



Astronomy News

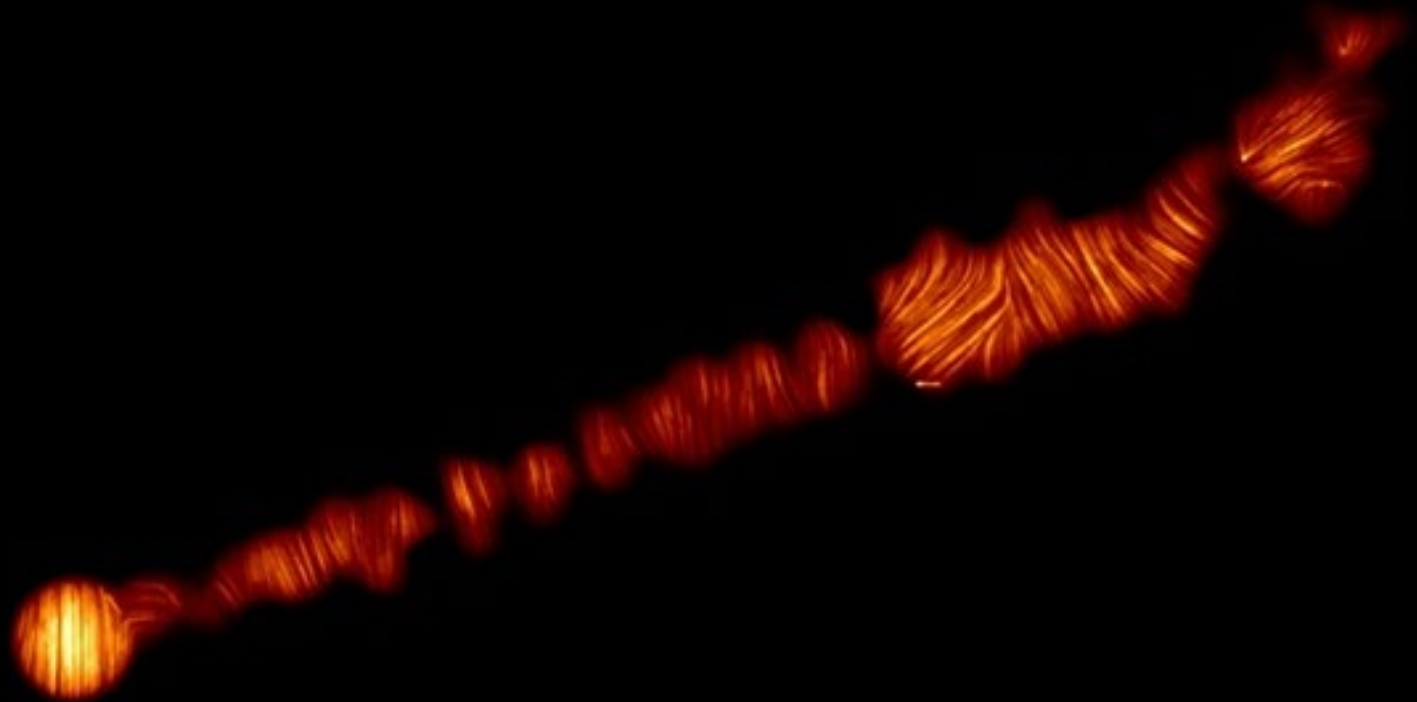
KW RASC 101 FRIDAY MARCH 26 2021

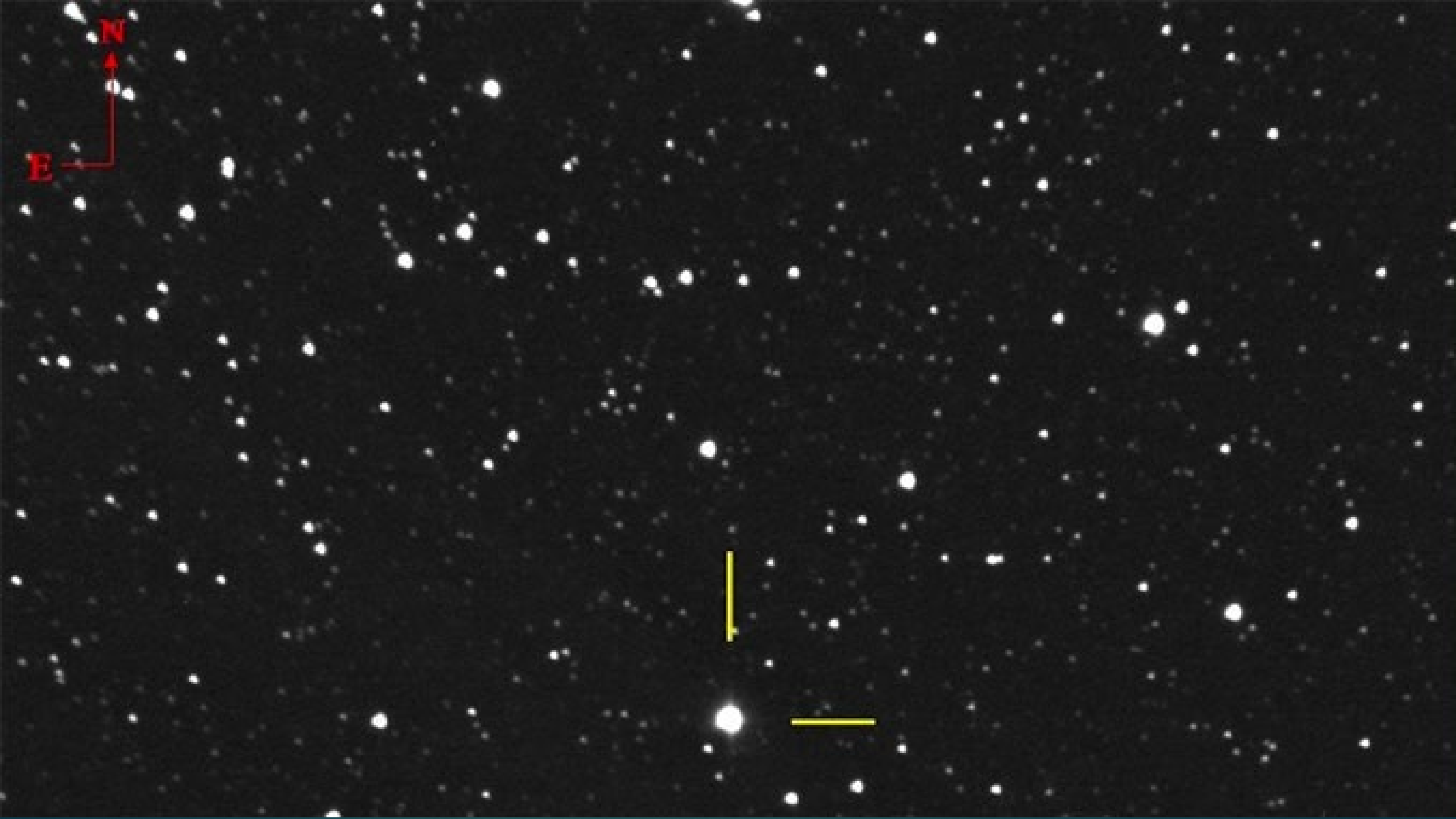
JIM FAIRLES

Global telescope creates exquisite map of black hole's swirling magnetic field

- ▶ <https://astronomy.com/news/2021/03/global-telescope-creates-exquisite-map-of-black-holes-magnetic-field>
- ▶ The Event Horizon Telescope's newest images of M87's supermassive black hole hint at how its jets are fired far into space.
- ▶ The elliptical galaxy M87 sits 55 million light-years away, at the heart of the nearby Virgo Cluster. Deep inside this galaxy lurks a supermassive black hole that weighs 6.5 billion times the mass of our Sun. That black hole instantly became famous in 2019 when the Event Horizon Telescope (EHT) collaboration released its portrait — the first ever direct image of the shadow of a black hole.
- ▶ Now, the EHT collaboration has released updated views of M87 that offer an unprecedented look at the light streaming from just outside its black hole. These pictures reveal the complex structure of a powerful magnetic field that astronomers believe is responsible for shooting a 5,000 light-year-long jet from the black hole at nearly the speed of light.

- ▶ Data taken with ALMA show the orientation of light within a portion of M87's far-reaching jet. The light's orientation is related to the structure and strength of the magnetic field in that region.







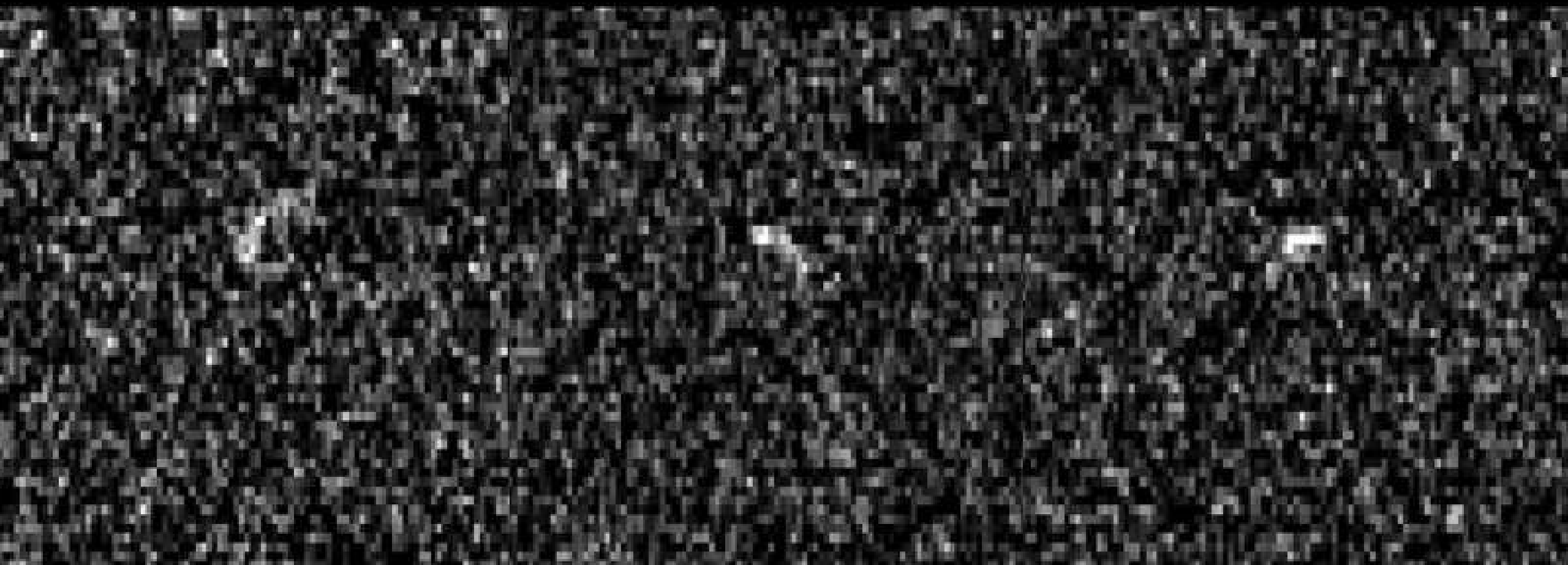
When did we first consider life might exist elsewhere in the universe?

- ▶ <https://astronomy.com/news/2021/03/when-did-we-first-consider-life-might-exists-elsewhere-in-the-universe>
- ▶ Ancient people looked up at the night sky and pondered the question of alien life, too.
- ▶ The SETI Institute — SETI standing for the Search for Extra Terrestrial Intelligence — was established in 1984, but humans have been thinking about and searching for life outside of our planet for many decades. The astronomer and astrophysicist Frank Drake (famous for the Drake Equation) was one of the institute's founders, but he was busy looking for alien life long before that. Drake conducted the first SETI-style search in 1959. The idea was to scan the skies with radio telescopes, trying to pick up signals from alien civilizations. And the search is still going on. Some experts such as Avi Loeb, an astrophysicist at Harvard University, have claimed that there's a good chance we've already been visited by aliens.
- ▶ The person who probably did the most to bring various efforts to the attention of the public was astronomer Carl Sagan. But the notion of, and belief in, alien life was around long before radio telescopes or science popularizers. So where did the idea that we're not alone in the universe get started? Since when did earthlings look up at the sky and think, hey, is anybody else home?



SETI: new signal excites alien hunters – here's how we could find out if it's real

- ▶ <https://theconversation.com/seti-new-signal-excites-alien-hunters-heres-how-we-could-find-out-if-its-real-152498>
- ▶ The US\$100m (£70m) Breakthrough Listen Initiative, founded by the billionaire, technology and science investor Yuri Milner and his wife Julia, has identified a mysterious radio signal that seems to come from the nearest star to the Sun – Proxima Centauri. This has generated a flood of excitement in the press and among scientists themselves. The discovery, which was reported by the Guardian but has yet to be published in a scientific journal, may be the search for extraterrestrial intelligence's (SETI) first bona fide candidate signal. It has been dubbed Breakthrough Listen Candidate 1 or simply BLC-1.
- ▶ Although the Breakthrough Listen team are still working on the data, we know that the radio signal was detected by the Parkes telescope in Australia while it was pointing at Proxima Centauri, which is thought to be orbited by at least one habitable planet. The signal was present for the full observation, lasting several hours. It also was absent when the telescope pointed in a different direction.



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Mar 9

Mar 10

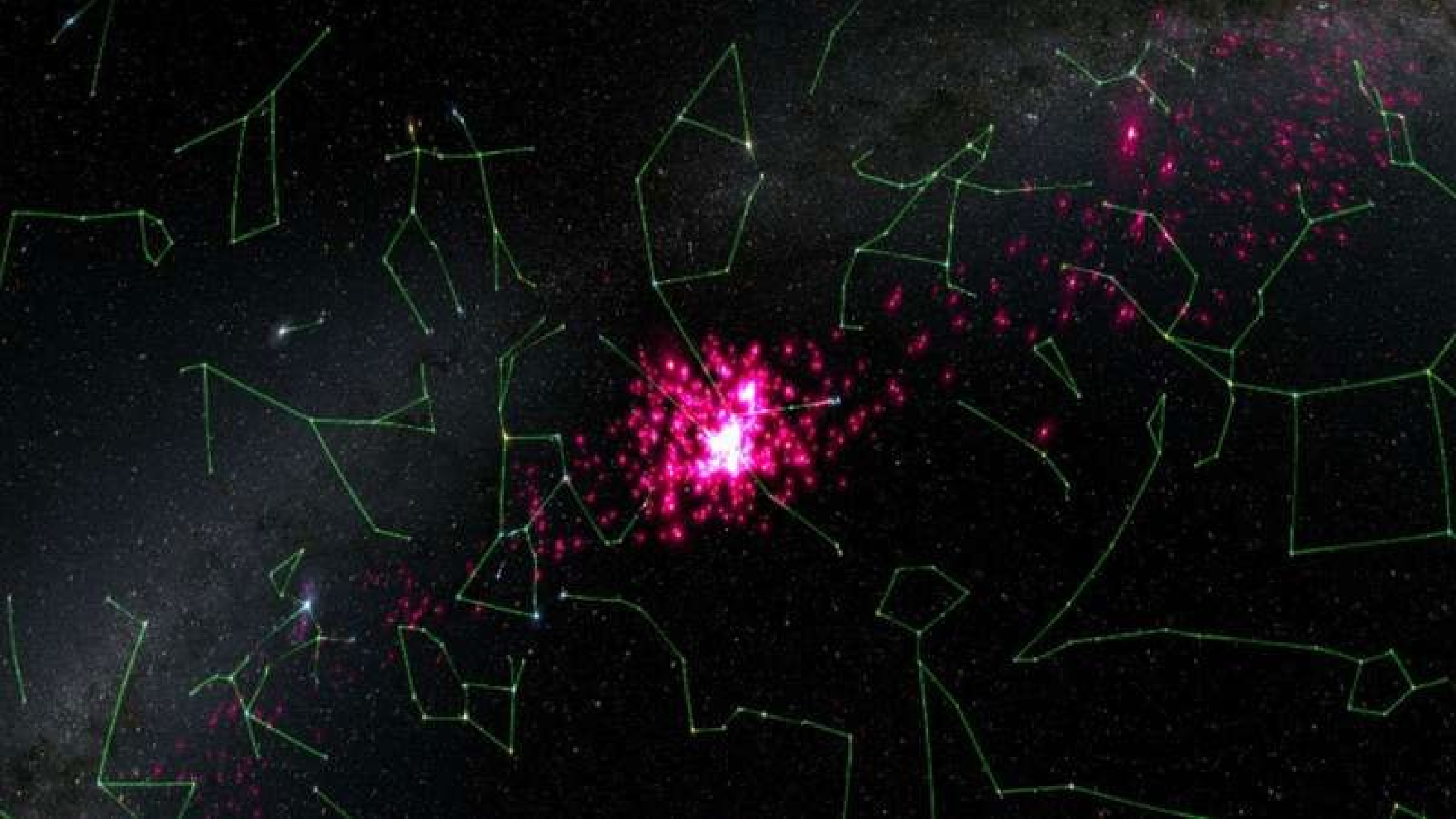
NASA analysis: Earth is safe from asteroid Apophis for 100-plus years

- ▶ <https://phys.org/news/2021-03-nasa-analysis-earth-safe-asteroid.html>
- ▶ The near-Earth object was thought to pose a slight risk of impacting Earth in 2068, but now radar observations have ruled that out.
- ▶ After its discovery in 2004, asteroid 99942 Apophis had been identified as one of the most hazardous asteroids that could impact Earth. But that impact assessment changed as astronomers tracked Apophis and its orbit became better determined.
- ▶ Now, the results from a new radar observation campaign combined with precise orbit analysis have helped astronomers conclude that there is no risk of Apophis impacting our planet for at least a century.
- ▶ On April 13, 2029, the asteroid Apophis will pass less than 20,000 miles (32,000 kilometers) from our planet's surface—closer than the distance of geosynchronous satellites. During that 2029 close approach, Apophis will be visible to observers on the ground in the Eastern Hemisphere without the aid of a telescope or binoculars.



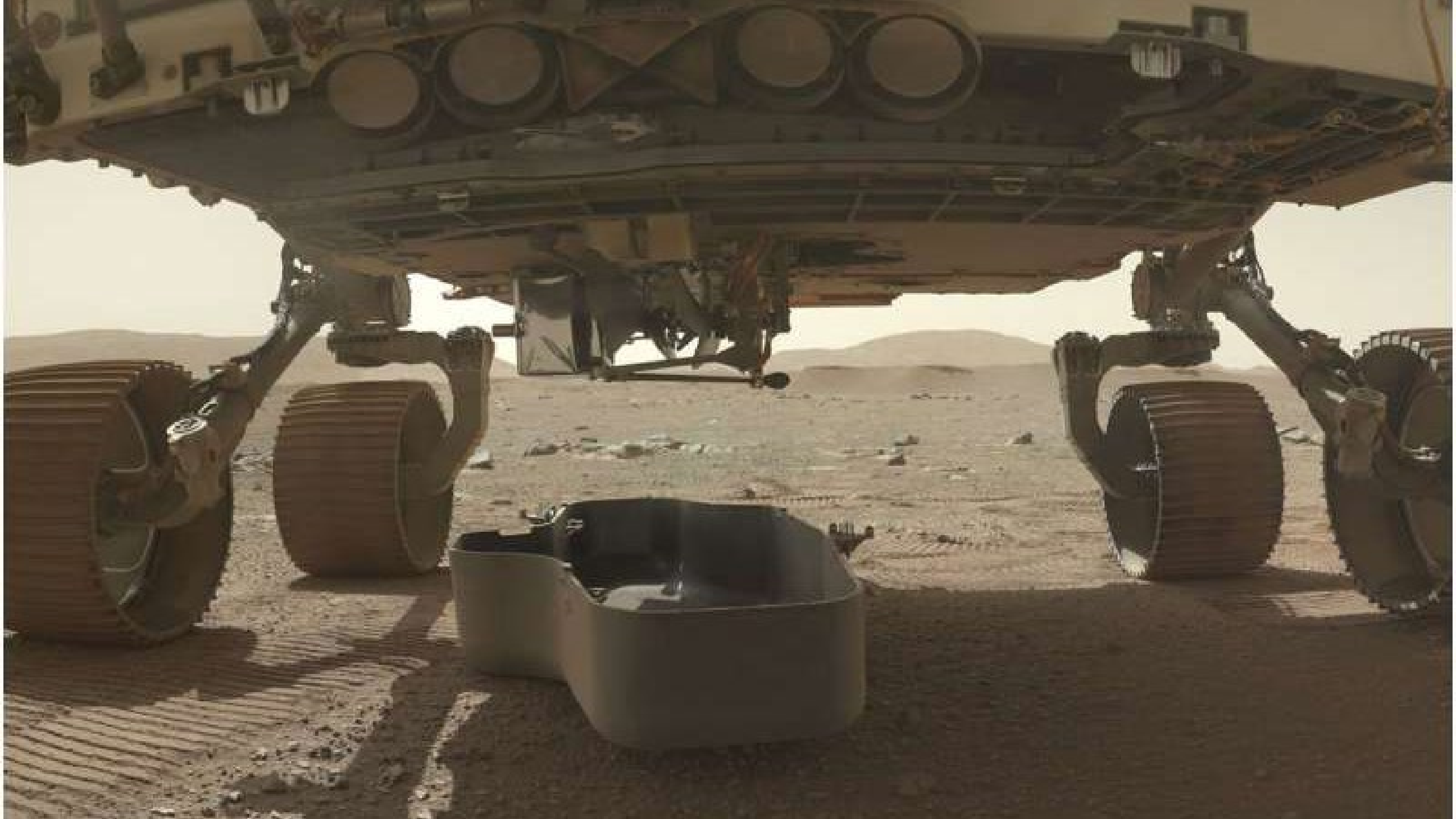
Ocean currents predicted on Enceladus

- ▶ <https://phys.org/news/2021-03-ocean-currents-enceladus.html>
- ▶ Buried beneath 20 kilometers of ice, the subsurface ocean of Enceladus—one of Saturn's moons—appears to be churning with currents akin to those on Earth.
- ▶ The theory, derived from the shape of Enceladus's ice shell, challenges the current thinking that the moon's global ocean is homogenous, apart from some vertical mixing driven by the warmth of the moon's core.
- ▶ Enceladus, a tiny frozen ball about 500 kilometers in diameter (about 1/7th the diameter of Earth's moon), is the sixth largest moon of Saturn. Despite its small size, Enceladus attracted the attention of scientists in 2014 when a flyby of the Cassini spacecraft discovered evidence of its large subsurface ocean and sampled water from geyser-like eruptions that occur through fissures in the ice at the south pole.



Is the nearest star cluster to the sun being destroyed?

- ▶ <https://phys.org/news/2021-03-nearest-star-cluster-sun.html>
- ▶ Data from ESA's Gaia star mapping satellite have revealed tantalizing evidence that the nearest star cluster to the sun is being disrupted by the gravitational influence of a massive but unseen structure in our galaxy.
- ▶ If true, this might provide evidence for a suspected population of 'dark matter sub-halos.' These invisible clouds of particles are thought to be relics from the formation of the Milky Way, and are now spread across the galaxy, making up an invisible substructure that exerts a noticeable gravitational influence on anything that drifts too close.
- ▶ The team chose the Hyades as their target because it is the nearest star cluster to the sun. It is located just over 153 light years away, and is easily visible to skywatchers in both northern and southern hemispheres as a conspicuous "V" shape of bright stars that marks the head of the bull in the constellation of Taurus.



Part of Wright brothers' 1st airplane on NASA's Mars chopper

- ▶ <https://phys.org/news/2021-03-wright-brothers-1st-airplane-nasa.html>
- ▶ This March 21, 2021 photo made available by NASA shows the released debris shield, center, for the Ingenuity helicopter, dropped on the surface of Mars from the bottom of the Perseverance rover. On Tuesday, March 23, 2021, NASA announced that the helicopter's first Mars test flight will occur around April 8.
- ▶ A piece of the Wright brothers' first airplane is on Mars.
- ▶ NASA's experimental Martian helicopter holds a small swatch of fabric from the 1903 Wright Flyer, the space agency revealed Tuesday. The helicopter, named Ingenuity, hitched a ride to the red planet with the Perseverance rover, arriving last month.
- ▶ Ingenuity will attempt the first powered, controlled flight on another planet no sooner than April 8. It will mark a "Wright brothers' moment," noted Bobby Braun, director for planetary science at NASA's Jet Propulsion Laboratory.
- ▶ The Carillon Historical Park in Dayton, Ohio, the Wrights' hometown, donated the postage-size piece of muslin from the plane's bottom left wing, at NASA's request.



Pandora mission would expand NASA's capabilities in probing alien worlds

- ▶ <https://phys.org/news/2021-03-pandora-mission-nasa-capabilities-probing.html>
- ▶ In the quest for habitable planets beyond our own, NASA is studying a mission concept called Pandora, which could eventually help decode the atmospheric mysteries of distant worlds in our galaxy. One of four low-cost astrophysics missions selected for further concept development under NASA's new Pioneers program, Pandora would study approximately 20 stars and exoplanets—planets outside of our solar system—to provide precise measurements of exoplanetary atmospheres.
- ▶ This mission would seek to determine atmospheric compositions by observing planets and their host stars simultaneously in visible and infrared light over long periods. Most notably, Pandora would examine how variations in a host star's light impacts exoplanet measurements. This remains a substantial problem in identifying the atmospheric makeup of planets orbiting stars covered in starspots, which can cause brightness variations as a star rotates.

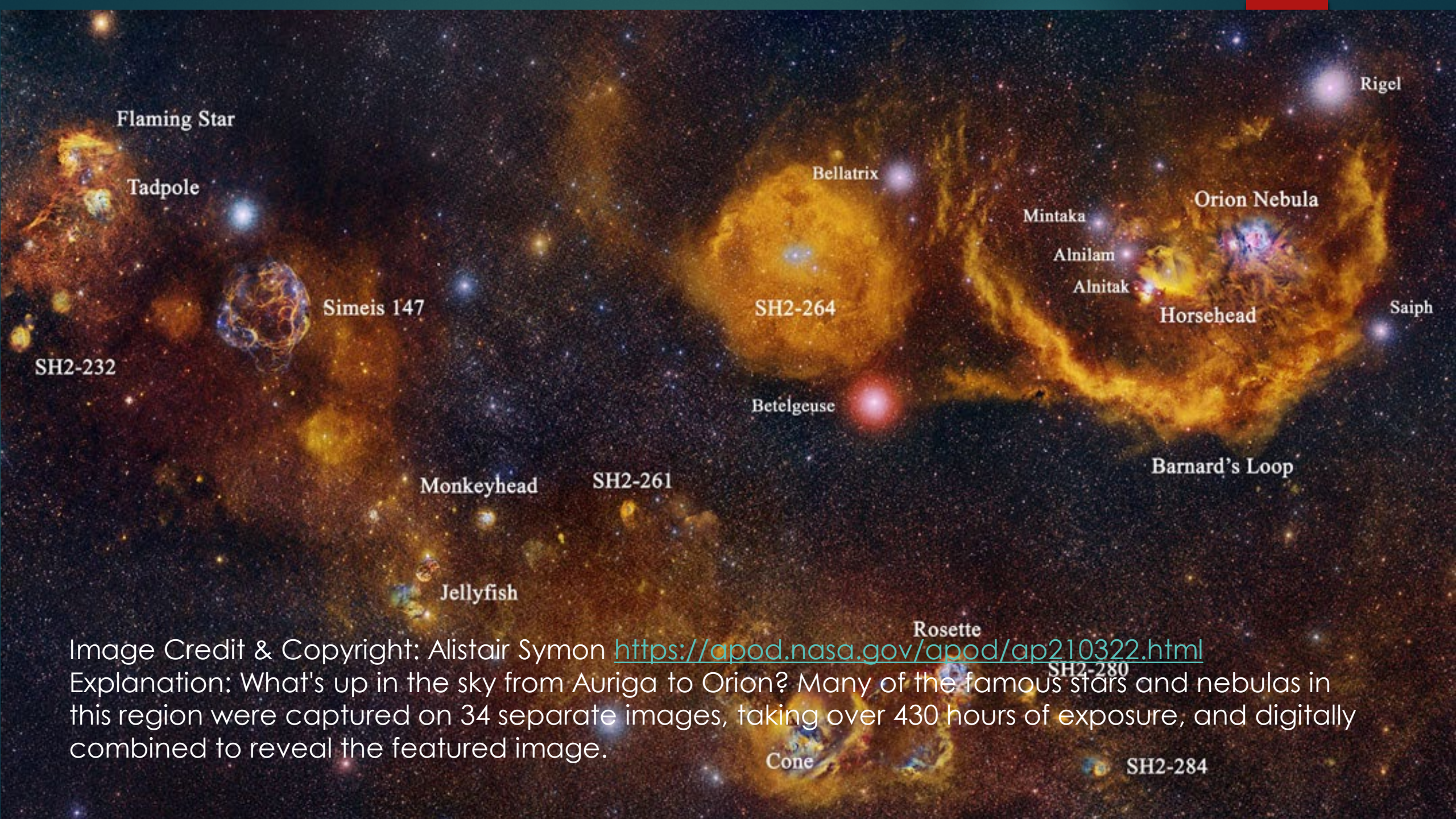


Image Credit & Copyright: Alistair Symon <https://apod.nasa.gov/apod/ap210322.html>

Explanation: What's up in the sky from Auriga to Orion? Many of the famous stars and nebulae in this region were captured on 34 separate images, taking over 430 hours of exposure, and digitally combined to reveal the featured image.



Questions?

<https://apod.nasa.gov/apod/ap210323.html>

Mars over Duddo Stone
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