation and innovation in safeguarding the peaceful exploration and utilisation of space for the benefit of all humanity.

Examining space terrorism underscores the evolving landscape of security threats in the modern world. By highlighting the potential for weaker actors, such as terrorist groups and individuals, to leverage space-based technologies for disruptive purposes, it prompts a critical reevaluation of traditional notions of power and security in the context of outer space. While the immediate threat

<sup>50</sup> ASMAT 2010.

<sup>51</sup> Spacewatch Global s. a.

of space terrorism may seem distant, the documented attempts to disrupt the space industry indicate a concerning trajectory. This suggests we are at the nascent stages of a potentially significant security challenge that will likely escalate over time.

The conclusion drawn from this analysis is clear: Policymakers must proactively address the emerging threat of space terrorism by developing robust counterterrorism policies tailored specifically for the space domain. Such policies should encompass preventative measures to safeguard space infrastructure and assets and mechanisms for intelligence gathering, threat assessment and international cooperation. Furthermore, given the inherently global nature of space activities, effective policy responses must be collaborative and multilateral, involving cooperation between governments, international organisations and private sector stakeholders.

In essence, the imperative to address space terrorism underscores the need for forward-thinking and proactive governance in space security. Failure to do so risks leaving critical space assets vulnerable to exploitation and disruption, with potentially far-reaching consequences for national security, economic stability and technological advancement. By acknowledging the emerging threat of space terrorism and taking decisive action to address it, policymakers can help to ensure the continued peaceful and secure use of outer space for the benefit of all humanity.

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