

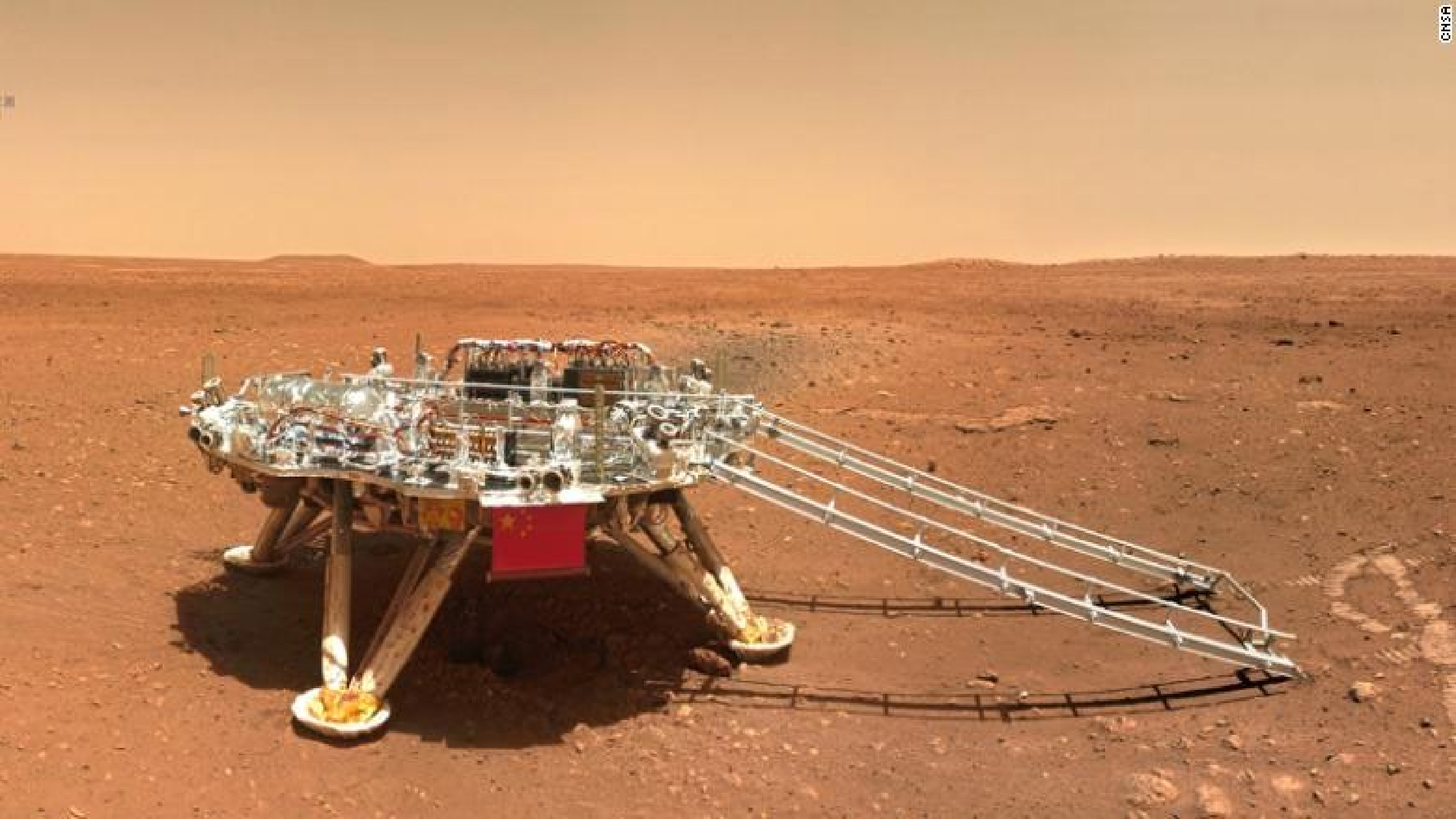
# Astronomy News

KW RASC FRIDAY JUNE 11TH  
2021

JIM FAIRLES

# China releases new images of Mars taken by its Zhurong rover

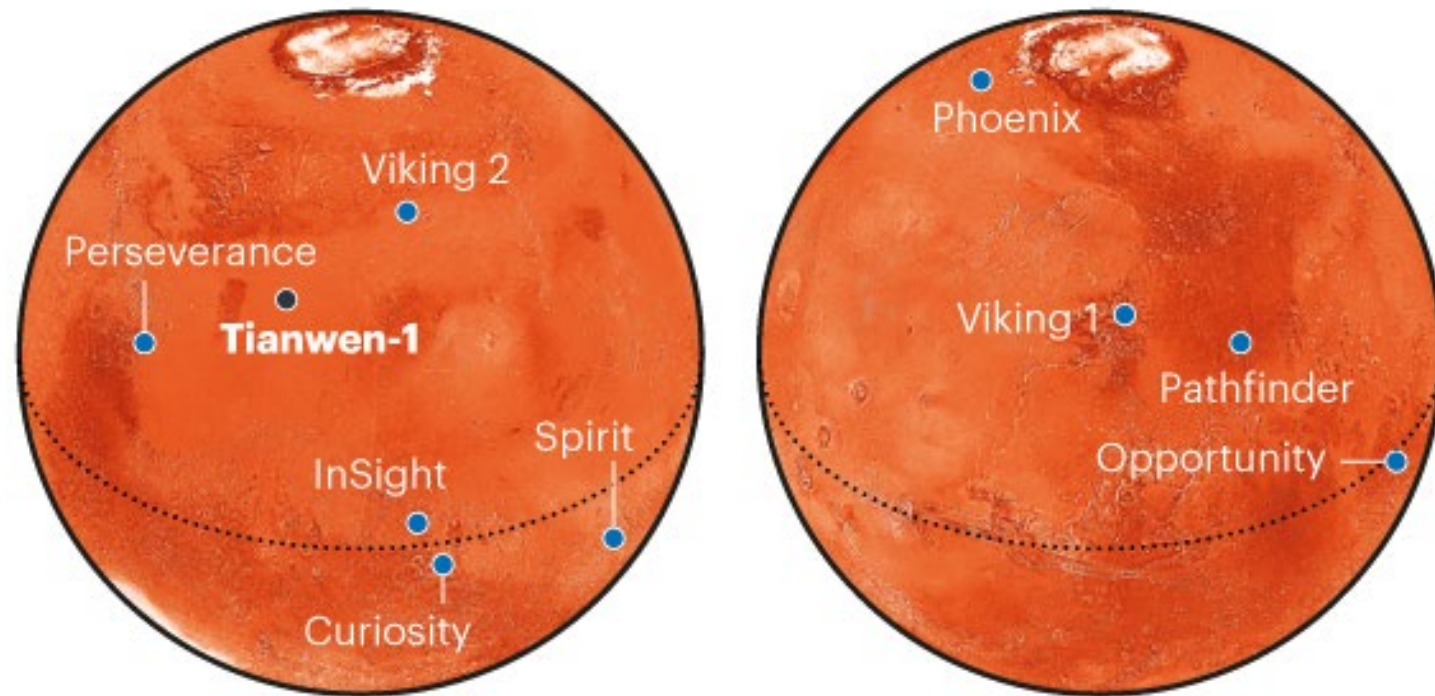
- ▶ <https://www.cnn.com/2021/06/11/asia/china-mars-rover-photos-intl-hnk-scn/index.html>
- ▶ China unveiled new photos of its Mars rover exploring the surface of the red planet on Friday, with state media hailing it as a sign of the mission's "complete success."
- ▶ The Zhurong rover, named after a god of fire in Chinese mythology, landed on the Utopia Planitia region of Mars on May 15. This is China's first Mars mission -- making it only the second country to land a rover on the planet, after the United States.
- ▶ The rover sent back its first images of Mars in May, several days after landing, showing a deployed ramp and the flat landscape where it arrived.
- ▶ The new photos this Friday included a 360-degree panorama of the landing area, stitched together from a number of images the rover took after landing before it began driving through the area, according to state-run news agency Xinhua. Another image showed the orange Martian surface, with scattered rocks, a circular crater on the far side, and dunes in the distance.



## LANDING SITE

A Chinese rover called Zhurong has landed in Utopia Planitia in Mars's northern hemisphere. Soviet and US missions have landed in many regions of Mars.

- **Tianwen-1** landing site in Utopia Planitia
- Previous missions



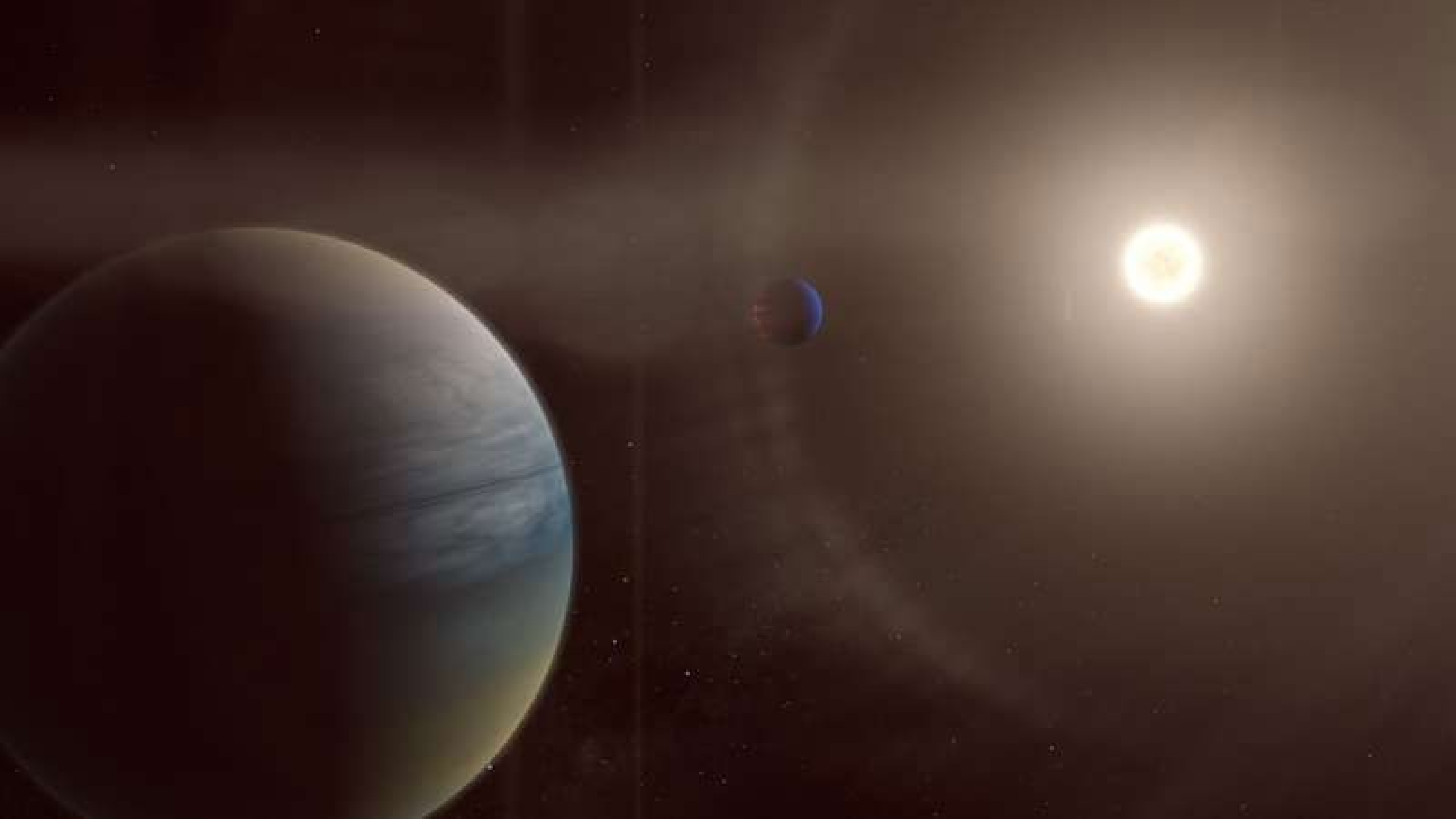


# CHIME telescope detects more than 500 mysterious fast radio bursts in its first year of operation

- ▶ <https://www.sciencedaily.com/releases/2021/06/210609123416.htm>
- ▶ <https://www.dunlap.utoronto.ca/instrumentation/chime/>
- ▶ Observations quadruple the number of known radio bursts and reveal two types: One-offs and repeaters
- ▶ To catch sight of a fast radio burst is to be extremely lucky in where and when you point your radio dish. Fast radio bursts, or FRBs, are oddly bright flashes of light, registering in the radio band of the electromagnetic spectrum, that blaze for a few milliseconds before vanishing without a trace.
- ▶ These brief and mysterious beacons have been spotted in various and distant parts of the universe, as well as in our own galaxy. Their origins are unknown, and their appearance is unpredictable. Since the first was discovered in 2007, radio astronomers have only caught sight of around 140 bursts in their scopes.

# CHIME telescope detects more than 500 mysterious fast radio bursts in its first year of operation

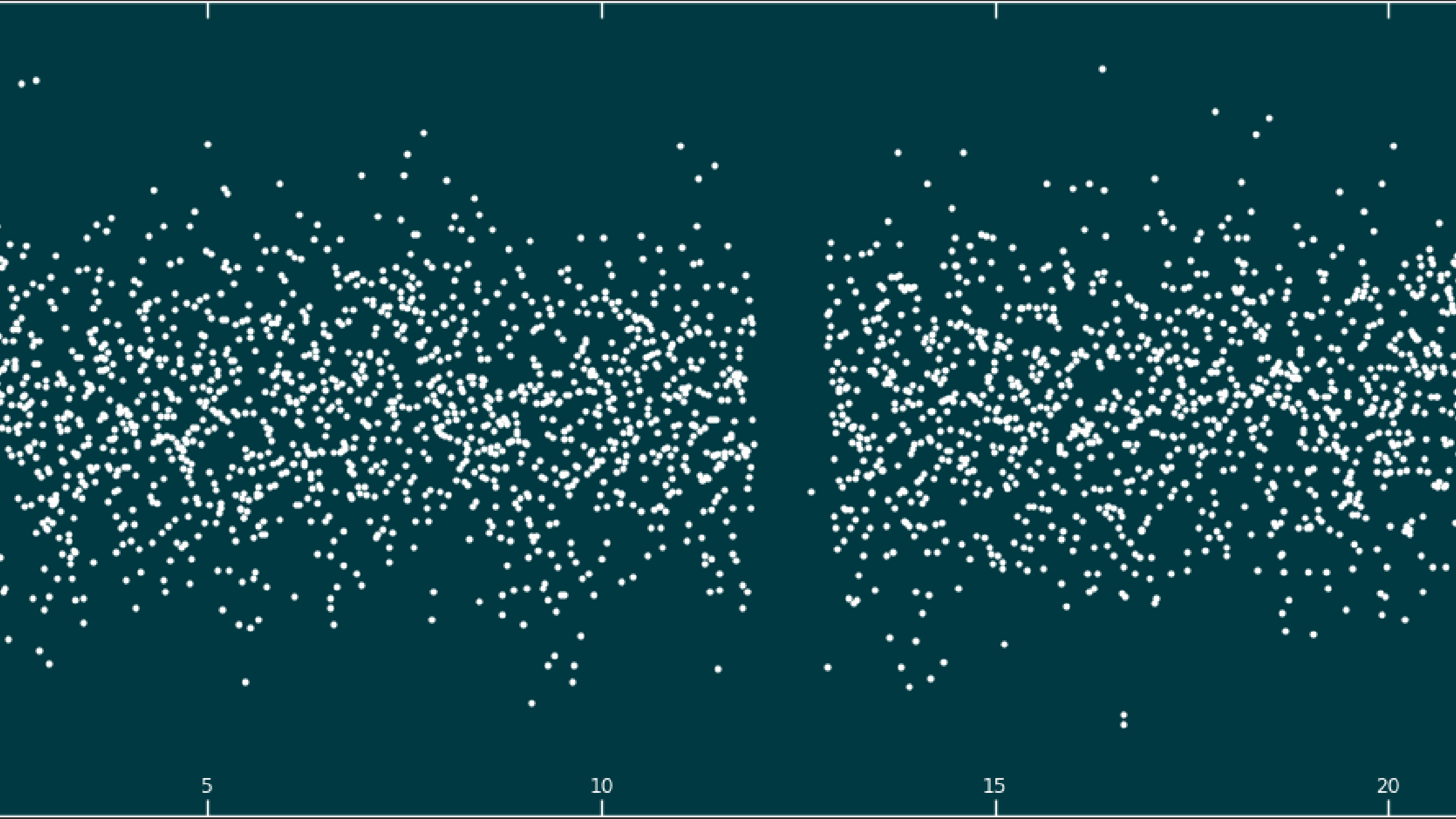
- ▶ Now, a large stationary radio telescope in British Columbia has nearly quadrupled the number of fast radio bursts discovered to date. The telescope, known as CHIME, for the Canadian Hydrogen Intensity Mapping Experiment, has detected 535 new fast radio bursts during its first year of operation, between 2018 and 2019.
- ▶ Scientists with the CHIME Collaboration, including researchers at MIT, have assembled the new signals in the telescope's first FRB catalog, which they will present this week at the American Astronomical Society Meeting.
- ▶ These observations strongly suggest that repeaters and one-offs arise from separate mechanisms and astrophysical sources. With more observations, astronomers hope soon to pin down the extreme origins of these curiously bright signals.





# Citizen scientists discover two gaseous planets around a bright, sun-like star

- ▶ <https://phys.org/news/2021-06-citizen-scientists-gaseous-planets-bright.html>
- ▶ At night, seven-year-old Miguel likes talking to his father Cesar Rubio about planets and stars. "I try to nurture that," says Rubio, a machinist in Pomona, California, who makes parts for mining and power generation equipment.
- ▶ Now, the boy's father can claim he helped discover planets, too. He is one of thousands of volunteers participating in Planet Hunters TESS, a NASA-funded citizen science project that looks for evidence of planets beyond our solar system, or exoplanets. Citizen science is a way for members of the public to collaborate with scientists. More than 29,000 people worldwide have joined the Planet Hunters TESS effort to help scientists find exoplanets.
- ▶ <https://www.zooniverse.org/projects/nora-dot-eisner/planet-hunters-tess>





# NASA's Perseverance rover begins its first science campaign on Mars

- ▶ On June 1, NASA's Perseverance Mars rover kicked off the science phase of its mission by leaving the "Octavia E. Butler" landing site. Until recently, the rover has been undergoing systems tests, or commissioning, and supporting the Ingenuity Mars Helicopter's month of flight tests.
- ▶ During the first few weeks of this first science campaign, the mission team will drive to a low-lying scenic overlook from which the rover can survey some of the oldest geologic features in Jezero Crater, and they'll bring online the final capabilities of the rover's auto-navigation and sampling systems.
- ▶ By the time Perseverance completed its commissioning phase on June 1, the rover had already tested its oxygen-generating MOXIE instrument and conducted the technology demonstration flights of the Ingenuity helicopter. Its cameras had taken more than 75,000 images, and its microphones had recorded the first audio soundtracks of Mars.



# Venus hotter than ever: 3rd new robotic explorer on horizon

- ▶ <https://phys.org/news/2021-06-venus-hotter-3rd-robotic-explorer.html>
- ▶ Venus is hotter than ever, with a third new robotic explorer on the horizon.
- ▶ A week after NASA announced two new missions to our closest neighbor, the European Space Agency said Thursday it will launch a Venus-orbiting spacecraft in the early 2030s. Named EnVision, the orbiter will attempt to explain why Venus is so "wildly different" from Earth, even though the two planets are similar in size and composition.
- ▶ NASA will provide EnVision's radar.
- ▶ NASA's own pair of upcoming missions to our solar system's hottest planet—called DaVinci Plus and Veritas—will be the first for the U.S. in more than 30 years. They'll blast off sometime around 2028 to 2030.
- ▶ "It's a Venus hat trick!" tweeted NASA's top science chief, Thomas Zurbuchen.



# Lunar IceCube passes critical testing at NASA's Goddard Space Flight Center

- ▶ <https://phys.org/news/2021-06-lunar-icecube-critical-nasa-goddard.html>
- ▶ The Lunar IceCube CubeSat successfully passed essential environmental testing at NASA's Goddard Space Flight Center in Greenbelt, Maryland. The spacecraft, pictured above, will fly aboard the upcoming Artemis I mission to the moon as a secondary payload to investigate the amount and distribution of water ice on the moon.
- ▶ The spacecraft must go through intensive testing on Earth before flight to ensure the systems can survive a rocket launch and perform in the harsh environment of space. Lunar IceCube's testing included thermal vacuum, which replicated the vacuum of space by draining the atmosphere from the chamber and exposing the spacecraft to extreme hot and cold temperatures.
- ▶ Once it reaches orbit, Lunar IceCube will begin its mission. NASA's Artemis program is returning humanity to the moon, but this time to stay. By understanding the dynamics of water and other substances on the moon that easily turn to vapor or gas, scientists will be able to predict seasonal changes and determine possible uses for lunar resources such as water.





# UFOs: How to calculate the odds that an alien spaceship has been spotted

- ▶ <https://phys.org/news/2021-06-ufos-odds-alien-spaceship.html>
- ▶ The US military has released previously classified photos and films related to unidentified flying object (UFO) sightings, which mostly show something blurry moving strangely. Still, I hear that a friend of a friend has gone from thinking there's a 1% chance that UFOs are aliens to now believing it is 50%. Is he rational?
- ▶ People are constantly seeing things in the sky they don't understand. The vast majority are airplanes, satellites, weather balloons, clouds, rocket launches, auroras, optical reflections and so on. But for some sightings, there's no known explanation. The problem is that people jump to the conclusion "unknown = aliens". And when you think about it, this is fairly odd. Why not angels?
- ▶ Anyway, I like to do maths instead. The Bayes formula (below), a mainstay of statistics, gives the probability (Pr) of something, given some evidence.
- ▶ Spelled out, it says that the probability that UFOs are aliens given some evidence is equal to how likely it is that the evidence would appear if UFOs really were aliens, times how likely it is that there are aliens. That needs to be divided by how likely the actual evidence is, which is notoriously difficult to work out.
- ▶ So I end up giving a one in 500 million chance to UFOs being aliens after looking at the footage.

$$\Pr(\text{UFO is aliens} | \text{evidence}) = \frac{\Pr(\text{evidence} | \text{UFO is aliens}) \Pr(\text{there are aliens})}{\Pr(\text{evidence})}$$

TOUCHDOWN PARACHUTES DROGUES RE-ENTRY RE-BUCKLE APOGEE

  
NEW SHEPARD  
MISSION NS-15



CAPSULE DESCENT  
VELOCITY

016 MPH

CAPSULE  
ALTITUDE

0,491 FT

T+ 09:53

# Jeff Bezos will blast into space on rocket's 1st crew flight

- ▶ Outdoing his fellow billionaires in daredevilry, Jeff Bezos will blast into space next month when his Blue Origin company makes its first flight with a crew.
- ▶ The 57-year-old Amazon founder and richest person in the world by Forbes' estimate will become the first person to ride his own rocket to space.
- ▶ Bezos announced his intentions Monday and, in an even bolder show of confidence, said he will share the adventure with his younger brother and best friend, Mark, an investor and volunteer firefighter. He said that will make it more meaningful.
- ▶ Blue Origin's debut flight with people aboard—after 15 successful test flights of its reusable New Shepard rockets—will take place on July 20, a date selected because it is the 52nd anniversary of the first moon landing by Apollo 11's Neil Armstrong and Buzz Aldrin.



# Astronomers spot a 'blinking giant' near the center of the galaxy

- ▶ <https://phys.org/news/2021-06-astronomers-giant-center-galaxy.html>
- ▶ Astronomers have spotted a giant 'blinking' star towards the center of the Milky Way, more than 25,000 light years away.
- ▶ An international team of astronomers observed the star, VVV-WIT-08, decreasing in brightness by a factor of 30, so that it nearly disappeared from the sky. While many stars change in brightness because they pulsate or are eclipsed by another star in a binary system, it's exceptionally rare for a star to become fainter over a period of several months and then brighten again.
- ▶ The researchers believe that VVV-WIT-08 may belong to a new class of "blinking giant" binary star system, where a giant star 100 times larger than the Sun is eclipsed once every few decades by an as-yet unseen orbital companion. The companion, which may be another star or a planet, is surrounded by an opaque disc, which covers the giant star, causing it to disappear and reappear in the sky. The study is published in Monthly Notices of the Royal Astronomical Society



# New NASA Challenge Offers Prizes for Sprouting Astronaut Food Systems

- ▶ <https://www.technology.org/2021/06/11/new-nasa-challenge-offers-prizes-for-sprouting-astronaut-food-systems/>
- ▶ Astronauts need hearty nutrients to maintain a healthy diet in space, but like any of us, they want their food to taste good, too!
- ▶ As NASA develops concepts for longer crewed missions to Mars and beyond, the agency will need innovative and sustainable food systems that check all the boxes.
- ▶ In coordination with the Canadian Space Agency, NASA has opened the Deep Space Food Challenge. The goal is to generate novel food production technologies or systems that require minimal resources and produce minimal waste, while providing safe, nutritious, and tasty food for long-duration human exploration missions.
- ▶ “We are excited to coordinate with the Canadian Space Agency to conduct this challenge and push the boundaries of food technology production that will help keep our future explorers healthy, knowing that some of these technologies could also have great terrestrial applications,” said Jim Reuter, associate administrator for NASA’s Space Technology Mission Directorate at the agency’s headquarters in Washington.





Questions?

# National RASC Update June 11 2021

- ▶ National General Assembly 2021
- ▶ <https://www.rasc2021ga.ca/>
- ▶ JUNE 25TH - 28TH 2021
- ▶ FEATURING KEYNOTE SPEAKER EMILY CALANDRELLI  
ALSO FEATURING SPEAKERS AARON PERSAD, KATE RUSSO, HILDING NEILSON & KATIE MACK
- ▶ Annual General Meeting! When: June 27th 2021, 6:00 - 7:30pm EDT
- ▶ <https://rasc.ca/agm2021>
- ▶ Currently 5300 members – increasing!
- ▶ Good financial position
- ▶ COVID-19 – follow public health guidelines.
- ▶ Insurance / volunteer screening policies
- ▶ New software and database.
- ▶ - GA 2022 and 2023