

Making the Ariane Rocket: Negotiating relations between European integration and the future of Europe in space

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FutureSpace is a European Research Council (ERC) Starting-Grant project based at the Science and Technology Studies department of the University of Vienna. Led by Asst.-Prof. Dr. Nina Klimburg-Witjes, the project investigates how the politics of the present are shaped by how the future of outer space is envisioned and vice versa. The research addresses the various and contingent visions of European space futures as they crystallise in current debates about the European Ariane launcher, arguably the most important component of the European space programme. The project focuses on the imaginative, material and political dimensions of European space futures, together with their complex and critical entanglements. For more information: futurespace-project.eu

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Introduction

Focusing on Ariane as a case study, this text offers tentative findings and insights into controversies about European space policy that further pertain to questions of future space governance. With ideas and perspectives shaped by Science and Technology Studies, it studies how technological and political decisions in building a European rocket reflect anticipated futures of European integration, their underlying values and tensions, and how these translate into (strategic) visions of Europe's future in space.

Geopolitical dynamics and an accelerating New Space Age

A new space race is in full swing. Today there is a wealth of public and private actors actively working towards ambitious outer space projects in the midst of intensifying international competition. In doing so, they perform and project bold images of human futures beyond Earth, which further gain increasing media exposure and influence in public discourse. SpaceX, Blue Origin and other commercial enterprises falling under the umbrella term NewSpace aim to capitalise on the promise of outer space as a novel economic frontier encompassing satellite communication networks, space tourism, space mining, human settlements on the Moon and Mars, and other socio-technological schemes. Meanwhile, China, India, and Russia are each advancing independent activities and operations in outer space, as the United States pushes for returning astronauts to the Moon in leading the Artemis programme. Facing such wide-ranging and fast-paced competition, European institutions and actors aim to promote their own grand visions for human futures in outer space. In November 2021, the Director General of the European Space Agency [ESA] stated his aim for "European footprints" on the Moon by 2030, which would "become a new economic

space, and a new continent”¹ of human activity. Such imagery leads to questions of how particular European value constellations shape space future visions and, in turn, how European outer space infrastructures and space policy are co-constitutive of these shared images in advancing processes of political (dis)integration.

Ariane

Since the first launch in 1979, the Ariane family of rockets—jointly built by 13 European countries—has been heralded as a symbol of European integration; a political, technological and economic success story of a “winning Europe” (cf. Harvey 2003). As a political project, Ariane has enabled European countries to access outer space without relying on other nations to launch European satellites (Al-Ekabi 2015). It is also a project of technological integration, of “domestic coherence” (Doboš 2018: 107), where different launcher parts are designed and constructed by different ESA member states, aligning with international policies such as the geo-return principle, which ensures every participating nation gets its fair share of industry contracts. As a large-scale infrastructure, Ariane is also entangled with and shaped by global politics, negotiated by a variety of social actors, has agency in state-making processes (cf. Scott 2009), and is embedded in current geopolitical tensions (Agnew 2009; Bauder and Di Mauro 2008). Today geo-return and other pillars of European scientific, technological and political integration is increasingly contested. The rise of the private sector in space, notably in the United States with SpaceX, has set an unprecedented pace of global competition for space launches which challenges European distributed production systems and the collective principles they are founded upon. Here, Ariane is increasingly seen as too expensive and with a bureaucratic governance system too complex to keep up with the speed of innovation set by its commercial competitors.

The first launch of the latest iteration of Ariane, Ariane 6, is currently scheduled for summer 2024 - four years later than first slated in 2020 - after a series of troubling delays. The fact that Europe has been lacking indigenous launch capacities constitutes what is often referred to as the “launcher crisis” and represents a critical moment for any future European space program. It does not only limit European ambitions for strategic autonomy off-planet Earth but also for European geopolitical leverage as an international partner in shaping human activity in a rapidly changing sphere of political, economic and military interest. The narrative of the launcher crisis is performed by different European space actors, who describe Europe as “lagging behind” and a need to “catch up” in the on-going space race. Whereas such controversies are multi-faced, positions polarise around two distinct ideas for the future of Ariane. The first urges for a more united European approach and a reinforced commitment to Ariane, organised under an ESA framework. The second argues for a disintegration of the existing European launcher program in favour of creating more agile partnerships between the corporate sector and a few powerful countries (Klimburg-Witjes 2021). This debate further reflects important and prevalent tensions between unity and plurality; between cooperation and competition. In both cases, the NewSpace ecosystem is transforming the politics of outer

¹ <https://www.derstandard.de/story/2000131455919/bis-zum-ende-der-dekade-steht-ein-europaeer-oder-eine>

space in Europe, and complicates the relations between the national, international, and supranational institutions currently responsible for European space futures.

In the absence of Ariane, a “technological gap” appears to be widening between Europe and major international space actors. The activities of China and the United States, in particular, cast long shadows over European space discourse and policy. Facing these developments, ESA recently commissioned a report by a dedicated High Level Advisory Group on the future of human and robotic space exploration, titled *Revolution Space*. In general, the report calls for Europe be more ambitious in asserting its autonomy as a space power, with “substantial investment [...] a precondition” if Europe is to “capture” its share of the promised riches and benefits of an emerging in-space economy. The document is full of language that joins promises of sovereignty in an opening space frontier with the fear of missing out. It fully embraces space race rhetoric in drawing hard lines delimiting Europe from its outside. For example, the report uses a metaphor describing an outer space future as a sort of dinner party, where if “you are not sitting at the table, you on the menu.” Framing the potential loss of European expertise to its competitors in other countries, it supports urgent calls for a change to European ways of doing things: to geo-return, and to Ariane in its current infrastructural form to accelerate the pace and increase the scale of European space activities.

Europe as a Space Middle Power

In the realm of space policy and technology, the historical narrative has long been dictated by the dominance of two superpowers: the United States and Russia. More recently, international attention has pivoted towards the evolving dynamic between the United States and China as a “new” great power rivalry in space. This shift prompts a closer examination of the roles middle powers play in this landscape, as well as how middle countries are or could be defined and the processes of developing such categorizations: for example, how soft power is measured? While their resources may not rival those of the great powers, they nonetheless can influence global politics beyond that of smaller states, offering a novel perspective on the ongoing competition. In a geopolitical setting characterized by great power competition, do middle powers harbour the potential and agency to carve out a distinct role in space policy and governance that transcends the traditional boundaries of great power competition? How are middle powers willing and able to leverage US-China competition to their advantage or challenge it and to the benefit of whom?

Moving away from monocentrism

In both academic and policy discussions, a consensus seems to emerge that the historic treaties for governing human activity in outer space, along with the institutions responsible for them (namely UN-COPUS), are no longer able to deal with manifold issues posed a rapidly changing space sector.² This section aims to describe how advocacy for decentralised, polycentric forms of space governance rhymes

² Paris Peace Forum (2024) states “outer space activities have increased so rapidly that institutional space governance frameworks no longer address the myriad challenges faced by space actors and the international community.”

with a European response to the contemporary realities of the outer space geopolitics and industry, and discuss the implications they pose for future European integrations.

Weiss (2015: 414) argues that “the speed of technical change and the unforeseen impacts of new technical capabilities stay well ahead of efforts by governments, the international community, and the private sector to manage, and via competitors with legacy technologies, to suppress or control”. The main argument here is that progress in science and technology has implications for the architecture of the international system itself, and that social actors are lagging behind in finding adequate ways to govern emerging technological systems (cf. Rosenau & Singh 2002, Keohane & Nye 2011). For researchers of global politics, this means attending to how specific forms of innovation are articulated, constructed, and justified; what visions of politics they outspokenly promote or tacitly encode; how, where, and by whom they become contested; and what broader implications they prefigure and entail.

STS scholars have therefore argued that innovation must be examined as its own political rationality in contemporary governance (Haddad and Benner 2021; Haddad, Vorlíček and Klimburg-Witjes 2024). As such, innovation rationality combines technological solutionism, market logics, and invocations of distributed creativity, ingenuity, and experimentality as ingredients for a remedy for almost all conceivable problems and challenges (Pfothenhauer and Jasanoff 2017), including for a multiplicity of security risks and threats.

As Tepper (2022: 489) conveys, “no U.N. treaty has been adopted, nor amended since 1979, and this is not expected to change in the foreseeable future.” This dearth in space governance development arguably relates to fragmenting trends in geopolitics (Ibid) rendering any potential unifying, universal charter highly improbable today. The Moon Agreement of 1979 arguably exemplifies how any treaty can be rendered ineffectual by major spacefaring states who choose not to ratify it according to their strategic interests. Tepper goes further in stating “[c]omprehensive monocentric governance is simply no longer feasible” (Ibid: 491) for outer space. In the absence of a global sovereign authority, and amid current international affairs, he argues that decentralised space governance is “inherent and inevitable”: citing the untenable position of a monocentric system in an already decentralised geopolitical sphere (Ibid). Moving away from monocentric institutions and binding agreements, Tepper proposes an embracing of fragmentation in polycentric governance models: where multiple, smaller legal instruments and governance forums can focus on single and specific issues. Here, the flexibility of adaptability of forums in responding to multidimensional changes and challenges in outer space practices, such as the urgent problem of space debris, is cited as a major advantage. In his words, these qualities are “especially important given the expected changes and disruptions in technologies and commercial models” (Ibid: 494).

On this note of disruptions, the text turns to consider the major changes in the launcher sector made by the rising commercial space industry, the polycentric trends in European space policy they arguably catalysed, and their implications of this shift for future European integration: focusing on the resolutions produced by the recent European Space Summit in Seville in November 2023. At the Summit, ESA

member, associate, and cooperating states agreed a gradual transition from a government-driven approach to a more commercial paradigm.

Through Tepper's ideas and opening up their notion of governance as a sort of "steering" of human space activity (Ibid: 487) to include launcher design, there appears a partial embrace of polycentrism by ESA and the EU in the proposals for future launcher programmes across multiple project streams. Whereas the first stream corresponds to securing the near future of the Ariane programme, a second stream opens up a stage for competition between European launch companies to provide services for future European missions. One important project is the *European Flight Ticket Initiative*, established with the primary aim of promoting the development of new European launcher systems that are manufactured exclusively within the European Union. Five companies were selected to participate: two from Germany (Isar Aerospace and Rocket Factory Augsburg), one from France (Arianespace), one from the United Kingdom (Orbex), and one from Spain (PLD Space). This decision to stimulate intra-European competition also represents a changing role of ESA from product developer to an anchor customer, thereby ceding design direction to commercial companies in the interest of accelerating industrial growth and closing the gap to major international space partners and competitors.

Such a shift is significant, not least because it changes a sense of hierarchy about European space activities. First, by stimulating a launcher competition, European space policy is arguably transitioning away from an "Ariane-Vega world" (IP1: 2023). Returning to Tepper, this movement arguably reflects a sense of the inevitable about future outer space activities, their production and their governance. So great is the impact SpaceX and other companies in upending the launcher sector, and so high are the stakes raised for independent access to outer space, the future appears already foreclosed. For Europe, embracing decentralised models and start-up innovation culture appears necessary to mitigate against any future launcher crises and maintain its status and leverage as a major international actor on and off-planet.

By ceding design autonomy to commercial companies, EU and ESA hope to guarantee strategic autonomy in securing independent European access to outer space. However, this tactic of opening intra-European competition, in the interests of accelerating space industries, poses many questions and troubling political implications, particularly when considering apparent tensions amid member states as well as between space agencies and commercial companies.

Europeanisations versus Nationalisms in Space

Many European countries are significant powers in their own right, and the EU as a whole arguably has the potential to compete more or less on par with China or the US in outer space activities. However, the EU does not speak with one voice, something we see very clearly also when it comes to space policy and governance and the complex arrangements of different actors and institutions responsible for space in

Europe.³ Prevalent notions like “strategic autonomy” or technopolitical independence already demonstrate a desire for greater independence from the United States. As Patarin-Jossec describes (2020: 258), “national sovereignty can be claimed and expressed through myriad forms besides national flags”. Surveying recent European space policy discourse, urgent rhetorical expressions of national interests are found working for and against international collaborations. Philippe Baptiste, director of the French space agency CNES, has stated the European space industry to be “largely French”⁴ in demanding the industry to pivot faster towards reducing production cycles and costs. In a recent ESA media briefing for Ariane 6, he further criticised commercial suppliers for what he termed “unacceptable” rises in costs that, in effect, were taking the programme “hostage”⁵. In these expressions, Baptiste shifts the boundaries defining France from Europe in relation to complementary strategic interests. By asserting the European space industry to be mostly French, he is protecting French autonomy and arguably framing national interests as European interests; creating a boundary out of the need to accelerate innovation and reduce costs, separating state and commercial actors for and against participating in such a strategy or technoscientific community. In criticising their increasing prices, Baptiste firmly excludes commercial suppliers from a European identity, working against a common ambition to access outer space. It is worth noting the leading role of France as an ESA and EU member state, and the central agency of Arianespace - a conglomerate of French aerospace companies Airbus and Safran - in the making of Ariane. Here, the launcher materialises a capacity for spaceflight to create claims of “national belonging” dependent upon “the expertise and qualifications” of industry (Jossec 2020: 265). Yet the rhetoric of an influential director conveys increasing tensions within Europe that are constituted by geopolitical dynamics and the current space race. In his words, Baptiste describes a critical juncture – a metaphorical fork in the road – for European and national space policy, that is consistent with the language and images of other actors and artefacts, including the Revolution Space report. More importantly, this rhetoric suggests a potential divergence of interests that can threaten CNES prioritising individual autonomy above any collective agenda. One longstanding ESA employee shared their concerns about initiating an intra-European launcher competition, as another instance of Europe “multiplying elements of potential disconnection” (IP 2: 2024). Reconsidering the elemental role of industrial expertise in shaping national identity, in a contemporary European context, this expertise can also become a controversial element of *difference* separating major space actors from minor in the race for space and the interests of a few from the many. Returning to issues of space governance, a serious fragmentation of the European bloc would arguably be damaging for its status as an important actor on par with leading spacefaring nations, capable of shaping norms and wielding soft power, as Doboš infers: “it is clear that the return to the sovereign nation-state system as took place throughout the nineteenth century would move the European international relevance firmly into the shadows of more important players like the PRC and the United States” (2017: 108).

³ ESA, EUSPA, DGDEFIS, member states etc.

⁴ <https://europeanspaceflight.com/cnes-boss-blames-contractors-for-ariane-6-being-too-expensive/>

⁵ https://www.esa.int/ESA_Multimedia/Videos/2023/11/Ariane_6_media_briefing_November_2023

Conclusion

This text presented some of the multiple, ongoing controversies based upon and relating to the Ariane launcher and proposes that debates about the programme's future will have implications for EU space governance in general. Facing a "launcher crisis" and calls for disintegration of Ariane, European space agencies are found embracing fragmentation and pluralisation of strategic autonomy in ways that rhyme with proposals for shifting towards polycentric forms of future space governance. By incorporating business models similar to their US counterparts in stimulating competition among national companies to provide services for future missions. In adopting a role of "anchor customer," ESA and the EU are handing greater agency to private companies in steering the design of future European access to space, with the aim of accelerating European innovation, scaling up industry, and thereby closing the technological gap to the more powerful nations leading the space race. However, as our initial research finds, the promises of embracing commercialisation and fragmentation must also be weighed with geopolitical and market dynamics inside and outside Europe, where national and company interests can collide with collective ambitions in increasingly public tensions. These "frictions" (Tsing 2005) go against shared images of unity – including those based upon Ariane – and pose further concerns surrounding initiatives such as the Flight Ticket Initiative, where increasing sites of intra-European competition can also be interpreted as multiplying elements of potential disconnection. Considering the controversies of European strategic autonomy shaped by and shaping Ariane, particular important questions arise to explore further at the International Conference on EU Space Governance. What does Europe stand to lose in embracing fragmentation and polycentric models for gaining independent access to space? In the need to stay relevant and to maintain a status of equal partner in international affairs, what becomes of European unity in embracing *this* sort of plurality? And, facing the seemingly inevitable shifts towards polycentrism, what kind of governing structures can hold Europe together in increasingly fraught political times?

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