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Article

Space Security and the Transatlantic Relationship

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Abstract
Since the end of World War II, outer space has been an arena in which both high and low politics have played out, and both the US and Europe have been heavily invested. This article examines the case study of space exploration as a window into the evolving nature of the transatlantic relationship. With the US government regularly deprioritizing Europe in its foreign policy and at times taking the transatlantic relationship for granted, the author argues that transnational and non-state actors have played an important role in maintaining the stability of the alliance. In terms of space, this means that the space community—space agencies, private actors, space enthusiasts, engineers, and scientists, among others—often enable transatlantic cooperation despite initial conflictual rhetoric stemming from political leaders. Importantly, while these transnational or non-state actors tend to view space as a peaceful domain for all of humankind, governments and militaries often treat space as the next battlefield. To support this argument, the article considers two major transatlantic space developments: the US's Space Force, which reflects a US desire to be dominant in space, and Europe's Galileo satellite system, which reflects a European goal to have strategic autonomy from the US. The author argues that the idea that space should be a peaceful domain for all of humankind is more strongly reflected in outcomes, despite the presence of conflictual, militaristic rhetoric.

Keywords
constructivism; Galileo; non-state actors; space; Space Force; transatlantic relationship

Issue
This article is part of the issue "Out With the Old, In With the New? Explaining Changing EU–US Relations," edited by Marianne Riddervold (Inland Norway University / University of California – Berkeley) and Akasemi Newsome (University of California – Berkeley / Inland Norway University).

1. Introduction

It is widely noted that the transatlantic relationship has gradually weakened over the course of several US presidencies, but especially during the Trump administration when there was a fundamental break at the political level (Acharya, 2017 Kagan, 2017; Rose, 2018; Simpson, 2016; Walt, 2016). Indeed, the premise of this thematic issue, as discussed in the introduction, is that there is far more potential for the transatlantic relationship to weaken than at any prior time (Riddervold & Newsome, 2022). With the US tendency to take Europe for granted alongside the EU's pursuit of strategic autonomy, is the transatlantic relationship actually unraveling over the long term?

Despite the fact that the US has de-prioritized Europe in its foreign policy landscape and has announced a pivot to Asia, I argue that the transatlantic relationship still remains intrinsically solid. Not only do deep economic, political, and security ties bind the two actors closely together, as demonstrated in their collective reaction to Russia's invasion of Ukraine, I argue that the transatlantic relationship is also increasingly sustained at the non-state and transnational levels where shared norms among certain key groups are strong and consistent. This is not a new phenomenon, but rather something that has long been in place and is now becoming increasingly important. Informal, people-to-people interaction across the Atlantic from business to tech to science has ensured the longevity of the relationship even as the political level has evolved in ways that would suggest more of a mercurial relationship.

This article analyzes the realm of space policy and space exploration as a window into the transatlantic

relationship. Although space is not necessarily the most obvious case to consider, the transatlantic space relationship is clearly an important dimension of it because space has been a staple on the transatlantic agenda for the entire post-World War II period. This same period also marks the origins of the European project and the current era of US-European relations. Moreover, space has been an arena in which both high-politics military and technological competition as well as low-politics scientific and economic development have played out. Advancements in space have broader implications for dual-use technologies, military capability, scientific knowledge, and diplomacy. Obviously, the most contentious political relationships when it comes to space are not between the US and Europe, but between the US, Russia, and China. However, given the aim of this thematic issue, I will keep the focus on the transatlantic relationship and leave aside the other international dimensions which are beyond the scope of this article.

As I have argued in previous work, since the dawn of the Space Age, despite the many opportunities evident in space exploration, there have been strongly competing approaches, among various state and non-state space actors, on how to take advantage of them (Cross, 2019). Europe and the US have been no exception to this. On the one hand, some military and political actors have tended to approach space as a war-fighting domain, and have internalized the notion that "space is the next battlefield," in which the US must maintain dominance (Slater, 2018). On the other hand, many non-state actors, such as space agencies, scientists, and commercial entities have tended to pursue space exploration as a shared, cooperative endeavor. I have argued that despite sometimes sharply opposed narratives coming from state versus non-state actors, in practice space actors have largely treated space as a fundamentally peaceful domain for all of humankind, an inherent part of the global commons (Cross, 2021). I have traced this approach back to what I call the original *spaceflight idea*—which is rooted in the initial impetus to explore space in the first place around a century ago (Cross, 2019).

This article builds on my previous research through a focus on the role space plays in the contemporary transatlantic power relationship. Beyond space itself, this case study also illustrates how and why non-state or transnational-level actors often sustain international relationships. Whether it is through sector-by-sector cooperation, people-to-people interaction, or the existence of epistemic communities, I argue that relationships among allies in the international system stem from more than just political decisions to establish shared regimes or institutions. Thus, my argument aligns most with the fourth approach put forward in the thematic issue: the socially constructed nature of the transatlantic relationship through actors' perceptions (Riddervold & Newsome, 2022). I argue that the ability of transnational social interactions to define interests through shared ideas can often be more influential than formal policies or areas of contention reached at the political level.

The article proceeds as follows. I first briefly review the current debate surrounding the nature of the transatlantic relationship. I then set the stage, establishing that the transatlantic relationship in space has long been robust. Finally, I argue that the role of non-state and transnational actors is important in maintaining this relationship, even when state actors push in more conflictual directions, as has occurred more recently. To illustrate this, I examine two recent examples: the US's Space Force and Europe's Galileo satellite system. These are good cases to consider because both are typically associated with conflict in the transatlantic relationship. The advent of the US Space Force reflects a US desire to be dominant in space, and Europe's Galileo satellite system reflects a European goal to have strategic autonomy from the US.

2. The Transatlantic Relationship Debate

Some scholars and experts contend that the transatlantic relationship has been subject to long-term erosion, a process that was clearly visible during the George W. Bush administration, but then even persisted during the Obama administration (as cited in Rhodes, 2021; Riddervold & Newsome, 2022; also see Knutsen, 2022; Raube & Vega Rubio, 2022; Smith, 2022). They cite contextual factors that have placed pressure on the relationship: a shift in US focus from Europe to China, the Indo-Pacific, and the Middle East, US domestic political polarization, and numerous EU crises, to name a few. According to this view, the Trump administration simply solidified and made more visible a process that was already under way. Even though President Biden's political approach and values share far more in common with those of European leaders, the expectation from this perspective is that the Biden presidency makes little difference in the transatlantic relationship's longer-term structural decline.

Other scholars have argued that the sharp break under Trump was an anomaly and that things are starting to return to "normal" post Trump. Indeed, in support of this view, neither neo-realism nor liberal institutionalism would anticipate a decline in the transatlantic relationship in the context of today's international system. Neo-realists like Waltz would argue that with the rise of another potential hegemon—China—we should expect the US and Europe to come closer together in order to balance against the threat (Waltz, 2010). And liberal institutionalists would argue that the ongoing existence of major institutions that stabilize world order, such as the UN and NATO, naturally serve to underpin a strong transatlantic relationship (Ikenberry, 2008, as cited in Newsome & Riddervold, 2022). Keohane, for example, argues that once cooperative regimes are created, complex interdependence has staying power, and does not require a hegemon to maintain it as long as it continues to align with the interests of the biggest players

(Keohane, 1984, p. 40). Other neo-liberals focus on how trade and economic interdependence bind states' interests together such that shared, absolute gains become far more desirable than pursuing relative gains which could lead to war (Simmons, 2003).

Along these lines, I contend that international regimes play an even stronger role than that for which many liberal theoretical approaches give them credit, particularly at the sub-state level (Ruggie, 1982). Many constructivists have placed a far greater emphasis on the role of transnational or non-state actors. Building on Deutsch et al.'s early concept of "security communities" (1957), Adler and Barnett (1998), for example, argue that if people have shared identities, common values, frequent and direct interaction, and effective or altruistic reciprocity across borders, they can form transnational communities more generally and security communities more specifically. A key quality of the transatlantic security community is not only shared norms, but also the ability to resolve any conflicts or disagreements peacefully (Deutsch et al., 1957, p. 5; Pouliot, 2006). Risse (2003) emphasizes the extent to which this extends beyond states and politics to non-state actors who have common identity and values, material interdependence, and shared institutions.

In line with these constructivist perspectives, I contend that even though there have been more sources of conflict in the transatlantic relationship recently—the Trump presidency, trade disputes, divergences in geo-political priorities, and so on—the transatlantic relationship endures in part because of the ongoing richness of transnational ties. Sometimes they fill gaps in areas not already formally defined by the transatlantic relationship. For example, during the Trump administration many American tech and AI companies were left in the dark in terms of how new aspects of their work would be regulated. In this vacuum, tech company professionals worked closely and directly with their European counterparts and the EU to ask for help in building a transatlantic normative and regulatory framework (Federica Mogherini, Kennedy School talk, March 2021). Even though the Trump administration had severed ties with Europeans on a governmental level in this area, non-state actors sought to fill the gap. At other times, transnational actors can override state-level conflict, making such competition less relevant to outcomes, such as when societal-level actions and protests in the US and Europe went against the Trump administration's withdrawal from the Paris climate change agreement (also see Hjertaker & Tranøy, 2022, and Olsen, 2022, on other stabilizing factors during the Trump era). And at still other times, these actors can influence or shift existing transatlantic policy through ideational persuasion, a dynamic I consider more fully below in terms of space policy.

In effect, my argument broadens the explanation of path-dependence in the transatlantic relationship from institutions to individuals and groups, as well as their ideas and practices (Pierson, 2000; Smith, 2022). An important dimension that international relations realists and liberals tend to discount is the actual substance and day-to-day practice of the relationship, i.e., the networks they form (Smith, 2022), which bring together the actors involved, the processes in which they engage, and the norms and interests they share. At the core of the constructivist approach is the notion that ideas define interests, rather than interests being predetermined by what is "rational," i.e., maximizing material self-interest through a cost–benefit analysis (Wendt, 1999). Even as state-level political interactions ebb and flow, or even gradually erode, those with the power to act upon their shared interests (defined by ideas and norms) play a fundamental role in maintaining international relationships.

To demonstrate this, I consider the case of space. In some respects, space is a hard test for the power of ideas because it is an arena fraught with military implications—much of the technology that is developed for space has dual use civil-military applications. In Wendt's (1999) terminology, advancements in space could even be seen as "rump materialism," which would make them exempt from the power of ideas. Better rockets mean better missiles, and because of this, state actors have tended to see space in militarized, competitive, and conflictual terms. Despite this, space remains peaceful and highly cooperative in actual practice. To understand this puzzle, I shed light on the ideas that matter to the key actors involved, and compare them to the outcomes. As I will demonstrate, there is ample conflictual language surrounding developments in space, even within the transatlantic relationship. Alongside this, however, are strong narratives expressing the idea that space is a domain for strong transatlantic cooperation, and for peaceful interactions more generally. The former tends to stem from the political level, while the latter stems from the various non-state and transnational actors involved in space, particularly scientists, engineers, space agencies, astronauts, space think tanks, and private space companies and start-ups.

Methodologically, I draw upon secondary sources as well as participant observation at the 2018, 2019, and 2020 International Astronautical Congress (IAC). The IAC is by far the most significant and largest annual event that brings together both state and non-state actors involved in space. As such, it is the most representative venue at which to observe how space actors conceive of space through how they talk about it. I supplement this with participant observation at the United Nations 2019 Space Security conference and 2020 Tufts University 7th Annual Civil-Military Relations Conference mainly to triangulate with observations from the IAC. While I attempt to draw out the actual mechanisms behind non-state actor persuasion, much of this process happens behind the scenes and is still classified so there are limitations to the evidence currently available. Nonetheless, using available sources, I seek to show

that transnational and non-state actors initially pursue different goals than states when it comes to space, and outcomes in transatlantic relations ultimately reflect the goals of the former, which view space more generally as a peaceful domain.

3. Transatlantic Cooperation in Space

To set the stage, Europeans have approached space exploration in a highly cooperative way from the very beginning of the Space Age. In 1958, the same year that NASA came into existence, European scientists proposed the creation of a similar European space organization: the European Space Research Organization (ESRO) and the European Space Vehicle Launcher Development Organization (ELDO; European Space Agency, 1966). Eduardo Amaldi (Italy) and Pierre Auger (France), who had previously launched the European Nuclear Research Organization (CERN), spearheaded the initiative (European Space Research Organization, 1974). ESRO and ELDO were formally established in 1964, and in 1975 were merged to form the European Space Agency (ESA). Since the late 1960s, NASA has cooperated closely with ESRO and then the ESA (Bonnet & Manno, 1994, p. 75; Logsdon, 1984, p. 12). These two space agencies have been central actors, populated with scientists and engineers, that have played a key role in shaping developments in space. While it might be tempting to think of space agencies as purely state actors, they have long pursued different goals from states (Cross, 2019), and actually have a formal mandate to achieve exclusively peaceful purposes in space (European Space Agency, 1975; National Aeronautics and Space Act, 1958), which political actors do not. They are comprised mainly of experts and scientists who play an important role in advising governments on what to do as well as interacting transnationally with their counterparts in other countries.

Over time, American scientists have encouraged European scientists to contribute more ambitious missions to transatlantic efforts, including the development of largescale space systems and manned spaceflight. In the 1970s, ESRO contributed the lab in Spacelab, while NASA provided the space shuttle. By the mid-80s, the US-European partnership in space was firmly established (Logsdon, 1984). Even as the ESA began to cooperate with other partners, as Logsdon put it in 1984, "the United States remains the partner of choice for ESA and individual European countries" (Logsdon, 1984, p. 13). After the end of the Cold War, transatlantic cooperation on space exploration ramped up. There has been a whole host of un-manned missions shared between American and European scientists: the 1993 International Rosetta mission, SOHO, Planck, Herschel Space Observatory, Euclid, Solar Orbiter, Orion Service Module, James Webb Telescope, and finally missions to Europa, the Jupiter System, and the Titan Saturn system (Machay & Hajko, 2015, p. 38). In addition, there have been manned missions, such as the International Space Station (ISS) and the upcoming Artemis mission to return to the moon and then go on to Mars. Indeed, this has led Machay and Hajko to argue that NASA and the ESA are "the two most developed cooperating space parties" (Machay & Hajko, 2015, p. 41).

Although the 1986 Space Shuttle Challenger accident led to a period of retrenchment, exploration of outer space is now experiencing a veritable renaissance. Seventy-two countries have active and growing space programs. The number of countries with launch capabilities has expanded from just two—the US and Soviet Union up through the 1970s—to 14. In addition, a fundamentally new dynamic is emerging in that the number of private space companies is growing exponentially, and they are not just working for governments. In the past, companies like Boeing and Northrup Grumman built and developed space technologies specifically because the US government gave them contracts to do so. Now, there is private demand for access to space, especially within the transatlantic region, and this has opened up a new market for space technology and access. The total space economy is now worth around US$447 billion, and is expected to grow to over US$1 trillion by the 2040s (Space Foundation, 2021). Space is rapidly becoming more central to science, commerce, and security with many aspects of daily life on Earth now reliant on it.

At the same time, the transatlantic relationship in space also exists within a changing security context that is framed in far more conflictual terms. The notion of Space Race 2.0 has been invoked repeatedly and forcefully, especially when it comes to the interaction between the US, Russia, and China (Charlton, 2017; Rajagopalan, 2018; Sachitanand, 2018). This tension has been precipitated by certain events, especially the Russian, Indian, and Chinese anti-satellite and missile tests. These examples are still, however, few and far between, and in practical terms, it is important to recognize that space is still not weaponized. (As I discuss in more detail below, even though militaries rely on satellites for information, such as positioning of other troops and weather updates, space itself contains no weapons that can target Earth or other objects in space.) So, how can we reconcile these different space developments—potentially both cooperative and conflictual—and understand their implications for the transatlantic alliance?

I argue that transnational and non-state space actors across the Atlantic not only have distinct interests from governments, they have also independently played a strong role in advancing goals in space, often persuading US and European governments to pursue peaceful-use activities (Cross, 2019). These actors have defined the goals, outcomes, and relationships between spacefaring powers for decades and this is reflected in outcomes (Cross, 2019). Their narratives about space rest on their ideas of the meaning of space for humankind. For example, space agencies focus primarily on advancing space science and promoting space exploration to the public (Newlove-Eriksson & Eriksson, 2013, p. 281).

Large commercial actors, such as Boeing, Raytheon, Thales, and BAE Systems, seek profit (Newlove-Eriksson & Eriksson, 2013, p. 283). And in the last few years, well-known start-ups like Virgin Galactic, Blue Origin, and SpaceX have pursued space tourism mainly because it has been a long-standing dream of their CEOs (Davenport, 2018). Think tanks working on space nearly always position themselves against the militarization of space. In short, unlike some states, non-state actors have no interest in pursuing a space arms race or cutthroat space competition across the Atlantic. Moreover, actual activities and developments in space largely reflect the arguments and ideas of these actors.

I now consider the US Space Force and Galileo as two prominent examples of transatlantic interactions involving space. They are hard tests for the power of transnational and non-state actors because both examples have clear military implications related to national power interests. Moreover, they also expose differences in how American and European governments approach space. If the peaceful goals of space actors are still reflected in outcomes despite high-stakes transatlantic differences, then this is evidence of the power of non-state and transnational actors in maintaining the transatlantic relationship.

3.1. The US Space Force and the Prospects for Space War

As access to space has become increasingly valuable, many governments and militaries around the world have launched *space forces*. As such, they have signaled that they are preparing for what they see as a near-term eventuality—space wars—invoking weaponized and militarized language as well as engaging in regular wargames to prepare for future scenarios in space. American government and military officials talk about the new US Space Force in terms of "allies" versus "adversaries," and have publicly promoted the slogan "Always the predator, never the prey," to justify its creation (Hitchens, 2019).

On the other side of the Atlantic, Europeans have also increasingly emphasized security implications in space as the landscape of actors becomes ever more crowded. In 2016, the EU's Global Strategy for the European Union's Foreign and Security Policy stipulated: "In space we will promote the autonomy and security of our space-based services and work on principles for responsible space behavior, which could lead to the adoption of an international voluntary code of conduct" (European Union, 2016, p. 42) The Global Strategy as well as the subsequent Space Strategy for Europe (from 2016) explicitly recognize space as a key area for defense and resilience of space infrastructure, among other things.

For realists and the policy practitioners who envision space as the next battlefield, any historical alliance between the US and Europe pales in comparison to the US's need to maintain dominance, or Europe's quest for some degree of strategic autonomy from the US. The underlying basis of the militarist approach clearly stems from a kind of simplified version of realism, which prioritizes preserving power, no matter what the context. As Wang argues, both the US and Europe continually seek absolute and relative gains in space, and they are beholden to structural considerations of cost–benefit analysis. In light of the fact that space is intricately connected to security because of the dual-use nature of the technology, Wang argues that "The essence of space politics is an endless struggle for power, interests, and prestige among states in the space policy domain with the most cost-effective strategy" (Wang, 2013, p. 14). According to Wang, the US and Europe have made decisions on whether to compete or cooperate with each other based on these rational calculations.

I argue, however, that outcomes in the space sector do not actually reflect power calculations and national competition (author's participant observation, IAC, 2018, 2019, 2020). Transatlantic space actors have proceeded with their goals, despite the Space Race 2.0 rhetoric, and in the name of the spaceflight idea. Repeatedly, non-state and transnational space actors from both the US and Europe have emphasized the importance of maintaining the peaceful nature of space, and they are actually achieving this. In terms of outcomes, European governments have strengthened their presence and contribution to space activities, but rather than seeking or projecting a sense of competition with the US, everything has been pursued in the name of cooperation. Similarly, despite outward appearances, US policy on space has been overwhelmingly cooperative.

Indeed, at the same time as the US government prepared to launch its Space Force, thousands of space actors—from start-ups to space agencies—convened at the annual IAC in Germany in 2018 and Washington DC in 2019. The theme of every plenary panel was ongoing and desirable international cooperation in space. The strongest expression of these ideas came from American and European participants. For example, ESA astronaut Alexander Gerst emphasized the importance of engineers, scientists, and astronauts in international space cooperation. He said in a 2018 phone call from the ISS to the IAC:

> We live in this amazing machine that was built by around 100,000 people. So far, we have conducted around 3,000 experiments in the lifetime of the ISS….And it is obvious that this is a machine—some say it's the most complex machine that humanity has ever built—no single nation could have done that alone….By putting our international…discrepancies aside and focusing on what unites us, our common visions, putting that together, enabled us to put together this machine. (author's participant observation, IAC, 2018)

NASA administrator Jim Bridenstine, despite being a Trump appointee, underlined the role of space agencies. In 2018, he said:

> We can't do what we do without the support of our international partners….There are more space agencies on the planet today than ever before…that means we have been able to do more today that we have ever before….We want to do more than we've ever done before, and collaboration and cooperation is the way to get it done. (author's participant observation, IAC, 2018)

And in 2019, at the IAC, rather than emphasizing US national interest, he said: "The US needs international partners. We can all do more if we work together than any of us can do if we go alone" (author's participant observation, IAC, 2019). Elaborating upon this, he said:

> We have now been living and working in space for almost 20 years….15 nations have been operating the ISS for almost 20 years. We've had astronauts from 19 different nations, most recently a new astronaut from the UAE. When we go to the Moon we want to take all of those international partners and we want to grow it….We want to see other astronauts from all the nations on the world on the surface of the Moon. (author's participant observation, IAC, 2019)

At the same event, Jan Woerner, at the time director-general of ESA, also emphasized the role of people-to-people interaction:

> The exchange of people and to meet people from all over the world is the important part. The second is the sharing of ideas. Third is communication. Fourth is cooperation, very concretely meeting people, discussing, and finding areas to work together. (author's participant observation, IAC, 2019)

And Elzbieta Bienkowska, Commissioner for the Internal Market, Industry, Entrepreneurship and SMEs at the European Commission, similarly described transnational collaboration: "Space is for everyone so need to work together to address challenges in a collaborative, cooperative way….In Europe we cherish the underlying cooperative culture and our EU programs will continue to provide benefits beyond Europe" (author's participant observation, IAC, 2019).

Thus, on the one hand there is the rhetoric associated with Space Force and US dominance, and on the other hand there is a highly cooperative narrative stemming from actual space professionals and experts. Which narrative is reflected in transatlantic outcomes?

In line with transnational and non-state actors' worldview, there is almost no area of space security in which the US and Europe are not closely working together and also amplifying the spirit of cooperation beyond the transatlantic region. While the IAC is a particularly visible venue to emphasize these ideas, these same space actors clearly play a key role in maintaining the transatlantic relationship beyond this in their everyday operations. The European Union External Action Service (EEAS), the Global Strategy, and the European Defence Action Plan all emphasize the importance of transatlantic cooperation amongst space actors. The European Space Policy Institute, a premier think tank on space, has outlined in significant detail the various independent and joint space initiatives in the transatlantic relationship today (European Space Policy Institute, 2018, p. 66). In security terms, these range from capacity building, legal and regulatory regimes, space diplomacy, space debris, space situational awareness, environmental protection, and infrastructure security (European Space Policy Institute, 2018, p. 66).

Moreover, in spite of the launch of the US Space Force in 2020, NASA and the ESA remain on track to return to the moon in the next few years (Doubek, 2021), build a permanent Lunar Gateway to maintain a human presence in the moon's orbit, and launch manned trips to Mars in the 2030s. The ESA's contribution to NASA in terms of the return to the moon, known as the Artemis program, is significant. The ESA is providing the heavy-lift launch vehicle (Ariane) for the Orion spacecraft, which will be used for multiple launches to the moon and then onto Mars. The Lunar Gateway, which will allow humans to stay on the moon to conduct experiments and prepare for launches to Mars, is intentionally designed with "open architecture." That is, all countries will have the specifications and data to enable them to dock on the Gateway and make use of it. The ESA will contribute to the Gateway's habitation, lunar communications, and means to refuel the Gateway, all before 2030.

All of this revolves around an ongoing dialogue among transatlantic space actors that explicitly and universally recognizes the need for deep and long-term international cooperation if they are to be successful (author's participant observation, IAC, 2018, 2019, 2020). The ESA remains NASA's chief partner in this respect, and both space agencies are tangibly ramping up their commitment to expand human space exploration. Thus, while the Space Force has yet to change the nature of the human presence in space, Artemis has had an enormous investment behind it and tangible outcomes that are compatible with the peaceful use of space. Through Artemis, the influence of space agencies as transnational actors pursuing the peaceful use of space is particularly visible.

Why then does US leadership often invoke the overblown language of space wars, space weapons, and space as a battlefield? It is of, course, natural for sectors of the military to talk in militarized language as that is their role in a state. They conform to the ideas that pervade their sector. It does not mean, however, that conflict or war is the best or most likely course of action. As Everett Dolman of the US Air Force's Air Command and Staff College put it: "As military, we don't make the decision to go to war. International cooperation is not in the purview of what we do" (author's participant observation, Tufts, 2020). Thus, it is always the remit of militaries

to prepare for any eventuality so that they can be ready should conflict be required. From the military point of view, as David Burbach of the US Naval War College describes it, "space is everything….Our whole way of warfare is enabled by satellites" (author's participant observation, Tufts, 2020). However, conflating the military perspective with the approach to space as a whole is far too narrow. When reflecting on the larger space situation, Damon Coletta, associate director at USAFA's Eisenhower Center for Space and Defense Studies said: "Possibilities for cooperation are rising at the same time as great power competition" (author's participant observation, Tufts, 2020).

Finally, if the militarist approach were making headways, and states, including in the transatlantic alliance, really were about to engage in "space wars," presumably by now there would be actual weaponization of space in some form. So far, this has not been a reality (European Space Policy Institute, 2018). There are neither weapons in space that can target Earth, nor space-based missile interceptors. There is no arms race in space. Indeed, to the extent that space has military relevance, it is simply through the use of satellites, and even still, the satellites are designed to protect national assets on Earth. In other words, the notion of "space war" is mainly psychological and informational. As Paul Szymanski argues, "space war" boils down to the information that satellites provide to militaries, not about waging an actual battle in space (author's participant observation, Tufts, 2020). Satellites can enable surveillance and communications. They can also support navigation, provide imagery, and anticipate weather. Even the most recent satellites technology, so called inspector satellites, go up to other satellites to gather information on their capabilities, but that is really the extent of the technology. Any possible damage done to satellites in orbit would have to come from Earth, and any retaliation against this possibility would more than likely play out on Earth. Several countries have proven that they can target satellites from Earth—China, Russia, the US, and India—through a missile or cyber/electronic means. There are still no actual weapons in space. Rather, non-state and transnational actors continually argue for a peaceful approach to space, and this bears out in actual practice in the transatlantic relationship.

3.2. Europe's Galileo Satellite System

A second example that scholars invoke as evidence for a growing rift, possibly signaling the unraveling of the transatlantic relationship in space, is Europe's global satellite navigational system, Galileo (Booker & North, 2005). In 2016, Europeans launched an independent GPS capability in part because they did not want to be totally strategically reliant on the US (Giannopapa et al., 2018). In the 1990s, especially during the Gulf War, interventions in Bosnia, and the Kosovo War, Europeans felt that the US was not as forthcoming as it could have been with intelligence and had diverging operational priorities (Giegerich, 2007). As a result, Europeans wanted to gain strategic autonomy to be able to act separately from the US, if and when the time came. Galileo marked the first time that the American monopoly on GPS technology ended. Given that a European alternative would seem to represent an effort to balance against US superiority in this area, the announcement of a competing, European system at first sparked deep mistrust and disagreement about the parameters and functioning of the new system (Lewis, 2004).

Realists, of course, take the perspective that the US prioritizes national supremacy in space, which entails maintaining its advantage and power, including satellite access, to the extent possible. Dolman said: "No nation relies more on space for its physical security and economic well-being than the United States." Over 70% of US weapons requires space, either for communications or battlefield situational awareness (author's participant observation, Tufts, 2020). The common argument about Europe, in this regard, is that although it is far behind the US in terms of overall space capability, it still aims to gain whatever advantage it can vis-à-vis the US (Wang, 2013). In essence, the realist perspective assumes that international cooperation occurs only when the actors involved have "no choice" or when it is the only way to achieve their strategic goals. The expectation would be that the US would do whatever it could to prevent Europeans from developing an alternative to GPS given that it would undermine US supremacy in this area.

In practice, however, as Europeans went forward with Galileo, initial political conflict ended up getting resolved by non-state actors. For example, a significant stumbling block, among others, was Galileo's planned signal frequency and code. US representatives feared that the original plan to use the so-called M-code frequency would represent a vulnerability to the system, which would also put US satellites and NATO assets at risk. The argument was that if Galileo overlapped with the US's GPS's spectrum, they would compete for signal strength. European representatives did not want to initially switch frequencies because this would result in reduced performance of their future satellites. As Giegerich (2007) argues, the agreement would not have been possible without significant scientific breakthroughs from non-state actors—engineers and signal experts—who were able to find unexpected ways to make Galileo's code signals and system performance compatible with the demands of both US and European diplomats.

With the benefit of these scientific breakthroughs, despite strong political disagreement at the beginning, during 2003–2004 European and American diplomats were able to negotiate a transatlantic agreement on Galileo, which ultimately resulted in a high level of cooperation. First, European space scientists designed Galileo to be wholly interoperable with the US GPS system, effectively enhancing the security of *both* actors (European Space Policy Institute, 2018). And second, space actors were persuasive in their commitments to

peaceful use, and had the new science to back it up, leading to effective transatlantic dialogue and compromise. American diplomats became convinced to switch to the European signal structure as the new international standard (Lewis, 2004).

In the process of establishing the parameters and utility of Galileo, a European space epistemic community closely consulted American scientists and diplomats, and the European Commission represented the interests of these actors. While the Galileo negotiations were complex and involved a range of thorny issues, this was not about the US government imposing its will on Europeans. To the contrary, US representatives actually *changed their minds* through the course of the discussions—from opposing Galileo as a threat to American GPS to accepting it—demonstrating that state actors listened to "the better argument" and were persuaded by the non-state and transnational actors involved (Risse, 2000). Ultimately, as Giegerich (2007) finds, when American representatives started to treat Europeans as equals, it was not difficult to actually use Galileo as a fulcrum to bring the transatlantic partnership *closer* together rather than farther apart.

Importantly, the transatlantic Galileo agreement reflected the idea among space actors that space was an arena to benefit all of humankind, and that by working together and making their systems fully compatible, the US and Europe would be able to benefit from a satellite system that is greater than the sum of its parts (Council Decision of 12 December 2011, 2011). Individuals on both side of the Atlantic, especially diplomats and scientists, were able to navigate otherwise politically charged discussions to find common ground and strengthen the transatlantic alliance.

In sum, the role of transnational engagement between experts, scientists, astronauts, and space diplomats is crucial to understanding the longevity and resilience of the transatlantic relationship when it comes to space. This carries on even despite periods of sharp, militarist language coming from political leaders. Advancements in European space technology not only stem from a desire to have some degree of autonomy, but also for European space actors to be better partners to their American counterparts and to contribute to the overarching international effort to use and explore space peacefully.

4. Conclusion

Over the past few years, there has been a unique confluence of space developments: (a) a rejuvenated phase in the Space Age, (b) a new realm of activity for private actors and commercial interests, and (c) frequent invocation of Space Race 2.0. While there has clearly been a rise in militarist framing of space, actual activities and policies still reflect the ideas of space experts and actors. In the transatlantic relationship, there has been much made of the tensions surrounding the creation of the US Space Force and the launch of the European Galileo satellite system, but the most noteworthy and tangible manifestations of transatlantic activities in space have been Artemis and the ISS. The ISS is universally acknowledged as "the largest civil cooperation programme in history" (European Space Agency, 1994, p. 1), with its stated goal very much in line with the spaceflight idea: "merging of different cultures and techniques reinforcing human communication capabilities across borders and language barriers" (European Space Agency, 1994, p. 1).

This is not to say that sharpened, militaristic rhetoric is purely benign. It does serve to emphasize the potential for, and possibly even create, a security dilemma in space (Patrick, 2019). If states and militaries ignore the highly peaceful and cooperative nature of space so far, fear of the weaponization of space—coming from misperceptions, miscalculations, and conflictual rhetoric—could lead to the actual weaponization of space. In this sense, it is important to remember, as emphasized in this thematic issue's framework (Riddervold & Newsome, 2022), socially constructed perceptions of actors do not only result in "positive" outcomes but may lead to conflictual outcomes in the context of crisis.

Nonetheless, there is much reason to expect that the spaceflight idea will remain strong as it has despite facing many geopolitical challenges over the decades. In 2005, the ESA compiled dozens of responses from a diverse pool of people to reflect on how space benefits society. The result of this compilation was the emergence of key understandings about space. First and foremost, the "one world perspective," also known as the "overview effect" (White, 1998), which emerged when Apollo 8 took the first picture of the Earth-rise, enables humans to see each other as coming from a single planet, from the whole Earth, rather than from small territories with boundaries. Second, space also provides the ability to dream about new frontiers, which on a practical level fuels science and careers. Third, it has developed new knowledge especially with respect to technology, computers, and health. Fourth, satellites provide invaluable information on the Earth itself, and have led to cooperation among nations and communication. Space experts often cite the statistic that for every dollar spent on space, the return on investment is somewhere between seven and 14 dollars.

With these strong motivations in mind, it is clear that space allows for transnational and non-state actors to build and maintain the fabric of international alliances based on their own logic of appropriateness. For them, space is part of the global commons and a realm for peaceful interaction for the benefit of all humankind. The path-dependence of these beliefs have clearly influenced actual day-to-day activities in space.

As noted in the introduction of the thematic issue, one cannot get a complete picture of the nature of the transatlantic relationship through examining just one policy area in isolation (Riddervold & Newsome, 2022). It is possible that space is in some ways a special area in

that it resonates with traditions of science diplomacy, i.e., cooperative relationships between states that can in some ways avoid being politicized by virtue of their scientific basis. While space scientists and engineers clearly see exploration of space this way, the dual-use military dimension of space technology prevents this area from being completely innocuous. I would ultimately emphasize the particular strength of the spaceflight idea, and the longstanding networks that have upheld it since the dawn of the Space Age.

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Conflict of Interests

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