



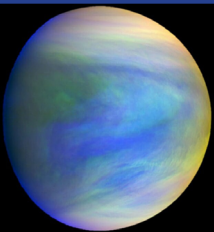
Astro

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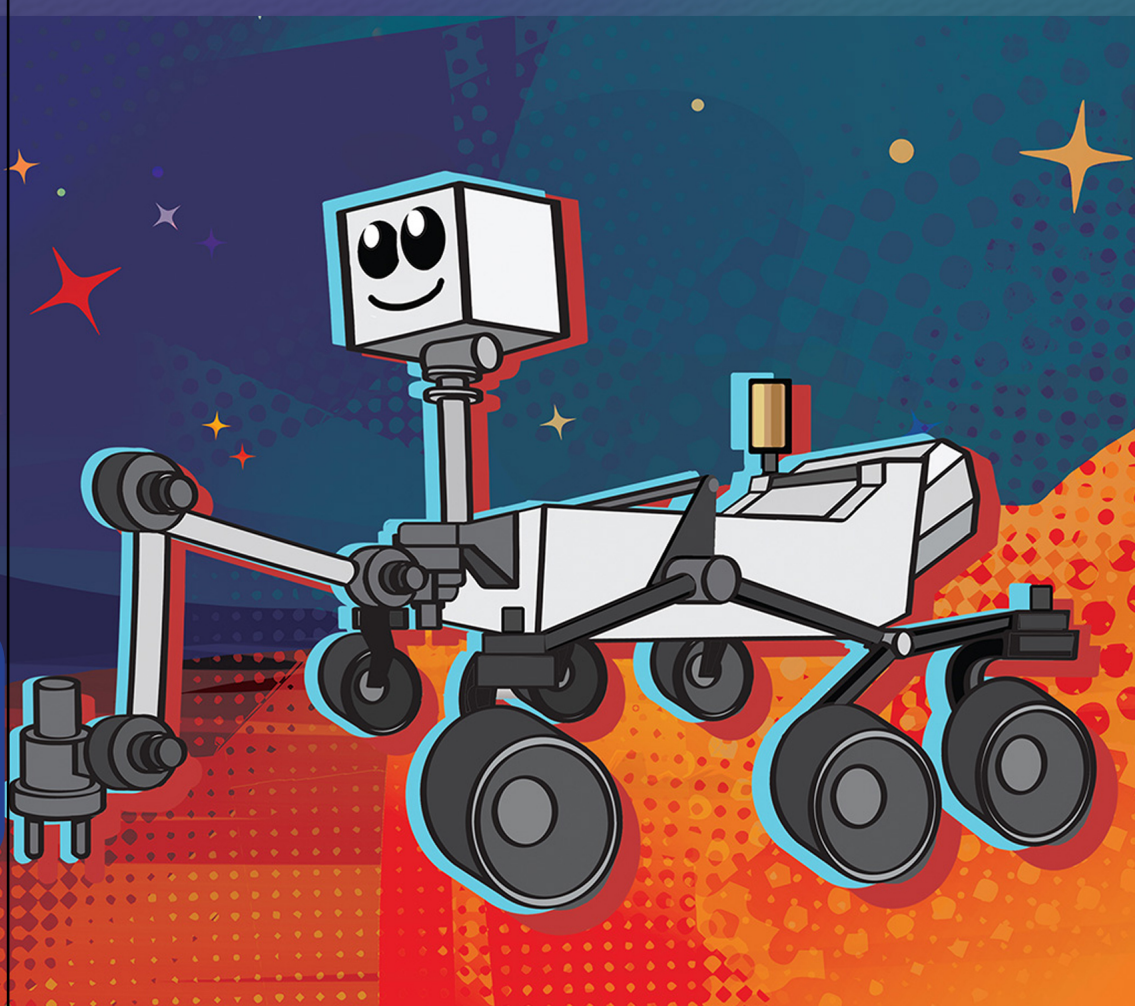
Mysterious Dark Patches in Venus' Clouds Are Affecting the Weather There

What the dark patches are is still a mystery, though astronomers dating back to Carl Sagan have suggested they could be extraterrestrial microorganisms.

The planet's hot, harsh atmosphere is thick with carbon dioxide and sulfuric acid. Atmospheric gases circulate amid cloud layers according to patterns that scientists don't fully understand. And Venusian clouds also contain strange, dark patches, called "unknown absorbers" because they absorb large amounts of solar radiation.

No one has yet determined what these dark patches are, but scientists have speculated that they might be forms of sulfur, ferric chloride or even microscopic life.

Astronomy.com



NASA Invites Students to Name Next Mars Rover

Starting Tuesday, K-12 students in U.S. public, private and home schools can enter the Mars 2020 Name the Rover essay contest. One grand prize winner will name the rover and be invited to see the spacecraft launch in July 2020 from Cape Canaveral Air Force Station in Florida.

The Name the Rover contest is part of NASA's efforts to engage students in the STEM enterprise behind Mars exploration and inspire interest in science, technology, engineering and mathematics.

The naming contest partnership is part of a Space Act Agreement between NASA, Battelle of Columbus, Ohio, and Future Engineers of Burbank, California, in educational and public outreach efforts.

NASA.gov



A 3-D Printed Telescope: The Analog Sky Drifter

A unique 3-D printed telescope named the Analog Sky Drifter may spark a revolution in amateur telescope making. In past years, the price of serious backyard telescopes has dropped considerably. Back until the 1960s, a six-inch aperture Newtonian was a 'big scope,' and the only option to gain access to something larger was to build it yourself. But the advent of two innovations that came on the scene in the 1970s—the Dobsonian mount and the Schmidt-Cassegrain reflector—put serious optics in the hands of backyard observers.

Now 3-D printing technology may just bring things around full circle. So why build a telescope today? Often, constructing your own telescope can give you those one of a kind features that aren't available on mass-produced telescopes. In the case of Robert Asumendi, his quest began with looking for a telescope that addressed his severe astigmatism. The result: The Analog Sky Drifter, a unique binocular telescope constructed almost entirely of 3-D-printed parts.

Robert's innovation addresses these with brilliant results. And he didn't even start with a workshop; he outsourced the designs on 3DHubs at first, before getting his own 3-D printer. And heck, the design just looks futuristic, as well.

Phys.org



NASA's James Webb Space Telescope Has Been Assembled for the First Time

Reaching a major milestone, engineers have successfully connected the two halves of NASA's James Webb Space Telescope for the first time at Northrop Grumman's facilities in Redondo Beach, California.

Once it reaches space, NASA's most powerful and complex space telescope will explore the cosmos using infrared light, from planets and moons within our solar system to the most ancient and distant galaxies.

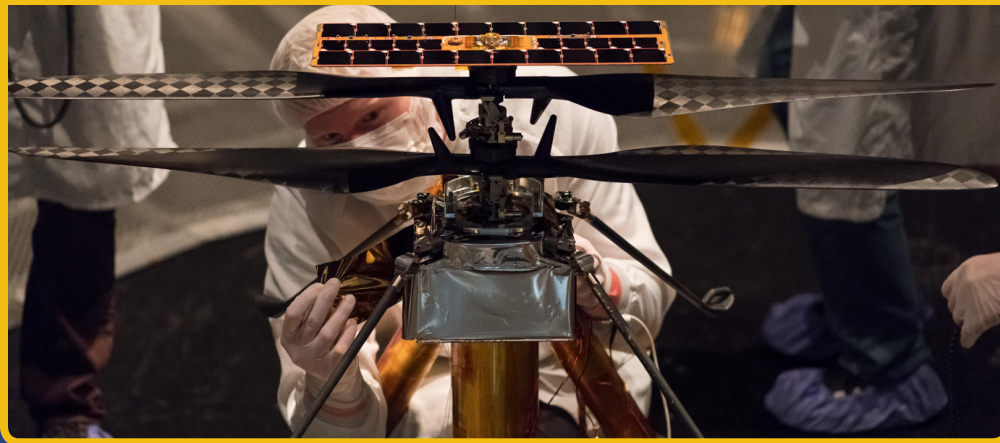
To combine both halves of Webb, engineers carefully lifted the Webb telescope (which includes the mirrors and science instruments) above the already-combined sunshield and spacecraft using a crane. Team members slowly guided the telescope into place, ensuring that all primary points of contact were perfectly aligned and seated properly.

The observatory has been mechanically connected; next

steps will be to electrically connect the halves, and then test the electrical connections. Both of the telescope's major components have been tested individually through all of the environments they would encounter during a rocket ride and orbiting mission a million miles away from Earth.

Now that Webb is a fully assembled observatory, it will go through additional environmental and deployment testing to ensure mission success. The spacecraft is scheduled to launch in 2021.

Webb will be the world's premier space science observatory. It will solve mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it. Webb is an international project led by NASA with its partners, ESA (European Space Agency), and the Canadian Space Agency.



On Icy Moons, Alien Life May Go with the Flow of Ocean Currents

One of the key determinants of which worlds can host life may lie in the motion of their oceans. Right now, calculating that motion is a challenge. After all, scientists can't just dip their toes in the water. But new research pulls together information about four of the most intriguing ocean worlds to inform models of what their subsurface oceans might be doing.

"These oceans are really interesting in and of themselves," Krista Soderlund, an expert on planetary fluid dynamics at the University of Texas at Austin and author of the new research, told Space.com. "You often are first drawn to a satellite by what it looks like on its surface, but I think that what is going on beneath the surface is just as exciting and interesting."

And according to her new calculations, there is indeed plenty going on beneath the surface of the solar system's icy moons. Soderlund focused on Jupiter's moons Europa and Ganymede and on Saturn's moons Enceladus and Titan.

In each case, she tried to understand how factors like the world's rotation rate, the thickness of its ice shell and the density of its seawater might affect how much water moves around the hidden oceans.

Space.com

NASA's Mars Helicopter Attached to Mars 2020 Rover

Engineers attached NASA's Mars Helicopter, which will be the first aircraft to fly on another planet, to the belly of the Mars 2020 rover in the High Bay 1 clean room at the Jet Propulsion Laboratory in Pasadena, California.

The twin-rotor, solar-powered helicopter was connected, along with the Mars Helicopter Delivery System, to a plate on the rover's belly that includes a cover to shield the helicopter from debris during entry, descent and landing. The helicopter will remain encapsulated after landing, deploying to the surface once a suitable area to conduct test flights is found at Jezero Crater, the rover's destination.

The Mars Helicopter is considered a high-risk, high-reward technology demonstration. If the small craft encounters difficulties, the science-gathering of the Mars 2020 mission won't be impacted. If the helicopter does take flight as designed,

future Mars missions could enlist second-generation helicopters to add an aerial dimension to their explorations.

The Mars 2020 rover, with the Mars Helicopter aboard, will launch on a United Launch Alliance Atlas V rocket in July 2020 from Space Launch Complex 41 at Cape Canaveral Air Force Station in Florida. When it lands at Jezero Crater on Feb. 18, 2021, the rover will be the first spacecraft in the history of planetary exploration with the ability to accurately retarget its point of touchdown during the landing sequence.

JPL is building and will manage operations of the Mars 2020 rover and the Mars Helicopter for NASA. NASA's Launch Services Program, based at the agency's Kennedy Space Center in Florida, is responsible for launch management. Lockheed Martin Space provided the Mars Helicopter Delivery System.



Astronomy Picture of the Day

The Moon and Jupiter over the Alps

Image Credit & Copyright: *Giorgia Hofer (Cortina Astronomical Association)*

What are those bright lights in the sky ahead? When hiking a high mountain pass in northern Italy three weeks ago, a conjunction between our Moon and the distant planet Jupiter was visible toward the south just after sunset. The picturesque mountains in the distance are Tre Cime di Lavaredo (Three Peaks of Lavaredo), a UNESCO World Heritage Site and three of the best known mountain peaks in Italy, the Dolomites, and the entire Alps. In the foreground on the left is Locatelli Hut, a refuge for tired hikers as it is located over an hour from nearest parking lot. The bright sky object on the upper left is Saturn. The entire scene was captured on a single 8-second exposure. Jupiter and Saturn will remain prominent in the southwestern sky after sunset this month, while the Moon, in its monthly orbit around the Earth, will pass near Jupiter again in about four days.

apod.nasa.gov



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