

# World's space achievements a bright spot in stressful 2020

December 16 2020, by Marcia Dunn

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In this May 30, 2020, file photo, a SpaceX Falcon 9, with NASA astronauts Doug Hurley and Bob Behnken in the Dragon crew capsule, lifts off from Pad 39-A at the Kennedy Space Center in Cape Canaveral, Fla. For the first time in nearly a decade, astronauts blasted towards orbit aboard an American rocket from American soil, a first for a private company. (AP Photo/John Raoux, File)

Astronauts blasted into orbit from the U.S. for the first time in nearly a decade, three countries sent spacecraft hurtling toward Mars, and robotic explorers grabbed rocks from the moon and gravel from an asteroid for return to Earth.

Space provided moments of hope and glory in an otherwise difficult, stressful year.

It promises to do the same in 2021, with February's landings at Mars and next fall's planned launch of the Hubble Space Telescope's successor—the next-generation James Webb Space Telescope.

Boeing hopes to catch up with SpaceX in the astronaut-launching department, while space tourism may finally get off the ground.

"2021 promises to be as much of a space exploration bright spot, perhaps even more," said Scott Hubbard, NASA's former "Mars Czar" now teaching at Stanford University.

Although the coronavirus pandemic complicated space operations around the globe in 2020, most high-priority missions remained on track, led by the U.S., China and the United Arab Emirates in a stampede to Mars in July.

The UAE's first interplanetary spacecraft, an orbiter, will scrutinize the Martian atmosphere. NASA's Perseverance rover is set to land Feb. 18 at an ancient river delta and lakebed where microscopic life may have once flourished. The rover will drill into the dry crust, collecting samples for eventual return to Earth.



In this image taken from video on Tuesday, Oct. 20, 2020, and released by NASA, regolith is dispersed as the Osiris-Rex spacecraft takes a sample of the surface of asteroid Bennu. (NASA/Goddard/University of Arizona via AP, File)

China's orbiter-rover duo Tianwen-1—quest for heavenly truth—also will hunt for signs of bygone life.

The European and Russian space agencies skipped the 2020 Mars launch window, their life-sniffing Mars rover grounded until 2022 because of technical issues and COVID-19 restrictions.

China also set its sights on the moon in 2020, landing and then launching off the lunar surface in December with the first moon rocks collected for return to Earth since the 1970s.

Japan brought back pieces of asteroid Ryugu—its second asteroid batch in a decade. More asteroid samples are on the way: NASA's Osiris-Rex spacecraft vacuumed up handfuls of gravel from asteroid Bennu in October for return in 2023.

Elon Musk's SpaceX, meanwhile, was buzzing in 2020. In May, it became the first private company to put people into orbit, an achievement previously claimed by just three global superpowers. The two test pilots were the first NASA astronauts to fly a new brand of spaceship in almost 40 years and the first to blast off from Florida since the shuttle program ended in 2011.



In this photo Dec. 6, 2020, file photo, provided by the Japan Aerospace Exploration Agency (JAXA), a member of JAXA retrieves a capsule dropped by Hayabusa2 in Woomera, southern Australia. The Japanese capsule brought back pieces of Asteroid Ryugu. (JAXA via AP, File)

In November, four more astronauts rode a SpaceX Dragon capsule to the International Space Station. Three weeks later, SpaceX launched its biggest cargo shipment yet to the space station for NASA.

"This is an impressive achievement which Americans should be proud of," astronaut-turned-senator Mark Kelly said of the Dragon capsule double-header.

Until the SpaceX flights, Russia's three-person Soyuz capsules were the

only way to get astronauts to the space station once NASA's shuttles shut down.

NASA's other hired crew transporter, Boeing, is scrambling to get its Starliner capsule back in action after a software-spoiled test flight in December 2019. The do-over—again with no one on board—is targeted for spring. If the repairs work and the capsule finally reaches the space station, the first Starliner astronauts could be flying by summer.



In this Aug. 13, 2019, file photo, NASA astronauts Doug Hurley, left, and Bob Behnken work with teams from NASA and SpaceX to rehearse crew extraction from SpaceX's Crew Dragon, which will be used to carry humans to the International Space Station, at the Trident Basin in Cape Canaveral, Fla. For the first time in nearly a decade, the two astronauts blasted towards orbit aboard an American rocket from American soil on May 30 2020, a first for a private company. (Bill Ingalls/NASA via AP, File)

Musk capped the year with a stratospheric test flight of Starship, the rocketship he's building to carry people to the moon and Mars. The Dec. 9 demo went better than anyone imagined until a fiery explosion at touchdown. Even so, Musk was ecstatic.

At the same time, SpaceX is expanding its Dragon-riding clientele. Late next year, SpaceX expects to launch the first privately financed Dragon flight in a deal arranged by Houston-based Axiom Space.

Axiom's Michael Lopez-Alegria, an ex-NASA astronaut and former president of the Commercial Spaceflight Federation, will accompany Israeli businessman Eytan Stibbe and two other paying customers to the space station. Stibbe, a former fighter pilot, was a close friend of Israel's first astronaut, Ilan Ramon, who died aboard space shuttle Columbia in 2003.

Will Tom Cruise be joining them? The actor was in talks with NASA this year about filming a movie at the space station.



In this July 28, 2020, file photo, Alexander Mather, of Burke, Va., stands next to a model of the Mars 2020 rover he named "Perseverance" in a contest, at the Kennedy Space Center in Cape Canaveral, Fla. Launched in July, NASA's Perseverance rover is set to land on Mars on Feb. 18 at an ancient river delta and lakebed where microscopic life may have once flourished. The rover will drill into the dry crust, collecting samples for eventual return to Earth. (AP Photo/John Raoux, File)

"This is the true beginning of private spaceflight and will get the ball rolling toward multiple private missions to orbit per year," Lopez-Alegria said in an email. "I've been preaching for almost a decade \_\_\_ that commercial human spaceflight is the next giant leap."

Two other space-travel companies—Jeff Bezos' Blue Origin and Richard



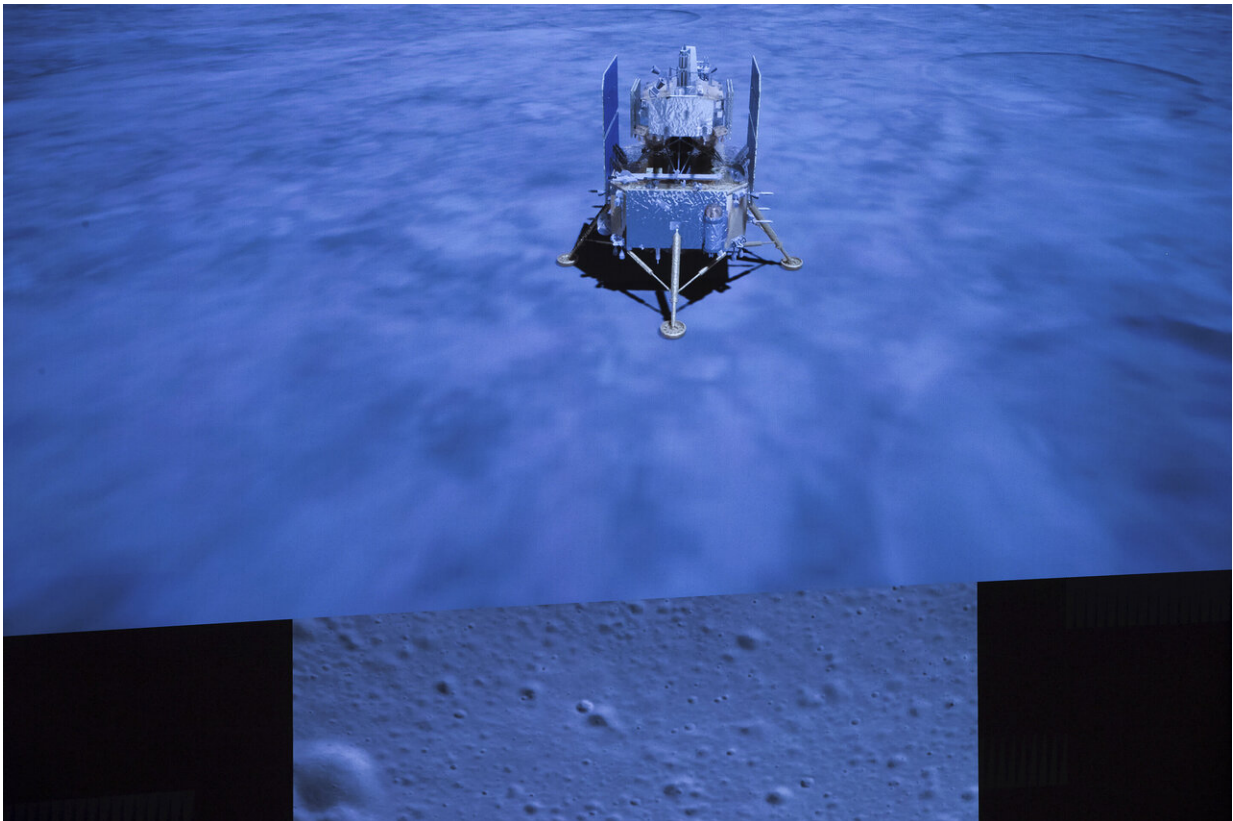
Branson's Virgin Galactic—are still conducting test flights and have yet to set firm dates for launching customers on short flights to the edge of space and back.

NASA is still targeting a November debut of its new moon rocket, the Space Launch System, with an Orion capsule that will launch without a crew. The Trump administration had set a 2024 deadline for the first moon landing by astronauts since NASA's Apollo program a half-century ago. Just this month, NASA introduced the 18 astronauts who will train for the moon program named for Artemis, the mythological twin sister of Apollo.

It remains to be seen how President-elect Joe Biden might alter the lunar-landing program.



In this July 20, 2020, file photo, an H-IIA rocket with United Arab Emirates' Mars orbiter Hope lifts off from Tanegashima Space Center in Kagoshima, southern Japan. The UAE spacecraft named Amal, or Hope, will scrutinize the Martian atmosphere from orbit. (Hiroki Yamauchi/Kyodo News via AP, File)



In this photo this Dec. 1, 2020, file photo, released by Xinhua News Agency, a display screen in Beijing shows the landed Chang'e-5 spacecraft and a moon surface picture, below, taken by camera aboard Chang'e-5 spacecraft during its landing process. The Chinese spacecraft landed on the moon to bring back lunar rocks to Earth for the first time since the 1970s, the Chinese government announced. (Jin Liwang/Xinhua via AP, File)



In this Dec. 9, 2020, file photo, SpaceX's prototype starship takes off during a test flight from their Boca Chica, Texas, facility. (Miguel Roberts/The Brownsville Herald via AP, File)

"Whatever else can be said about the four years of the Trump administration, they have been positive for the U.S. civilian space program," noted John Logsdon, professor emeritus at George Washington University's Space Policy Institute. "No prior major programs were cancelled, the human exploration program was given clear direction, and funding for existing programs was increased."

"This is a legacy that the Biden administration can build on, so that in future years there can be a continued string of successes."

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