

Corona Virus 2020 Impacts on Space Exploration

An international Press Compress

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The Covid-19 virus pandemic outbreak became known to the public at the beginning of 2020. It is suspected to have started at the Chinese city of Wuhan to travel to unexpected places causing violent eruptions around the world.

On February 11, 2020 several media sources in the USA still indicated that under the FY2021 budget proposal, the Trump administration will propose a nearly \$3 billion increase for NASA, with most of the extra money going to building commercially operated lunar landers. By so doing, Trump has decided to go all in for landing the “first woman and the next man” on the moon by 2024. He is also going to directly challenge some in Congress who have expressed reservations about that goal. [1]

In March 2020 reports tickled in with speculations and official statements on the impacts this pandemic would have also on global space exploration plans and its associated industries.

Starting in April 2020, I collected various articles from the Internet to get a snapshot of the current assessments – with the plan to compare those predictions at the end of the Year 2020 with the actual situation.

A general assessment assumed space industries should fare better against coronavirus than other industries. [2]: Government customers in defense and emergency response have robust needs for satellite connectivity and geospatial data in times of crisis, and commercial demand for connectivity remains strong. [2].

NASA and ESA are currently supporting mission-essential and public services operations for all spacecraft with skeleton teams at the control centers supported by telework and “home - office” work with limited exceptions for on-site work helps to maintain critical planning and operations activities.

Ames, Michoud, Stennis Kennedy Space Center (KSC) and ESA Kourou-CSG launch complexes are at a stage with reduced personnel on-site to protect life and critical infrastructure. [3] [4]

Of course the results at the end of the year 2020 are influenced also by “natural” delays and shifts by other causes – however I hope the impact is not as severe as feared if the crisis last longer than a year as some virologists predict, and space (funds) will still be there to continue exploring its secrets and expand our horizon.

The following list is far from being complete, it merely reflects status of mayor projects using the available official information and other reports available at the time:

	Status April/March 2020	Status End of 2020 (Nov. 26, 2020)
USA	<p>AEHF-6 AEHF-6 satellite launch took place as scheduled on March 26, 2020[2]</p> <p>Dragon Demo-2 NASA announced that the SpaceX Dragon crew Demo-2 launch has been set to May 27, 2020 as the target launch date for sending two astronauts to the ISS from Kennedy Space Center in Florida, aboard a rocket built by the commercial service provider SpaceX. [5, April 17, 2020] – This would be the first crewed launch from American soil since the retirement of the Shuttle in 2011.</p>	<p>AEHF-6 is part of a SATCOM system operated by United Space Airforce. Launched as planned</p> <p>Demo-2 lifted-off on May 30, 19:22 GMT, sending a crew of 2 Astronauts to the ISS. SpaceX Falcon 9</p> <p>SpaceX Crew-1 launched Nov. 16, 2020, SpaceX Falcon 9: First operational mission of NASA’s Commercial Crew Program.</p>

	<p>SLS and Orion SLS and Orion work has been stopped. [3], [4]</p> <p>James-Webb-Telescope A shift of the James-Webb-Telescope planned for 2012) has to be expected. [3], [4]</p> <p>Event Horizon Telescope (EHT) EHT, an international consortium of about 200 scientists using a global array of telescopes who last year revealed the first-ever direct images of a black hole, had to cancel its 2020 observing campaign. [9]</p> <p>Mars Rover The Mars Rover “Perseverance” and Mars Helicopter are planned for summer 2020. [3][4]</p> <p>Gateway Most development work on the Gateway program continues, any onsite activity beyond securing hardware is temporarily suspended [3]. The first launch, the Power and Propulsion Element (PPE) was planned for Qutr 4, 2022. [10]</p> <p>ISS All work supporting ISS operations continues. Current planning dates for “End-of Life” (EOL, currently 2028) are ranging between 2024-2030. [10]</p> <p>Total Launches in 2020 (Status Nov. 26)</p>	<p>First un-crewed flight slipped multiple times, now Nov. 2021 (Budget 2020: 2.525 Mio \$)</p> <p>Current launch date: Oct. 31, 2021 (Ariane 5 EAC)</p> <p>National Science Foundation Grant (12,675 M) for EH II, a greatly enhanced Telescope, running until end of Sept. 2023</p> <p>Lift off July 30. 11:50 GMT on Atlas V (as planned)</p> <p>The European Space Agency (ESA) received authorization and funding to support its planned contributions to the Gateway including habitation and refueling. In October 2020, ESA signed an agreement with NASA to contribute habitation and refueling modules and enhanced lunar communications to the Gateway. Russia has also expressed interest in cooperating on the Gateway.</p> <p>Uninterrupted operations occurred throughout 2020, including the first SpaceX crew flight (Demo-2) and the first Commercial Crew Program Crew-1 delivery by SapceX to the ISS.</p> <p>Total: 38 Failed: 3</p>
ESA	<p>Kourou CGS/Arianespace Launches from Kourou are suspended and Roskosmos, using Kourou-CGS for Soyuz-2 rocket launches, retracted the majority of their launch personnel. [4] Arianespace paused missions from Europe’s South American spaceport following the French government’s call for limiting non-essential activities. [2]</p> <p>Galileo OHB, responsible for the completion and maintenance of the European Galileo navigation system expects delays but sees no crises introduced by the virus.</p>	<p>ESA had 3 Ariane launches and 2 Vega launches (one of them failed) from Kourou: Jan. 16 Eutelsat Connect AR-5ECA Feb. 18 Comms Satellite AR-5ECA Aug.15 Galaxy-30 AR-5ECA</p> <p>Sept.02 Small Satellites Vega Nov.16 SEOSAT Vega (failed)</p> <p>Nov. 21 Sentinel-6 Falcon 9 Vandenbg.</p> <p>The 2020 planned completion of the fleet from 22 to 24 active satellites has been postponed to the year 2021.</p>

	<p>Contrary, new applications for the Galileo navigation system might be developed (e.g., “tracking App” for virus infected persons). [7]</p> <p>ExoMars Rover The planned launch of the life-hunting ExoMars Rover planned for July 2020 has been delayed to 2022 due to failed ground tests. [4]</p> <p>Total Launches in 2020 (Status Nov. 26)</p>	<p>A Galileo “tracking App“ as not developed.</p> <p>Postponed now to Sept. 20, 2022</p> <p>Total: 5 Failed: 1</p>
China	<p>Mars Mission Despite the coronavirus pandemic, China is still working towards its upcoming mission to Mars— and still expects to launch in July 2020 as planned. [1] (Tanwen-1 Mission)</p> <p>Moon Mission Chang’e 5 Lunar sample retrieve mission.</p> <p>Launchers Expace, a launch vehicle manufacturer, operates out of Wuhan, the pandemic’s epicenter, which currently is under lockdown. However, with Expace “taking hits”, China still expects to launch more than 40 rockets this year. [1]</p> <p>Total Launches in 2020 (Status Nov. 26)</p>	<p>Lift-off on time, July 23, 04:41 GMT Long March launch vehicle.</p> <p>Launched on Nov. 23, 2020, Long March L/V</p> <p>China has now carried out 34 launches in 2020, which was briefly more than any other country (Status 17 Nov. 2020)</p> <p>Total: 35 Failed: 4</p>
Russia	<p>Soyuz Launch System/ISS Baikonour operates according to schedule under international quarantine procedures.</p> <p>The ISS MS-16 crew was launched successfully as planned on April 9, 2020 observing a strict quarantine regime. [6]</p> <p>Total Launches in 2020 (Status Nov. 26)</p>	<p>Russia announced 33 launch attempts for 2020 and has 12 completed (5 pending in December 2020). MS-16 crew (April 9, 2020) and MS-17 crew (Oct. 14, 2020) launched as planned.</p> <p>Total: 12 Failed: 0</p>
Japan	<p>JAXXA space and science operations largely remain unaffected. However all visitors to their numerous field centers have been suspended until April 30. [10]</p> <p>Total Launches in 2020 (Status Nov. 26)</p>	<p>Japan had three successful launches in 2020: one military satellite, one cargo supply flight to ISS and one Mars mission: the “Hope” (Al-Amal) mission with Emirates (VAR) Space Agency (UAESA) and University of Boulder. Liftoff: July 19, 2020 21:58 GMT</p> <p>Total: 3 Failed: 0</p>

Summary: As can be derived by the highlighted portions of the text, only the European space activities have been significantly impacted by the Covid-19 crisis.
No impact on the schedules for 2020 could be observed for the SpaceX plans
The Russian international space commitments were met as scheduled, however it cannot be judged how earnest the announcement of 33 launches at the beginning of 2020 was, therefore any Covid-19 impact or any other reasons cannot be associated with the 50 % offset in the launch schedule.
As spin-off information it looks like the 2021 planned NASA budget is still committed without cuts, however it remains to be seen what impacts the administrative transition from President D. Trump to J. Biden will have for landing the “first woman and the next man” on the moon by 2024 within the ARTEMIS plan.

References:

[1] <https://thehill.com/opinion/technology/482265-trump-goes-all-in-for-nasas-artemis-return-to-the-moon-program>

[2] Industry: <https://spacenews.com/space-may-fare-better-against-coronavirus-than-other-industries-report-says/>

[3] NASA HQ: bettina.inclan@nasa.gov / karen.northon@nasa.gov

[4] SZ: <https://www.sueddeutsche.de/wissen/raumfahrt-die-corona-krise-und-das-weltall-dpa.urn-newsml-dpa-com-20090101-200331-99-535029>

[5] NY Times: <https://www.nytimes.com/2020/04/17/science/spacex-nasa-crew-dragon.html>

[6] MS-16 Launch: <https://www.nasaspaceflight.com/2020/04/soyuz-2-1a-human-launch-m>

[7] OHB: <https://www.sueddeutsche.de/wirtschaft/raumfahrt-abstand-im-reinraum-1.4872381>

[8] China: <https://futurism.com/the-byte/china-coronavirus-launch-mars-mission>

[9] Industry: <https://www.space.com/coronavirus-covid-19-space-industry-impacts.html>

[10] Wikipedia:

https://en.wikipedia.org/wiki/Impact_of_the_2019%E2%80%932020_coronavirus_pandemic_on_science_and_technology

[11] The world's orbital launch attempts in 2020 (as of November 26, 2020)

<http://www.russianspaceweb.com/2020.html>