The Geopolitics of Outer Space: How going back to the Moon is reshaping international politics

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How going back to the Moon is reshaping international politics

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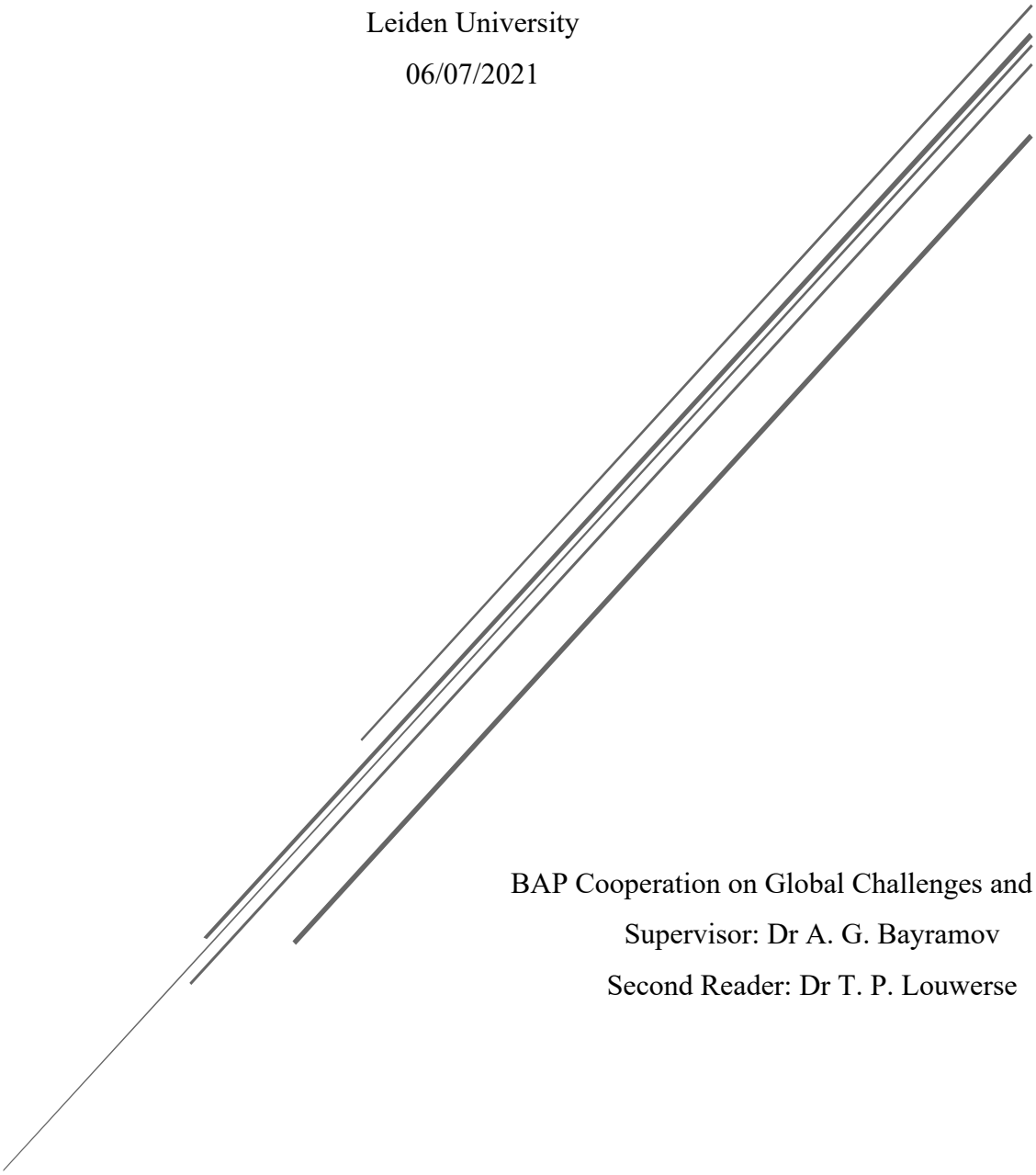

BAP Cooperation on Global Challenges and Crises

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Abstract

In the past few years, all major space powers have revamped their interests in the conquest of the Moon as a key geopolitical asset. In May 2020, the United States was the first space-faring state to officialise a set of bilateral agreements, the Artemis Accords, aimed a legally and politically support the extraction, utilisation and commercialisation of lunar resources, as well as the permanent settlement of a lunar outpost. The American space agenda marked the opening of interesting times for the politics of space exploration, as all major space powers have either embraced or criticised the American approach. As such, this thesis attempts to fill the gap in the literature on the geopolitical implications of space exploration. In order to do so, a descriptive process-tracing of the single case study of the Artemis Accords is carried out, while investigating its geopolitical link with the international space agenda of four major space powers: the US, China, Russia and Europe. While relying on both primary and secondary data, the analysis allows to conclude the inherent geopolitical value of states' practice in outer space, as well as the underlying political, economic and diplomatic factors that are at the heart of international politics. Outer space is increasingly bounded by geopolitical value, to a level seeing only during the 1960s space race, and while the future of international politics is yet to be determined, one thing is certain: it will pass by the Moon.

Keywords: Space Exploration, Astropolitics, Artemis Accords, International Cooperation

The Politics of Outer Space

When in 1957 the Soviet Union launched for the first time a human-crafted object into space, a new realm of international relations was born. The history of the Space Age was soon shaped by the duality of cooperative and competitive interactions, providing plenty of examples of both: from the highly competitive Moon race in 1960s, passing by the seminal Apollo-Soyuz partnership program in 1975, to the ground-breaking twenty-two parties International Space Station (ISS) project. At the same time, space has been rapidly bounded by economic, political and legal projections that contributed to the strategic balance of power of nations; making outer space the ultimate frontier of international relations (Blackburn, 1999).

More recently, the dynamics of space activities have rapidly evolved; from the higher battleground between two competing superpowers to an ever more "congested, contested, competitive" (King & Blank, 2019, p. 125) environment, shaped by numerous new actors, both national and private. From two in the 1960s, to forty-seven in 2006 and to more than seventy today, the number of actors investing in space has progressively incremented, and the financial returns of the new space economy are, figuratively and literally, skyrocketing. In the 21st century, scientific, commercial and telecommunication satellites have become essential for Earth activities, making the control of space intrinsic of geopolitical value. At the same time, space technology is getting less expensive and widely available, to the extent that some scholars refer to the "democratization of space" (Baioicchi and Wesler, 2015), as ever more actors have the ability to participate in outer space activities, making space the high ground of international politics.

Although new technologies are redrawing the geopolitical value of space exploration , the fundamental patterns of space activities remain constant. Cooperation and competition among actors are still the soul of space activities, as the technological, economic and political interests of space exploration are the main drivers of state practice. Both geostrategic and geoeconomics motivations lie behind the emergence of massive space actors like China, as well as behind the reluctancy to hand over dominant position held by historic space powers such as the United States of America (US), Russia and, to a lesser extent, Europe. It is hence not a coincidence that the space relations among the biggest space powers are ever more characterized by geopolitical calculus, as in light of the new strategical opportunities that lie in the conquest of outer space, enormous benefits can be achieved.

In the last few years, space has become a considerable topic in states' political agendas, as new technologies are leading to the prospects of new ground-breaking space projects, which

in turn have significant geopolitical value. In particular, the near-future permanent settlement of the Moon and the exploitation of lunar resources is one of the hot topics of space politics, to the extent seen only in the 1960s race to the Moon. The interests in Earth's natural satellite and the exploitation of its resources is not new, but only recently, fifty years after the Apollo 11, states are truly demonstrating technological, political and economic interest in going back to the Moon; and this time for staying.

On May 2020 the National Aeronautics Space Administration (NASA) has shared to the public a set of bilateral agreements, the Artemis Accords (henceforth referred as "The Accords") with the aim of economically, technologically and legally sustain the American lunar ambitious (NASA, 2020). Meanwhile China has not only announced its interest in going to the Moon, but also declared its intention to become the leading space power by 2049 (Goswami, 2018). Russia, after not being considered in the Accords, has recently agreed to participate in the Chinese lunar development project, moving away from its longstanding space cooperation with the West. Meanwhile, Europe's internal difficulties have led to a discrepancy of interests, where a few countries, namely Italy, Luxembourg, and the United Kingdom officially signed the Accords, while the rest remained sceptical. At the heart of these developments lie national interests, such as geostrategic supremacy, technological superiority as well as political prestige and space has become a crucial arena where achieve them. Whether this results in a new political space race to the Moon culminating in the international recognition of human development, or in a sci-fi looking battleground for the military showdown between space superpowers is yet to be determined.

Although the political dynamics of space exploration usually remain out of the scope of the general public, substantial interdisciplinary literature has been interested in the manifold economic, political and legal challenges inherent in the sector. More specifically, Blamont (2016), Nochim (2005) and Riess (2005) have raised important discussions on the normative model of space cooperation, while Byers (2019) Mathieu (2010) and Zhao (2016) have provided interesting empirically-based analysis of the geostrategic role of international agreements. At the same time, the literature was not able to flourish at the same pace as the evolving dynamics of international space exploration, leaving considerable gaps in the understanding of the current events. In particular, an investigation in the relationship between the recent American space agenda enshrined in the Accords, and the consequential political moves of other important space powers such as China, Russia and Europe is very limited. Furthermore, the academic literature has often lacked consideration for the geopolitical

consequences of space politics, focusing rather on the theoretical premises intrinsic in the realm of international space exploration.

Byers (2019) introduces the concept of "complex and resilience interdependence" (p. 33). It refers to the phenomenon that often occurs in hostile and complex environments, such as outer space, where states tend to establish a cooperative dialogue on the base of necessity and overcome whichever political tensions for the sake of beneficial cooperation. Nonetheless, Byers does not make the next steps of considering the implications that such concept can have on the international order of cooperation; step that this thesis attempts to make. In this sense, it could be argued that, according to Byers' argument, the US and China could overcome their political disagreements for the sake of space exploration, similarly to the progressive realignment between the US and Russia after the end of the Cold War; a possibility that, considering the recent political tensions, seems almost utopistic. Similarly, Zhao (2016) argues that as space exploration becomes more transnationally engaging, the barriers to international cooperation are less prohibitive and hence states are more likely to engage in cooperative dialogues. However, Zhao falls in the same cognitive trap as Byers (2019), failing to connect his arguments to the geopolitical consequences that they imply, as, for instance, analysing the relationship between the space agendas of the ever more internationally engaged space actors.

To clarify, this implicational critique is merely speculative in light of what this thesis attempts to contribute, and not on the quality of the existing literature. Simply put, this thesis attempts to shed light on the geopolitical interconnection between the recent American space agenda, and three other major space powers: namely China, Russia and Europe. In particular, the focus is centred on the Artemis Accords and their geostrategic implications in the international space realm; arguments that have not been addressed by the existing literature yet.

This thesis will be divided in three main sections. First, the methodology behind this thesis is presented. In this section, the research design is broken down by discussing the motives and justifications behind the case selection, data collection and method of analysis. Successively, the theoretical framework on which this thesis relies is discussed, in order to better contextualize and collocate the successive analysis of real-world events. The theoretical discussion is centred on the neorealist lens, which is one of core theories of the emerging school of thoughts of *astropolitics*. Last, relying on both the methodological and theoretical assumptions presented, the analysis is carried out. This section carries out a detailed investigation of the complex duality between cooperation and competition in light of the promulgation of the Artemis Accords by looking at the political responses by China, Russia and Europe.

Consequently, in order to guide this thesis, the following research question is formulated: "*How does the promulgation of the US-led Artemis Accords affects the patterns of international space cooperation among China, Russia and Europe?"*, which, combined with the following sub-questions, will guide this thesis:

1. Has the exclusion of China and Russia from the Artemis Accords led to consequential cooperative alignment between the two space powers?
2. What are the causes and implications of the selective bilateral partnership in the Artemis Accords by the European countries?

The Theory of Astropolitic

The aim of this section is to introduce the theoretical tools that will help to better comprehend the analysis of real-world political scenarios. Ever since space has become an achievable geographical territory, the main tenets of international relations (IR) theory have been applied to this vanguardist new realm; leading to the emergence to what later will be referred as the field of astropolitics. Just as the historical paradigms of IR theory have framed terrestrial geographical environments, outer space was rapidly bounded by the concepts of anarchy, rivalry and cooperation, balance of power and so on. As such, in order to provide a theoretical lens, the realist approach to outer space politics pioneered by Everett C. Dolman (2002) is introduced as the theoretical backbone of the field of astropolitics. Successively, a revamp of the realist perspective, the so-called neorealist astropolitic, is presented and embraced as main theoretical framework of this thesis.

The emergence of neorealist astropolitic

In his seminal book "*Astropolitik: classical geopolitics in the Space Age*" (2002) Dolman directly draws from the geographical arguments of classical geopolitical theory and pioneers a realist view of outer space. Dolman was one of the first scholars that emphasized the cruciality of geographical assets such as orbits, regions of space and launch locations. In his view, these represent essential points over which states are expected to compete strategically and struggle to control. This is due to the fact that from a realist point of view, outer space is essentially seen as an anarchic system, which lacks a world government, and thus states will naturally compete to maximize their power projections.

According to Dolman (2002), whichever state is able to ensure crucial geographical positions in space, will inevitably become the hegemon on Earth, granting both long-term control of outer space regions, as well as more imminent advantages on Earth's surface. Dolman constructs this point on the concept of Mackinder's (1912) geodeterminism, or in this case *astrodeterminism,* by arguing that having the control of geographic such as Earth's orbit or securing the most efficient launching point on Earth's surface, states will have control over the strategic opportunities of potential rivals, as well as grating the indirect control of territories of vital importance on Earth. This in turn gives to the dominant state unmatched military and economic benefits, that are translated into strong international political power._ At the same time, Dolman's thoughts did not consist merely in the application of old-school IR tenets to the realm of space but were developed even further to the point of coning the term *Astropolitik*,

which he synthesized as "a simple but effective blueprint of space control" (2002, p. 9). While warning on the misuse of classical terms like geopolotik or realpolitik, Dolman borrows the main paradigms classical geopolitics to design a pragmatic argument for the pursuit of space dominance by powerful space-faring states. Essentially, Dolman argues that outer space should not and will not remain a neutral and peaceful zone, and thus capable countries should necessarily attempt to seize control of this geopolitically vital asset, otherwise other competing powers will do it first and gain a dominant advantage. Relying on such assumptions, Dolman further argues that it should be the US that should aim at being the hegemon, as it would be a benevolent dictator that would ensure peaceful and prosperous use of outer space resources.

Dolman's (2002) arguments, especially like the latter, generated several criticisms by successive scholars like MacDonald (2007) who criticizes Dolman's claim that space is a lawless frontier. MacDonald points out the fact that, although relatively weak and outdated, currently there is an existing legal framework regulating outer space activities, and hence, differently from what Dolman argues, states practice in outer space is shaped and regulated by an existing international regime, which influence the power relations among space-faring states. Taking this into account, in MacDonald's view *Astropolitik* is nothing more than a "manual to achieve space dominance" (p. 607) which fails to consider contextual dynamics, such as the legal regime, or the political relations between states. Moreover, Havercroft and Duvall (2009) also criticize Dolman's thought arguing that because it will not be possible to physically occupy regions of space, at least in the near-future, if a democracy-prone state like the US becomes the hegemon, it will inevitably establish a peaceful and democratic environment. However, as the authors point out, while the military occupation of space territories will not occur soon, dominant space powers will still be able to control territories on Earth trough surveillance methods and projection of force (p. 56). Hence, Havercroft and Duvall essentially embrace Dolman's core argument that the control of space grants important strategic advantages to dismantle the more overstretched claim of inherent benevolence of the US as the hegemonic space power.

Taking such critiques into mind, scholars like Pfaltzgraff (2013) and Wang (2009) re-modelled Dolman's (2002) realist groundwork in a more modern, less imperialist and utility-based perspective, which can be labelled as the neorealist astropolitics school of thoughts. Essentially, neorealists focus more on the conditions under which states decide whether to cooperate and compete, as a result of power perceptions, domestic values as well as international patterns (Pfaltzgraff, 2013). International space policy is hence the result of complex geopolitical interactions among national and international systems, which are in turn

shaped by power projections, utility-maximisation, and security concerns (Wang, 2009). As a result, the neorealist remodelling of Dolman's groundwork particularly suits the interest of this thesis, as the analysis will be centred on the complex geopolitical interactions among space-faring countries, providing high explanatory value.

While the groundwork of the neorealist school of thoughts draws directly from its classical realist predecessor, such as the concepts of balance of power, anarchy and strategic calculus, in other aspects it proposes a different and interesting view. For instance, in Dolman's (2002) realist argument, states are generally sceptical of international cooperation in space as they are afraid of weakening their strategic advantages by favoring less developed countries. However, from a more modern perspective, Pfaltzgraff (2013) argues that when international cooperation benefits the pursuit of national interests, states are likely to enter in cooperative dialogues rather than in competitive relations, and this is often the case in outer space. National interests can be seen a variety geographical, ideological and economic factors, which are at the hearth of states practices in space and shape international space policy. Hence, differently from the offensive realism proposed by Dolman, neorealism provides a solid base for understanding not only conflictual relations, but also cooperation conditions in space. In this sense, it is particularly interesting Pfaltzgraff's reasoning that the more powerful space-faring states that have high interests in space are generally the ones that can benefit the most from space exploration in the near future, as they are the only ones technologically capable of extracting resources, implement surveillance technology or even weaponize space in order to have more control. Consequently, dominant states are more likely to actively enshrine an international regime that regulates space activities beneficial to their national interests in space activities. At the same time, less developed space-faring states that enjoy a weaker position are more incentivized to favour a global common and common heritage logic, as by lacking the technological capabilities to benefits from space activities, they attempt to limit the advantages that more advanced states could gain. Such argument will result particularly insightful in the analysis section, where the international space policies of countries with different status and power are investigated and compared.

To conclude, from a neorealist point of view, international space affairs can be seen as entrenched in the flexible and pragmatic balance of geopolitical interests, which determine the strategy variation of space-faring states (Wang, 2009). Hence, the patterns of international cooperation and competition in outer space occurs according to structure-determined conditions and utility-based calculus: space-faring countries behave according to their incentives that lie both at the national and international level, which determine the patterns of

cooperation and competition. Hence, neorealist astropolitic becomes particularly helpful when analysing the behaviour of space actors as a consequence of their perceptions of national interests; exercise that this thesis attempts to do. Nevertheless, it is important to recognize the fact that no single theory is able to comprehensively understand, describe and predict every political behaviour on Earth, and therefore it is naïve to expect to have different results in space. Hence, the theoretical lens embraced in this thesis, and any other approaches in general, should not be seen as the holy grails of knowledge that are capable to explain every complexity of the world, but rather, as theoretical instruments from which is helpful to extrapolate insightful arguments with high explanatory value.

Methodology

In order to provide a clear comprehensive view on the international space affair dynamics, this thesis conducts a qualitative study of the Artemis Accords in light of its geopolitical correlation with the Russian, Chinese and European space agendas. As a follow, in this section the research design that structures this thesis is briefly presented. First, the rationale and justification behind the case selection is illustrated, including a brief overview of the Artemis Accords as a novel type of bilateral agreement. Second, the data collection strategy is presented, as well as the use the data have for the analysis. Last, the chosen method of analysis is exemplified, discussed and justified.

Case selection

This thesis uses a single case study design, as it allows not only for a comprehensive examination of political processes and mechanisms, but also an in-depth description and knowledge of a phenomena: the implications of the Artemis Accords on state actors' space agenda (Della Porta, 2008). This coincides with Geertz's (1973) notion of thick description, which serves as an interpretative tool to analyze complex and particularistic phenomena. This is particularly useful in the setting of outer space as it allows to study contextual conditions that, according to the neorealist view, are at the heart of state practice. This design appears as relevant for this thesis, as it complies with Yin's (1994) deception of a case studys as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 13). As such, a single case study of the Artemis Accords, enhanced by a thick description of the geopolitical context around the Accords, perfectly enables the evaluation of the complex geopolitical implications of the recent international space agenda. Nonetheless, one shall keep in mind that the results of a single case study remains context-specific, limiting hence this thesis' external validity.

The Artemis Accords: a novel approach

The focus on the Artemis Accords is motivated by this thesis' objective: investigate its link with major actors' international space agenda. The rationale behind the choice of the Accords as center of the analysis lies in the novelty of the approach undertaken by the US, as well as in the important geopolitical implications that have already emerged globally. Although bilateral agreements represent one of the main means to achieve international cooperation in space

(Riess, 2005), they are rarely used as regulatory tools and rather more as technologically-specific programs. Nevertheless, from analysing the Accords themselves, as well as observing the geopolitical context, it seems evident that aim of the Accords is to establish a regulatory framework. In fact, the Accords embody a set of ten legal principles aimed at "operationalizing" the norms enshrined in the 1967 Outer Space Treaty (OST), the principal international treaty regulating space activities (Salmeri, 2020). Some sections are remarkably brief, such as the one on the "peaceful purposes" which simply states that the space activities under the Accords should be carried out exclusively for peaceful purposes (NASA, 2020). Other sections instead, the ones that generated more controversies, are more developed. In particular, the two principles that regulate the utilization of space resources and the establishment of "safety zones" have raised many doubts among the international community. These are considered as norms that safeguards American interests, rather than the continuation of OST's common heritage principles (Wang, 2009). Hence, despite building on the core principles of the existing international legal regime, the core aim of the Accords is to innovate and construct a legal support for the American space activities and to provide the foundation for future international customary law. As a result, these Accords appear as particularly relevant to singularly study in relations to state actors.

Data collection strategy

As the focus of this thesis is centered on novel events, the data are drawn from both primary and secondary sources, allowing for a synergic understanding of the context that seeks to investigate the geopolitical implications of the recent American space agenda on the international world order.

First, this thesis heavily relies on secondary sources. These include the opinion and experiences of sector practitioners, such as space exploration strategists, government officials and workers from national space agencies. Retrieved and collected from reported statements, found in scientific journals and online newspapers, these statements provide insightful perspectives on the spectrum of international space affairs. Such secondary sources are taken into account as they are the most updated data on this topic, a fundamental component when dealing with contemporary and quickly evolving arguments such as international space cooperation. At the same time, some crucial data considered in this thesis have been only accessible through secondary sources. Indeed, in the case of China and Russia, due to both practical motives like lacking knowledge of the spoken language, as well as the restricted access of media sources, the data could be retrieved mostly through online sources that reported

the words of the experts rather than from primary sources. Secondly, this paper uses primary sources when pursuing to identify the studied states' views on the Artemis Accord. As such, on top of using the Accords themselves - essential for the interpretation of the rest of the data collected - this thesis also relies on information found in official documents of governmental agencies. As such, the use of primary data permits a higher quality of data, allowing for a pure investigation of the sources (Halperin & Heath, 2017).

One shall note that the sole use of secondary resources holds limitations, especially due to the lack of academic data directly addressing the scope of this thesis. As a result, this thesis also uses primary sources of data collection in order to conduct an analysis based on a descriptive-interpretative exercise.

Method of analysis

This thesis aims to provide a thorough qualitative analysis of the international space agenda, in relation to the Artemis Accords as potential breakers with the traditional patterns of space cooperation. While a quantitative approach would permit establishing the extent of the correlation between the Accords and the states' space agenda, this thesis rather aims to uncover *how* these Accords affect patterns of international space cooperation. Therefore, under a single case study design, the choice of a qualitative method of analysis is driven by this thesis' aim to reveal the mechanisms behind this link (Queirós et al., 2017). As such, a qualitative approach allows a more in-depth exploration of geopolitics that cannot be analyzed quantitively (Roshan & Deeptee, 2009).

In the analysis, process tracing, defined as "a method for identifying the causal relations that connect hypothesized causes and outcomes" (Halperin & Heath, 2017, p. 247) is employed, allowing to better uncover the variables of interest. This enables the tracing of causal pathways through tracking sequences of events, permitting to link variables and outcomes (Mahoney, 2012). Hence, not only does this method provide a comprehensive overview of the sequential steps, but also presents high sensitivity, which in turn increases internal validity, the possibility of identifying alternative justifications and potential bias (Bennet & Elmann, 2007). Furthermore, combined with a single case study it is argued that such method of analysis provides robust explanatory power by embracing causal complexities while taking into consideration the time and context of events. This suits the aim of this thesis as it allows to investigate the dynamics and reasons behind the recent American space agenda embodied in the Artemis Accords, and its correlation with the four main space actors' political response.

Despite its high methodological relevance for the purpose of this thesis, process tracing, alike qualitative methods, bears limitations. Most notably, King, Keohane and Verba (1994) regard process tracing as a method with low capability of yielding strong causal inference, as the many intervening variables considered blur the relationship between the independent and the dependent variable. Consequently, relying on process tracing leads to an inherent difficulty to properly estimate the effects of an independent variable. Nonetheless, although Vennesson, Della Porta and Keating (2008) view process tracing as a "a procedure for identifying steps in a causal process leading to the outcome of a given dependent variable of a particular case in a particular historical context" (p. 231), it is important to note that this is not the purpose of this thesis. Rather, this thesis conforms to Collier's (2011) understanding of descriptive process tracing. According to him, this specific method focuses on the unfolding of events or situations over time. It focuses on finding and interpreting evidence, rather than finding strong evidence of causal relations. In this sense, by combining the description of the Artemis Accords and the already scholarly identified causal pathways with the Chinese, Russian and European space agenda, process tracing allows to convert historical narrative into causal explanations. Nevertheless, it is important to underline that although this design seems to bypass King et al.'s (1994) limitation, this thesis remains based on already established causal patterns. As the testing of this causal relation stands out of the scope of this thesis, this weakness cannot be shunted.

As aforementioned, the analysis of this thesis is mostly interpretative. Nonetheless, the practice of process tracing allows a clear understanding of the geopolitical consequences that the new American space agenda has on the international world order. By illustrating a comparative picture between different actors, a clear comprehensive view can be provided. More specifically, by considering the perspectives of the countries that have embraced the Artemis Accords, as well as the one of the states that criticised the American approach, this thesis' external validity is enhanced.

Space Exploration in the 21st Century: between cooperation and competition

Drawing from the theoretical and methodological insights of the previous sections, the analysis of this thesis focuses on the geopolitical consequences intrinsic in the renewed interests from major space actors in the permanent settlement on the Moon. To do so, this section is dived in three main parts. First, the space relations between the US, Russia and China are analysed, with particular attention to the incremental Sino-Russian cooperation as a consequence of the recent American space administration. Second, the transatlantic space relations between the US and Europe are taken into account by investigating the reasons behind the unilateral decision by a few ESA member states to sign the Accords. Third and last, a brief discussion of the main findings is presented, highlighting the link with the theoretical expectations and considering future scenarios.

Russia, China and the United States: a geopolitical game

When on May 2020 NASA revealed to the public its intention to draft a new international agreement in support of the exploration of the Moon, active concerns on its geopolitical implications quickly flourished. Initially, it was not clear whether this new treaty would have been globally in scope by relying on the existing legal structure, or just a set of bilateral regulations aimed at legitimizing and supporting the American lunar activities. A few months later, when on the 13th of October 2020 seven partner countries signed the Artemis Accords, it was clear that the latter was the path undertaken by the major space power. As a matter of fact, the Accords so far are explicitly directed towards “like-minded” countries, which by signing the agreements enter in a bilateral relationship with the US. The so-called like-minded countries can be seen as the historical American space partners, such as Canada, Japan and Europe, but with the relatively surprising exclusion of US’ major space partner of the last few decades, namely Russia.

This decision did not come without any surprise, as ever since the 1975 Apollo-Soyuz program the cooperative relations between the US and Russia fostered enormously. Most notably, when in in 1993 the US formally invited Russia to participate in the International Space Station project, the level of interoperation between the former rivals become standard practice; to the extent that until recently the two space agencies were interdependent to maintain and sustain the ISS. As understood by the theory, the decision to include Russia as a key partner of the ISS had military, economic and diplomatic reasons behind, including the

need of Russian technological expertise as well as the political and economic interests of having the former Soviet Union on board of the most expensive international project of humankind at the end of the Cold War (Whithing, 2003).

Perhaps there are similar motives behind the exclusion of Russia from the next "big" international space project. Indeed, both the Pentagon and the more recently established US Space Force have actively criticized Russia's space activities, as for the instance when Russia tested a direct anti-satellite missile, with the result of categorizing Russia as a hostile country (United States Space Command, 2020); signalling that the American administration is now more sceptical of Russia's space activities and hence is more reluctant to enter in cooperative dialogues. Moreover, it can be argued that while at the end of the 20th century the technological level between Russia and the US was similarly advanced, in the last two decades NASA's technological expertise and capabilities develop much faster than the Russian counterparts. Embracing the neorealist view, this can be reflected in higher scepticism to cooperate, as dominant space-faring states have interests in avoiding the share of strategic technology with a less developed, but potentially competitive, space power.

At the same time, Russia has not missed the occasion to publicly criticise the American approach carried out through the Accords. Criticism arose in particular after the former President of the US Donal Trump signed on the 6th of April an executive order aimed at supporting NASA's Artemis program. In the executive order, the American view on space resources utilization was reflected and implemented as legislation, which is centred in the long-term exploitation of Moon's resources by both the private and public sector with the objective of creating a fruitful lunar economy (Stimers, 2020).

Crucially, the US officially stated that while still committing to the 1967 OST, it does not recognize outer space as global commons, but rather as a commercial opportunity (The White House, 2020). This particular view was not shared by the Russian administration, as immediately after the signing of the executive order a statement from Roscosmos' Deputy Director General Sergey Saveliev was published on the agency's website describing the American intentions as an "attempt to expropriate outer space and aggressive plan to actually take over other planets" (Roscosmos, 2020). Saveliev later added that such behaviour will hinder the international legal framework while also posing a challenge to fruitful international cooperation. This refers in particular to the 1979 Moon Agreement which specifically considers the Moon and any other celestial bodies as "common heritage of mankind" and hence prohibits privatization of lunar resources (UNOOSA, 2020).

Interesting enough, the Moon Agreement was ratified by only eleven countries and heavily opposed by both the American and Russian administration. Hence, while with the executive order the US explicitly rejected the validity of the Moon Treaty as international customary law in order to allow for the near future exploitation of lunar resources, Russia is now relying on a treaty that has never signed to argue the illegitimacy of the American activities. This can be seen as a calculated move from Russia, as currently it lacks the capabilities and technological expertise to benefits from the lunar economy as much as the US, and hence it is in its national interests to limit the exploitation of strategic resources from another, more technologically capable, space-faring countries.

Switching the focus more to the East, China was also not particularly positive when the Artemis Accords were publicised. In fact, although the cooperative space history between the Red Giant and the US has been almost non-existent, China has raised important criticism towards the American approach on the Moon. Indeed, as, coincidentally enough, the announcement of the Artemis Accords arrived soon after China's milestone achievement of successfully testing a proprietary heavy launcher, the Long March 5b, the Accords have been perceived as an attempt to minimize the Chinese space capabilities.

Most notably, Song Zhongping, a Chinese military aerospace expert, heavily criticised the Accords by comparing them to the 18th century enclosure movement in Great Britain (Global Times, 2020). Song refers in particular to the concept of "safety zone" enshrined in the Accords, which essentially entitle states to declare sovereignty on territories around their lunar activities, inside which other states need to request accessibility to the proprietary states. The US claims the legitimacy of the safety zone in the OST principle of avoidance of harmful interference and on the idea that they would allow for peaceful exploitation of lunar resources without technically claiming sovereignty (NASA, 2020). However, China has expressed its concerns with this practice, and rather sees the American approach as an attempt to legitimately colonize the lunar surface through common practice recognized by international partners (Ji et al., 2020). Additionally, Song further criticised the American narrative by considering it as a product of a "Cold War mentality" which in his opinion is exclusively centred in outcompeting China and Russia in outer space in order to pursuit their national interests and neglect the common heritage of outer space (Global Times, 2020). Furthermore, Ma Zhanyuan, a Chinese professor of Political Science, also revealed his concerns that as it is unrealistic to formulate a globally recognized treaty on lunar activities in the short term, by unilaterally enacting laws allowing the exploitation of space resources the US is exploiting its position by not considering

the interests of less technologically capable countries but just the American ones (The Beijing News, 2020).

Sino-Russian cooperation: a new duality?

Interestingly enough, the initial exclusion by the US and the consequential public criticism from both China and Russia has translated in a progressive alignment in interests between the two space powers. Indeed, perceiving the Accords as the unilateral pursuit of American interests, both China and Russia soon grasped the opportunity to counterbalance the US hegemony and rapidly announced important cooperation projects.

Most notably, on the 9th of March 2021, the Chinese National Space Administration (CSNA) and the Russian space agency, Roscosmos, have signed a Memorandum of Understanding (MoU) for the construction of and International Lunar Research Station (ILRS). This is an influential decision, that in fact represents China's largest international space project, and while it did not come out of nowhere, it can be certainly traced to the American space policy undertaken with the Artemis Accords. As a matter of fact, Deng Xioaci (2021), a Chinese space analyst, pointed out that alongside the technological advantages of sharing the burden of such important project, the signing of the MoU between China and Russia reflects the recent trend of reciprocal scepticism with the US. Most importantly, according to Deng after the officialization of the American space interests through the Accords, both China and Russia became tangibly worried that the American lunar agenda would results in loss of resources and geopolitical power, and hence it was necessary to counterbalance promptly.

As such, China and Russia have found a common ground to mutually enhance their national geopolitical interests, as China can certainly benefits Russia's lunar expertise, which has sent more than twenty probes to the Moon and gathered a considerable amount of valuable data, while Russia can favour from China's economic, technological and political determination. This can be a crucial burden for the future of the American global leadership, as, according to a former researcher at the China Academy of Space Technology China, Pang Zhihao, Russia's expertise, combined with key strategic technology and excellent astronauts' training capacity, "will all no doubt accelerate the program's advancement" (Global Times, 2021a).

It is hence safe to say that the sharing of information, technological expertise, and economic burden in light of an international projects is seen by both Russia and China as an optimal strategy to quickly counterbalance the still more advanced American space ambitions. Only time will tell whether this alignment in the Sino-Russian space relations will continue

solidly and result in new space race towards the Moon vis-à-vis with the US and its allies, or perhaps it has been a purely political move. Either way, one thing is clear: space has become once again a crucial political battlefield.

Europe and the United States: a deteriorating alliance?

In between the polarisation of competing space giants lies the unique in model, position and role of the European Space Agency (ESA). Historically bounded to the American space program, ESA and its twenty-two member states have been generally keen to cooperation projects with NASA; undertaking a long-lasting partnership that have led to various ground-breaking space projects. Nevertheless, ESA's space policy was also aimed to achieve independent space power, and especially more recently, it undertook important steps toward this strategic direction, most notably with the development of its own proprietary global navigational system (Galileo). At the same time, ESA has never been reluctant to partnership projects with also other space powers such as Russia and China, as it always favoured the technological and scientific benefits over the political arguments. As a matter of facts, for the development of heavily debated and strategically crucial Galileo project ESA relied on substantial economic subsidies from China, move that was not seen very kindly by the US (Wang, 2009)

Nonetheless, with the advent of Artemis Accords, ESA's indiscriminate open posture to international cooperation has been challenged, as the American approach had generated variegated opinion among ESA member states. As a matter of facts, the Accords have been signed by only three ESA members: Italy, Luxembourg and the United Kingdom, while notable partners like France and Germany have not jumped on board of the US-led (space)ship.

For starting, the bilateral approach undertaken by the US, combined with the setting of an ambitious deadline, have obstructed ESA's member states to go through the lengthy decision-making process, making it impossible to sign the Accords as one organization. At the same time, considering the positions publicised by officials from different European space agencies, it is safe to say that even if the negotiations would have happened, they would not have reached the minimum of 17 states to sign an agreement as whole (Newman, 2020). This is particularly true if considering that France and Germany, the two biggest ESA contributors together with Italy, have not warmly welcomed the Accords. In particular, Jan Wörner, head of the German Aerospace Center (DLR), despite being a firm supporter of the "Moon Village", a lunar outpost from which all space-faring countries could contribute and benefit, has regarded the Accords as too US-centric and in contrast with the principle of non-appropriation of the

OST. At the same time, although France has not yet presented an official position, the initial missing signature can be safely perceived as scepticism towards the American approach. Indeed, as Sylvie Espinasse, head of ESA's Washington D.C. office, stated, ESA member states have different positions towards the Accords, in particular on how this have been addressed to the international community, and hence more time and negotiations will be necessary in order to fully embrace the American plans (SpaceNews, 2020).

The transatlantic historical alliance is hence becoming less granted than in the past; at least with regards to space affairs. It is not clear whether other ESA member states will eventually sign the Accords, or they will stick to the confidence in the legitimacy of the international system, or, perhaps more unlikely, if some will join the Sino-Russian project. In any case, due to its geographical, political and economic position, Europe plays an important role in the geopolitical game of space exploration; making ESA's and its member states' future space policy a crucial topic for the future of international politics

Discussion: the geopolitical implications of the Artemis Accords

It is hence clear that when on May 2020 the US presented to the world their near-future space plans in the form of the Artemis Accords, the geopolitical spectrum of international space affairs changed radically. On the one hand, two historically, technologically and politically different space powers found a common ground of cooperation in order to counterbalance the American plans, witnessing the power of incentives. On the other hand, a long-lasting transatlantic cooperative relationship has been challenged by the explicit unilateral approach undertaken by the US, leading to a point of uncertain geopolitical future.

From the Sino-Russian perspectives, the signing of a MoU between the two powers opens to an unprecedented cooperative framework alternative to the American one, and with the increasing number of important space actors, this has not to be underestimated. Crucially, both sides have agreed to push forward to international cooperation by opening their lunar project to "all nations that are interested in the project as well as partners of the international community" (Global Times, 2021b). The importance of the alignment between China and Russia in opposition to the American leadership is not to be considered merely on its geopolitical implications in outer space, but it could represent a turning point even for Earth-bounded international politics. As a matter of facts, it is not to underestimate the power of cooperation as a consequence of common interests, which can lead to deeper integration and even to a spill-over effect in other sectors. Hence, it could be that in the next years, following

the alignment of interests in outer space, China and Russia will increase cooperation in Earth-bounded sectors; process that will lead to important geopolitical consequences.

Moreover, it is important to highlight the fact that China and Russia are pursuing a narrative of global heritage which is bounded in the international legal framework; narrative that has interesting implications for emerging space countries. Indeed, as seen in the theory section, countries that are not capable to exploit resources tend to establish a regulatory regime that will prevent more technologically advanced countries to further develop. This is exactly what China and Russia are strategically attempting to do: claiming the illegitimacy of the American approach in order to limit the benefits that the US can gain from its technological superiority.

In parallel to the great power game, as the Accords were not debated within the traditional international framework, the European allies had political and bureaucratic trouble jumping on the American boat, leading to important discrepancies inside the ESA which in turn translates in weaker support for the US space agenda. This is particularly interesting as it further demonstrates the pragmaticism of international space cooperation. As a matter of fact, the prospects of a near-feature unified European position on the Accords seems unlikely, and while some countries quickly welcomed the Accords, other expressed their scepticism; demonstrating how national interests govern state practice, even if bounded by a regional organization. This can be seen in countries like Italy, which already have a developed space industry that can benefit extensively from lunar exploration and hence quickly adopted the Accords, while Germany, which has been more concerned with the legitimacy of the principles then on the economic benefits has not participated yet. Such internal discrepancies not only lead to international uncertainty and hence weaker legitimacy, but also can hinder the long-lasting development of the European space sector, which was able to flourish by relying on the highly beneficial model of intergovernmental cooperation around ESA.

Lastly, the promulgation of the Accords has explicitly revealed the American interests towards the future of space activities; namely to legitimize its national interests through the seeking of global leadership. This highlights the importance role of space diplomacy as a geopolitical tool through which states pursue their national ambitions. The next decades of space exploration will be extremely interesting for both Earthly and space-bounded international politics, as following the Artemis Accords the patterns of international cooperation have started changing, opening to uncertain geopolitical scenarios.

Conclusion: towards a new space race?

The recent announcement of the Artemis Accords has certainly changed the present and future of international politics, both in space and on Earth. Fundamental economic, political and technological reasons lie behind the decision by the principal space powers to go back to the Moon by the end of the decades, and manyfold geopolitical consequences have already arisen.

The United States, the most dominant space power, has opted for a biliteral approach directed towards non-threatening countries, with the goal of enshrining and legitimising an international legal framework beneficial to establishment of a new lunar economy. While seven other countries, including three ESA member states, have warmly welcomed the American approach enthusiastic to access the benefits of new space opportunities, the Accords have raised substantial criticism among the international space community. Most importantly, Russia and China, two of the most powerful space-faring states, have publicly expressed their concerns, which are founded on political, economic and legal interests. While the reasons behind this scepticism are variegated, the two Eurasian powers have rapidly seized the opportunity for counterbalancing the American power and on March 9th 2020, signing an eventful agreement for the joint construction of a lunar research station: opening to a potential new space race. At the same time, even inside the European Space Agency discrepancies arose relating to the Accords; as by lacking the time and capabilities to provide a unitary decision, member states acted singularly, according to their national interests. As such, the international legitimacy of the Accords is weakened by not being recognized by the diplomatically powerful Europe, raising interesting scenarios.

The aim and scope of this thesis was to shed light on the patterns of international cooperation in light of these ground-breaking events, a topic often neglected by the existing literature. As seen both theoretically with the neorealist astropolitics and empirically with the cases of the US China, Russia and Europe, space represents a crucial strategic frontier. Characterized by power projections, economic opportunities and political prestige, states practice is shaped by the patterns of cooperation and competition. With the renewal of interest in the exploration of space, and in particular with the near-future plans of establishing permanent settlements on the Moon and extract strategic resources, space is filled with geopolitical interests, to a level seen only during the first space race. Crucially, as seen in the 1970s, ambitions in space are translated in politics on Earth, which in turn shape the global order of international relations. Hence, in order to correctly assess the international relations of

the 21st century, it is fundamental to consider, comprehend and predicts the patterns of space exploration as key factors in the field of international politics.

Certainly, with projects of this scale and of this novelty, it is hard to predict which actors will be able to demonstrate their power projections in space, opening to manyfold scenarios. Future researchers have plenty of arguments that are worth investigating, from the role of emerging space-powers such as South Korea, which in the meantime signed the Accords, the rising space power of India as well as the consolidating private sector and its technological and commercial implication for the future of space exploration. This thesis was limited in scope, as the principal goal was to shed light on the geopolitical dynamics of space exploration; a topic that is often underestimated. Nevertheless, considering the vast complexities and immense possibilities that lie in the exploration of the dark skies, future research will certainly flourish. A new realm of international relations was born with the launch of Sputnik I in 1967, and now, fifty years later the Moon landing, it is old enough to determine the future of humankind.

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