ASTROPOLITICS
https://doi.org/10.1080/14777622.2023.2196017

Routledge
Taylor & Francis Group

Outsourcing the American Space Dream: SpaceX and the Race to the Stars

Johan Eriksson [a] and Lindy M. Newlove-Eriksson [b]

[a]Södertörn University, Huddinge, Sweden; [b]Swedish Defence University, Stockholm, Sweden

ABSTRACT

Whereas the rise of private space entrepreneurship is indisputable, we contend that contrary to the "NewSpace" narrative, the development of privately owned and operated human spacefaring does not dispel or fundamentally alter the American space dream, but rather implies continuity of the narrative of America as the dominant global space power, specifically regarding a return to the Moon and with the explicit aim of colonizing Mars. Herein, we analyze the continuity of the American space dream and how it is expressed by public and private space actors, as well as being supported by popular culture, entertainment, and an active space enthusiast community. We maintain that the continuity of the American space dream as a unifying national narrative is facilitated by how private spacefaring is dependent on the U.S. Government's emphasis on the pivotal role of private space industry for space exploration. This dependent relationship provides incentives for private space entrepreneurs to share and leverage the established American space dream. The continuity of the American space dream is achieved through a prevailing, yet reconfigured, government-industrial complex.

Introduction

We challenge herein the claim that the emergence of private space entrepreneurship implies original new visions, as well as a takeover of previously government-led space exploration by private actors. By contrast, this paper argues that the rise of private space entrepreneurs – specifically within the United States, which is where such endeavors are most visible – implies continuation rather than a major break with the past, particularly with respect to human spacefaring beyond Earth orbit. We contend that the rise of SpaceX and other major private space entrepreneurs, which constitute "NewSpace", does not dispel or fundamentally alter the American space dream[1] in terms of vision, public support for funding,[2] and infrastructure. Rather, NewSpace advances all this.

CONTACT Johan Eriksson johan.eriksson@sh.se Department of Political Science, School of Social Sciences, Södertörn University, Sweden

To make this argument, we first scrutinize how privatization of space is perceived in contemporary space policy discourse. Thereafter, we review the American space dream and how it has played out in the context of NASA and space policy, something which is related to the classic American notion of "the frontier". We then examine SpaceX and how the currently most notable private space company furthers visions of the American space dream.

Two explanations for public-private continuity of the American space dream are suggested. First, the foundational significance of the American dream for national identity and unity, in which the space narrative of the final frontier is embedded, is discussed. Second, the prevailing space dream is in part due to the continued government dependency on public support for private human spacefaring through shared government funding and contracts carrying forward the U.S. space program. The leasing of national space infrastructure to private space companies, and public policy in support of outsourcing and public-private partnerships, uphold American aspirations in space in this context. The continued relevance of international space law, which places accountability of private spacefaring with hosting launch states, is a further factor. We conclude by summarizing observations and suggesting implications for theory and research on techno-optimistic visions and patterns of public-private power in a global context.

Space as a private affair

Privatization is regarded as a major structural change in contemporary governance, industry, and exploration of space.[3] Space is certainly no longer a bipolar domain, dominated only by two superpowers, but shared by 70 or more states with some form of space program – with an increasing number of states with space launch capacity. In addition, space technology and exploration are increasingly in the hands of private entrepreneurs. This development is often labelled "NewSpace", intended to highlight the structural change implied by the rise of private space entrepreneurs.[4] This trend is followed through annual fora and online journals, such as *New Space: The Journal of Space Entrepreneurship and Innovation*,[5] and *NewSpace Journal*.[6] NewSpace emphasizes that private space actors are no longer government contractors of state-run space programs, but also develop and operate their own spacecraft on a private basis that supplement, and even replace, once government-only human space exploration – what some observers refer to as a "game changer".[7] As the leader of Mars Society, one of the most significant space advocacy interest groups, Robert Zubrin, puts it,

> A new space race has begun. But the rivals in this case are not superpowers, but competing entrepreneurs. These daring pioneers are creating a revolution in spaceflight that promises to transform the near future.[8]

Notably, multi-billionaire space entrepreneurs Elon Musk, Jeff Bezos, and a handful of others enjoy support from enthusiasts across industry, government, academia, entertainment, and civil society. Their supporters consider Musk in particular as a visionary pioneer, arguably taking giant leaps not just in development of reusable and less costly spacecraft, but also in how he conceives of a interplanetary (Moon and Mars) human future in space.[9] NewSpace advocates, many found in space industry, parts of academia and the wider U.S. space enthusiast community, envision how these private entrepreneurs have realized a major shift away from bureaucratic, inefficient, overpriced and slow-moving NASA projects.[10] SpaceX in contrast to government-led projects, is viewed not only as fast-moving, innovative, risk-taking, and adventurous in human space exploration, but also as a promise of a new "Earth-independent" world – a peaceful human community and settlement based on science and engineering on the "final frontier".

Zubrin is one of the most outspoken and public advocates of this perspective, claiming that space colonization is necessary for the preservation and improvement of both culture and democracy.[11] There is undoubtedly a strong element of techno-utopianism in the NewSpace literature praising Musk and the other few "space barons", in that technology is seen as the solution to both the survival and betterment of humanity. Little to nothing is said about systems of governance and politics, how conflicts are to be handled, and how human rights are to be protected. In a similar optimistic fashion, Muegge and Reid address what they call "a profound change underway in the space industry" and go as far as considering Musk and SpaceX as exerting "entrepreneuring as emancipation", implying an ability to exert "autonomy, authoring, and the making of declarations".[12] In the words of Gary Martin, Director of Partnerships, NASA Ames Research,

> We are at a turning point in the history of space exploration and development. [. . .] The established state-run industrial space sector is no longer the only game in town.[13]

In effect, many observers claim a transfer of space power from public to private is taking place, particularly in the United States.[14] This power transfer is seen as occurring due to a combination of public and private dynamics, and decisions over the past 30 years. In the United States, critique of "wasteful", "inefficient", and "disastrous" NASA projects gained leverage in the U.S. Congress and in the news media.[15] This critique became particularly salient after the U.S. Space Shuttle Columbia and Challenger disasters. Adding to this, was the cancellation of the Space Shuttle program in 2011 due to on-going costs, safety, and supply management issues. Hence, the United States unilaterally shut down its independent capacity to send humans into space, and for the subsequent decade relied entirely on the Russian Soyuz for human spaceflight. Only in November 2020, when SpaceX became the first private enterprise in history to send humans to the International Space Station (ISS),

did the U.S. Government dependence on Russian space launch capacity end. When the Dragon-crewed capsule, owned and operated by SpaceX, docked with the ISS on 11 November 2021, history was made, arguably marking the shift from a state-centric to a commercialized, private space age punctuating the NewSpace narrative. Importantly, this development was possible due to NASA's Commercial Crew and Cargo Program and the associated Commercial Orbital Transportation Services program (COTS) partnership agreements for private space launches, which started in January 2006.[16]

In theoretical terms, we challenge the International Relations (IR) literature on the general rise of non-state actors and private authority in global affairs, which claims that state-centrism has plagued conceptualizations, and that contemporary international relations are characterized by fragmentation of power and pluralization of actors.[17] In contrast, our contribution offers a critique of the exaggerated interpretation of a general shift in narrative and in power, from public to private, providing an understanding of this relationship, particularly with respect to government-industrial complexes. From this perspective, prevailing state-dependency appears particularly evident in high-cost and high-risk megaprojects, the category to which human space programs belong. Without reverting back to the IR state-centric theory of Realism, which subjugates the power of non-state actors, this work offers a more nuanced perspective on the emergence of private space entrepreneurship. Specifically, this paper elaborates on the continued state-centered dependency for human spacefaring, both regarding vision and governance, even in an age of private space entrepreneurship.

American space dream

While the original U.S. space program was spurred by the early Cold War and the associated "space race" with the Soviet Union, the visions guiding it were connected to an earlier and wider narrative – American Dream. The concept of American Dream is the focus of broad literature, and though it seems to escape any exact definition, it is generally considered to have a strongly progressive and utopian character.[18] Lawrence R. Samuel suggests that American Dream, while mutable and amorphous, expresses a "perverse fascination" with "hope" and "change".[19] For Samuel, "it is the belief that tomorrow can and will be better than today that best defines the American Dream".[20] This is considered a core element of American identity and nation-building,

> Most of the keywords and concepts we associate with who we are as a people (pragmatic, resourceful, aspirational, optimistic, entrepreneurial, inventive) are all present in the orbit of the American Dream.[21]

"American Dream" is also present in motivations of the U.S. space program over the decades since its inception following World War II. According to

Samuel,[22] John Glenn's 1962 orbit around Earth confirmed American know-how and reassured American public faith in "the Dream". Optimistic adventurism and belief in overcoming obstacles, of making the impossible possible, are also present in U.S. President John F. Kennedy's famous "Moon speech" held at Rice University on 12 September 1962: "We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard".[23] In this speech, President Kennedy also connected the ambition to become "the world's leading spacefaring nation" with the establishment of colonies in America in the 1600s, thus explicitly associating the U.S. space program to reach the "final frontier" with the original frontier in the conquest of the Western United States.[24]

It is noteworthy how leading space enthusiasts in America continually strived to mobilize and maintain popular support for the U.S. space program – considered crucial as it implies massive costs – for funds that readily could have been spent on other policy objectives. Also, popular science texts and their production spelled out American visions of becoming spacefaring. Two key figures who popularized space for the American audience were engineer Wernher von Braun, and astronomer Carl Sagan. Both were associated with NASA's space program, communicating the goals of U.S. space policy to a wider audience.

German-born von Braun helped design and develop the V-2 rocket used by the Nazi regime during World War II. At the end of the war, von Braun and his team surrendered to U.S. forces and was recruited by the U.S. Army, becoming a U.S. citizen in 1955. In his work for the U.S. Army, von Braun directed the embryonic U.S. ballistic-weapon program. Later, von Braun led NASA's development of the Saturn space rockets, which were used when the U.S. reached its goal of being the first to place humans on the Moon on 16 July 1969.[25]

In the 1950s and onwards, von Braun was portrayed both in *Life* and *Time* magazines as a visionary genius, "bright-eyed with the dream that gave Germany its V-2 and the U.S. its first orbiting satellite".[26] It may seem surprising that von Braun, who had been a SS officer and member of the Nazi party, became a trusted leader within the U.S. space program. In fact, he was perceived as "Americanized", and he certainly spent time and energy on missionizing the American space dream, publishing several popular science texts on how and why the United States should go to the Moon and Mars, and further explore the universe. Among other ideas, von Braun proposed the development of a rotating wheel-shaped space station to provide artificial gravity, later known as a "von Braun wheel" (although the concept was first formulated by Russian scientist Konstantin Tsiolkovksy in 1903) – a concept which inspired Stanley Kubric's 1968 movie *2001: A Space Odyssey*. Wernher von Braun also published several ambitious proposals for a permanent lunar base, as well as for the colonization of Mars. Whereas von Braun was not the

first figure to suggest technologies for space stations and permanent missions to the Moon and Mars, he certainly became one of the most widely recognized. In his 1952 popular science book *Das Marsprojekt* (later translated into English as *The Mars Project*), he proposed a "an enormous scientific expedition" of 10 fully reusable spacecraft to be sent to the red planet, with as many as 70 astronauts accompanying at one time. Interestingly, von Braun claimed that such a large endeavor as a Mars mission required what is today often termed public-private partnership,

> Since the development of the long-range liquid rocket, it has been apparent that true space travel cannot be attained by any back-yard inventor, no matter how ingenious he [sic] might be. It can only be achieved by the coordinated might of scientists, technicians, and organizers belonging to nearly every branch of modern science and industry.[27]

While *Das Marsprojekt* focused on technical issues, such as what kind of spacecraft and propellant should be used, and how to find a landing spot, the book inspired both NASA projects and the popular imagination of going to Mars (for example, through cooperation with Walt Disney, leading to a handful of episodes on human spacefaring on the television show *Disneyland*, which aired in the 1950s). Wernher von Braun helped convey the idea that a human mission to Mars was both technologically feasible, and that it was a worthy strategic goal. His impact on subsequent planning of human spaceflight in general and U.S. missions to the Moon and Mars in particular cannot be underestimated.[28]

General arguments for a U.S. space program were stated early on and have been largely consistent over time. In a 1950s report from an expert panel commissioned by U.S. President Eisenhower, four reasons were stated (note that with the establishment of NASA as a civilian agency, defense-related space issues were left with the U.S. Department of Defense),

> (1) the compelling urge of man to explore and discover;
> (2) the defense objective for the development of space technology;
> (3) national prestige; and [. . .]
>
> (4)new opportunities for scientific observation and experiment which will add to our knowledge and understanding of the earth, the solar system, and the universe.[29]

In the 1980s, popularization of space continued with astronomer Carl Sagan. While Sagan was a productive scientist, with several hundred scientific articles published across several disciplines, like astronomy, astrobiology, and astrophysics, he rose to public recognition through popular science. Sagan wrote and narrated the television series *Cosmos: A Personal Journey*, which became the most widely watched television series in American history at that time, and which has been seen by 500 million people in at least 60 countries. In

comparison with von Braun, Sagan's approach was less technocratic and more focused on the search for extraterrestrial life, the vastness of the universe, and the possibility of human survival on other planets. Sagan also addressed politicized issues, including openly rejecting U.S. President Reagan's 1980s "Star Wars" program, and supporting the nuclear disarmament movement. In Sagan's work for NASA, he was part of the team behind the Mariner 1 and 2 missions to Mars.

Of particular importance for popularizing visions of human space travel, is Sagan's 1994 book *A Pale Blue Dot: A Vision of the Human Future in Space*, in which he wrote, "every surviving civilization is obliged to become spacefaring – not because of exploratory or romantic zeal, but for the most practical reason imaginable: staying alive". Since the 1950s, NASA has developed several human Mars mission plans, and within most of them the motive of "survival of humanity" certainly appears. These plans also emphasized the scientific endeavor focused on the search for life, understanding the nature of the universe; a romantic motive (American space dream) of the frontier-mindedness; and adventurous zeal of humanity to go where no one has been before.

What then, are the visions presented in NASA plans for sending humans to Mars? Notably, even prior to the establishment of NASA in 1958, proposals for Mars missions existed in the American space community. Yet, it was particularly with the formation of NASA that such plans took genuine shape. A 2001 report documenting NASA human Mars mission plans from the 1950s until 1970 stated that since its inception NASA has maintained the idea of human Mars missions as an important long-term goal; the "one major goal that has yet to be met".[30] While the focus of NASA's human space mission planning originally was on going to the Moon, which was accomplished in 1969, the long-term goal of placing humans on Mars prevailed, and plans for how to do it continued to be developed, even when funding and political will for it was lacking. Whereas the American-Soviet race to the Moon was real and explicitly stated, there never really existed any race to Mars, even if robotic expeditions were launched, and technical feasibility plans for human missions continued to be developed. As is well documented, once the Apollo Moon missions ended in 1972, the U.S. human spacefaring program changed its focus to Earth-orbiting spacecraft (Space Shuttle program, 1972–2011), and space stations (Skylab 1973–1979, and the multinational ISS, since 1984).

It is noteworthy that while NASA maintained the monopoly of launching spacecraft and sending humans into space until SpaceX was licensed and contracted to do so, NASA has always worked with private aerospace contractors on design, innovation, and feasibility studies for a number of space projects. Several early contractors are still in business with NASA, including General Dynamics, Boeing, and Lockheed Martin.[31] For example, on behalf of

NASA, Lockheed Martin designs and manufactures the new Orion crew module.[32]

SpaceX and American space dream

The vision of space exploration and human spaceflight expressed by SpaceX and founder Elon Musk himself is key for demonstrating the pattern of continuity of the American space dream, both in form and content. Unpacking the contemporary governance of American space exploration is enabled by analysis of SpaceX and its relations with NASA and the U.S. Government, showing a public-private partnership and procurement of commercial services, where NASA buys private space services as a customer, where NASA buys private space services as a customer.

Elon Musk has repeatedly stated the ultimate goal of SpaceX, the very reason why he founded the company, is to "make humanity multiplanetary".[33] Indeed, the mission statement of SpaceX – a primary NASA partner – reads that the company was founded in 2002 to "revolutionize space technology, with the ultimate goal of enabling people to live on other planets".[34] Musk has provided a few different reasons for permanent space settlement, but the primary reason given is simply survival, rather than adventurism or scientific exploration,

> I think there are really two fundamental paths. History is going to bifurcate along two directions. One path is we stay on Earth forever, and then there will be some extinction event. I do not have an immediate doomsday prophecy, but eventually, history suggests, there will some doomsday event.

The alternative is to become a space-bearing civilization and a multiplanetary species, which I hope you agree is the right way to go.

So how do we figure out how to take you to Mars and create a self-sustaining city – a city that is not merely an outpost but that can become a planet in its own right, allowing us to become a truly multiplanetary species.[35]

Whereas the motive of survival may seem dystopic, Musk also motivates his ambition to colonize Mars in more romantic, optimistic words. As stated on the official SpaceX website,

> You want to wake up in the morning and think the future is going to be great – and that's what being a spacefaring civilization is all about. It's about believing in the future and thinking that the future will be better than the past. And, I can't think of anything more exciting than going out there and being among the stars.[36]

Among Musk's most ambitiously stated goals is to have a population of one million "Martians" by 2050, sending several SpaceX Starships every week.[37] Musk's oft-stated vision is thus not simply to establish a small

permanent outpost on Mars, but to build an Earth-independent Martian society. Notably, Musk, like other space entrepreneurs and NASA, direct much energy at clarifying how to reach and survive deep space, and how life should be organized once there.

Musk has also stated that he would prefer some form of direct rather than representative democracy on Mars, dispensing of the "coercion of politicians" and conflicts between "interests", claiming that Mars represents an opportunity to "rethink the whole nature of government, as was done in the creation of the United States in the 18th century".[38] This kind of romanticism is also reflected in how Musk's persona has been characterized in the media, and indeed in some scholarly work – as the real-world's Tony Stark, i.e., the Marvel fictional multi-billionaire who built himself a rocket-powered armored suit allowing him to fly like Superman.[39] Indeed, Musk himself does not shy away from flirting with fiction and pop culture. Notably, he had a red convertible Tesla car sit on top of one of his SpaceX rockets, with an astronaut doll at the steering wheel, blasting David Bowie's *Starman* on the car stereo in the vacuum of outer space.[40]

How then, does the SpaceX narrative compare with the spacefaring visions of NASA? The answer is that there are distinct similarities, both with contemporary, as well as past U.S. space policy and NASA mission plans. Former U.S. President Obama, speaking at the Kennedy Space Center on 15 April 2010, made an explicit reference to well-known themes of the American Dream,

> For me, the space program has always captured an essential part of what it means to be an American – reaching for new heights, stretching beyond what previously did not seem possible. And so, as President, I believe that space exploration is not a luxury, it's not an afterthought in America's quest for a brighter future – it is an essential part of that quest.[41]

The visionary difference that can be observed between SpaceX and NASA concerns mainly the more outspokenly ambitious goal of SpaceX in building a society on Mars. This is not contradictory to what NASA has stated, although the words of the agency tend to be less majestic; whereas Musk speaks of building a Martian society, NASA states that a goal is to expand human presence in space, including on Mars. The 2015 NASA "Journey to Mars" mission plan, which outlines goals set by a bipartisan NASA Authorization Act, and the 2010 U.S. National Space Policy, stated the following,

> Why Mars? Mars is the horizon goal for pioneering space; it is the next tangible frontier for expanding human presence. [. . .] Together with our partners, we will pioneer Mars and answer some of humanity's fundamental questions: Was Mars home to microbial life? Is it today? Could it be a safe home for humans one day? What can it teach us about life elsewhere in the cosmos or how life began on Earth? What can it teach us about Earth's past, present, and future?[42]

NASA's "Journey to Mars" plan also states that "Mars is an achievable goal", since the red planet has already been reached with "wildly successful robotic explorers".[43] Based on experience from the ISS and through the development of new spacecraft, such as the Space Launch System (SLS) and the Orion human spacecraft, NASA is sending humans first to the Moon by 20,204–2025 (i.e., the Artemis project), and then to Mars in the following decade, using a lunar base as a stepping stone into deep space. Obstacles are acknowledged, but seen as inspiring rather than impossible,

> There are challenges to pioneering Mars, but we know they are solvable. We are developing the capabilities necessary to get there, land there, and live there.[44]

Hence, the familiar American Dream themes of frontier-minded optimism and making the impossible possible prevail in contemporary U.S. space policy are adopted and expanded upon by major U.S. private space entrepreneurs, in particular Elon Musk and Jeff Bezos.

Further, it is certainly not only private space entrepreneurs that make use of popular culture and public opinion to promote their own visions. For example, NASA's "Journey to Mars" mission plan was released simultaneously with the Hollywood movie *The Martian*. On its website, NASA states that it provided guidance on production design and technical consultancy for *The Martian* and displays pictures from the movie, as well as provides links to NASA's real Martian projects.[45] Moreover, in 2020, it was announced that NASA had agreed to have a fiction movie made at the ISS, starring Tom Cruise.[46] This NASA-Hollywood production was beaten by Russia, however, which in October 2021 completed shooting a fiction movie called *Challenge* onboard the ISS, starring Russian actor Yulia Peresild.[47] This could be interpreted as a new, but different kind of space race, one that not only makes use of and inspires science fiction, but effectively blurs the boundary between science and fiction. The science-popular culture interface is not a novel one; it is prevailing feature in the promotion of American spacefaring from von Braun, Sagan, and to more present times with NASA and private space entrepreneurs.[48]

Explaining the prevailing space dream: mythology and policy

Having demonstrated that the vision of SpaceX coincides with and continues that of NASA rather than replacing it with something novel, the question that begs an answer is why? Why do new private space entrepreneurs carry forward the American space dream, in terms of national pride and adventure, rather than in terms of expressing private interests, such as profit-making and achieving market-leading status?

We suggest two explanations for the continuity of the American space dream in this new age of outsourcing and privatization. First, we look at the

foundational significance of the American space dream for American identity and unity. Second, we explore the continued dependency on public, governmental support for private spacefaring in terms of funding, infrastructure, and in public policy.

Pervasiveness of the American space dream

The American space dream of conquering and colonizing the "final frontier" persists, rather than being replaced by something else via NewSpace entrepreneurs, such as Elon Musk. Space industry, both new and long-established, tap into this mythos of the dream, take advantage of it, and espousing and conveying belief in it. Moreover, private entrepreneurs taking on the role of *avant-garde* is neither alien nor new to the American dream. Indeed, public-private partnerships are a core element of the American dream, on Earth, as well as in space.

For example, the U.S. Western frontier was conquered by hunters, fur-traders, and settlers; adventurers colonizing territories and building new communities in foreign lands. These actors were not representing "the state", but many of them received license and contracts from public authorities to colonize America. Similarly, SpaceX and a few other successful private bidders assist in carrying out the American dream of colonizing outer space. Whereas the new lands to be conquered are most likely uninhabited with the possible exception of microbes, or do not show any signs of indigenous life at all, ideas and rhetoric used to mobilize the colonization of space have remained largely unchanged since the times of Earthly colonization.

Private spacefaring depends on public support

In addition to the foundational nature of the American space dream, which continues to be endorsed by NASA and the U.S. Government, private advocacy for the dream can be explained by how private space industry relies on public funding, public infrastructure, and public policy. Our contention is that while private space industry has certainly flourished over the last 20 years, and some corporations including SpaceX have successfully developed new spacecraft and launched multiple missions, SpaceX nonetheless largely depends on public funding, governmental space infrastructure, federally employed astronauts and staff, and on policies and laws that make private space travel legal.

In the words of McCurdy, "Perpetually short of investment capital, Elon Musk used government awards to enlarge the value of his firm and attract more private investors".[49] Since its inception in 2002, SpaceX finance has relied on a combination of commercial satellite services, private investments, and government funding. Yet when it comes to human spacefaring, and deep space missions, it is still largely a matter of government contracts. Notably,

SpaceX raised capital and won NASA contracts for both cargo and crew transports to the ISS. Later, in 2021, SpaceX won the $2.9 billion U.S. dollars (USD) contract to use its new reusable Starship spacecraft for NASA's Artemis mission to the Moon.[50] SpaceX is valued at $100 billion USD as of October 2021 making it one of the most highly valued companies in the world; by way of comparison, the 2022 NASA budget is at just below $25 billion USD.[51]

SpaceX is dependent on U.S. space infrastructure, particularly three main governmental launch sites leased by SpaceX – at Kennedy Space Center and Cape Canaveral, both in Florida – and Vandenberg Space Launch Complex in California. SpaceX has thus far one major launch complex, Brownsville South Texas Launch Site, which they own and operate. With respect to human spacefaring, SpaceX has accomplished one private human spaceflight missions, and sent both NASA astronauts and private astronauts to the ISS, the latter in liaison with Axiom space corporation. SpaceX also has plans for sending additional private civilians into space, including Japanese billionaire Yuzaka Maesawa and eight selected companions going on a Moon fly-by mission of space tourism scheduled for 2023 into 2024 depending when SpaceX Starship is operational.[52]

In addition to public funding and reliance on governmental space infrastructure, SpaceX and other aerospace corporations, such as Axiom Space, Blue Origin, Lockheed Martin, and Boeing would not have been able to reach space without public policies supporting their endeavors and legal changes that made private space projects legally possible. Industrial contractors have always played a crucial role in the U.S. space program and public policies encouraging private enterprise in space have existed throughout the space age. However, a notable change came with the Obama Administration, and the space policy that declared that human spaceflight must rely on spacecraft designed, manufactured, and operated by the commercial space industry, especially through various commercial cargo and space launch programs.[53] Since then, U.S. authorities have licensed private space launches.

Ultimately, the U.S. Government is legally accountable for whatever private space companies and their employees are doing in space. Yet, private space companies are accountable to the U.S. Government through licensing laws that align with national and international laws. All this is stated in Article VI of the Outer Space Treaty, the main international legal framework for space activities,

> States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the

Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.[54]

Conclusion

This paper demonstrates that the emergence of the NewSpace commercial space enterprise implies continuity, rather than systemic change, particularly with regard to human spaceflight and deep space exploration. The American Dream of making the impossible possible, and conquering all frontiers has been expressed in starkly similar words since the inception of the space age in the 1950s. Likewise, while private space enterprise has made much technological and economic progress since the U.S. Space Shuttle program was cancelled in 2011, particularly through design and manufacture of cheaper and reusable spacecraft, private space industries remain dependent on the U.S. government. This dependency – again particularly noticeable with respect to human spacefaring – is conditioned by public contracts generating funding, reliance on governmental launch sites, and governmental policy supporting and licensing private space launches. Consequently, the NewSpace narrative of a tremendous rise in private space authority needs to be replaced with a more nuanced understanding of the government-industrial space complex, which continues to display a considerable degree of continuity.

More generally, we suggest that the literature on private authority and fragmentation of state power in world affairs is based on far too sweeping generalizations. Further research should apply theory more thoroughly to look for explanations of prevailing governmental power in space, and explore under what conditions private space authority might become the stronger party. Moreover, further research should also take a more systematic and comparative look at the wider space industrial complex, in the United States and beyond. Approaches to public-private partnerships are not necessarily the same in all cases in determining whether human spacefaring is led by private or public actors. In addition, further research should scrutinize the motives and visions of national space agencies and entrepreneurs to assess patterns of continuity and change. It is suggested that this can be discovered through personal interviews, participant observation, and systematic analysis of public statements.

Notes

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Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The work was supported by the Östersjöstiftelsen [3148-3.1.1-2017].

ORCID

Johan Eriksson http://orcid.org/0000-0002-1526-0521
Lindy M. Newlove-Eriksson http://orcid.org/0000-0002-4249-4518