SPACE EXPLORATION PROJECT GROUP NEWS FROM YOUR SOLAR SYSTEM AND BEYOND



NEWSLETTER



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Newsletter



Location is Launchpad 39A, Florida, date is May 30th, 7:22pm UTC, 3:22 local time: this is a new historical date in the era of human spaceflight.

Almost 9 years after the last Space Shuttle mission, STS 135, NASA, more in general USA, gained again the capability of sending human beings in orbit thanks to the new crew vehicle Dragon (renamed Launch America by the crew members) developed by Space-X as part of the NASA's Commercial Crew Programme. The two astronauts, Robert Behnken and Douglas Hurley, lifted-off from the Kennedy Space Center on board the Falcon 9 and successfully docked with the International Space Station (ISS) the following day at 14:19 UTC, where their connational Chris Cassidy, ISS Commander, and the two Russia crew members, Anatoly Ivanishin and Ivan Vagner, welcomed them on-board.



This is just the beginning of a new exciting era of Space Exploration:





SpaceX's Crew Dragon renamed Launch America by the crew members. (Image: © SpaceX)

Additional information can be found at:

https://www.nasa.gov/specials/dm2/

https://www.space.com/spacex-crew-dragon-demo-2test-flight-explained.html

https://www.youtube.com/watch?v=lrTXg1qkAZs



SPACE GENERATION ADVISORY COUNCIL



Performed and Upcoming Events

In these difficult times with millions of people affected by the on-going worldwide coronavirus pandemic, SGAC members prepared a solidarity message to comfort people and let them know that nobody is alone:

The SEPG leadership team is working on a series of webinars on different topics with professionals and experts in the field:

- Can we mine the Moon? Benefits and challenges of Space Resources Utilization with Mr. Paolo Pino from Politecnico of Turin

- Forward to the Moon: Sustainable Lunar Activities and Principles for a Moon Village, with Dr. Piero Messina from ESA, Prof. Mark Sundahl from Cleveland Law and Ms. Dimitra Stefoudi from Leiden University

- Towards a Lunar Economy with Dr. Giuseppe Reibaldi from the Moon Village Association and Mr. Carlos Espejel from ispace Europe

- Fly me to the Moon - Analogue Missions for Lunar Exploration with Dr. Ilaria Cinelli, SEPG Co-Lead, and Dr. Aleksander Wasniowski from LUNARES

All the videos are posted on the SEPG Facebook page: <u>https://www.facebook.com/pg/sepg.sgac/videos/?ref=page_internal</u>

SEPG is proud to announce that starting from the end of May, a group of SEPG members joined the SGAC team that will participate in the international Mars City State Contest organized by the Mars Society. A team of 30 students and professionals will try to design in a bit more than a month a city that could self-sustain as much as possible 1'000'000 inhabitants.

All the information about the contest can be found at:

Remind that SGAC has a dedicated Calendar with all the upcoming webinars, give it a look to see what is coming next:

https://spacegeneration.org/events/category/webinar



One step closer to landing humans

on the Moon

The proliferation of actors involved in advancing sustainable space exploration is ever expanding. In order to realise the Artemis program, NASA has chosen three private U.S. companies to take the role in designing and building human landing systems. Blue Origin, SpaceX and Dynetics are tasked with this role, with a combined sum totalling \$967 million for the 10-month period until February 2021.

Additional information can be found at:

https://www.nasa.gov/press-release/nasa-names-companies-to-develophuman-landers-for-artemis-moon-missions



Lunar Transport Blue Moon Photo credit: © Blue Origin

The Artemis Accords: Rules for Space Exploration

Alongside technological advancements are much needed legal rules.

The Artemis Accords seeks to set out common rules for future space exploration through bilateral agreements. Currently, 10 principles have been outlined.



NASA administrator Jim Bridenstine posted on Twitter, including a link to Artemis Accords on the NASA website. Photo credit: © Jim Bridenstine via twitter Some of the most notable principles are: peaceful purposes, interoperability, protecting heritage –we can recall Apollo mission landing sites-, permission of space resource extraction and deconfliction of activities through avoidance of harmful interference via safety zones. These principles aim in achieving safe and sustainable space exploration in light of the variety of actors involved, by having a shared vision of principles, established in the Outer Space Treaty of 1967.

Additional information can be found at:

https://www.nasa.gov/specials/artemis-accords/index.html

China's new spacecraft

Technology is advancing at an expeditious rate and brings us all the more closer to Outer Space. It is not an easy mission for a spacecraft to re-enter the earth's atmosphere.

However, on the 5th of May, China sent its new spacecraft on the Long March 5B rocket, which returned to earth.

It is reported that the vessel was in

orbit for 2 days and 19 hours, completing a series of experiments, and successfully returning back to earth by landing on a predetermined site on the dry Dongfeng landing zone, Inner Mongolia autonomous region.

This marks a technological advancement for future space exploration missions. China now holds ambitions for the spacecraft to transport astronauts to the envisioned Space Station, which China aims to complete by 2022, and in the long run to the Moon.

Additional information can be found at:

https://www.nasaspaceflight.com/2020/05/newchinese-crew-capsule-returns-earth/



Return capsule May 8th 2020 at 1:49pm (Beijing time) Photo Credit: © Wang Jiangbo/Xinhua

Reaching for the Asteroids

OSIRIS- REx mission

Space exploration includes conducting important scientific research.

Asteroids contain resources that can be used for this research. Bennu is a B- type near earth asteroid, and is a target for the OSIRIS-REx mission. This is a mission intended to collect asteroid samples. To get close to the asteroid, sampling rehearsals are required.

So far, OSIRIS-REx has been conducting sampling rehearsals and the sample collection mission will take place on October 20th 2020. The surface for sampling has been identified as the Nightingale site, ensuring safe access by the spacecraft to the site. Subsequently, on September 24th 2023, the spacecraft containing the capsule with the asteroid sample will approach earth to release the latter in a parachute landing. Over time, sample parts will be distributed to research groups.

Additional information can be found at:

<u>https://www.asteroidmission.org/why-bennu/</u> <u>https://solarsystem.nasa.gov/missions/osiris-rex/in-</u> <u>depth/</u>



Illustration imagine showing NASA's OSIRIS-REx spacecraft moving toward asteroid Bennu to collect a sample. Photo credit: © NASA/Goddard/University of Arizona

Analog missions

Terrestrial missions in preparation for extra-terrestrial exploration

While the Artemis program which envisions to put the next man and woman on the Moon by 2024 is on the horizon, analog missions are being conducted closer to home. These missions take place on earth

locations with similar characteristics to that of space environments. To achieve sustainable space exploration, these missions aim to carry out testing and studies of infrastructure, technology, research and behavioural effects. For instance, LUNARK will carry out an analog mission in Northern Greenland by building a simulated Moon habitat for research.



MARS

Vision of the Lunar Habitat Photo credit: © SAGA Space Architects Located in an area with harsh climates, the Moon habitat will endure hurricane winds and temperatures dropping to -30°C.

Additional information can be found at:

https://www.kickstarter.com/projects/sagaspacearchitects/lunarkbuilding-and-testing-a-moon-home-for-everyone?ref=b3iena

Eight-month Long Analog Mission

In preparation for the Artemis exploration program, NASA is seeking U.S participants to be part of an eight-month long analog mission. This mission will take place in Moscow, where participants will experience conditions expected to arise in future space exploration missions to the Moon and Mars. The focus of this mission will be the study of physiological and psychological effects of isolation that astronauts may face in future missions.

This data will help NASA understand the effects of isolation and long spaceflight journeys.





https://www.nasa.gov/ feature/nasa-seekingus-citizens-for-socialisolation-study-formoon-and-mars-missions/



Japanese HTV cargo ship makes its final flight

J∦¥A

The mission marks the final flight of JAXA's HTV spacecraft and its H-IIB rocket as the country pursues a new booster, the H-III rocket, and an advanced HTV-X spacecraft for future missions beginning in 2022.

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Additional info can be found at: <u>https://www.nasaspaceflight.</u> <u>com/2020/05/h-iib-last-htv-mission-iss/</u>

May 22

May 20

EKS 4 early warning satellite for Russian military



Between 10:00 and 12:30 Moscow Time on May 22, 2020, a Soyuz booster and Fregat upper stage successfully carried a missile warning satellite into orbit for the Russian military. Additional info can be found at: <u>http://russianspaceweb.com/eks4.html</u>

May 24

JUPITER

LauncherOne first orbital test flight

A Virgin Orbit LauncherOne rocket made its first orbital test flight after dropping from a modified Boeing 747 carrier aircraft over the Pacific Ocean off the coast of California. Additional info can be found at: <u>https://www.space.com/virgin-orbit-first-launcherone-rocket-test-</u>

may-2020.html

May 25

Rocket Lab "Don't Stop me Now"



Rocket Lab launched an Electron rocket on a rideshare mission carrying three payloads for the U.S.

Additional info can be found at: https://directory.eoportal.org/web/ eoportal/satellite-missions/content/-/ article/electron-launcher-of-rocketlab

May 27

Crew Dragon Demo 2

A SpaceX Falcon 9 rocket launched a Crew Dragon spacecraft on its first test flight with astronauts on-board to the International Space Station under the auspices of NASA's commercial crew program.





SATURN

Space related Science **Curiosities**

The formation of a new planet



Twist showing what scientists believe to be a formation of a new planet. This has been spotted by ESO's Very Large Telescope. Photo credit: © ESO/Boccaletti et al.

Outer Space is a vast area with phenomenons happening beyond our imagination. Today we are able to see and witness the wonders of outer space thanks to science advancements. An especially interesting aspect of the wonders of space to the science community is the formation of new planets. The European Southern Observatory's Very Large Telescope (ESA VLT) has discovered a spiral in a disc around the young AB Aurigae star, which scientists believe to be the formation of a new planet. It is reported that this formation is located in the constellation of Auriga, 520 light-years away from Earth. Being able to observe something so far away from us is a successful step in space science exploration and knowledge on planet formations. Additional information can be found at:

https://www.eso.org/public/news/eso2008/

Observing our star: Parker Solar Probe



Artist illustration of of Parker Solar Probe Photo Credit: © NASA/Johns HOpkins APL/Steve Gribben

Our star has its own mysteries.

Hence, on August 11th 2018 NASA launched the Parker Solar Probe, with the aim of studying corona, which is the sun's outer atmosphere.

The main points of study are the sun's corona and the solar wind. The original intended length of information gathering through flyby's last 11 days. The latest flyby commenced on May 9th and will go through to June 28th, reaching its closest point on June 7th. It is reported that this data will be made available to the public in November 2020.

Additional information can be found at:

https://blogs.nasa.gov/parkersolarprobe/

URANUS

<u>New observations and new evidence:</u> <u>DLA0817g Disk galaxy</u>



Artist illustration of the Wolfe Disk Photo Credits: © NRAO/AUI/NSF, S. Dagnello

It seems that our understanding of long gradual galaxy formation may have been changed. Astronomers observed the disk galaxy by using the Atacama Large Millimetre/submillimetre Array (ALMA).

It is reported that the disk galaxy DLA0817g, also known as the Wolfe Disk, has reached its mass at 1.5 billion years after the big bang, only being 10% of its current age. This proves the capability of much quicker galaxy formations, suggested by researchers as being achieved through a cold mode accretion scenario. Further information of the results can be obtained in the Journal Nature.

Additional information can be found at:

https://www.mpg.de/14829540/they-grow-up-so-fast-new-observations-show-that-massivedisk-galaxies-formed-exceptionally-early-in-cosmic-history

SPACE RELATED



Space Thoughts - Michael J. Listner

This space lawyer and founder of Space Law & Policy Solutions, has created a channel in which, through dynamic and informative videos, we can be aware of, not only the latest news in space, but also those issues affecting outer space activities that may be complex to understand.

You can find all of his videos at: <u>https://www.youtube.com/channel/UC6Ykq1wgCPjOAelamkETZkQ</u>

Space Café Webtalks- <u>SpaceWatch.</u> <u>Global</u>

This switzerland-based digital magazine and portal for those interested in space and the far reaching impact of the space sector. Through their web talks, we'll get to see the thoughts of those working in the industry about the future of space applications or space law. In their last webtalk, Prof. Dr. Kai-Uwe Schrogl, president of the International Institute of Space Law, shared his thoughts on the future for the space industry.

Additional info can be found at: <u>https://spacewatch.global/2020/05/space-cafe-webtalk-33-minutes-with-</u> prof-dr-kai-uwe-schrogl-on-26-may-2020/



Space For Humanity

Space for Humanity is an organization expanding access to space and cultivating a culture of interconnectedness as we venture into the stars; and in this new project, they have created a series of online free sessions where they discuss what humanity's latest venture in space can teach us as we navigate these challenging times. You will be able to see NASA's astronauts, space investors, engineers and visionaries.

Check their webpage for more information: https://www.spaceforhumanity.org/webinar



Make Space Boring

Jason Kanigan shows us space and all its applications and questions in a close and didactic way, in order to turn the field of space into a matter that is familiar and close to those who think it still seems far away. Through their videos you will be able to learn, inform yourself, watch interesting interviews and find out about the latest advances. You can watch them at:

https://www.youtube.com/watch?v=YmX55SZ9p64&list=PL4FYkJGI9Ezp-ZZxe-DC-Qcx047JHwM5CH





Ipcoming Astronomy Events

June 4

This is the best time to view Mercury since it will be at its highest point above the horizon in the evening sky. Look for the planet low in the western sky just after sunset.

June 5 <u>Penumbral Lunar Eclipse</u>

Mercury

A penumbral lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra. The eclipse will be visible throughout most of Europe, Africa, Asia, Australia, the Indian Ocean, and Australia. On the same day, depending on your location, you will be able to see the Full Moon, at 3:12 p.m. EDT (19:12 GMT).

Conjunction of the Moon and Venus

June 19

A penumbral lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra. The eclipse will be visible throughout most of Europe, Africa, Asia, Australia, the Indian Ocean, and Australia. On the same day, depending on your location, you will be able to see the Full Moon, at 3:12 p.m. EDT (19:12 GMT).

<u>June Solstice</u>

June 20

Happy Solstice! The June solstice occurs at 21:43 UTC (21:43 GMT). This is the first day of summer (summer solstice) in the Northern Hemisphere and the first day of winter (winter solstice) in the Southern Hemisphere.

June 21

New Moon

The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.

<u>Annual Solar Eclipse</u>

The path of the eclipse will begin in central Africa and travel through Saudi Arabia, northern India, and southern China before ending in the Pacific Ocean. A partial eclipse will be visible throughout most of eastern Africa, the Middle East, and southern Asia.

Additional info can be found at: <u>https://www.photopills.com/articles/astronomi-</u> <u>cal-events-photography-guide#step7</u>

ARE YOU A GAMER? DO YOU YOU LIKE FLIGHT SIMULATORS?

Then you have now the opportunity to fly a pretty unique vehicle: the Space-X Crew Dragon!

Space-X developed and made available an online flight simulator with which players can try to dock the crew vehicle to the International Space Station.

The commands are quite simple, you have two main controllers that modify to different physical properties of the vehicle:

- Translational velocity
- Rotational velocity

Beware! In order to safely dock to the station, these velocities need to be within specified limits!

Good luck to all the Space Pilots! <u>https://iss-sim.spacex.com/</u>





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