August 2021

Oklahoma Space Alliance

A Chapter of The
National Space Society

A free email newsletter of the Oklahoma Space Alliance

July 2021, Big Step for Commerical Space

Left to right are chief pilot Dave Mackay, Colin Bennett, Beth Moses, Richard Branson, Sirisha Bandla and pilot Michael Masucci
IMAGE SOURCE: VIRGIN GALACTIC.

Jeff Bezos, second from left, with crew mates (l to r) Oliver Damen, Wally Funk, and Mark Bezos.

August 2021 OSA Meeting

Saturday, August 14 , 2021

Cliff McMurray's home 2715 Aspen Circle in Norman.
Non-vacinated persons should wear a mask
Zoom link
https://us04web.zoom.us/j/79444489279?pwd=R2hLS2R3RnVoUFVMcS9UaDRWMW9sUT09

Quote of the Month

""When the time comes to start building deep space transports and refueling rocket tankers, it will be the commercial industry that steps up, not another government-owned, government-managed enterprise."

— Buzz Aldrin

Oklahoma Space Alliance
Update

August, 2021

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Branson flies to edge of space on SpaceShipTwo

by **Jeff Foust** — July 11, 2021

WhiteKnightTwo and SpaceShipTwo take off from Spaceport America in New Mexico July 11 on a flight to take six people, including Virgin Galactic founder Richard Branson, to the edge of space. Credit: SpaceNews/Jeff Foust

SPACEPORT AMERICA, N.M. — Virgin Galactic founder Richard Branson and five other people flew to the edge of space on the company's SpaceShipTwo suborbital vehicle July 11, the culmination of an effort that started nearly 17 years ago.

The SpaceShipTwo vehicle, named VSS Unity, took off from Spaceport America in the southern New Mexican desert at 10:40 a.m. Eastern, attached to its WhiteKnightTwo aircraft. Takeoff was delayed by 90 minutes because of weather overnight that slowed launch preparations. The vehicles flew to an altitude of about 13,700 meters before WhiteKnightTwo released Unity at 11:25 a.m. Eastern.Full Story https://spacenews.com/branson-flies-to-edge-of-space-on-spaceshiptwo/

Video: 2:25 https://www.youtube.com/watch?v=pKJjzJyDTd8e

Table of Contents

Blue Origin launches Bezos on first crewed New Shepard flight

by **Jeff Foust** — July 20, 2021

Blue Origin's New Shepard vehicle lifts off on its first crewed flight July 20 from West Texas. Credit: SpaceNews/Jeff Foust

VAN HORN, Texas — Blue Origin performed its first crewed New Shepard launch July 20, sending company founder Jeff Bezos and three other people on a suborbital flight.

New Shepard lifted off from Blue Origin's Launch Site One in West Texas at 9:12 a.m. Eastern on the NS-16 mission. The crew capsule, called RSS First Step, separated from its booster and reached a peak altitude of 107 kilometers before descending under parachutes to a landing 10 minutes and 10 seconds after liftoff. The booster performed a powered landing nearly seven and a half minutes after liftoff.

On board New Shepard was Jeff Bezos, the founder and recently retired chief executive of Amazon.com, who established Blue Origin more than two decades ago. He has invested several billion dollars into the company, creating New Shepard as well as its New Glenn orbital launch vehicle under development, the BE-4 engine and lunar lander concepts.
"Best day ever!" he exclaimed minutes after landing.

Full Story : https://spacenews.com/blue-origin-launches-bezos-on-first-crewed-new-shepard-flight/
Video 10: 42 https://www.youtube.com/watch?v=kKdDoPw36bU

Chinese rocket companies are preparing for hop tests

Preparations for a static fire test of the Nebula-M test stage in July 2021. Credit: Deep Blue Aerospace

HELSINKI — A number of Chinese rocket firms are preparing to carry out first hop tests in a bid to develop reusable launch vehicles.

Beijing Deep Blue Aerospace Technology Co., Ltd., carried out a 10-second static fire test of the 7.3-meter-high "Nebula-M" technology verification test vehicle, the company announced July 13.

Deep Blue Aerospace plans to follow up with a variable thrust test before attempting vertical takeoff, vertical landing tests with the Nebula-M. No timeline for the attempts was provided.

The Nebula-M uses a Leiting-5 (Thunder 5) kerosene-liquid oxygen, electric-pump-fed engine and will attempt meter- and 100-meter-level hops. The tests can be considered analogous to SpaceX's Grasshopper experimental flights as a step towards reusable rockets.

In the longer term China has stated that it is targeting smart, recoverable and reusable launch vehicles by around 2035. Design concepts for China's future super heavy-lift launcher, the Long March 9, appear to be shifting from the established Long March-style with side boosters to a single core version with clustered engines more amenable to first stage reusability, according to a presentation from a senior Chinese rocket designer.

Full Story Space News: https://spacenews.com/chinese-rocket-companies-are-preparing-for-hop-tests/

Oklahoma's Space Port Eying Commercial Space Travel Possibilities

WASHITA COUNTY, Oklahoma -
Richard Branson's trip to the edge of space has Americans looking to the stars and officials at Oklahoma's spaceport say it's the perfect time to launch the state's second largest industry into the final frontier.
"It is prime time for the state of Oklahoma to be talking about Burns Flat, Oklahoma again," Lt. Gov. Matt Pinnell said.
With a nearly 3-mile-long runway and a designated space flight corridor, Space Port Oklahoma is one of 12 FAA licensed space ports in the United States.

Video: https://www.news9.com/story/60ef71b3b39a5d0bf1f1c9eb/oklahomas-space-port-eying-commercial-space-travel-possibilities

Astronaut captures sparkling 'shooting star' video as Russian space station module falls to Earth

From his perch on the International Space Station, a French astronaut watched a long-running Russian space module break into pieces in a shower of fireworks. What's more, he caught the event on video.

The European Space Agency's Facebook page shows a sped-up timelapse of the module, called Pirs, meeting its fiery demise Monday (July 26) under the watch of Thomas Pesquet.

"Atmospheric reentry without a heat shield results in a nice fireball," Pesquet wrote in the post, which also included a French description. "You clearly see smaller pieces of melting metal floating away and adding to the fireworks."

Space station situation with Russian module misfire more serious than stated: report

Image credit: Thomas Pesquet/ESA/NASA)

Editor's Note: Aug. 3, NASA issued a statement over social media sharing that the space station "was 45° out of attitude when Nauka's thrusters were still firing & loss of control was discussed with the crew. Further analysis showed total attitude change before regaining normal attitude control was ~540°. Station is in good shape & operating normally."

On Thursday (July 29) morning, Russia's long-awaited research module Nauka docked with the space station. But a few hours later, the module accidentally fired its thrusters, briefly tilting the space station and causing it to lose what engineers call "attitude control."

However, while NASA said on Twitter and officials repeated during public comments about the incident that the orbiting lab tilted about 45 degrees, that appears not to have been the full story. According to reporting by The New York Times, Zebulon Scoville, the NASA flight director leading mission control in Houston during the event, says the station tilted far more severely than just 45 degrees.

NASA awards contract to Northrop Grumman to build Gateway module

WASHINGTON — NASA has awarded a contract worth $935 million to Northrop Grumman to build and integrate the first habitation module for the lunar Gateway.

NASA announced July 9 it finalized a contract with Northrop Grumman to build the Habitation and Logistics Outpost (HALO) module for the Gateway. That module, one of the first for the Gateway, will serve as a habitat for visiting astronauts and a command post for the lunar orbiting facility. It will have docking ports for Orion spacecraft, cargo vehicles like SpaceX's Dragon XL and lunar landers, as well as for later modules to be added by international partners.

The fixed-firm-price contract covers assembly of HALO as well as integrating it with another Gateway module, the Maxar-built Power and Propulsion Element (PPE). Northrop will also be responsible under the contract for preparing the combined modules for launch on a SpaceX Falcon Heavy, as well as activation and checkout of HALO after launch.

Full Story https://spacenews.com/nasa-awards-contract-to-northrop-grumman-to-build-gateway-module/

Video summary 0:40 https://www.youtube.com/watch?v=Hnd5poID3Rc

NASA issues contracts for nuclear thermal propulsion studies

The study contracts awarded to three teams of companies will support concept studies of reactors for nuclear thermal propulsion systems that could power future missions to Mars. Credit: NASA

WASHINGTON — NASA has selected three teams of companies to perform concept studies of nuclear thermal propulsion (NTP) reactors while making plans to fund similar studies for nuclear surface power systems.

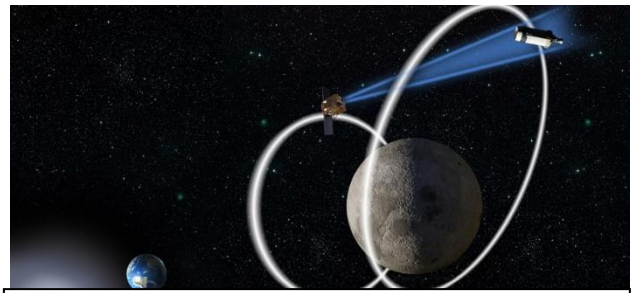
Jim Reuter, NASA associate administrator for space technology, announced the awards in a presentation at the American Astronautical Society's Glenn Memorial Symposium July 13. Each contract is worth approximately $5 million and will last one year.

One contract will go to BWX Technologies, working with Lockheed Martin. A second contract will go to General Atomics Electromagnetic Systems, working with X-energy and Aerojet Rocketdyne. The third will go to Ultra Safe Nuclear Technologies, working with its parent company, Ultra Safe Nuclear Corporation, as well as Blue Origin, General Electric Hitachi Nuclear Energy, General Electric Research, Framatome and Materion.

Full Story: https://spacenews.com/nasa-issues-contracts-for-nuclear-thermal-propulsion-studies/

Good explaination video nuclear thermal propulsion. YouTube 3:04
https://www.youtube.com/watch?v=miy2mbs2zAQ&t=64s

If China and the US Claim the Same Moon-Base Site, Who Wins?



The Cislunar Highway Patrol System (CHPS) is a space experiment designed to demonstrate domain awareness capabilities out to the moon. AIR FORCE

There's a not-so-quiet race back to the moon underway, but the two largest factions, with China and Russia on one side, and the United States and its partners on the other, are not recognizing each others' proposed rules on what's allowed once they get there.

Lawmakers and space policy analysts are concerned: How do you avoid conflict in space if the international laws and policies on Earth no longer apply?

“Many terrestrial military doctrines are not applicable in space, or at least not as applicable. If you get beyond 50 miles, or at least 62 miles, suddenly different rules apply. We need to start being aware of that,” says Rep. Jim Cooper, D-Tenn.

There’s already some aggressive international elbowing over the rules of satellite operations. As with the moon, there’s no consensus yet on how to respond to aggression in Earth orbit, the head of U.S. Space Command Gen. James Dickinson told attendees at last week’s Sea Air Space conference.

“The behavior of some of our adversaries in space may surprise you,” Dickinson said. “If similar actions have been taken in other domains, they'd likely be considered provocative, aggressive, or maybe even irresponsible. And in response, the U.S. government would take corresponding actions using all levers of national power, a demarche, or a sanction or something to indicate we won't tolerate that type of behavior, but we're not quite there yet in space policy.”

In 1967, the U.N. General Assembly adopted a treaty on the use of outer space that promised cooperation and banned nuclear weapons, military maneuvers, and military installations off-planet. The agreement also requires countries to take “appropriate international consultations” before making any moves that would “cause potentially harmful interference” with other space programs, and allows countries to “request consultation” if they believe such interference is likely.

In addition to those two major alliances, private firms such as Blue Origin are also working on private moon bases.

Full Story: https://www.defenseone.com/technology/2021/08/if-china-and-us-claim-same-moon-base-site-who-wins/184352/

Related Links: Space Force Journal “Cislunar Spacepower, The New Frontier”
https://thespaceforcejournal.com/issue-2-2-cislunar

China launches secretive suborbital vehicle for reusable space transportation system

HELSINKI — China conducted a clandestine first test flight of a reusable suborbital vehicle Friday as a part of development of a reusable space transportation system.

The Chinese suborbital vehicle for a reusable space transportation system launched from the Jiuquan Satellite Launch Center in the Gobi Desert, northwest China. Credit: Modified Copernicus Sentinel data 2020

The vehicle launched from the Jiuquan Satellite Launch Center Friday and later landed at an airport just over 800 kilometers away at Alxa League in Inner Mongolia Autonomous Region, the China Aerospace Science and Technology Corp. (CASC) announced.

No images nor footage nor further information, such as altitude, flight duration or propulsion systems, were provided. The CASC release stated however that the vehicle uses integrated aviation and space technologies and indicates a vertical takeoff and horizontal landing (VTHL) profile.

Full Story https://spacenews.com/china-launches-secretive-suborbital-vehicle-for-reusable-space-transportation-system/

Video 8:05 https://www.youtube.com/watch?v=pieOVtaj3hw

City-sized asteroids smacked ancient Earth 10 times more often than thought

Asteroid impacts created infernal conditions on the young Earth. (Image credit: SwRI/Simone Marchi, Dan Durd)

Asteroids the size of cities, like the one that wiped out the dinosaurs, slammed into the ancient Earth way more often than previously thought, a new study has found. Approximately every 15 million years, our evolving planet would get a hit by a piece of rock about the size of a city, or even a bigger province, scientists with the new study said in a statement. The research was [Title] presented at the Goldschmidt This violent period, which took place between 2.5 upheaval on a regular basis, with the chemistry

near its surface undergoing dramatic changes that can be traced in the rocks in the ground even today, the researchers said.

n the study, Simone Marchi a principal scientist with the Southwest Research Institute in Boulder, Colorado and colleagues looked at the presence of the so-called spherules, small bubbles of vaporized rock that were thrown up to space by every asteroid impact, but then solidified and fell back to Earth, forming a thin layer that geologists see in the bedrock today.

Story https://www.space.com/ancient-earth-hit-by-city-size-asteroids-often
For in depth knowledge on asteroids see The B612 Foundation An organization " Dedicated to the discovery and deflection of asteroids." https://b612foundation.org/
Video 1:57 https://www.youtube.com/watch?v=yhODlE2EOlY
NSS video on Planteary defense 2:54 https://space.nss.org/planetary-defense/

New FAA rules change who qualifies for commercial astronaut wings

By Chelsea Gohd

The Federal Aviation Administration (FAA) has changed their qualifications for commercial astronaut wings, and Blue Origin's first flight crew might no longer be eligible. That, however, doesn't change whether or not they are astronauts.

The Blue Origin "astronaut pin" that all crew members receive after flight, next to the patch for the first New Shepard mission. (Image credit: Blue Origin)

Recently, two crews from the space tourism companies Virgin Galactic and Blue Origin launched their first fully crewed suborbital test flights on SpaceShipTwo and New Shepard vehicles, respectively, each reaching different boundaries of space.

Virgin Galactic's space plane surpassed a 50-mile (80 kilometers) altitude and Blue Origin's capsule reached 62 miles (100 km) above Earth's surface, a boundary known as the Kármán line. However, while both missions passed these thresholds, it is possible that not everyone on these flights will earn official commercial astronaut wings with the FAA.

Full story with video: https://www.space.com/faa-commercial-astronaut-wings-rule-change

Watch NASA's Mars helicopter Ingenuity explore intriguing Raised Ridges in new video

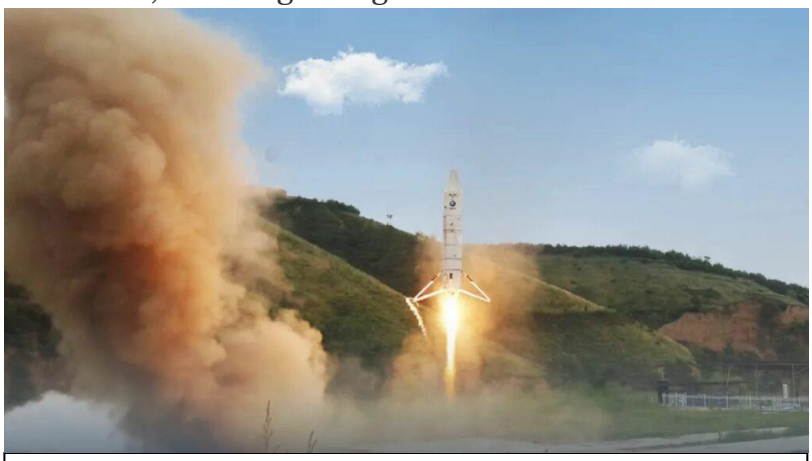
In a brand-new video, you can watch Ingenuity make its highest and most complex flight to date, which took the autonomous craft over an area known as Raised Ridges.

During this trip, its 10th flight, Ingenuity covered a distance of 310 feet (95 meters) and soared to a record altitude of 40 feet (12 meters). Combined with the distances traveled throughout all of its 10 flights, Ingenuity has now flown for more than one mile.
This flight, completed on July 24, was the most complex of all Ingenuity flights, according to a NASA statement, and saw the helicopter perform multiple maneuvers while passing through 10 distinct waypoints.
Video: https://preview.vanilla.tools/fte/space/5ff13ea2-f14e-11eb-a505-820d9401232a/news/watch-ingenuity-explore-intriguing-raised-ridges-in-new-video
YouTube 4:11 https://www.youtube.com/watch?v=gkHlaBdHqU4
Successfully completed 11th flight https://www.youtube.com/watch?v=gkHlaBdHqU4

Chinese space firm launches and lands small test rocket

by **Andrew Jones** — August 2, 2021

HELSINKI — A Chinese private launch company carried out a first low-altitude vertical takeoff, Deep Blue Aerospace fired up the Nebula-M VTVL test stage at a facility at Tongchuan, Shaanxi Province, reaching a height of almost 10 meters before briefly hovering and landing safely, the company announced Aug. 2.



A hop test of Deep Blue Aerospace's Nebula-M test stage in July 2021. Credit: Deep Blue Aerospace

The 7.3-meter-high Nebula-M used a variable thrust Leiting-5 (Thunder 5) kerosene-liquid oxygen, electric-pump-fed engine. The test was part of the development of the 2.25-meter-diameter Nebula-1 orbital launcher, which is to be capable of lifting 500 kilograms to 500 km Sun-synchronous

Deep Blue Aerospace described the test as a “grasshopper jump,” referencing SpaceX’s Grasshopper experimental flights as part of Falcon 9 development. It followed a 10-second static fire test of the “Nebula-M” technology verification test vehicle July 13, with two subsequent 60-second hot fire tests later in the month.

The next step is a 100-meter-level test and assembly of the Nebula-M2 test stage. Testing of the launcher's Leiting-20, 20-ton-thrust kerolox engine is expected to be completed in 2021.

Full Story https://spacenews.com/chinese-space-firm-launches-and-lands-small-test-rocket/

NSS "A Day in Space" Segment 3 — Buzz Aldrin Interview by Geoffrey Notkin

"A Day in Space" Segment 3—BUZZ ALDRIN: In this exclusive interview, Buzz Aldrin of Apollo 11 discusses his history with NASA, his decades of work with the NSS, his vision for the future of spaceflight, and international cooperation in the final frontier. Interviewed by NSS president Geoffrey Notkin.

Video 44:07 https://www.youtube.com/watch?v=Lu7mnrKqjNY

That's All Folks