



# Taking Advantage of a Pivotal Decade in Outer Space

By Peter Juul | October 28, 2020

Summer 2020 marked a turning point for the U.S. space program as investments made over the past decade began to bear fruit. In May, astronauts launched from American soil for the first time in almost nine years, and July saw the Mars rover Perseverance blasting off for the red planet.<sup>1</sup> Moreover, NASA has scheduled the first operational commercial crew mission to the International Space Station (ISS) for November 14.<sup>2</sup>

These launches represent just the start of what will be a pivotal decade for the United States both in space and here on the Earth. The 2020s will define the U.S. space program—and indeed the nation as a whole—for decades to come. It's no exaggeration to say that the next administration's decisions will determine whether American astronauts voyage to Mars in the coming decades—and whether the United States maintains or relinquishes its status as the world's leading spacefaring nation. Wise investments made over the course of the next administration will pay dividends well into the future, not just for the space program but for American society writ large. The United States derives vast economic benefits from its robust national space program, including jobs and public investment in high-tech industries such as aerospace and computing. NASA alone directly employs almost 17,000 people, while according to aerospace industry figures, nearly 150,000 people work in the space sector.<sup>3</sup>

Recent experience shows the need for any incoming administration to establish a clear direction for space policy early on—and forge good working relations with Congress and the global scientific community in the process. The next president cannot afford the months and years that recent administrations have needed to formulate their space policies and appoint NASA leadership. Fortunately, however, the next administration will not need to initiate any lengthy or searching space policy reviews; it can build on the solid foundation of space exploration capabilities that NASA has laid over the past decade.

Most importantly, the next administration needs to send a clear and early signal of policy intent that NASA leads America's national effort in space—not the U.S. Department of Defense (DOD) or the U.S. Space Force. The bombast surrounding

the creation of the latter has undercut the primacy of NASA and other civilian space agencies. It will be up to the next administration to tone down this rhetoric and restore NASA to its rightful place as the face of America's overall space policy. Among other things, this effort will allow the administration to clearly communicate that America's space program remains focused on exploration that is primarily civilian in intent and nature; reaffirm NASA's leadership; chart a timely course to guide the overall national effort; and shape international cooperation going forward. In the end, it is in America's national interest to ensure that space remains a realm for peaceful competition and, hopefully, cooperation with like-minded nations that wish to offer their own contributions.

Indeed, there is a glaring need to refocus the national space program on exploration and discovery for all mankind rather than commercial exploitation—such as schemes for asteroid mining—or explicit notions of geopolitical competition. While geopolitics remains the subtext of national space programs the world over, American national interests are best served by active leadership in space, not loose talk about strategic competition.<sup>4</sup> Actions still speak louder than words when it comes to the geopolitics of space exploration.

Above all, however, a bold yet realistic program of space exploration can serve as an important symbol of national renewal and reconstruction in the decade to come. In the wake of the current administration's policies on and mishandling of the coronavirus pandemic, it will be crucial to rebuild and display a sense of national competence and confidence. An ambitious space exploration program can help to accomplish that, but it will require a modest but substantial increase in resources. Even as the nation recovers from the coronavirus-induced economic recession, it cannot afford to surrender grander national ambitions.

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## Refocusing human spaceflight on the red planet

Early on, the next president and NASA administrator should reaffirm that Mars remains the focus of America's human space exploration effort. That would break with NASA's current emphasis on going back to the moon "to stay."<sup>5</sup> But shifting focus away from a more or less permanent lunar presence and back to Mars won't result in any rapid or major changes to NASA's human spaceflight program in the short term. Only minor adjustments to current plans will be necessary, as the moon can serve as a proving ground for the skills and capabilities needed for voyages to Mars. There's no need for the next administration to rock NASA's boat or induce whiplash with a serious policy reset. Moreover, putting Mars back at the center of NASA's human space exploration program will bring the next administration into better alignment with Congress.

In support of these goals, the next administration should move ahead with its current Artemis program, albeit with some minor alterations.<sup>6</sup> For one, it should push back what is likely an unrealistic goal of 2024 for the first human lunar landing in more than five decades and replace it with a more reasonable target date such as 2026.<sup>7</sup> Such a delay would give NASA additional time to perfect and test the systems required to send astronauts back to the lunar surface while addressing concerns raised in Congress about an unnecessary rush back to the moon.<sup>8</sup> Indeed, the Space Launch System rocket has already faced a number of problems that have postponed its first launch date by at least three years.<sup>9</sup> In the realm of international cooperation, a short delay would also give the administration more time to build global support for the Artemis Accords, a set of informal international rules for space exploration recently put forward by NASA Administrator Jim Bridenstine.<sup>10</sup>

More importantly, the next administration should work to put flesh on the bones of the Artemis program, starting with explicitly shifting its objective from establishing a semipermanent human presence on the moon to using the moon as a temporary proving ground for the techniques and capabilities needed to mount a human expedition to Mars in the late 2030s.<sup>11</sup> This subtle shift would sync up well with NASA's current outline of the Artemis program, including long-standing proposals for a lunar Gateway—a small space station near the moon—as well as more recent plans to build an Artemis base camp near the moon's south pole.<sup>12</sup> If recent draft NASA authorization legislation is any indication, such a substantive adjustment would likely win bipartisan support in Congress.<sup>13</sup>

The United States should also aim to leverage its investments in the ISS and NASA's Commercial Crew Program as best it can over the next decade. Right now, ISS partner nations remain committed to operating the station until 2024.<sup>14</sup> The next administration should start the process of extending the international commitment to the ISS to 2028. Partner nations and agencies have previously displayed a willingness to extend the service life of the ISS, and Congress has given similar indications.<sup>15</sup> Extending the life of the ISS would provide the much-delayed Commercial Crew Program with more opportunities to taxi astronauts back and forth from the station, giving NASA a greater return on its investment in that program.<sup>16</sup>

More than anything else, Artemis and the ISS constitute NASA's primary building blocks for a human expedition to Mars in the late 2030s. As with astronaut Scott Kelly's year in space, the ISS gives NASA the opportunity to study the effects of long-duration spaceflight on astronauts before they are sent on a multiyear Mars mission. Working closely with Congress, the next administration should explicitly refocus America's human spaceflight program—comprising Artemis and the ISS—around this long-term goal. The federal government can achieve this if it lays a suitable foundation now and in the coming decade.

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## Pushing the frontiers of robotic exploration

However, human spaceflight represents only a part of space exploration. For decades, U.S. robotic explorers, such as the Voyager probes to the outer solar system and Mars rovers such as Curiosity, have expanded the frontiers of discovery and staked America's claim to global scientific leadership. As the next president takes office, work will be well underway on the decadal survey that determines the nature, scope, and number of robotic exploration missions NASA will pursue in the coming decade.<sup>17</sup> The next administration should make clear to NASA and those working on the survey that it will make additional funding available for planetary exploration—enough funding to allow for an additional large-scale flagship missions, such as the Galileo and Cassini probes to Jupiter and Saturn, and an additional New Frontiers mission over the next decade.<sup>18</sup>

In addition to the already planned Europa Clipper mission to Jupiter's intriguing and possibly life-supporting moon,<sup>19</sup> NASA's robotic exploration program should focus on two main priorities: recapitalization of the robotic infrastructure orbiting Mars and missions to the distant ice giants of Uranus and Neptune in the outer solar system. Proposed NASA budget cuts threaten to sever the agency's communications with its orbiting robots just as the United States launches the rover Perseverance as part of an ambitious mission to return Martian samples to Earth.<sup>20</sup> By endangering NASA's robotic exploration of Mars, these cuts to NASA's Martian communications infrastructure also put the prospects for a potential human expedition to the red planet in the late 2030s at severe risk.

Though the decadal survey process will ultimately determine where in the solar system America sends its robotic explorers, the next decade presents a rare opportunity to visit Uranus and Neptune. In the early 2030s, a planetary alignment will occur between Jupiter, Uranus, and Neptune that could reduce the travel time needed for any probe to reach the outer solar system.<sup>21</sup> Since it takes seven to 10 years for a mission to go from approval to liftoff, work on these missions will need to begin as soon as the next decadal survey is published in 2022 in order to meet launch dates of the mid-2030s for Uranus and 2031 for Neptune, the latter of which is further away and so requires more time to reach after launch. The next administration should let it be known early on that it will fully fund and support such missions if the decadal survey and NASA choose to make them priorities.

All in all, this robust program of human and robotic exploration will likely require annual NASA budgets of at least \$28 billion in current U.S. dollars over the course of the 2020s. Exact numbers will differ from year to year given program timelines and exigencies, but that figure represents \$3 billion more than the most recent NASA budget request.<sup>22</sup> That is a modest bump in the context of a \$660 billion federal discretionary budget,<sup>23</sup> but a necessary one if the nation is to make progress toward its space exploration goals over the pivotal coming decade.

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## Reasserting America's space policy as civilian in intent and nature

Bombastic official rhetoric surrounding the Space Force has muddled perceptions of America's space policy at home and abroad. Regardless of the Space Force's actual and rather mundane role in the nation's overall space policy, this rhetoric hurts American national interests and damages American prestige by putting a military face on the national space program. The next administration should clear up this confusion by establishing in no uncertain terms that the main thrust of America's space program remains civilian—not military—in nature and intent.

There are three main ways the next administration can accomplish this objective without a top-to-bottom restructuring of space policy. First, it should aim to normalize the Space Force. Regardless of one's opinion on its creation, the Space Force serves an important national security function—particularly when nations such as China and Russia appear intent on transforming space into an arena for military competition.<sup>24</sup> But it will be up to the next president to define the Space Force's role and place in the same way that Presidents Dwight D. Eisenhower, John F. Kennedy, and Lyndon B. Johnson ensured civilian leadership over America's early space efforts in the 1950s and 1960s. The next president and U.S. secretary of defense should present the Space Force's operations as routine and unextraordinary in nature, a continuation of previous DOD activities that will not dominate or define America's national space effort.

Next, a receptive administration should steal a page from NASA's original 1958 charter and reaffirm NASA as the nation's lead space agency.<sup>25</sup> The DOD and the U.S. Department of Commerce—which house the Space Force and the National Oceanic and Atmospheric Administration (NOAA), respectively—both have crucial roles to play in America's space policy, but they should not be charged with leading and coordinating the nation's main space endeavors. Here again, the next administration should work closely with Congress and across party lines to advance the requisite legislation.

In supporting NASA and NOAA, the next administration should put greater emphasis on and resources behind the agencies' space weather and Earth observation programs.<sup>26</sup> These programs provide vital information about the Earth and solar system. NOAA's space weather satellites, for example, monitor phenomena such as solar flares and coronal mass ejections that threaten to disrupt the vast array of satellites, such as GPS satellites, that Americans rely on in their everyday lives. Though perhaps not as exciting or prestigious as America's human and robotic space exploration programs, the NASA and NOAA space weather and Earth observation satellite programs remain vital to the national and global well-being.<sup>27</sup> The next administration cannot afford to neglect this critical orbital infrastructure and should make every effort to ensure it remains fully functional and adequately funded.

Above all, making NASA the United States' lead space agency is integral to reasserting the predominantly civilian character of America's space program. But it would also render the reestablished National Space Council unnecessary.<sup>28</sup> As the nation's lead space agency, NASA would possess clear lines of authority within the executive branch: All nondefense space policy roads in the U.S. government, so to speak, would lead to NASA. Moreover, NASA would emerge as a clear point of contact on Capitol Hill for those members and committees interested in and holding authority over America's space program.

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## Conclusion

When it takes office in January 2021, the next presidential administration will need to hit the ground running on space policy. It cannot afford to delay for months and years to articulate a national space policy and appoint relevant personnel to lead critical agencies such as NASA, in no small part because it must refocus America's space program on exploration and discovery for humanity as a whole.

However, thanks to the efforts of previous NASA administrators such as Charles Bolden Jr., the next administration will not need to start from scratch. Over the past decade, these able administrators laid a solid foundation for space exploration on which the nation can build moving forward. But NASA must be pointed in the right direction and given the resources it needs to do its job. Accordingly, the next administration should work early, often, and on a bipartisan basis with relevant members and committees of Congress to set American astronauts on course for an expedition to Mars in the late 2030s.

This is a bold but realistic goal—one that can lift the nation's spirits and invest in its economic future at the same time. But it can only be achieved if the next administration and Congress work together to keep America's space program on track.

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## Endnotes

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