#### Prefer comparative worlds

#### 1] Reciprocial Burdens- Under their paradigm for debate, the negative can just criticize the affirmative while the aff has to defend that they are perfect—that’s unreciprocal. Reciprocity is key to fairness because it allows both debaters an equal chance of winning and makes sure the debate is structurally fair. Structural fairness is good for debate because it is the only way that we can both have an equal chance at winning the round, which is key to people staying in debate. Debate is a pre-requisite to any other voter. 2] Topical Education- a truth testing position is more philosophically or definitionally based—it rejects the truth of the resolution instead of discussing why the resolution is good or bad. Truth testing advocates for more philosophical and less topical education. Topical education is more important than philosophical education because we are given a resolution to debate about it, not about philosophy. Education is key to debate because that’s why we are here; debate is an activity paid for by schools for students to learn.

### T – Appropriation

#### Interpretation: Ownership of and right to use extraterrestrial resources is distinct from ownership of real property. The affirmative must defend that states ought to ban sovereignty over real property in outer space.

Pershing 19 (Abigail D. Pershing is a Robina Fellow at European Court of Human Rights. Graduate of UChicago in Sociology, Public Policy and Yale Law School.), “Interpreting the Outer Space Treaty’s Non-Appropriation Principle: Customary International Law from 1967 to Today”, The Yale Journal of International Law, Volume 44, Issue 1, 2019, pg. 161, <https://openyls.law.yale.edu/bitstream/handle/20.500.13051/6733/Pershing.pdf?sequence=2> NT

In contrast to earlier legal theory that denied the possibility of appropriation of any space resources, **scholars now widely accept that extracting space resources from celestial bodies is a “use” permitted by the Outer Space Treaty** and that extracted materials become the property of the entity that performed the extraction.80 Stressing the fact that the Treaty does not explicitly prohibit appropriating resources from outer space, other authors conclude that the use of extracted space resources is permitted, meaning that the new SPACE Act is a plausible interpretation of the Outer Space Treaty.81 However, scholars have been careful to cabin the extent to which they accept the legality of appropriation. For instance, although Thomas Gangale and Marilyn Dudley-Rowley acknowledge the legality of private appropriation of extracted space resources, they nonetheless emphasize that **“[o]wnership of and the right to use extraterrestrial resources is distinct from ownership of real property” and that any such claim to real property is illegal.**82 Lawrence Cooper is also careful to point out this distinction: “[t]he [Outer Space] Treaties recognize sovereignty over property placed into space, property produced in space, and resources removed from their place in space, but ban sovereignty claims by states; international law extends this ban to individuals.”83

#### So, The ost treaty says that property is something placed into space, property produced in space, and resources removed from their place, and names are none of these.

#### Standards – The aff merely defends banning distribution of the right to sell names, which is not sovereignty over property in space.

#### 1] Limits – the aff explodes limits because now they can ban actions that aren’t appropriation and just extraction – their interp justifies affs about space resource mining, space-based nuclear power, resource conflict, satellites, and cooperative space exploration like the ISS. At best, their aff is extremely unpredictable because of non-T advantage areas, and at worst, it’s extra-T because the aff defends banning appropriation but also mining, allowing them to solve DAs about space innovation and tech by circumventing links and solving internal link chains. Unpredictable limits controls the internal link to every other standard – the neg can’t predict and prep for every non-T aff about actions that aren’t appropriation – there are no universal neg generics that apply – this abuse o/w on magnitude since that explodes the number of 7-minute case negs the neg needs to have even game against this aff.

#### 2] Prefer our interpretation – hold the line in the 1AR and force them to find a comparative counter-interp like ours that clearly demarcates what is topical and what’s not. Ours o/w on precision and solves predictability.

#### DTD on T – the debate shouldn’t have happened if they were abusive

#### Competing Interps on T since its binary and a question of models – Good enough isn’t good—there can be no reasonable interp of what the topic actually means

#### No RVIs on T – 1] Illogical—T is a gateway issue, winning T is meeting a baseline to have the debate to begin with 2] T is reactionary, they shouldn’t win for meeting their preround burden 3] Forcing the 1NC to go all in on theory kills substance education and neg flex—o/w on real world

#### Treaties are normal means for establishing necessary multilateral space iLAW [0:19]

* Space is historically unregulated because no country has a jurisdictional claim in space
* The only way states have made large multilateral legislation is through treaties to standardized norms
* Countries view multilateral norms as necessary to prevent space conflict

Goguichvili et al 21 (Sophie Goguichvili is a Program Associate with the Science Technology and Innovation Program, working on space, cybersecurity, 5G, and artificial intelligence policy. Sophie is particularly interested in the shifting role of technology and how it will influence the future of conventionally resilient democratic nations. Previously, she interned in the Office of the Director, President, and CEO at the Wilson Center, where she researched and drafted memoranda on contemporary topics in international affairs and national security. She received her BA in International Studies from the School of International Service at American University. Sophie is a native speaker of Georgian and has attained full professional proficiency in French. Other listed authors are Alan Linenberger and Amber Gillette.), “The Global Legal Landscape of Space: Who Writes the Rules on the Final Frontier?”, Wilson Center, <https://www.wilsoncenter.org/article/global-legal-landscape-space-who-writes-rules-final-frontier> NT

The Five UN Space Treaties **As previously mentioned, a series of treaties adopted by the U.N. General Assembly (UNGA) form the foundation of the global space governance system**. The first and most significant of these treaties is the “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and Other Celestial Bodies,” more commonly known as the Outer Space Treaty or OST for short (1967). The Outer Space Treaty is considered the most comprehensive space treaty and provides the basic framework for international space law, namely: the exploration and use of outer space for peaceful purposes by all States for the benefit of mankind (Art. I); the outlaw of national appropriation or claims of sovereignty of outer space or celestial objects (Art. II); a ban on the placement of weapons of mass destruction in orbit or on celestial bodies (Art. IV); that astronauts should be regarded as the envoys of mankind (Art. V); and that States are required to supervise the activities of their national entities (Art. VI). Although the Outer Space Treaty is the cornerstone of international space regulation (with 111 ratifications and 23 signatories), gaps in governance were evident immediately after its adoption. The primary weakness of the OST is that it only addresses the non-placement of weapons of mass destruction and not conventional weapons in space. While placing a weapon in space would be deemed an act of war universally, the OST’s lack of scope is particularly important in the modern-day context where ground-based weapons such as anti-satellite (ASAT) weapons exist to target space assets. The OST’s vague language about how states manage their space resources raises additional issues, as States have taken it upon themselves to define terms based on their own national priorities and interests. Besides competing national priorities and interests in space, many definitions of terms were written before space technologies advanced. Definitions of “space weapon,” “defensive” or “peaceful” use of outer space, and “astronaut” have all evolved and changed since the original treaty was written. To supplement these gaps, four additional treaties were created, but were largely unsuccessful in garnering enough support and mitigating the deficiencies of their predecessors. Expanding on Articles 5 and 8 of the OST, the second foundational U.N. space treaty “The Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space'', termed the Rescue Agreement (1968), states that States must take measures to rescue and assist astronauts in the event of an accident, distress, or emergency landing, and return them to their launching state in addition to assisting launching states with recovering space objects that return to the Earth outside the native state of launch. Even though the Rescue Agreement is clear on the status of astronauts as “envoys of mankind,” an opportunity for other States to test the Agreement’s efficacy—or assist an astronaut in distress has not yet occurred to help when one state’s astronauts or cosmonauts were in distress. The third foundational U.N. space treaty, “Convention on International Liability for Damage Caused by Space Objects,” termed the Liability Convention (1972), outlines the liability of Launching States for damage caused by their space objects both on the Earth or in space as well as procedures for the settlement of claims for damages endured. This means that states remain responsible for any space assets launched from their territory, which infers that the same states are liable for any damages should there be an accident. According to the Liability Convention, claims against damage or destruction are brought by a state against a state, irrespective of who caused the incident, whether it was a commercial actor or a State space agency. According to most national legal instruments, an individual or an industry could initiate a lawsuit against another individual or industry, but regarding international space law, the Liability Convention determined that states are ultimately responsible even if an incident is caused by a private actor. The Liability Convention has only been invoked one time, in 1978, when the USSR’s Cosmos 954 satellite accidentally reentered Earth’s atmosphere, scattering around 50 kg of radioactive uranium-235 over northern Canada. Although this area was sparsely populated, several residents were accidentally exposed to radiation before a major recovery campaign succeeded in sweeping a total area of 124,000 square kilometers over the course of almost one year (Karacalıoğlu, 2014). Since the 1950s, debris have been accruing in space. NASA estimates there are roughly 22,000 objects larger than 10cm in diameter in near-Earth orbit. The Liability Convention outlines the liability of Launching States for damage caused by their space objects both on the Earth or in space. Credit: NASA/JSC/Orbital Debris Program Office The fourth treaty, “Convention on Registration of Objects Launched into Outer Space,” termed the Registration Convention (1976), has a straightforward objective of registering space objects. Building on Article VIII of the OST which deals with the registration and jurisdictional aspects of launched outer space objects, the Registration Convention states that launching States must maintain a registry of their space objects and provide the U.N. with information on the objects they launch into outer space. This treaty is important from the standpoint of both the Rescue Agreement and the Liability Convention in that without the registration of space objects, no State could ever be held accountable should an incident occur. Its purpose, therefore, is to identify which State’s object it was, as well as to fix liability and compensation on states for damage or destruction. The fifth treaty, “The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies,” termed the Moon Treaty (1984), has received the least support by Member nations for its reaffirmation and elaboration of Outer Space Treaty provisions in the context of appropriating and exploring the Moon and exploiting its resources. The Moon Treaty states that the Moon shall be used by all states “exclusively for peaceful purposes,” and that “(A)ny threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited.” Additionally, it prohibits the placement or use of weapons of mass destruction (WMD) on the Moon, as well as the “establishment of military bases, installations, and fortifications, the testing of any type of weapons and the conduct of military maneuvers” (U.N. Office for Disarmament Affairs, 1979).

## CP

#### Text: The United States federal government should propose that it will say it is unjust for private agencies to appropriate outer space by asserting the right to name bodies in space and then selling those naming rights to customers, as practiced by the firms described in the case, but in a genuine, bilateral, and binding consultation process with the North Atlantic Treaty Organization and support the proposal throughout the consultation process.

#### The counterplan is legitimate – ‘resolved’ implies immediate, unconditional adoption of the plan.

#### The aff wrecks NATO – historical examples prove ilaw is wrecked with sudden announcements with no prior consultation

Dempsey 16 – Judy Dempsey is a nonresident senior fellow at Carnegie Europe and editor in chief of Strategic Europe. (“From Suez to Syria: Why NATO Must Strengthen Its Political Role,” 12-8-16, [https://carnegieeurope.eu/2016/12/08/from-suez-to-syria-why-nato-must-strengthen-its-political-role-pub-66370, accessed 3-10-21)](https://carnegieeurope.eu/2016/12/08/from-suez-to-syria-why-nato-must-strengthen-its-political-role-pub-66370,%20accessed%203-10-21))//kel$

Divisions over this issue are not new. NATO has always been plagued by disagreements about whether it should have a political role. “NATO’s future was assured only when the Allies demonstrated its continued vitality as a military instrument in a new strategic environment, dealing with non-Article 5, out-of-area contingencies,” Frédéric Bozo of the University of Nantes argued over a decade ago. “In the absence of such a demonstration, seeking to rejuvenate NATO at the time by ‘politicising’ the organisation would simply have led to the creation of a [talking] shop.”9 Another talking shop is exactly what the Three Wise Men’s report wanted to avoid, because the authors knew that it would not address the need for genuine and transparent political discussions and consultations. It was the lack of consultation and the scant regard for smaller members of the alliance before and after the Suez Crisis that threw open the question of a political role for NATO. It seemed that some allies were more equal than others and could pursue their own military agendas. As the report stated, “a member government should not, without adequate advance consultation, adopt firm policies or make major political pronouncements on matters which significantly affect the Alliance or any of its members, unless circumstances make such prior consultation obviously and demonstrably impossible.” The Suez Crisis rocked the credibility of the alliance. It also left France and Britain with fundamentally different perceptions about the roles of the United States and NATO. “The UK learned to never leave the side of the United States. . . . The French learned to never trust the British nor rely on the Americans,” Daniel Keohane of the Center for Security Studies in Zurich has argued.10 And the crisis damaged NATO unity at a time when the alliance was involved in a military and ideological confrontation with the Soviet Union. The Three Wise Men’s report was published just two months after the Kremlin sent Soviet troops into Budapest to crush the anti-Communist Hungarian Uprising. The foreign ministers who authored the report pulled no punches about the atmosphere in the alliance after the Suez Crisis. “The practice of consulting has not so developed in the NATO Council as to meet the demands of political changes and world trends,” they wrote. “The present need, therefore, is more than simply broadening the scope and deepening the character of consultation. There is a pressing requirement for all members to make consultation in NATO an integral part of the making of national policy. Without this the very existence of the North Atlantic Community may be in jeopardy. . . . There cannot be unity in defence and disunity in foreign policy.” Strong words, but did they have an enduring impact?

#### Space policies like the aff are a key sticking point for NATO – consultation necessary to resolve disputes inside NATO

NATO 21[12-2-2021 “NATO’s approach to space” https://www.nato.int/cps/en/natohq/topics\_175419.htm]

Space is a dynamic and rapidly evolving area, which is essential to the Alliance’s deterrence and defence. In 2019, Allies adopted NATO’s Space Policy and recognised space as a new operational domain, alongside air, land, sea and cyberspace. This policy guides NATO’s approach to space and ensure the right support to the Alliance’s operations and missions in such areas as communications, navigation and intelligence. Through the use of satellites, Allies and NATO can respond to crises with greater speed, effectiveness and precision. © SpaceX Starlink Mission **Space is increasingly important to the Alliance's and Allies' security and prosperity**. Space capabilities bring benefits in multiple areas from weather monitoring, environment and agriculture, to transport, science, communications and banking. The information gathered and delivered through satellites is critical for NATO activities, operations and missions, including collective defence, crisis response and counter-terrorism. In 2019, Allies adopted a new Space Policy and declared space an operational domain. NATO remains a key forum for Allies to share information and coordinate activities on various space-related issues. Space is becoming more crowded and competitive, and satellites are vulnerable to interference. Some countries, including Russia and China, have developed and tested a wide range of counter-space technologies. NATO Allies have condemned Russia’s reckless and irresponsible anti-satellite missile test of 15 November 2021. NATO's approach to space will remain fully in line with international law. In October 2020, Defence Ministers decided to establish a NATO Space Centre at Allied Air Command in Ramstein, Germany. At the 2021 Brussels Summit, NATO recognised that attacks to, from or within space present a clear challenge to the security of the Alliance and could lead to the invocation of Article 5 of the North Atlantic Treaty.

#### NATO is key to resolving rising security challenges – *US leadership is key*

**Weinrod**, former presidentially-appointed US national security policy position in US DOD and on Capitol Hill, January 15, **2016** (Bruce, “We Still Need NATO,” <https://www.the-american-interest.com/2016/01/15/we-still-need-nato/>) DR

**Strong U.S. leadership is needed to reinvigorate this essential alliance.** Since the collapse of the Soviet Union, critics have questioned U.S. membership in and support for the North Atlantic Treaty Organization (NATO). They have argued that NATO successfully accomplished its original Cold War mission and thus is no longer needed. The charge that NATO is obsolete, however, overlooks the fundamental importance to U.S. international security interests of a standing multilateral organization with strong and flexible core military capabilities that can be calibrated to respond both to a wide range of 21st-century security challenges and the recent resurgence of Russian expansionism. That said, U.S. administrations over the past quarter-century, and their counterparts in most of the major European allied states, have allowed significant military deficiencies to develop within NATO. Some of these deficits reflect a growing political dis-alignment among the allies in the absence of a Soviet adversary, some of them are the product of excessive thrift in service of welfare-state budgets, and others are the result of old-fashioned neglect and lack of leadership. Whatever the mix of reasons, the true test for NATO’s relevance in the coming months and years will be whether NATO member-states provide sufficient resources to deter or if necessary prevail against significant threats such as Russia now presents, as well as to fulfill its other important missions. If the member-states, and especially the United States, fail this test, they will pros1vide an opening for those who argue that the United States need not and should not be in the business of supplying global common security goods. This would be a very unfortunate outcome, as it could undermine the ability of the United States to protect its vital interests.

### NATO Says Yes

#### NATO will say yes – they’re walking *a fine line* and *wants to appease the US*

Smith, Writer at Foreign Policy, 04-02-19 (Julie, “NATO Needs Solidarity for Its 70th Birthday,” <https://foreignpolicy.com/2019/04/02/nato-needs-solidarity-for-its-70th-birthday-trump/)//EF>

**The United States plays a unique role in NATO.** Part of that role should include pushing allies to meet their defense spending targets. But working on NATO issues for Defense Secretaries Robert Gates and Leon Panetta taught me that the U.S. role stretches far beyond that. As the only NATO ally with a global posture and the capabilities to match, the United States, for its part, must alert allies to new threats, push the alliance toward innovation, and help maintain unity across the members**. When the United States abdicates those other important leadership roles, NATO starts to stall.** For Pompeo, a more effective approach than admonishment **would be to issue a call for a return to NATO solidarity**, **which must always begin with the United States**. Then, to showcase Washington’s commitment, Pompeo could announce that the State Department and Pentagon officials who were tasked with calculating a bill for allies hosting U.S. troops have been told to stop work. **That would send a strong message to NATO allies. Pompeo should also back off from Trump’s holier-than-thou approach** on defense modernization, **admit that waging future war will require new ways of thinking that can’t yet be found on either side of the Atlantic**, and remind allies that the best solutions to tomorrow’s challenges start with everyone uniting over a **common purpose.**

# JF22 – DA – Space Heg

#### US Space Exploration key to maintaining heg and preventing Chinese dominance

**Fisher 21**, Richard. [Richard D. Fisher, Jr. is a senior fellow with the International Assessment and Strategy Center.] “In Space, China Seeks Galactic Hegemony - Center for Security Policy.” *Center for Security Policy*, 25 Mar. 2021, <https://centerforsecuritypolicy.org/in-space-china-seeks-galactic-hegemony/>. [GHS-AA]

For the leadership of the Chinese Communist Party (CCP) the main goal for its investments in outer space is as simple as it is portentous: victory. As the CCP has set the goal of having the dominant military power on Earth by 2049, it also wants to be the dominant terrestrial power in space. In the mid-1980s, former CCP leader Deng Xiaoping charged China’s technologists with devising a path to space. From its beginning, China’s space program has been controlled by the CCP’s People’s Liberation Army (PLA), yielding dual-use benefits from its unmanned and manned programs. In 1989, the CCP survived the only significant internal challenge to its rule — from a national upsurge of democracy and accountability protesters fueled by a growing knowledge of the West’s freedoms — culminating in the Tiananmen Massacre. In the aftermath, the CCP decided regime survival required reform for rapid growth at home, and the status gained from power projection abroad — not only domination of Eurasia, but a global capacity to match its main rival, the U.S. By 1992 or thereabouts, the CCP appears to have also decided that hegemony on Earth was insufficient; it had to achieve hegemony over the heavens as well. That year, the “921 Program” set out three major goals: devise working rocket transport to space; begin exploration of the Moon; and build a large space station. In 1999 China had launched its 3-passenger Shenzhou spaceship, a modified copy of the Russian Soyuz, and by 2020 it had tested its 6-passenger successor. China launched its first Moon fly-by Moon probe Chang’e-1 in 2007; its first Moon lander Chang’e-3 in 2013, and the Chang’e-5 Moon sample-return mission was completed in December 2020. In April 2021 China is expected to launch its first module of its Tiangong three-crew space station to be completed in 2022. By 2021, a little over three decades from its beginnings, China turned a space program intended to match that of Russia and the U.S., into a space strategy designed to ensure that the CCP dominates the coming age of the “Space Economy,” that in turn will determine political-economic preeminence on Earth. The CCP has decided that investments in space power will become a primary engine for scientific discovery and technological breakthroughs to sustain China’s dominant economic power on Earth. Like many other nations, the CCP realizes that for coming generations, leadership and dominance of the “Space Economy” will determine primacy on Earth. Numerous reports and statements by Chinese government space and space industry officials have revealed that in the 2020s and beyond China’s space program will grow exponentially, to occupy the Moon, then Mars, nearby asteroids, and to the moons of Jupiter by the mid-2030s. To achieve these goals China will build its Long March-9 super heavy-lift space launch vehicle (SLV) that can loft 140 tons to Low Earth Orbit (LEO) and perhaps over 200 tons with later versions. There will eventually be “reusable” versions of this SLV, providing competition to the Starship of the U.S. private sector SpaceX Corporation. By 2040 China plans to master space nuclear propulsion powerful enough to halve the time needed for Chinese to reach Mars and Jupiter. Chinese state media reports that 60 Long March-9 SLVs could be built between 2030 and 2035. About 40 of these could allow China to select the ten best locations to build Moon Bases with long-term habitats and equipment to mine water-ice and other minerals. This will allow China to begin the business of producing oxygen, rocket fuel, and to start building new space infrastructure such as massive solar power gathering satellites. With these, China might achieve energy independence, or become an energy exporter to client states supporting the CCP’s hegemonistic ambitions. To dominate the Moon, Chinese sources indicate the PLA-controlled space program will deploy a constellation of navigation and communication satellites around the Moon. Chinese sources also say the Moon will be used to observe the Earth, or more precisely, which they do not say, track all of the crucial satellite systems in between that contribute to America’s current margin of military superiority. China’s moon program will then extend to the Lagrangian Points –the five regions of balanced gravitational forces around the Earth and Moon which allow the more fuel-efficient placement of observation and communication satellites or manned outposts. These can help monitor and control the “Earth Moon System,” and control who benefits from the Space Economy. With its Tianwen-1 Mars probe expected to land this June, China will be the first country to simultaneously deploy a Mars orbiting satellite, a Mars lander, and a Mars rover to explore its landing site. In 2008 China may send its first Mars sample return mission, which could occur just after, or simultaneously with, a U.S. mission. By the mid-to-late 2030s China could be sending manned missions to Mars with the goal of finding choice sites for resource exploitation. In addition, China has ambitions to explore nearby and distant asteroids which also hold the potential for being vast sources of water and mineral resources, as well as possible locations for large manned settlements. In the same vein, in 2030 China plans to its first mission to Callisto, one of Jupiter’s more promising moons, with better safety margins and possible resources to help enable human habitation. These are grand ambitions on the part of the CCP, but as a dictatorship it will face no opposition or funding constraints, and can command needed inputs across the whole of society without interruption. Abroad, the CCP can subsidize participation in its space programs via its $1 trillion Belt & Road Initiative – a global commercial, diplomatic, military and intelligence infrastructure network across 70 countries, some of which have space programs. This helps ensure a large coalition of political support for the CCP’s hegemonic goals, on Earth and in space, including fellow UN Security Council member Russia. China intends to write the rules, not follow them, in Space just as in the South China Sea, Hong Kong, WHO, and financial markets. For the United States, it is clear that President Barack Obama’s 2010 decision to cancel George W. Bush’s Constellation program to return to the Moon was a strategic disaster that gifted the CCP with a decade to advance its plans for space hegemony. If the U.S. is to catch up, it is imperative that the U.S. return to the moon early, with as many space allies as possible, in order to secure choice positions and ensure China does not achieve monopoly control. **It is** also **crucial to build the U.S. space private sector into the main engine to develop the Space Economy and to ensure its benefits for America** and other democracies. Across the U.S. space enterprise, protection of critical technologies, legacy programs, key resources, and secrets needs to be prioritized and rigorously enforced, given the pervasive espionage efforts and serial successes of the PRC, and other enemies which have cost the U.S. trillions of dollars. The Trump Administration’s realization of the CCP’s space threat spurred its creation of the Space Force as a separate service, and the signing of the Artemis Accords as the basis of a coalition for a U.S.-led rules-based open-use approach to space. Much remains to be done to rapidly build upon these initiatives so critical to moving beyond exploration, to actual expansion and exploitation of both near and deep space, before the initiative is ceded to the PRC and it’s too late. The magnitude and consistency of the U.S. commitment to space will be vital not only technologically, but also diplomatically as countries face the decision of where to place their ‘space bets’, choosing to bandwagon with the U.S. or with China. What priority the Biden Administration will assign to the nation’s space enterprise is unclear, given its early dismissive attitude toward the Space Force, and the fact that most of its key national security team worked for Barack Obama — who when cancelling the moon program in 2010 proclaimed, “We are no longer racing against an adversary.” What is clear is that if China achieves military and commercial hegemony in space, the resulting wealth, power, and status will ensure that its dictatorship survives far longer, and becomes even more threatening to the U.S. military, economy, and alliances — and indeed to freedom, both on earth and in space. “Who lost Space?” is not a debate the nation can afford or deserves to have.

#### Commercial space technology and satellite launches are key to US military power and primacy.

**Hampson 17**, Joshua. [Security Studies Fellow at The Niskanen Center] “The Future of Space Commercialization.” *Niskansen Center*, 25 Jan. 2017, <https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf>. [GHS-AA]

Perhaps the most important legacy application of outer space for Americans is national security. The United States relies heavily on satellites for capabilities that make its global power projections and deterrence structures work. Satellites provide valuable real-time intelligence information, connect platforms and bases around the world, and provide the basis for highly accurate navigational systems on land, at sea, and in the air. It is not just that this space infrastructure is useful for American warfighters, but that it is essential. Elbridge Colby, a senior fellow at the Center for a New American Security (CNAS), wrote in his examination of recent changes to the space environment that space capabilities are “the stuff of which American global military primacy is made.” Military capabilities that the United States has 24 come to rely on, from remotely piloted drones to precision weaponry, all rely on satellites. To 25 manage this, The United States Space Command has 38,000 airmen based around the world working to secure access to national security space assets.26 It is not just the military that relies on satellites—the intelligence community does too. While the unclassified military space budget is around $10 billion on outer space a year, total national security 27 space spending may be over $25 billion annually. This reliance on outer space is not going to end any 28 time soon. At an event at the Center for Strategic and International Studies (CSIS) on October 24, 2016, Deputy Assistant Secretary of Defense for Space Policy Doug Loverro, spoke to the importance of leveraging space capabilities. Mr. Loverro highlighted that space is fundamental to everything the 29 United States does in conventional war, as well as nuclear deterrence, and disabused the notion that the country should pursue ways of fighting and projecting power without relying on outer space. Such an argument, he contends, is “not an attractive notion.” Going to war without space capabilities would put American soldiers at risk. Even so, managing the space environment is becoming more complex for the defense community. There is a growing perception that heavy reliance on satellites creates a soft spot in American defenses. America’s rivals have highlighted U.S. space capabilities as a possible vulnerability to 30 exploit. For some capabilities—particularly situational awareness, nuclear command and control, 31 and coordination among America’s widespread military and intelligence assets—satellites have become an almost “single point of failure.” This means that any one accident or disruption could 32 degrade or shut down a key tool. Concerns over this reliance have led to warnings of a “space Pearl Harbor” as defense analysts see American outer space assets as potentially ripe targets for 33 exploitation by international rivals.34 The United States is moving to mitigate some of these concerns by making more resilient and adding redundancy to the system. That way, if one satellite is damaged or degraded, the system as a whole still functions. The success or failure of these efforts may ultimately depend on commercial outer space. Building up U.S. space capabilities solely through government initiative could have both fiscal and operational problems—such a strategy would likely be expensive and spread unforeseen vulnerabilities across the entire American satellite fleet. Working with commercial companies for capabilities can reduce costs while providing strength through variation. Commercial satellites, for example, currently provide the military with 80 percent 35 of its satellite communications needs. Commercial providers also provide the vital launch services 36 that get the satellites into orbit. Today, these providers are the United Launch Alliance (ULA) and 37 Space Exploration Technologies (SpaceX). Without these companies, the United States government 38 would have to rebuild national launch capabilities. In the future, other commercial launch companies, such as Orbital ATK and Blue Origin, could also provide launch services for the military and 39 40 intelligence community. In short, **a more robust commercial space market is key to ensuring the resilience of American national security by assuring access to space.**

#### Military readiness and credible deterrence solves every threat---satellite and tech leadership sustain military overmatch, but decline emboldens rivals and causes miscalc and arms races that escalate.

Hal Brands 18. Henry A. Kissinger Distinguished Professor of Global Affairs at the Johns Hopkins University School of Advanced International Studies, Senior Fellow at the Center for Strategic and Budgetary Assessments and the Foreign Policy Research Institute, Ph.D. in history from Yale University. “Chapter 6: Does America Have Enough Hard Power?” American Grand Strategy in the Age of Trump; pp. 129-133.

Much contemporary commentary favors the first option—reducing commitments—and denounces the third as financially ruinous and perhaps impossible.5 Yet significantly expanding American capabilities would not be nearly as economically onerous as it may seem. Compared to the alternatives, in fact, this approach represents the best option for sustaining American primacy and preventing a slide into strategic bankruptcy that will eventually be punished. Since World War II, the United States has had a military second to none. Since the Cold War, America has committed to having overwhelming military primacy. The idea, as George W. Bush declared in 2002, that America must possess “strengths beyond challenge” has featured in every major U.S. strategy document for a quarter century; it has also been reflected in concrete terms.6 From the early 1990s, for example, the United States consistently accounted for around 35 to 45 percent of world defense spending and maintained peerless global power-projection capabilities.7 Perhaps more important, U.S. primacy was also unrivaled in key overseas strategic regions—Europe, East Asia, the Middle East. From thrashing Saddam Hussein’s million-man Iraqi military during Operation Desert Storm, to deploying—with impunity—two carrier strike groups off Taiwan during the China-Taiwan crisis of 1995– 96, Washington has been able to project military power superior to anything a regional rival could employ even on its own geopolitical doorstep. This military dominance has constituted the hard-power backbone of an ambitious global strategy. After the Cold War, U.S. policymakers committed to averting a return to the unstable multipolarity of earlier eras, and to perpetuating the more favorable unipolar order. They committed to building on the successes of the postwar era by further advancing liberal political values and an open international economy, and to suppressing international scourges such as rogue states, nuclear proliferation, and catastrophic terrorism. And because they recognized that military force remained the ultima ratio regum, they understood the centrality of military preponderance. Washington would need the military power necessary to underwrite worldwide alliance commitments. It would have to preserve substantial overmatch versus any potential great-power rival. It must be able to answer the sharpest challenges to the international system, such as Saddam’s invasion of Kuwait in 1990 or jihadist extremism after 9/11. Finally, because prevailing global norms generally reflect hard-power realities, America would need the superiority to assure that its own values remained ascendant. It was impolitic to say that U.S. strategy and the international order required “strengths beyond challenge,” but it was not at all inaccurate. American primacy, moreover, was eminently affordable. At the height of the Cold War, the United States spent over 12 percent of GDP on defense. Since the mid-1990s, the number has usually been between 3 and 4 percent.8 In a historically favorable international environment, Washington could enjoy primacy—and its geopolitical fruits—on the cheap. Yet U.S. strategy also heeded, at least until recently, the fact that there was a limit to how cheaply that primacy could be had. The American military did shrink significantly during the 1990s, but U.S. officials understood that if Washington cut back too far, its primacy would erode to a point where it ceased to deliver its geopolitical benefits. Alliances would lose credibility; the stability of key regions would be eroded; rivals would be emboldened; international crises would go unaddressed. American primacy was thus like a reasonably priced insurance policy. It required nontrivial expenditures, but protected against far costlier outcomes.9 Washington paid its insurance premiums for two decades after the Cold War. But more recently American primacy and strategic solvency have been imperiled. THE DARKENING HORIZON For most of the post–Cold War era, the international system was— by historical standards—remarkably benign. Dangers existed, and as the terrorist attacks of September 11, 2001, demonstrated, they could manifest with horrific effect. But for two decades after the Soviet collapse, the world was characterized by remarkably low levels of great-power competition, high levels of security in key theaters such as Europe and East Asia, and the comparative weakness of those “rogue” actors—Iran, Iraq, North Korea, al-Qaeda—who most aggressively challenged American power. During the 1990s, some observers even spoke of a “strategic pause,” the idea being that the end of the Cold War had afforded the United States a respite from normal levels of geopolitical danger and competition. Now, however, the strategic horizon is darkening, due to four factors. First, great-power military competition is back. The world’s two leading authoritarian powers—China and Russia—are seeking regional hegemony, contesting global norms such as nonaggression and freedom of navigation, and developing the military punch to underwrite these ambitions. Notwithstanding severe economic and demographic problems, Russia has conducted a major military modernization emphasizing nuclear weapons, high-end conventional capabilities, and rapid-deployment and special operations forces— and utilized many of these capabilities in conflicts in Ukraine and Syria.10 China, meanwhile, has carried out a buildup of historic proportions, with constant-dollar defense outlays rising from US$26 billion in 1995 to US$226 billion in 2016.11 Ominously, these expenditures have funded development of power-projection and antiaccess/area denial (A2/AD) tools necessary to threaten China’s neighbors and complicate U.S. intervention on their behalf. Washington has grown accustomed to having a generational military lead; Russian and Chinese modernization efforts are now creating a far more competitive environment. Second, the international outlaws are no longer so weak. North Korea’s conventional forces have atrophied, but it has amassed a growing nuclear arsenal and is developing an intercontinental delivery capability that will soon allow it to threaten not just America’s regional allies but also the continental United States.12 Iran remains a nuclear threshold state, one that continues to develop ballistic missiles and A2/AD capabilities while employing sectarian and proxy forces across the Middle East. The Islamic State, for its part, is headed for defeat, but has displayed military capabilities unprecedented for any terrorist group, and shown that counterterrorism will continue to place significant operational demands on U.S. forces whether in this context or in others. Rogue actors have long preoccupied American planners, but the rogues are now more capable than at any time in decades. Third, the democratization of technology has allowed more actors to contest American superiority in dangerous ways. The spread of antisatellite and cyberwarfare capabilities; the proliferation of man-portable air defense systems and ballistic missiles; the increasing availability of key elements of the precision-strike complex— these phenomena have had a military leveling effect by giving weaker actors capabilities which were formerly unique to technologically advanced states. As such technologies “proliferate worldwide,” Air Force Chief of Staff General David Goldfein commented in 2016, “the technology and capability gaps between America and our adversaries are closing dangerously fast.”13 Indeed, as these capabilities spread, fourth-generation systems (such as F-15s and F-16s) may provide decreasing utility against even non-great-power competitors, and far more fifth-generation capabilities may be needed to perpetuate American overmatch. Finally, the number of challenges has multiplied. During the 1990s and early 2000s, Washington faced rogue states and jihadist extremism—but not intense great-power rivalry. America faced conflicts in the Middle East—but East Asia and Europe were comparatively secure. Now, the old threats still exist—but the more permissive conditions have vanished. The United States confronts rogue states, lethal jihadist organizations, and great-power competition; there are severe challenges in all three Eurasian theaters. “I don’t recall a time when we have been confronted with a more diverse array of threats, whether it’s the nation state threats posed by Russia and China and particularly their substantial nuclear capabilities, or non-nation states of the likes of ISIL, Al Qaida, etc.,” Director of National Intelligence James Clapper commented in 2016. Trends in the strategic landscape constituted a veritable “litany of doom.”14 The United States thus faces not just more significant, but also more numerous, challenges to its military dominance than it has for at least a quarter century.

#### US-China war causes extinction

**Sharman 17** [Citing professor of Chinese studies and director of King's College London's Lau China Institute & Professor of Politics at the University of Warwick], Jon. “War between China and America ‘Could End Life as We Know It on Earth.’” *The Independent*, 5 Feb. 2017, http://www.independent.co.uk/news/world/americas/us-china-war-be-end-of-life-earth-nuclear-weapons-apocalypse-steve-bannon-donald-trump-white-house-a7561821.html.

While the prospect remains relatively remote, experts have told The Independent they believe such a conflict would be catastrophic, throwing the entire globe into turmoil and potentially ending "life as we know it on Earth". The United States would likely win because sending China's untested forces against the might of America's military would be like pitching farmers against Achilles and his warriors, said one, but even a conventional military victory would be a strategic disaster. It would set off a global economic crisis and create a potential power vacuum inside defeated China "the like of which we can't imagine". Mr Bannon said war would erupt in the South China Sea in "five to 10 years". He said: "They’re taking their sandbars and making basically stationary aircraft carriers and putting missiles on those. They come here to the United States in front of our face—and you understand how important face is—and say it’s an ancient territorial sea." The US and China have been engaged in a back-and-forth dispute over military build-up and territorial claims in the region for some years. In December the US said it would base its deadliest fighter jets in Australia, and days later China seized an unmanned US Navy drone. It followed a diplomatic spat around then-President-elect Trump's congratulatory phone call with Taiwan's Prime Minister Tsai Ing-wen, which broke with decades of US policy. Mr Trump has been forthright about China's influence, blaming it for the loss of American jobs. The war of words recently heated up when a Chinese military official was quoted as saying talk of war with the US under Mr Trump "are not just slogans, they are becoming a practical reality". Trevor McCrisken, associate professor of politics and international studies at the University of Warwick, said that if war broke out "we would be looking, I would imagine, at World War Three". He said: "I really do think that would be the end of life as we know it on Earth. "From a global strategic risk level I would say the last thing you want is war between the United States and any of the major powers because of the risks of escalation, obviously the potential for nuclear weapons to be used. The likelihood of nuclear exchange between the two principals involved is high." But, he added, the "overwhelming view of most policy-makers in Washington since at least the late 1970s" favours a form of "cooperative, if competitive" relationship with China. Dr Peter Roberts, director of military sciences at the Royal United Services Institute, said: "America would take military losses. They would lose thousands and thousands [of personnel]. But China would be utterly defeated. If America goes to war, it wages war in its totality. They would go to this with unparalleled violence and energy." The US has an "overall competitive edge" partly due to technological superiority, Dr Roberts said, but also because the four branches of its military—Army, Navy, Marine Corps and Air Force—are trained to work closely together. "It's demonstrated how it can use all those arms to deliver military victory," he said. In contrast, China's services operate "individually" and also have less, and less recent, combat experience compared to their American counterparts. "There's a huge difference between someone who's been in combat before, and someone who hasn't," Dr Roberts said, comparing the potential confrontation to one between Greek hero Achilles and farmers recruited from the fields. Kerry Brown, professor of Chinese studies and director of King's College London's Lau China Institute, said: "US naval superiority is massive. And if we are talking just military, then for sure, a conflict right beside China would hurt China more than the US. "It would, of course, totally upend supply routes, however, and probably cause a global recession. So it would, no matter who won in terms of military outcomes, be lose-lose and cut against the logic of self interest of both the US and China." Professor Brown added: "We have to expect this war of words to simply get worse. The best outcome is that the two sides ultimately compromise—China acts more responsibly, and stops its adventurism, and the US concedes it more space. The worst outcome would be a misunderstanding that would lead to real conflict."

### Case

#### Black, Hispanic, Indigenous men and WOMEN have achieved amazing things in space, and have been honored by putting their names on celestial bodies

#### NASA 21

https://www.nasa.gov/feature/goddard/2021/newly-named-asteroids-reflect-contributions-of-pioneering-astronauts

Twenty-seven asteroids have been named in honor of African American, Hispanic, and Native American astronauts, and one cosmonaut, who have helped expand our horizons beyond Earth and to inspire the next generation of space explorers. Among the 27 people who inspired these new asteroid names are Stephanie D. Wilson, Joan Higginbotham, and Ed Dwight Jr., a captain in the U.S. Air Force who became the first African American astronaut trainee in 1961. José Hernández, who developed the first full-field digital mammography imaging system, also inspired an asteroid name. [The full list of astronauts](https://minorplanetcenter.net/iau/ECS/MPCArchive/2021/MPC_20210127.pdf) and their namesake asteroids was released on February 23 by the Minor Planet Center, an organization affiliated with the International Astronomical Union (IAU), that’s responsible for the identification, designation and orbit computation for minor planets and other objects. Up until now, these asteroids had provisional names indicating their time of discovery. All 27 are located in the asteroid belt between Mars and Jupiter. (103738) Stephaniewilson and (103739) Higginbotham were named after women who have made significant contributions to space exploration. On top of distinguished engineering careers, both were selected in 1996 to join NASA’s Astronaut Group 16, nicknamed “The Sardines” because of its large class size of 44 candidates. In this image from 2003, retired astronaut Joan Higginbotham took a break from training for the STS-116 mission and is shown in front of a NASA T-38 trainer. ***Credits: NASA*** As an electrical engineer at NASA’s Kennedy Space Center in Florida, Higginbotham worked on 53 space shuttle launches between 1996 and 2007. As an astronaut, she launched from Kennedy aboard the space shuttle Discovery to the International Space Station (ISS), where she served as a mission specialist on an assembly mission. Wilson, an aerospace engineer, worked for several years at NASA’s Jet Propulsion Laboratory in Pasadena, California, as a member of the Attitude and Articulation Control Subsystem team for NASA’s Galileo spacecraft. After becoming an astronaut, she traveled to the space station three times, logging more than 42 days in space. Today, Wilson is on NASA’s [Artemis Team](https://www.nasa.gov/specials/artemis-team/) of astronauts, one of whom will become the first woman to set foot on the Moon. NASA astronaut Stephanie Wilson is a member of the Artemis Team, a select group of astronauts charged with focusing on the development and training efforts for early Artemis missions. ***Credits: NASA*** [More information here](https://www.nasa.gov/astronauts/biographies/stephanie-d-wilson/videos) Consecutively named asteroids were chosen for Wilson and Higginbotham in a nod to the fact they were selected as astronaut candidates in the same class. Asteroid (92579) Dwight was named after Ed Dwight Jr., who was born in 1933 in Kansas City, Kansas. He recounts [in a media interview](https://www.nytimes.com/video/opinion/100000006865864/almost-famous-the-lost-astronaut.html) being stunned by a newspaper article profiling a black pilot, a revelation of unimagined possibility. This set him on his own pursuit of flight. After making it to the rank of captain in the U.S. Air Force, he was recruited to be the first African American astronaut trainee. In the astronaut program, he encountered deeply entrenched racism, was eventually forced out, and resigned from the Air Force in 1966. Dwight chose a wildly different path after this major setback, returning to his early love of the arts by reinventing himself as a sculptor of African American history. He created more than a hundred memorials globally and many thousands of other artworks. Former astronaut José Hernández working controls on the flight deck of space shuttle Discovery while docked with the International Space Station on Aug. 31, 2009. ***Credits: NASA*** José Hernández, the astronaut behind asteroid (122554) Joséhernández, was born into a migrant farming family and spent his youth working in the fields. When he was in high school, Hernández was inspired by Franklin Chang-Díaz, a long-time astronaut who flew seven space shuttle missions from 1986 to 2002. Hernández went on to receive bachelor’s and master’s degrees in electrical engineering, worked on X-ray lasers, developed the first full-field digital mammography imaging system, and then became an astronaut. Hernández traveled on the space shuttle Discovery to the ISS in 2009 on a mission to deliver a Multi-Purpose Logistics Module. Now asteroids (122554) Joséhernández and (115015) Chang Díaz can inspire the next generation of space explorers. “It's an honor and a privilege to name these asteroids in recognition of fellow space explorers while also adding to the message of the power and value of diversity for all human endeavors," said Marc W. Buie, an astronomer who discovered the 27 asteroids in the last couple of decades. Buie is a Boulder, Colorado-based astronomer at the Southwest Research Institute, which is headquartered in San Antonio, Texas. Buie is also a co-investigator on [NASA’s Lucy mission](https://www.nasa.gov/mission_pages/lucy/overview/index), which will launch atop the Atlas V 401 rocket from Cape Canaveral, Florida, on October 16, 2021. Its 12-year mission — the first of its kind — is to study seven Trojan asteroids that are among the two swarms of space rocks that circle the Sun, leading and following Jupiter in its orbit. Lucy will also fly by one main-belt asteroid. The asteroid-naming proposal to the IAU, an organization that approves and certifies the names of astronomical objects and features, was a team effort by scientists and students involved with Lucy. It was led by [Cathy Olkin](https://www.boulder.swri.edu/~colkin/CathyOlkin/About_Me.html), deputy principal investigator of the Lucy mission at Southwest Research Institute, and [Keith S. Noll](https://science.gsfc.nasa.gov/sed/bio/keith.s.noll), a planetary astronomer at NASA's Goddard Space Flight Center in Greenbelt, Maryland, who serves as Lucy project scientist. “Last summer a group of us got together to honor a diverse group of astronauts who have traveled to space and the pioneers who paved the way for these explorers,” said Olkin. “But there are many more, and we hope to add their names to the sky in the future.” Besides Olkin and Noll, the research and citation writing group included Katherine Kretke, Lucy communications lead; Carly Howett, Lucy instrument scientist; Donya Douglas-Bradshaw, Lucy project manager; Edward ‘Beau’ Bierhaus, Lucy scientist; Jake Olkin, graduate student at University of Michigan; and Zach Olkin, undergraduate student at Georgia Tech. Here is the full list of newly named asteroids and the astronauts they honor: [(92579) Dwight](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Dwight;orb=1;cov=0;log=0;cad=0#orb) Edward (Ed) Joseph Dwight Jr. (b. 1933) was the first African American astronaut candidate. He served in the Air Force, working as test pilot before serving in the Aerospace Research Pilot School. After leaving the Air Force he went on to become an influential sculptor and author. [(92892) Robertlawrence](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Robertlawrence%20;orb=1;cov=0;log=0;cad=0#orb) [Robert H. Lawrence Jr](https://www.nasa.gov/feature/robert-lawrence-first-african-american-astronaut). (1935-1967) was selected for the Manned Orbiting Laboratory (MOL) program. He was the first African American to be selected as an astronaut and was the only MOL astronaut with a doctorate. He perished in a plane crash before he had the opportunity to go to space. [(92894) Bluford](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Bluford;orb=1;cov=0;log=0;cad=0#orb) [Guion Steward Bluford Jr.](https://er.jsc.nasa.gov/seh/bluford.htm) (b. 1942) was the first African American astronaut in space. He was a part of four space shuttle missions between 1983 and 1992, which included deploying satellites, testing robotic arms, and conducting research. Bluford logged a total of 688 hours in space. [(95449) Frederickgregory](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Frederickgregory;orb=1;cov=0;log=0;cad=0#orb) [Frederick Drew Gregory](https://www.nasa.gov/sites/default/files/atoms/files/gregory_frederick.pdf) (b. 1941) is a retired astronaut who was the pilot on one space shuttle mission and commander on two other missions. In 1989, he was the first African American to command a space flight. He also served as deputy administrator of NASA. [(97508) Bolden](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Bolden;orb=1;cov=0;log=0;cad=0#orb) [Charles Frank Bolden Jr](https://www.nasa.gov/node/396058). (b. 1946) is a former astronaut who flew on four space shuttle missions (two as the pilot and two as the commander). From 2009-2017, he was NASA’s administrator. [(97512) Jemison](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Jemison;orb=1;cov=0;log=0;cad=0#orb) [Mae Carol Jemison](https://www.nasa.gov/sites/default/files/atoms/files/jemison_mae.pdf) (b. 1956) is a retired astronaut who flew on the space shuttle in 1992. There she conducted scientific experiments. She was the first African American woman to travel to space and the first African American woman admitted into the astronaut training program. [(103733) Bernardharris](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Bernardharris;orb=1;cov=0;log=0;cad=0#orb) [Bernard Anthony Harris Jr.](https://www.nasa.gov/sites/default/files/atoms/files/harris_bernard.pdf) (b. 1956) is a former astronaut who flew on two space shuttle missions. In 1993, he was a mission specialist who carried out research as part of Spacelab D-2. As payload commander on the space shuttle Discovery in 1995, he became the first African American to conduct a spacewalk. [(103734) Winstonscott](https://ssd.jpl.nasa.gov/horizons.cgi?find_body=1&body_group=sb&sstr=103734) Winston Elliott Scott (b. 1950) is a former astronaut who flew two missions to space. Scott completed three spacewalks to retrieve satellites and evaluate the assembly of the ISS. He also performed experiments on the effects of zero gravity on the human body. [(103737) Curbeam](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Curbeam;orb=1;cov=0;log=0;cad=0#orb) [Robert Lee Curbeam Jr.](https://www.nasa.gov/sites/default/files/atoms/files/curbeam_robert.pdf) (b. 1962) is a retired astronaut and the first person to perform four spacewalks on a single mission. While in space, Curbeam helped fix a solar panel and install a new truss in the ISS. He spent more than 37 days in space and 45 hours on spacewalks. [(103738) Stephaniewilson](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Stephaniewilson;orb=1;cov=0;log=0;cad=0#orb) [Stephanie Diana Wilson](https://www.nasa.gov/astronauts/biographies/stephanie-d-wilson/biography) (b. 1966) is the second African American woman to fly in space. She has flown on three missions, and as of 2020, logged the most time in space of any African American astronaut (42 days). She also served as the ground commander for the first all-women spacewalk in 2019. [(103739) Higginbotham](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Higginbotham;orb=1;cov=0;log=0;cad=0#orb) [Joan Higginbotham](https://www.nasa.gov/sites/default/files/atoms/files/higginbotham_joan.pdf) (b. 1964) is an electrical engineer and former astronaut. As an engineer at NASA’s Kennedy Space Center, she participated in 53 space shuttle launches before becoming and astronaut and the third African American woman to go to space. [(104698) Alvindrew](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Alvindrew;orb=1;cov=0;log=0;cad=0#orb) [Benjamin Alvin Drew](https://www.nasa.gov/sites/default/files/atoms/files/drew_b_alvin.pdf) (b. 1962) is an astronaut who flew two space shuttle missions to the ISS as a mission specialist. He logged more than 25 days in space. He also conducted two spacewalks. [(108096) Melvin](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Melvin;orb=1;cov=0;log=0;cad=0#orb) As an astronaut, [Leland Devon Melvin](https://www.nasa.gov/sites/default/files/atoms/files/melvin_leland.pdf) (b. 1964) helped build the ISS, with flights aboard the space shuttle Atlantis in 2008 and 2009. Melvin is also an engineer with experience using sensors to assess damage of aerospace vehicles and was an NFL football player with the Detroit Lions. [(108097) Satcher](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Satcher;orb=1;cov=0;log=0;cad=0#orb) [Robert Lee Satcher Jr.](https://www.nasa.gov/sites/default/files/atoms/files/satcher_robert.pdf) (b. 1965) is an orthopedic surgeon, chemical engineer and retired astronaut. He was the first orthopedic surgeon in space and participated in two spacewalks as part of a space shuttle flight to the ISS in 2009. [(114705) Tamayo](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Tamayo;orb=1;cov=0;log=0;cad=0#orb) Arnaldo Tamayo Méndez (b. 1942) was the first person of African ancestry and the first Hispanic (Cuban) cosmonaut to travel into space with the crew of Soyuz 38 in September 1980. He received the first Hero of the Republic of Cuba medal and many other honors. [(115015) Chang Díaz](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=115015;orb=1;cov=0;log=0;cad=0#orb) [Franklin R. Chang Díaz](https://www.nasa.gov/sites/default/files/atoms/files/chang-diaz_franklin_0.pdf) (b. 1950) was an astronaut for 25 years and flew seven space shuttle missions from 1986 to 2002. He logged more than 1,600 hours in space and helped to deploy the Galileo spacecraft to Jupiter. He is the first Costa Rican astronaut and is also of Chinese descent. [(116162) Sidneygutierrez](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Sidneygutierrez;orb=1;cov=0;log=0;cad=0#orb) [Sidney M. Gutierrez](https://www.nasa.gov/sites/default/files/atoms/files/fs-2018-08-002-jsc-nasashispanicastronauts-2.pdf) (b. 1951) is a former astronaut. He was the pilot on the space shuttle Columbia in 1991. That mission was the first Spacelab mission dedicated to biological sciences. He was the commander of a space shuttle Endeavour mission in 1994 that used radar to study the Earth. [(117703) Ochoa](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Ochoa;orb=1;cov=0;log=0;cad=0#orb) [Ellen Ochoa](https://www.nasa.gov/centers/johnson/about/people/orgs/bios/ochoa.html) (b. 1958) is a former astronaut. In 1993, she was the first Hispanic woman to go to space. She flew four space shuttle missions, logged nearly 1,000 hours in space, and became director of NASA’s Johnson Space Center in Houston. [(117704) Lopez-Alegria](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Lopez-Alegria;orb=1;cov=0;log=0;cad=0#orb) [Michael Lopez-Alegria](https://www.nasa.gov/sites/default/files/atoms/files/lopez-alegria_michael_0.pdf) (b. 1958) is a retired astronaut who flew on four NASA missions: three aboard the space shuttle, and one on the Soyuz spacecraft for a long-duration mission aboard the ISS. He has performed 10 spacewalks during his 257 days in space.While in space, he performed experiments on materials, biotechnology and combustion. [(118768) Carlosnoriega](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Carlosnoriega;orb=1;cov=0;log=0;cad=0#orb) [Carlos I. Noriega](https://www.nasa.gov/sites/default/files/atoms/files/noriega_carlos.pdf) was born in 1959 in Peru and became an astronaut in 1996. He was a mission specialist aboard the space shuttle Atlantis on NASA’s sixth mission to dock with the Russian Mir Space Station, and aboard the space shuttle Endeavour mission to deliver and install the first set of solar arrays to the ISS . [(118769) Olivas](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Olivas;orb=1;cov=0;log=0;cad=0#orb) [John D. Olivas](https://www.nasa.gov/sites/default/files/atoms/files/olivas_john.pdf) (b. 1966) is a former astronaut. Olivas flew two space shuttle missions, in 2007 and 2009, to assemble the ISS. He conducted five spacewalks during those two missions. [(119890) Zamka](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Zamka;orb=1;cov=0;log=0;cad=0#orb) [George D. Zamka](https://www.nasa.gov/sites/default/files/atoms/files/zamka_george.pdf) (b. 1962) is a retired astronaut. Zamka piloted the space shuttle Discovery in its October 2007 mission to the ISS. He was the commander of the space shuttle Endeavour mission in February 2010, an ISS assembly mission. [(119993) Acabá](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Acaba;orb=1;cov=0;log=0;cad=0#orb) [Joseph Acabá](https://www.nasa.gov/astronauts/biographies/joseph-m-acaba/biography) (b. 1967) flew to the ISS in 2009, 2012 and 2018, aboard both the space shuttle and the Soyuz spacecraft. On his first flight, he participated in spacewalks to assemble the space station. As of July 2020, he has spent 306 days in space. [(122554) José M. Hernández](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=122554;orb=1;cov=0;log=0;cad=0#orb) [José M. Hernández](https://www.nasa.gov/sites/default/files/atoms/files/hernandez_jose.pdf) (b. 1962) was born into a migrant farming family. He became an astronaut and was a mission specialist on space shuttle Discovery’s mission to the ISS in 2008. Prior to his time as an astronaut, Hernández helped to develop the first full-field digital mammography imaging system. [(122555) Auñón-Chancellor](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=122555;orb=1;cov=0;log=0;cad=0#orb) [Serena M. Auñón-Chancellor](https://www.nasa.gov/astronauts/biographies/serena-m-aunon-chancellor/biography) (b. 1976) is an engineer, physician, and astronaut. She has collected meteorites in Antarctica, served as an aquanaut on an undersea research station, and was a flight engineer on the ISS for six months in 2018. [(126965) Neri](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Neri;orb=1;cov=0;log=0;cad=0#orb) Rodolfo Neri Vela (b. 1952) is the first Mexican person to travel to space. In 1985, he was a payload specialist on the space shuttle Atlantis. During the flight, he conducted experiments, including many on the subject of human physiology. [(127030) Herrington](https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=Herrington;orb=1;cov=0;log=0;cad=0#orb) [John Herrington](https://www.nasa.gov/image-feature/astronaut-john-herrington-carried-a-piece-of-native-american-history-to-space) (b. 1958) is a former astronaut and a member of the Chickasaw Nation. Herrington was a mission specialist aboard space shuttle Endeavour for the 16th space shuttle flight to the ISS, performing three spacewalks during the mission. ***Media Contact:*** [***Nancy Neal Jones***](mailto:nancy.n.jones@nasa.gov?subject=New%20asteroid%20names) ***NASA's Goddard Space Flight Center, Greenbelt, Md. 301-286-0039***