



CORPORATE COSMOS

How commercial American space imagines
our future and shapes our present

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EXECUTIVE SUMMARY

Over the past ten years, and without a lot of public or political attention, space has become a site of commercial investment and development. Already much in our daily lives depends on growing satellite systems, crowding Earth's orbit, for communication, navigation, weather information, and the surveillance and prediction of climate change patterns. And in just a few years ambitious plans for industrial development in outer space will, too, be on the threshold of fruition: helium and mineral mining, water extraction, solar engineering, and permanent base building. We have entered the age of the orbital economy and the rise of commercial space actors.

This report explores the ideas and ambitions of what is currently the most dominant force within that new landscape: the American space industry, which is effectively an extension of American tech, and as such wields unparalleled forms of private power. More specifically, the report unpacks an American space industry driven not just by profit, but by two grand-scale visions of the future. Firstly, a tech-optimist vision of space as a climate solution: a both profitable and sustainable way out of contemporary ecological dilemmas. Secondly, a tech-libertarian vision of space as a place of political revolution: a realm free from the reach of states, and as such an arena in which the virtues of market innovation might be displayed.

As the report concludes, commercial American space, like much of the wider tech industry, is not simply a passive government instrument or partner, blindly loyal to the axioms of American statecraft, liberal democracy, or a rule-based world order. Ultimately, it is a critic of deliberative, regulatory statecraft, and an advocate of corporate leadership as the governance form of the future. Only CEO activism, much of the American space industry believes, will be visionary, agile, risk-willing, and – if need be – ruthless enough, to navigate the complexities of a high-paced, high-tech, and crisis-ridden future.

This, then, is not a report on how commercial American space has been a boost to American national capabilities in a risky global space race. Rather, it is a report on the risks that the rise of commercial American space might itself entail. Aimed particularly at European policymakers, the report is thus also a call for caution. In the EU struggle to draw up an attainable strategy for space, treating private American space simply as an ally may be tempting. It is not that straightforward an ally and, if given a seat at the table, will most likely prove to be a Trojan horse.

INTRODUCTION

This is a report on how the private American space industry imagines our future and shapes our present. Why? Most obviously, because space, in the blink of an eye, has become a crucial component of the global economy: from the exploding market of commercial satellites that now make up a vital part of our global tracking, navigation, security and communications networks, to a new Golden Age of outer space exploration, where radical agendas of mineral mining, geo-engineering, and human space travel compete for attention and investment (Crane 2019; Gilbert 2021; Marshall 2023). But more importantly, it is because the American space industry, has become a powerful political actor, with radical ideas of its own. Most of those ideas revolve around opposing, even replacing, the logic of a regulatory, state-based world order. Western publics and governments need to pay attention.



In terms of money, in terms of technology monopolies, but more than anything, in terms of framing and shaping ideas, the commercial American space industry has become a force to be reckoned with.

Naturally, no single state or corporation owns or controls space – and an increasingly diversified number of global actors cooperate or compete for presence within it. China is ramping up research and investments, hoping to surpass American dominance by 2045 (Fischer 2023). India now has more than 140 space startups and recently launched a rocket designed to put a lander and a rover on the moon (Travelli 2023). Numerous African countries too are gearing up – indeed analysts project that the African Space Agency (AfSA), established by the African Union in 2017, is poised to become a powerful future hub of space innovation (Moore 2023a). And at the European Space Agency (ESA), strategists hope that its Euclid satellite – intended as a unique mapping and scenario-building tool – will place Europe right at center stage.

Yet amidst this complex race for space, the American space industry stands out. In less than a decade, the United States has developed a commercial space market like no other. Headed by the very same handful of American individuals and corporations that already have a near monopoly on owning, controlling, and designing global

communication and information systems (Sarang 2021), and led by a new breed of CEO activists, who not only wield unparalleled private economic power, but large-scale cultural influence too (Fernandes et al. 2021; Fejerskov 2018). In terms of money, in terms of technology monopolies, but more than anything, in terms of framing and shaping ideas, the commercial American space industry has become a force to be reckoned with.

In the world of media and entertainment, this expansion of American tech into space has not gone unnoticed: reportage and commentary on the wealth and adventures of such colorful investors as Elon Musk, Jeff Bezos, or space tourism guru Richard Branson, flow in steady supply (Davenport 2019; Isaacson 2023). This goes for the academic arena too, where histories of the origin of space exploration (Deudney 2020; MacDonald 2017) or prognoses of its long-term geopolitical implications, are beginning to emerge (Marshall 2023).

But in the practical realm of European foreign policymaking, we have yet to catch up with the deeper questions that surround the privatization of space, and the fact that mostly, it is American companies – steeped in the distinctly techno-optimist and fiercely anti-statist perspectives of American political culture – that dominate.

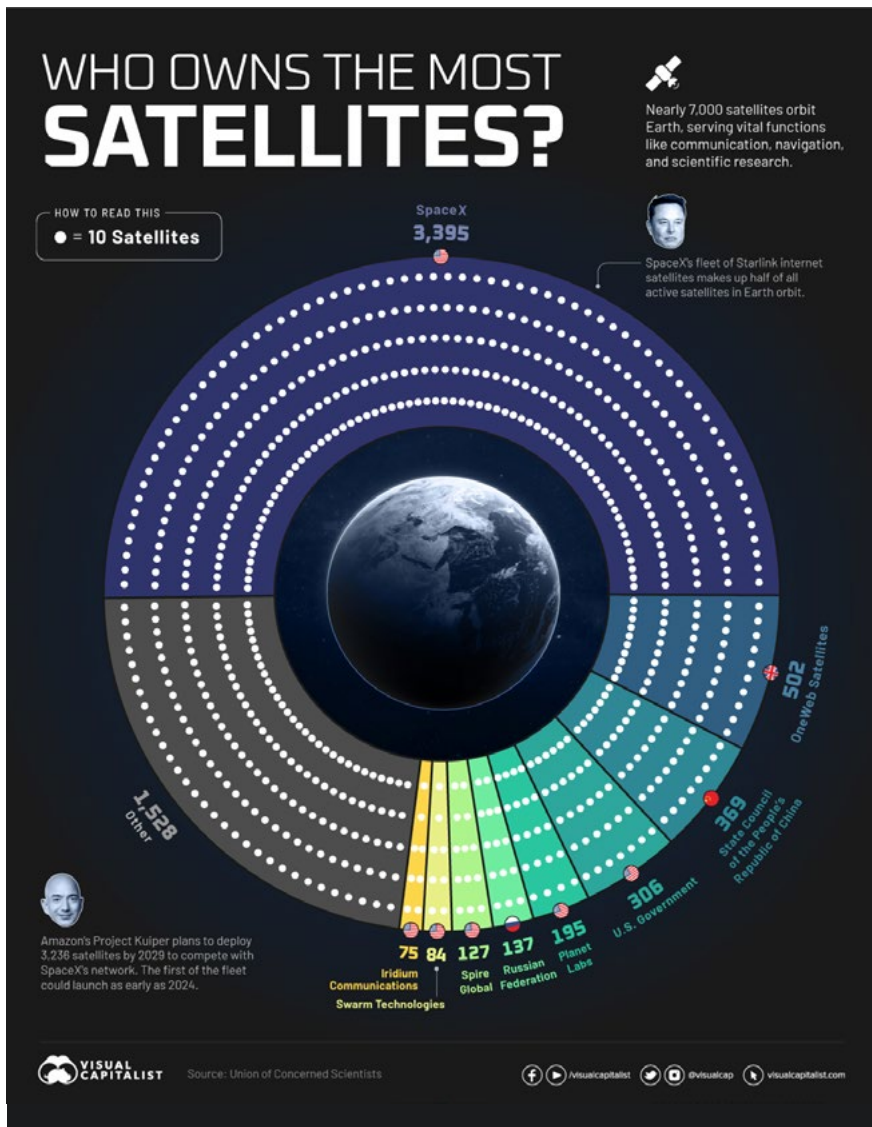
Questions and answers

This report thus asks a first and simple question: What does the American space industry want? What, beyond the invention of satellite-systems, design of launch rockets, or accumulation of wealth, do private American space entrepreneurs seek to achieve in space? What problems, opponents, or constraints do they hope to get rid of? And what new realities do they hope to create? What are their claims, their aims, their beliefs – and their alliances?



**To American tech, space is more than economic opportunity;
it is a clean slate to rethink our models of government.**

In reply, the report unpacks a commercial American space industry informed by a radical political project: to use space as the place where we rethink the rule and governance of states. Headed by corporate utopians – owners and investors who perceive themselves as designers of not just our technical, but our social and political futures too – it pushes two interlinked agendas. Space as a green solution: a profitable, yet sustainable way out of the difficult dilemmas of climate change,



Source: Visual Capitalist/Union of Concerned Scientists.

resource depletion, and biodiversity loss. And space as a place of political revolution: a realm of independence from the reach of states, and as such an arena in which the virtues of corporate leadership – technical vision and ingenuity, risky and rapid decision-making – may be shown off. To American tech, space is more than economic opportunity; it is a clean slate to rethink our models of government. Only if we grasp this expansive and profoundly anti-regulatory ideological dimension to commercial American space, can we gauge the scope of its potential implications.



Illustration Rasmus Fly Filbert, Illustration partly generated by AI. The high-profile space CEOs, many of whom wield unprecedented economic power, operate under two guiding imaginaries: the tech-optimist vision of space as a “green solution” and the tech-libertarian idea of space as a future place of “political revolution.”

Aims and audience

Who is this analysis relevant for? The report is aimed at all with an interest in how the development and ownership of technology transforms the dynamics of democracy and security. It is not a report on the technicalities of US military capabilities in space. Nor is it an evaluation of the comparative strengths or weaknesses of either NASA or NATO in a growing global space race. It is a report on the risks which the rise of commercial American space might itself represent – not least when viewed from the perspective of American partners in Europe.

This is not to ignore that NASA still matters – nor to deny that there are also powerful national players in space (Ben-Itzhak 2022). But it is to suggest that we take the potentially disruptive power, autonomy, and ideas of commercial geopolitical actors seriously. As the political institutions of American democracy grow more polarized and paralyzed, corporate American actors have seized hold of the agendas of grand strategizing and future order-making. It is the aim of this report to unpack what that means in the realm of space – and to equip both citizens, journalists, advisors, and

decision-makers, with an understanding of why the tech-optimist and anti-statist imaginaries advanced by American commercial space, might not only bring “possibilities” or “solutions,” but could also:

- divert attention from sustainability risks on Earth and give rise to new ones in space;
- erode the cohesion of American democracy and the decision-power of the American state;
- deepen the divides and inequalities of global geopolitics, while weakening the reach and norms of global institutions.



As the political institutions of American democracy grow more polarized and paralyzed, corporate American actors have seized hold of the agendas of grand strategizing and future order-making.

Beyond the issue of a military and industrial global space race in other words, the report speaks to readers concerned with space ecology, the fracture of American democracy, and the future of rules-based global governance.

Analytical framework and concepts

The report is based on a basic theoretical premise: that ideas matter in geopolitics (Deudney 2020; Tjalve 2020). Three conceptual “prisms” frame its analysis and must be briefly introduced.

Commercial space as a political movement. The report approaches commercial American space as something akin to an ideological movement. Economically speaking, it is a deeply divided market, competing for investors, attention, profits, and staff. Yet is also a surprisingly uniform cultural and professional class, shaped by like-minded universities and coalescing around a handful of geographical locations (Barbrook 1996; Foer 2017; Chafkin 2021). As a range of studies show, American tech is a community of knowledge and practice, deeply dedicated to a set of shared disruptive and transformative political ideals (Haas 2021; Selling & Strimling 2023).

Space technologies as political imaginaries. The report views technology design as a form of political imagination (Jasanoff 2004). To construct the architecture of space is to shape our use of it (Tutton 2021). It follows that the commercial American space industry does not simply produce neutral instruments or “tools”: satellites, rockets, launch boosters, and space robotics. Ultimately, it designs futures – a particular vision of what space is, and how we ought to develop, inhabit, share, border, or regulate it.



The current race for space is not simply a rush for territory, profit, or technological dominance. It is also a struggle over public and political perceptions

American tech as a global soft power. The report treats commercial American space, and the wider American tech industry of which it is part, as a highly influential and deeply strategic soft power. The current race for space is not simply a rush for territory, profit, or technological dominance. It is also a struggle over public and political perceptions (Deudney 2020). The influence of the American space industry therefore cannot be measured in numbers only: of rocket launches, market shares, investment growth. Above all, it relies on a form of cultural hegemony, impacting how the rest of us think or talk about space, by spurring and inspiring emulation (Rubenstein 2022).

Empirical sources

The report makes use of a wide variety of sources. It draws on surveys, statistics, and economic data, as well as on statements, homepages, and reports from key companies. It also makes use of statements, interviews, or publications by and with key industry profiles – mostly at the CEO level. Cross-sector reports and surveys that represent the outlook and assumptions of the wider, more “anonymous” space industry are included to support overall claims and insights. No interviews have been conducted for this report specifically, but the author draws on previous research stays and field studies within Silicon Valley.

Structure and chapters

The report has a two-part structure:

IN PART I: IDEAS

Ideas, the initial chapter describes the recent privatization of American space activities and the radical shift from science and exploration to commerce, development and industrialization which has accompanied it. A second chapter then explores the tech-optimist and profoundly anti-statist imaginaries which drive the rising American space industry forward. As the section concludes, the American space industry, far from being a neutral state instrument or easily manageable public-private partner, is now a hybrid geopolitical actor with radical political visions of its own. Ultimately, it views space as a place of independence from the reach of states, and a realm in which to experiment with corporate leadership as the governance form of the future.

IN PART II: IMPLICATIONS

Implications, two consecutive chapters explore what that agenda, and the imaginaries which inform it, could mean for Europe and the world in relation to: the climate and sustainability agenda; to the cohesion of American democracy and sovereign foreign policymaking; and in relation to the divides, dynamics, and institutions of global geopolitics. A final conclusion maps out the many and critical ways in which the ideas of the American space industry, inseparable from the broader American tech industry, matter. It also makes a plea for caution, as the European Union draws up its future strategy for space and its regulation.

Photo and description: NG Images / Alamy Stock Photo. The private US space industry took off in 2015 when the "Commercial Space and Launch Competitiveness Act" was passed. The bill introduced a radical idea – private property rights in space – explicitly declaring, that anything a US citizen or company can recover from an asteroid or planetary body, they may also own, use, or sell.



IDEAS: HOW THE AMERICAN SPACE INDUSTRY IMAGINES THE FUTURE

THE AMERICAN PRIVATIZATION OF SPACE

When the construction of the collaborative International Space Station began in 1998, only 600 satellites were in orbit, almost all of them government owned. Their purposes were military or scientific. Today, there are more than 8,000 satellites in orbit, almost all of them commercial and most of them American (Green 2023). In fact, Elon Musk's SpaceX exerts something like a near monopoly on both the expansion of satellite mega-constellations and the transportation of US space cargo. Without SpaceX, and the multiple smaller start-ups that surround it, the US – and the Pentagon – would effectively be grounded (Farrow 2023; Sanger & Lipton 2023).

Why then, have the outlook and visions of commercial American space gone largely un-scrutinized? Likely because the process of privatization that gave birth to its rise has been so rapid and so radical that its ramifications are only now beginning to dawn. Modern space exploration took off in the context of the Cold War, born out of the national rivalry between the United States and the Soviet Union, and employed as a sort of extraterrestrial arena for the contest between their competing civilizational models (Lai 2021). Policy analysts have thus been used to thinking of space as a state-driven enterprise, aided and co-developed by private contractors and civil researchers, but ultimately funded, controlled, and imagined by the state. In the American context this means NASA – The American National Aviation and Space Agency.

Not anymore. Today, the more correct association would be a handful of major private space corporations, followed by a very long list of smaller companies and start-ups, all with inventive, enigmatic names: Planet Labs, Capella Space, Firefly, Think Orbital. The US now has well over 5,000 space-focused companies and an exponential rise in private space investments (Koetsier 2021). In 2010, only \$300 million in private investments flowed into it. By 2021, that number had skyrocketed to \$10 billion – and in 2022 to a soaring \$14.5 billion (McKinsey 2022; see also Deloitte 2023 and BryceTech 2023).



The commercial expansion into space is but the most recent step in a process of digitalization, which in less than twenty years has transformed the power structures of our world.

What has spurred this explosion of the private American space industry on, is a mantra first hailed by American politicians and now championed by the private industry itself: that government kills initiative and regulation stifles innovation. In the early years of the twenty-first century, politicians across the American political spectrum were frustrated with the speed of American space innovation. While computers had “shrunk from the size of living rooms to back pockets” since the 1970s, close to nothing had happened in the technology of rockets (Davenport 2019, 40). By 2010 that frustration mounted, with President Obama cancelling the NASA Constellation Mission and US politicians calling out for privatization (Rubenstein 2022, 27). Yet it was not until 2015, when a bipartisan US house and senate passed the Commercial Space and Launch Competitiveness Act, that a private industry took off. The bill introduced a radical idea – private property rights in space – explicitly declaring, that anything a US citizen or company (which under US law has the status of personhood) can recover from an asteroid or planetary body, they may also own, use, or sell.

The legality of the bill vis-à-vis global space law remains an issue of dispute among international legal scholars (Blount & Robinson 2016). But it more than delivered what its architects hoped for: an acceleration of private space investment, research, and innovation.

From the perspective of the American state, the most important thing that has happened is that Musk and SpaceX have successfully managed to design a reusable booster for rockets, radically reducing the costs of launches and travel. Moreover,

private space companies now have the technological capabilities to transport cargo in Low Earth Orbit and to deliver astronauts to the international space station. These are milestones that have reignited NASA hopes of returning to the Moon, and fueled Pentagon dreams of a US ahead in the race for Mars.

Yet what has also happened is that commercial American space has become an exploding market and autonomous political power with a will of its own. It is important to understand, that commercial American space is not some new industry, separate from the already existing world of American tech. As a figure like Elon Musk illustrates – head of not just SpaceX and the satellite network Starlink, but also of Tesla and the social media platform X (Twitter) – it is part and parcel of it. The commercial expansion into space is but the most recent step in a process of digitalization, which in less than twenty years has transformed the power structures of our world. As such, it is an extension of what some refer to as the “Big technification of everything”: that is, the rise of a few and unrivalled corporations which effectively own the global “infrastructural core” (Hendrikse et al. 2021). China has two of these: Aliba and Tencent. The remaining ones – Apple, Amazon, Facebook, Microsoft, Alphabet/Google – are American. In 2020 each of these giants crossed the threshold of US\$1 trillion market capitalization. And in 2022, their combined financial assets stood at a staggering US\$631 billion (Fernandes et al. 2020).

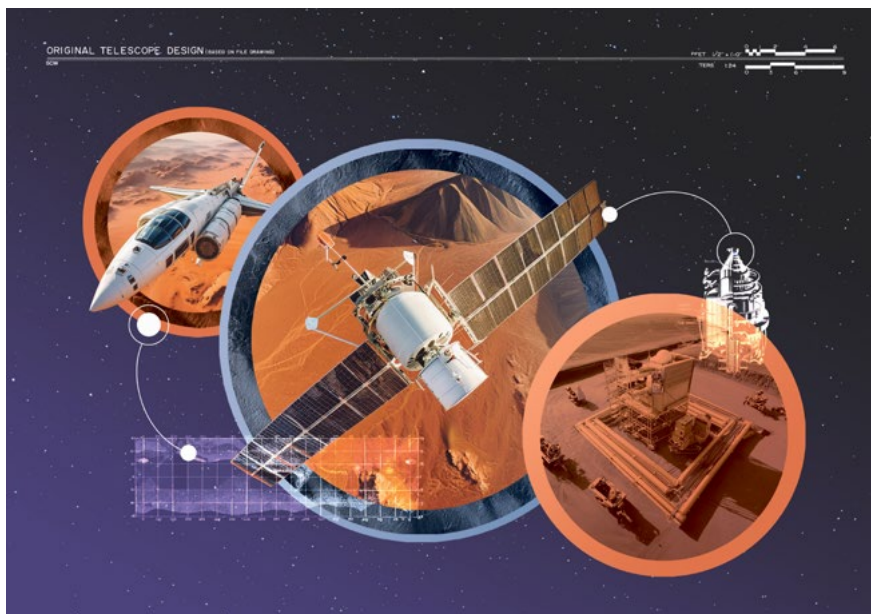


Illustration and description: Rasmus Fly Filbert, Illustration partly generated by AI. As part of its ambition to industrialize and long-term colonize space, the commercial American space industry has diversified into a wide range of markets.

Commercial American space then, builds on both the power and the people of existing American tech: Tesla's Elon Musk, Amazon's Jeff Bezos, PayPal and Palantir's Peter Thiel. What makes it different – what imbues it with a more explicitly political or radical edge – is that it operates within a realm not yet shaped by states. In its own understanding, it operates outside of where state power really counts, building new worlds – and imaging new political futures.

Satellites.

The innovation and production of satellites and satellite support ground equipment for purposes of navigation, communication, data processing, security, warfare, weather prediction, or climate modelling. Key companies: SpaceX, OneWeb, Kuiper, Palantir.

Mining.

Development of space mining technologies, including satellites for scouting, and robotics or machinery for extracting planetary or asteroid resources: helium, water, minerals. While the timeline and financial prospects are uncertain, this is a market which attracts attention. Key companies: Karman, TransAstra, Astroforge.

Logistics.

The innovation, design, and production of space logistics: shuttle systems, maintenance and repair systems, refueling depots, storage facilities, materials, and robotics for the building of planetary bases. Key companies: Blue Origin, Gateway Galactica.



Photo and description: Painting by John Gast/ Chronicle of World History / Alamy Stock Photo.
Commercial American space views itself as an extension of a long American tradition not only for technological innovation and daring geographical expansion, but also for radical political revolution.

OLD AMERICAN MYTHS AND NEW COMMERCIAL UTOPIAS

What then, are the motivations that drive the private American space industry forward?

In almost all of its rhetoric, slogans, and symbolics, the American space industry airs a staple of old American myths: ideas of mission and destiny, of daring expansion and risky experiment, and of movement and progress that leads ever onwards and upwards (Stephanson 1995). Above all, it invokes the original American exodus from an old and worn-out Europe to a free and virgin new world, as a parallel or metaphor for the commercial expansion into space (Rubenstein 2022; Weinersmith & Weinersmith 2023).

Yet in the hands of commercial American space, these originally national myths have transformed into a corporate utopia – one turned against the American state. “Space”; as Elon Musk said in podcast in 2021, “is a chance to rethink the nature of government, as was done in the creation of the United States” (Canales 2021). In the parable of Old Worlds and New Worlds in other words, it is now Capitol Hill that

stands in for decadent, worn-out Europe, and the CEOs of commercial space that are the daring, freedom-seeking settlers in search of a place to escape it. Tapping into broader public sentiments of discontent with twenty-first century bureaucracies and political decision making, most of the space CEO profiles now speak of space as a second American exodus – not simply a new scientific or economic frontier, but a clean slate upon which to redesign the organization of society and to rethink what American democracy means in a digital and potentially catastrophic age. In the words of Peter Thiel, “there are no free places left in the world,” because “freedom and democracy have proved incompatible.” Yet in “outer space, there is a limitless possibility to escape from world politics” (Thiel 2009). In other words: the American state may have urged commercial American tech to go to space on its behalf. But from the perspective of the industry itself, states are the vessels of an old and dying order. In contrast, the giant commercial corporations are harbingers of the new.

Two overarching imaginaries drive that agenda.

Space as a (climate) solution

To begin with, there is the imaginary of space as a climate solution, and of commercial space-designers as the pioneers that will save humanity. We are “going to space to benefit Earth,” as the homepage of Blue Origin puts it. The American tech industry, as numerous books, surveys, and studies have pointed out, is fundamentally optimistic about the benign and progressive nature of human technological designs – driven by faith in technological ‘solutionism’ (Morozov 2013; Sætra et al. 2022). It firmly believes that humans have the capacity to think and design their way to a place of harmony and plenty. And yet commercial American tech has also come to understand that terrestrial landscapes are growing frayed and vulnerable – that there are natural limits to growth and expansion on Earth. Spurred on by the radical events of the global covid pandemic, and the successful advancement of AI, it has in fact become an industry immersed in fears of catastrophe and in consequence, a community open to ever more radical technical solutions (Bordelon 2023). The emergence of think tanks like the San Francisco-based LifeBoat Organization, or the procurement of ‘doomsday exits’ among Silicon Valley billionaires, provide illustrative examples of this sense of urgency, and of the “survivalist ethics” which now pervade much of its mood, debates, and choices (Osnos 2017).

It is against this backdrop that American tech has latched onto space like a bee to honey. The most prominent public figure in this turn to space as a path of salvation has been Elon Musk, who views his many companies – not least Tesla and SpaceX – as key parts of his personal “Master Plan” for converting the world to a fossil-free,

low-emissions future. Speaking at Tesla headquarters in Austin, Texas, at an investors day in 2023, he proclaimed that there is a clear path to sustainable energy on Earth – one which “doesn’t require destroying natural habitats” and notably, one which “doesn’t require us to be austere and stop using electricity and sort of be in the cold or anything” (Musk quoted from Hawkins & Shakir 2023). In other words: a way out of the otherwise difficult trade-offs between growth and responsibility, which a future of climate change, resource depletion, and biodiversity loss demands.

Not only Musk, but American tech at large, has turned the gaze of sustainability innovation towards the skies, intrigued by the “galactic proportions” of Lebensraum.

At the time, the plan involved expanding wind and solar energy schemes as well as upping the mining of minerals on Earth. Since 2016 though, not only Musk, but American tech at large, has turned the gaze of sustainability innovation towards the skies, intrigued by the “galactic proportions” of Lebensraum it offers: space, they have come to believe, can be a way out of the otherwise closing limits to growth on Earth (Deudney 2020). It may also, they contend, provide the knowledge, the resources, and the climate managements tools, that will help restore Earth.



Photo and description: Stocktrek Images, Inc. / Alamy Stock Photo. View from the International Space Station of Hurricane Dorian as the storm churned over the northwestern Bahamas.

**THE LIST OF POTENTIAL SPACE CLIMATE SOLUTIONS IS LONG,
BUT MOST IMPORTANTLY, IT INCLUDES:**

- **Satellite monitoring:** The provision of accurate and real-time data on climate patterns, deforestation, and pollution levels.
- **Climate modeling:** Advanced space-based systems, such as Earth-observing satellites, contributing to climate modeling and enabling more accurate climate predictions.
- **Remote sensing:** Satellites with remote capabilities to measure variables like sea temperatures, vegetation health, and ocean circulation, aiding in managing ecosystems.
- **Resource extraction:** Space mining of resources such as rare earth metals and minerals, reducing the environmental impact of extracting these on Earth.
- **Geo-engineering:** Emerging technologies that could manipulate climate systems, including carbon removal, solar radiation management, and cloud manipulation.
- **Renewable energy:** Space-based solar power systems that could collect sunlight in space and transmit it to Earth, providing a limitless, sustainable source of clean energy.
- **Agriculture and food optimization:** Space-based technologies that can predict agricultural yields, helping to improve food security and optimize resource utilization.

The field of satellites aside, many of these technologies are still in their infancy or distant. As the following chapter explains, several of them are high-risk. But all of them are part of the technological repertoire which commercial American space now unites around as solutions for a sustainable future. To the industry, they are more than just “technologies”: embedded in larger visions of what the design of future industrialism could look like, they are ultimately something akin to “grand strategies” for, or “corporate utopias” of, twenty-first century civilization (Tutton 2021). This is not to say that the industry is of one mind – deep divergences exist. For instance, some – most – imagine space as a sort of “resource bank,” providing energy sources and raw materials to the fragile biosphere of Earth. Here, Jeff Bezos’ vision of a future in which Earth is largely residential, and space the primary site of heavy industrial production and waste depositing is illustrative. Others – like Musk and his ambition of a city on Mars – are less focused on the synergies between space and Earth, and are preoccupied with human space habitation and colonization

only (Rubenstein 2023; Weinersmith & Weinersmith 2023). In this latter, darker vision of Earth's future, the focus of science and innovation now is almost entirely on finding alternative spaces of living, of making humankind an "interplanetary species" (Musk 2017).

Space as a political revolution

If the American space industry is divided on exactly what makes up an attractive, green, space future, it agrees that it will take corporate visionaries to imagine and produce it. To many of the American space profiles – Musk, Bezos, and Palantir's Peter Thiel – we are at a historical juncture not dissimilar to that of the original exodus from Europe. A moment where the paradigms of the past have been exhausted and a push towards new shores is inevitable.

Viewed from this perspective, space is something akin to a governance laboratory – a place to rethink the governance forms of tomorrow and to showcase corporate leadership, technical ingenuity, and market innovation as superior modes of problem-solving in an accelerated, digital age. That vision stems partly from the predictably libertarian impulse of corporate America. It also stems from an American tech and space industry raised in the counter cultural attitudes or "California ideology" of the American West Coast (Barbrook 1996; Foer 2017). But beyond these sources of knee-jerk skepticism towards centralized state authority, a much deeper disillusion with political leadership has taken hold – a sense that the era of grand public visions is somehow over. As the venture capitalist Peter Thiel, who was an early investor in Facebook, a co-founder of PayPal and now chairman of the increasingly space-focused Palantir, bemoans in a recent interview, the days when great things could be achieved in government – the New Deal, the Hoover Dam, putting humans on the moon – are gone. Instead, he sees a federal apparatus that is in a permanent state of stalemate, limping behind, rule-bound, and stifling of innovation: a "senile, central-left regime" (Thiel quote from Gellman 2023). In consequence, Thiel now seems bent on what his interviewers and biographers describe as an "almost nihilistic impulse to demolish it" (Gellman 2023; see also Chafkin 2021).

Reservations about democracy as the pinnacle of political organization for eternity are expressed by Musk too. He now often and actively speaks about the need for more "direct" and "streamlined" approaches to governance – ones that center technical expertise, market mechanisms, and speedy decision making. Likewise, he consistently airs the idea that space is the ideal place to experiment with alternative models of government (Canales 2021). Along similar lines, Jeff Bezos has weighed in, expressing concern that the ideal of consensus will impede the kind of

groundbreaking decisions that current problems demand. In his views, if not his actions, Bezos is less radically critical of public government than Thiel. But ultimately, all these key profiles agree that the rapid pace of technology evolution and the slow, incremental process of democratic deliberation are on a collision course, with democracy on the losing end. And they all see a growing discrepancy between the complex technical know-how that an urgent societal crisis demands, and the kinds of knowledge which a democratically elected form of leadership can have. On several occasions, therefore, figures like Thiel and Musk have aired proposals that a combination of direct, digital popular opinion polls, and some version of corporate oligarchy or “technocracy,” could be the future (see also Taplin 2023).

To many the American space profiles – Musk, Bezos, and Palantir’s Peter Thiel – we are at a historical juncture not dissimilar to that of the original exodus from Europe.

Is this sense of disillusion with public governance, and openness towards radical alternatives reserved for the top layer of American tech and space CEOs only? Perhaps. But studies and surveys suggest a diffusion of libertarian and anti-establishment norms across the workforce and boardrooms of the sector, including its lower-level coders, engineers, and designers (Selling & Strimling 2023).



Illustration and description: 3000ad / Alamy Stock Photo. Drawing on American myths, the commercial American space industry speaks of space as a second American exodus or war of independence. Only this time, it is Capitol Hill that stands in for decadent, centralized Europe, and commercial, leader-driven tech that is the adventurous pioneer – setting sails and embracing risk to save all.

Takeaway: American Independence 2.0

To the American tech industry, space is more than profit. It is a climate solution and a place to re-invent what the future of democratic governance might look like – a realm of independence from the inertia of state bureaucracy, and a place to showcase agile, corporate problem-solving, as the more adequate governance form of the future. Drawing on old American myths, its CEOs speak of space as a second American War of Independence. Only this time, it is Capitol Hill that stands in for decadent, centralized Europe, and commercial, leader-driven tech, that is the adventurous pioneer – setting sail and embracing risk to save all. The most outlandish of its corporate utopias may sound inconsequentially ridiculous: cities on Mars; junkyards in space. But their satellites or mining plans are real – and their perspectives have already shaped our world. What are the implications? That is the question addressed in the section that follows.



To the American tech industry, space is more than profit. It is a climate solution and a place to re-invent what the future of democratic governance might look like.



Photo and description: imageBROKER/Christian Huetter/ Alamy. Geo-engineering the sun.

IMPLICATIONS: HOW THE AMERICAN SPACE INDUSTRY SHAPES THE PRESENT

While the presidencies of Barack Obama and Donald Trump differed widely, both spurred on the rise of an autonomous American space industry – hailing its growth and vowing to stay out of its way. Promising, as Vice President Pence would put it, “to be a customer, but not a competitor” (Pandey 2018). What these consecutive American administrations hoped for of course, was to build a market and ally – yet as the current White House is learning, something more than a market and something else than a partner has emerged. This section explores the implications. How do the techno-optimist and often markedly anti-statist imaginaries of the American space industry shape our present – and what does it mean for the strategic risks and dilemmas of Europe:

- in relation to the hard and risky choices of the global climate and sustainability agenda?
- in relation to the cohesion of American democracy and sovereign foreign policymaking?
- and in relation to the divides, dynamics, and institutions of global geopolitics?

THE CLIMATE, SUSTAINABILITY, AND GLOBAL JUSTICE AGENDAS

The most immediate and significant area in which the new American space industry has already had an impact, is in the framing of Western attitudes towards the global environmental crisis. This is certainly true across the capitals of Europe, where the notion of space as a “climate solution” has been rapidly making its way into national industrial and environmental strategies and where hopes of either modelling European sustainability efforts on ideas from American tech and space innovation, or becoming its partner or sub-contractor, are pervasive (Frandsen, Petersen & Tjalve 2023; Rosengren 2023).

In Denmark for instance, as one example of a small European country, the official national space strategy (currently anchored in the Ministry of Science and Innovation) now declares that “space is an instrument for knowledge about climate and climate change” and a tool for the “optimization and control of environmental resources.” It also looks ahead to a future that is “green, digital, and sustainable” (UFM 2021).

Likewise, at the European Space Agency (ESA), the most fronted slogan and headline is now “Space for a Green Future.” with a mission statement committed to “accelerating the use of space” for “purposes of carbon neutrality” and the “greening of society” (ESA 2023). Naturally, some of that tech-optimism stems from European research and industry itself, but a significant driver – and the most radical in terms of pushing space resource extraction and commercial space development – is the American industry.

What are the risks and dilemmas involved?

Diversion

Most immediately, there is a risk that the market-promoted promise of space will turn out a diversion. That the unrestrained rush for both “green” and yet profitable solutions in space will attract our attention and funds, while ignoring real options. Distant, only half-potential futures up there, put ahead of painful but already possible paths towards sustainability down here.

Take the example of space mining. With a green transition that depends on minerals, and with a global mining industry valued at US\$2022.6 billion in 2022, the idea that extracting planetary and asteroid minerals could be both lucrative and “green” is enticing (Moore 2023b). But the mining of space involves massive transportation of cargo. And while the invention of reusable rockets and capsules do constitute

landmark achievements for more sustainable space transport, it does not undo the fact that the launching and moving of space objects still involves large and direct emissions of combustion into different layers of the atmosphere, inducing ozone depletion and affecting Earth's energy balance. Scientific understanding of the magnitude or effects of that impact is scarce and international regulation almost non-existent (Sirieys et al. 2022). For now, in other words, mining space may be financially attractive but, despite its promise of keeping the destruction and waste products of mining off Earth, it is not sustainable (Segura-Salazar & Moore 2023). It is a diversion.



Recent scientific estimates suggest that by 2100 the amount of space junk could well multiply by a factor of fifty.

Similar concerns are at play with regard to climate geo-engineering, which involves strategies such as redirecting sunlight away from Earth or constructing cloud-like, stratospheric shields. These are high-risk technologies, that have been pushed by market actors for years – not least due to low-cost potential. But because of their far-ranging and potentially catastrophic consequences, they have not been politically appealing. This is changing. In 2022, President Joe Biden put into motion a five-year research outline, funding research and innovation on the possibilities of geo-engineering techniques in space: spraying highly deflective particles into the stratosphere, thereby deflecting sunlight and cooling the planet. Biden – in sync with a widening segment of Western political decision-makers that are growing frustrated if not right out despairing – has argued that we cannot afford to simply ignore this potential avenue. Others insist that the very idea of solar radiation management is a dangerous one to entertain, as its built-in promise of cheap and fast solutions allows for publics and political leaders to remain complacent (Trenberth 2022). And others again argue that by focusing on technologies of mitigating rather than stopping climate change, we shall get to a point where mitigation is the only option left (McKibben 2022). In this vein, more than 380 international scientists recently signed an open letter calling for a global non-use agreement of solar geo-engineering.

Disaster

More radically, there is the risk that the dual drives of profit and panic will lead to unintended disaster: that the dangers involved in space industrialization are as formidable as the ones which it seeks to solve (Pitron 2020). Whereas the commercial American approach is one of “trial-and-error,” scientists outside of it call for caution

over speed (Green 2023; Hornsey 2021; Dæhlen 2023). The industrialization of space involves young, immature fields of science – artificial intelligence, quantum physics, robotics – whose capacity, reach, and interplay, are still deeply under-scrutinized. What will happen, scholars ask, when we let those technologies loose in a space that we are also largely unfamiliar with? If we set AI to calculating large-scale tinkering with the mega-patterns of solar radiation, cloud formation, and climate systems? Robots to mine the surface of planets, asteroids, or the Moon? And what about space junk – the debris from a space that is quickly filling up with a new scale of military and industrial human hardware? Fears of unforeseen and cascading implications pile up.



The industrialization of space involves young, immature fields of science – artificial intelligence, quantum physics, robotics – whose capacity, reach, and interplay, are still deeply under-scrutinized.

This is not just paranoia – it is already here. This is particularly true in relation to space satellites. As acclaimed international researchers argue, the development of mega-satellite systems has already begun “multiple tragedies of the commons, including tragedies to ground-based astronomy, Earth orbit, and Earth’s upper atmosphere” (Byers & Boyles 2021). Our near space is not, as the euphemism of a new and vast frontier suggests, “endless.” In the Low to Geostationary Earth orbit, where the majority of the current satellite expansion takes places, it is already getting clogged. This crowding comes not just from satellites or objects in use, but also from the debris that continues to cascade out of past collisions or explosions. Known as the “Kessler syndrome,” these objects multiply as their escalating patterns of collision lead to ever smaller pieces of junk. Across parts of Earth orbit now, areas so thick with debris that they are called “bad neighborhoods,” are emerging. And if humans do not tread lightly, scientists project that some orbital paths could become too dangerous to be used at all (Green 2023).

At the moment, there is no treading lightly: fronted by Musk’s Starlink, but closely followed by such companies as OneWeb or Amazon’s satellite project Kuiper, the projected human expansion of satellites in orbit stumbles forward at a running pace. The ambition is to soon provide globe-spanning, fast-paced, space-based internet and communications services to even the most remote rural regions. This takes not only singular satellites, but entire mega-constellations – very large networks of



Illustration and description: Alejandro Miranda / Alamy Stock Photo. There are more than 8,000 active satellites in space, and the Low to Geostationary Earth orbit, where the majority of the current satellite expansion takes places, is already getting clogged. This crowding comes not just from satellites or objects in use, but also from the debris of past collisions or explosions. Across parts of Earth orbit, areas so thick with debris that they are called "bad neighborhoods" are emerging. And if humans do not tread lightly, scientists project that some orbital paths could become too dangerous to be used at all.

satellites – the size of which continues to grow. Musk and SpaceX have announced plans to have a staggering 42,000 Starlink satellites in operation by 2030. And Amazon has just booked 83 launches to deploy most of its Kuiper constellation over the next five years.

These commercial ambitions are by no means unique. Across the globe states are rushing to get satellites of their own: data, knowledge, and – by implication – autonomy. In an increasingly space-based geopolitical environment, states now realize that procuring nationally-owned satellites, rather than buying data from

commercial actors, or relying on data from allies, is a precondition for maintaining state sovereignty (Machi 2023). Not only in relation to the pursuit of climate and sustainability aims, but also related to cybersecurity or broader military security. In the realm of cybersecurity, satellites have in fact become weapons – complex parts of defensive communication strategies – and the leading states want not just some, but many. Speaking on this issue at Arlington Virginia in September 2023, US Deputy Secretary Kathleen Hicks announced that the Pentagon hopes to fend off possible Chinese attacks on US communications systems by launching thousands of smaller, cheaper satellites into Low Earth orbit (Sanger & Lipton 2023). “Imagine constellations of ADA2 systems on orbit,” she explained, “flung into space, scores at a time, numbering so many that it becomes impossible to eliminate or degrade them all” (Hicks 2023).



Illustration and description: Science Photo Library / Alamy Stock Photo. Mining space for the resources of a green energy transition, too, has become a race. At the level of nation states, the world is now divided between the US-led Artemis Accord (which in the case of moon mining, relies fully on SpaceX) and a competing Chinese–Russian alliance around plans for an International Lunar Station (de facto led by China). The commercial American space industry, though, appears to be largely oblivious to these inherent geopolitical dynamics.

In conjunction then, there is something akin to a “space junk time bomb” ticking. Recent scientific estimates suggest that by 2100 the amount of space junk could well multiply by a factor of fifty. And because of a destructive interaction between space debris and climate change, these are numbers that could end up even worse: our planet’s atmosphere “naturally pulls orbiting debris downward and incinerates it in the thicker lower atmosphere, but increasing carbon dioxide levels are lowering the density of the upper atmosphere, which may diminish the effect” (O’Callaghan 2021). In other words: where space junk used to drop into the atmosphere and burn up there, it might now stay in space indefinitely.

If it comes to such disaster, it will not be due to directly malign intentions, it will be the result of reckless, partial interests and unintended, but cascading implications. Commercial actors somewhat acknowledge the danger – indeed private companies like the American LEO Labs, now sell satellite and space debris monitoring as a service and product in itself. There is also a substantial part of the commercial satellite market that wants regulation and they look to Europe to get it. But what kind of regulation? “Right of way” rules - roads, stoplights, penalty systems – that will secure the safety of property and movement? (Frandsen 2023). Or the safety of space as a global commons – safety from human traffic? (Byers & Boyles 2023). Regulation that creates the framework in which further industrialization becomes secure and predictable enough for investors to engage? Or space stewardship, emphasizing long-term sustainability and the protection of space as a collective future good?

Divider

The most disturbing danger of making space a commercial-led strategy of climate salvation however, is that space-based “solutions” could become multipliers of the divides, inequalities, and rivalries on Earth: access to satellites and data that grows scarce and contentious; gateways to asteroids, planets, and mining that turn into objects of rivalry, or sustainable technologies that gain dual-use, militarized applications.

Again, this is not just speculation. And again, an example is satellites. In theory, every country that wants to build or expand a climate monitoring capacity, can do so easily and cheaply. As a result of rapid commercialization satellites are getting smaller and more affordable by the minute. Getting a “parking lot” in orbit, is entirely free of charge – under the auspices of the UN agency International Telecommunication Union, these are allocated on a “first come, first served” basis. But as the Geostationary Orbit fills up (the part of space most conducive to this type of monitoring), those who

got there first are at an advantage. And those who got there first are the ones who could afford to get there early (Ogden 2022). The same holds true for satellite mega-constellations, where the expansions by SpaceX's Starlink or Amazon's Kuiper, are de facto reserving a place of near monopoly. Where will potential competitors, moving into the market from Asia or Africa as costs get lower, "park"? There is not much room left.

Mining space for the resources of a green energy transition too has become a race. This kind of heavy industrial endeavor takes a whole other level of capital, and only the largest, wealthiest commercial markets have the resources to get into the field. At the level of nation states, the world is now divided between the US-led Artemis Accord (which in the case of moon mining, relies fully on SpaceX) and a competing Chinese–Russian alliance around plans for an International Lunar Station (de facto led by China). The immediate object of these two competing "blocs" is getting to and exploiting the resources of the moon. The entire situation is ridden with emerging tensions. China and Russia's alliance in space is unequal and frail (Azarova 2021). So too is the relationship between SpaceX, NASA, and by implication, the Artemis Accord: working together to get there, but who owns and controls what is mined? And both NASA and China have their eyes on a site near the South Lunar Pole (Dobos 2022).

The commercial American space industry though, is largely oblivious to these inherent geopolitical dynamics. It continues to view space as a place of cosmopolitan collaboration – in an "era of scientific advancement," which in the illustrative words of Planetary Society CEO Bill Nye, will "transcend political and cultural boundaries." It therefore does not see a need for inhibitions or regulations, but views anarchy and risk-taking as a necessary part of their space cosmopolitanism. What this tends to overlook is that "solutions" don't exist in a void: the inherently neutral technologies of space satellites, space data, or space minerals, are already engulfed in dynamics of rivalry and zero-sum thinking.

Indeed, as the expanding field of "climate realist" research points out, even the threat of climate collapse – the one risk that would seem to unite us all – has fallen short of uniting the world (Lieven 2021). What is emerging, they contend, is a zero-sum scramble for transition. A sort of "green Great Game" (Bajpae 2023), engaging not only nations, but also regions and cities, reaching for access to scarce materials or expensive technologies. Initiatives like the Trans-Atlantic Global Arrangement on Sustainable Steel and Aluminum or NATO's Climate Change and Security Action Plan reflect this trend of securitization and the entrenchment of the logics of



Photo and description: MediaPunch Inc / Alamy Stock Photo. In 2016 Peter Thiel put his weight and money behind Trump's political campaign. In line with parts of Trump's narrative Thiel also sees government as broken and unable to achieve great projects of the past such as the New Deal, the Hoover Dam and putting humans on the moon. Instead, he sees a federal apparatus that is in a permanent state of stalemate, limping behind, rule-bound and stifling of innovation: a "senile, central-left regime."

protectionism and alliance-making in the sustainability field. Just as an increasingly protectionist securing of materials for the transition into clean energy is unfolding on Earth, so too is the rush to secure access and interests – rich states ahead of poorer states – beginning to appear in space (Ogden 2022).

Takeaway: Risky tech-optimism

European democracies embrace the lure of commercial American tech-optimism at their peril. Its promise of growth and sustainability for all sounds enticing, but comes with high-risk caveats: endangering ecosystems, deepening tech monopolies, widening global economic inequalities, disrupting rule-based national and global governance institutions, and encouraging something akin to an anarchic geopolitical gold rush. It is indisputable that the data and science which we acquire from space now play crucial roles in our understanding, prediction, and navigation of climate change. It is also possible, if not immediately likely, that the mining – and sharing – of space resources could be long-term developed in sustainable ways: just, inclusive, and common. But it is politically naïve to overlook and not plan for the already unfolding possibility of the opposite.

AMERICAN DEMOCRACY AND GLOBAL ORDER

If the ideas and technologies of commercial American space are of importance to global agendas, what then of its implications for global actors – most significantly for the United States itself? What do the ambitions and agendas of the commercial American space industry mean for the frayed dynamics of American domestic politics? Or the ability of the United States to project power abroad? What, in short, do they mean for Western actors, principles, and institutions in the contemporary global order?

Domestic disruptor

In democracies, political cohesion and public legitimacy is a precondition for sound, consistent and predictable foreign policymaking (Tjalve & Williams 2015). Yet, for almost a decade now, American democracy been in a permanent state of domestic conflict and Congressional paralysis with frayed political relations (Osnos 2021) and deepening demographic polarization (Hochschild 2016). Even those most loyal to defending the continued prevalence of American dominance will admit to the depth of the crisis. In a new special issue of Foreign Affairs on the threats to American power, former American Secretary of State Robert Gates, describes domestic collapse as a genuine worry: “The American public has turned inward; Congress has descended into bickering, incivility, and brinkmanship; and successive American presidents have either disavowed or done a poor job at explaining America’s global role” (Gates 2023, 44).



In 2016, and much to the surprise of both American and international observers, Thiel put his his weight and money behind Donald Trump’s presidential campaign.

The commercial American space industry is both a reaction to, and a contributing driver of this evolving American fragmentation. As already described in the previous section, a segment of the CEO-level in American tech now views government vision as absent: a sort of vacuum, in which corporate visionaries have been forced to pick up the mantle. But beyond the fact that corporate space has socio-political visions of its own, it has also grown into an active player in American presidential politics – and in the deepening culture wars between the East Coast federal government and the rebellious, economic powerhouses of the American south and west: Texas, California, and Florida.



Photo and description: Vladyslav Yushynov / Alamy Stock Photo. Elon Musk is among several American tech CEOs expressing reservations about centralized, representative democracy as the pinnacle of political organization for eternity. Since his takeover of Twitter and transformation of this into X, he has used the platform to air critique of the American state on several occasions.

It was Peter Thiel who began this explicit intervention into American presidential politics. In 2016, and much to the surprise of both American and international observers, Thiel put his weight and money behind Donald Trump's presidential campaign. In the early days of the Trump administration, he was also one of its leading advisors. Most had thought of Silicon Valley as the antithesis to conservatism and did not understand the connection. But the most basic theme of Trump's American Right – disrupting the political establishment, undoing federal power – resonates well with commercial tech narratives (Chafkin 2021; Tjalve 2021). While Thiel is not putting money or voice behind Trump in 2024, he put large sums of money into MAGA candidates in the 2022 midterms (Helmre 2022). Along with these candidates, he endorsed the idea of a "stolen election" and downplayed the January 6 assault on Congress (Reich 2022).

In the meantime Elon Musk, too, has become an active political player, turning his back on the Democratic Party, and aligning himself with the 2024 presidential campaign of Ron DeSantis – a longtime ally of Trump and, like him, an anti-establishment, anti-federal culture warrior. He has also asked his millions of followers on X to do the same (Mohsin et al. 2023). DeSantis is the current governor of Florida, and on the day after Musk announced DeSantis' campaign on X (formerly Twitter), DeSantis passed a Florida legislation that relieves regulation or liability of the private space sector further (Thakker 2023). Not just SpaceX, but also Blue Origin has its launch facilities in Florida.



The American tech and space industry now positions itself in the political landscape.

What has happened, in other words, is a realignment of how the American tech and space industry now positions itself in the political landscape (Chafkin 2021; Berger 2016). In line with their self-perceived role as social architects – not just designers of rockets or software – Musk and Thiel have emerged as outspoken critics of the state – indeed even as sympathetic to the idea of secession. In a 2022 interview Musk remarks that “there is a good chance that, in the future, people may decide they no longer want to be part of the United States. They may want to go their own way, and if a group of states or a region decides that it’s in their best interest, well, that’s their right” (Farrow 2023). Musk has also hinted at the prospect of trying to form his own “sovereign” or autonomous entity within Texas. In an attempt to escape “overregulation, overlitigation, over-taxation,” he moved SpaceX headquarters from California to Texas in 2020 and is now in the process of building what he hopes will be a fully autonomous city for SpaceX outside Austin (Gjovik 2021). To Musk, the political culture of Texas – with its ideals of radical self-governance – is the most suitable place to experiment with the innovative political entities of tomorrow. Or, as the Austin mayor responsible for negotiating Musk’s move put it: “What he wanted from the city was speed...a promise that there would be no bureaucracy” (Grind et al. 2023).

The commercial American space sector then, has become something of a paradox in domestic American politics. On the one hand, the cultural symbolics of space – astronauts, rockets, the genius scientist – remains a unifying factor. As a recent PEW survey shows, the American public still thinks of space as a shared, apolitical, national dream (PEW 2023). And even amidst the polarized turmoil of the Trump

presidential transition, and the January 6 assault, lawmakers reached a bipartisan consensus to commit to an American mission to Mars (Lindgren 2021). But, on the other hand, several of the corporate owners of space, have become active players in the polarization of American politics and the erosion of federal legitimacy.

A report like the present one cannot expand on these intricate domestic dynamics. But as the 2024 presidential election draws near, European partners should pay heed to the political alliances, and shifts in domestic geographic power that commercial American space is part of. Possibly, its alignment with disruptive candidates and agendas will be a piece of the puzzle that the stability and predictability of the US as



Photo and description: Alex Konon / Alamy Stock Photo. Musk's decision to ship Starlink satellite equipment to Ukraine in the hours after the invasion kept the country able to communicate and, later on, to target Russian assets. When Musk unexpectedly announced the potential closure of Starlink in Ukraine on Twitter in October 2022, suggesting negotiations with Russia, it sent shock waves through the White House and the world. The incident underscored the almost presidential-like power that the monopolies of communication technology have given corporate leaders access to, and the growing influence of private entities in global affairs.

international power, actor, and partner constitutes. And regardless of what the growing alliance between American tech and the anti-federalist or straight-up secessionist parts of the New American Right achieve, the mere existence of it affects global perceptions of the United States and of its ability to forge federal leadership or mobilize public support.

Alternative geopolitical actor

This increasingly autonomous agenda of American commercial space CEOs plays into the exercise and sovereignty of American foreign policy too. American political leaders and their NATO partners are beginning to wake up to that commercial space is not always “an instrument” for the White House or Pentagon to control (Farrow 2023; Sanger & Lipton 2023). When available and reliable, its technologies are an asset. But to the extent that the private space contractors on which national American strategies rely set their own individual agendas, their technologies are a dependency and a vulnerability in an already complex and hybrid world.



Several of the corporate owners of space, have become active players in the polarization of American politics and the erosion of federal legitimacy.

The most illustrative example here is the case of Starlink and the Russian war in Ukraine. In just a couple of years, the SpaceX satellite network has gained global reach. At the moment it is the only provider of high-speed, low-latency internet access to underserved and remote areas of the world. It was Musk’s decision to ship Starlink satellite equipment to Ukraine in the hours after the invasion that kept the country able to communicate and, later on, to target Russian assets. When Musk declined a Ukrainian request to widen coverage to Crimea, they were not able to precisely aim drones in an attack on Russian ships (Sanger & Lipton 2023). The US Government too became increasingly dependent on Starlink for secure and uninterrupted communication channels in Ukraine, making Musk and SpaceX a precarious private party to the war. When Musk unexpectedly announced the potential closure of Starlink in Ukraine on Twitter, suggesting negotiations with Russia, this sent shock waves through the White House and the world. The incident underscored the almost presidential-like power that the monopolies of communication technology have given corporate leaders access to, and the growing

influence of private entities in global affairs. It also sparked diplomatic concerns about the complicated intersection between technology, security, and corporate responsibility. In the White House, sources report that there was a veritable sense of shock – not least after learning that Elon Musk had reportedly been on the phone with Putin himself (Farrow 2023).

In the war that has broken out between Israel and Hamas after the attacks on October 7 last year too, the American Government now closely monitors the role of Musk. They worry not only about Starlink's capacity to shape information flows and impact the dynamics of the conflict itself, but also about the parallel control which Musk has of X (formerly Twitter), and his use of that platform to shape American or global narratives. Early in the war Musk made comments that were widely perceived as antisemitic. A few days later, he was invited for a private visit with Israel's prime minister Benjamin Netanyahu. Again, the incident illustrates that a corporate actor of his magnitude now effectively pursues his own independent diplomacy (Mohsin et al. 2023).

And the influence does not end there. In the US, voices both outside and within the American administration now raise worries that the American state has grown inescapably dependent upon Musk and the wider commercial space industry. To go to the moon or Mars, the US now relies entirely on SpaceX, pouring money, support, and legitimacy into its efforts. Only days after Musk snubbed Biden on the issue of Israel and Gaza, the Pentagon signed its most expansive SpaceX contract to date (Sanger & Lipton 2023). Meanwhile, the position of Musk himself is this: "Who owns Mars? The Martians do." That small comment is perhaps the most important conclusion of all to be drawn from the ramifications of commercial American space and its vision of the future.

Takeaway: A Trojan Horse

The commercial American tech industry has become an autonomous economic, political, and ideological player. In the polarization of domestic American politics, it plays an active and disruptive role. In global conflicts, it owns what is now possibly the most important military asset – the technical infrastructures that enable, access, distribute and shape communication. It also owns, designs, develops, and imagines the technologies beneath the industrialization of, and geopolitical struggle over, outer space resources. And it independently meets with Western global opponents, has public opinions about Western global problems, and opposes Western global solutions and institutions.

At the moment, Europe solves the governance problems of commercial American tech by inviting it in – from Covid, to health, to security, the American tech and space industry has been getting key seats at the table (Klein 2020). Thiel's Palantir, is now in charge of reforming the British National Health Services, with proclamations that they will “rip the whole thing from the ground and start over,” replacing state dysfunction with “market mechanisms” (Milmo 2023). Even the EU's cloud-initiative Gaia-X, intended to reclaim “digital sovereignty” for European nation-states, has the American tech – and space industry as key co-formulators. Is that strategy wise – or is it, as some argue, something akin to a Trojan Horse? (Fermigier & Frank 2020).



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Photo and description: Paul Hennessy / Alamy Stock Photo. Elon Musk and Kirk Shireman, manager of the International Space Station Program, speak at a press conference after the launch of a SpaceX Falcon 9 rocket at Cape Canaveral Air Force Station on April 08, 2016. The rocket was carrying the Dragon spacecraft filled with around 7,000 pounds of cargo for the International Space Station.

CONCLUSION

Space is back. It is on the front pages of our magazines and at the center of our popular culture products: movies, documentaries, streaming shows. Yet while the adventures of space travel once again climb to the forefront of public attention, the radical and risk-filled implications of a world that has moved from national space exploration to commercial space development still lack deep political analysis and genuine, democratic attention. Citizens view space as a realm of entertainment - governments simply as an instrument of industrial policies or technical security plans. Space is more than these.

It is a race for resources, access, and ownership, and above all it is a struggle over what gets adopted as visions of attractive and legitimate futures. Is space a mining zone, travel destination – even future site of human civilization? And could it – should it – be a green solution? Is it a climate answer – or a climate risk? And who, in an era of contested models of liberal, bureaucratic governance, should own and govern space? Market innovators? Nation-states? Or competing civilizational alliances? Space, in other words, is not simply a place of impressive rocket launches, courageous astronauts, or speedy internet. It is where an important part of the power relations, the civilizational visions, and the governance structures of our future are shaped. These will matter not just up there, but also down here.

This report has zoomed in on a single, but important, actor in that battle of ideas: the commercial American space industry. As the report has unpacked, that industry has become an autonomous economic, political, and ideological player. In the polarization of domestic American politics it plays an active and disruptive role. In global conflicts it owns what is now possibly the most important military asset – the technical



Photo and description: Jon G. Fuller/VWPics / Alamy Stock Photo. In an attempt to escape “overregulation, overlitigation, over-taxation,” Musk moved SpaceX headquarters from California to Texas in 2020, where he is now in the process of building what he hopes will be a fully autonomous city for SpaceX staff. To Musk, Texas – with its political ideals of radical self-governance – was the right place for experimenting with the innovative political entities of tomorrow. He has hinted at the prospect of trying to form his own “sovereign” or autonomous entity within Texas.

infrastructures that enable, access, distribute and shape communication. It also owns, designs, develops, and imagines the technologies behind the industrialization of, and geopolitical struggle over, outer space resources. And it independently meets with Western global opponents, has public opinions about Western global problems, and opposes Western global solutions and institutions.

At the moment Europe approaches commercial American tech by emulating its ideas or inviting it to advise on its own regulation. As the report has tried to show, continuing that strategy comes at Europe’s peril. Most importantly, the report has unpacked the risks of the tech-optimist and anti-regulatory agenda of commercial American space, namely:

- endangering space ecosystems with too rapid, too expansive, and too high-risk initiatives,
- deepening tech monopolies and widening global inequalities,

- disrupting American domestic politics, tilting the balance of power away from American federal institutions, and further eroding sovereign American decision making.

It is indisputable that the data and science that we acquire from space now plays a crucial role in our understanding, prediction, and navigation of climate change. If developed in cautious steps, and as a common tool, satellite-based knowledge could prove critical to halting the deterioration of Earth biosystems and embarking on a path of stewardship and repair. It is also possible, if not immediately likely, that the mining – and sharing – of space resources could be long-term developed in sustainable ways: justly and inclusively. But it is politically naïve to overlook and not plan for the already unfolding possibility of the opposite.



Who, in an era of contested models of liberal, bureaucratic governance, should own and govern space?

How to do that? This report has no simple or exhaustive recommendations. Its most salient advice is this: approach the increasingly powerful American space industry not as a market, but as an autonomous political and ideological actor. This involves more than having legal experts work out new regimes of regulation. More expansively, it means having a political vision of, and opinion about, space ecology, the pace and extent of the human use of technology, and the power relations between public governance organs and private commercial actors (Adler-Nissen 2023). European policymakers cannot regulate US space actors, nor dictate American industrial policies. But they can avoid blind emulation of their ideas. And they can abstain from inviting them to the table.

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