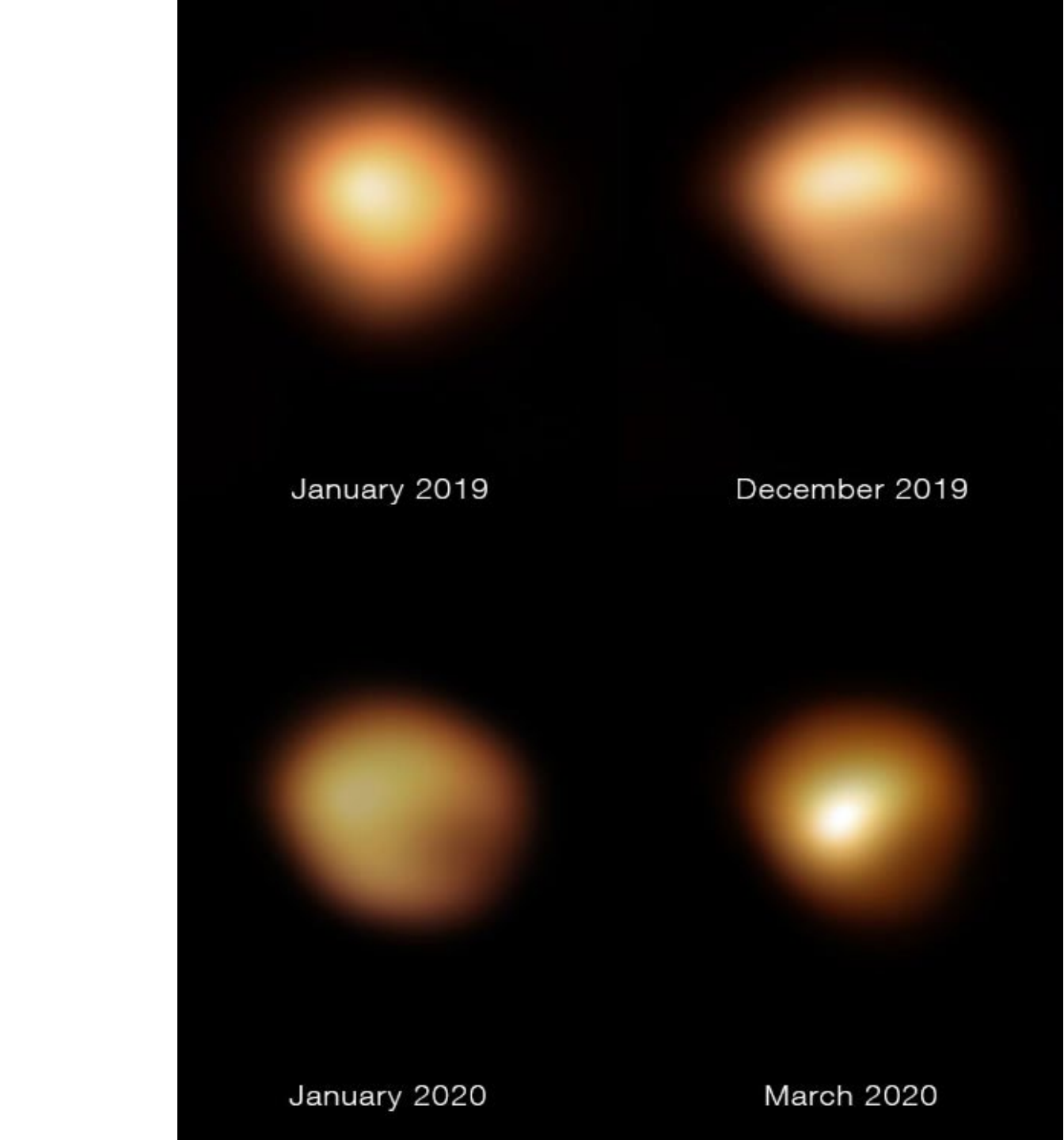




# Astronomy News

KW RASC FRIDAY JUNE 25TH 2021

JIM FAIRLES



January 2019

December 2019

January 2020

March 2020



Dust Cloud  
Caused  
Betelgeuse's  
Great Dimming  
Event,  
Astronomers Say

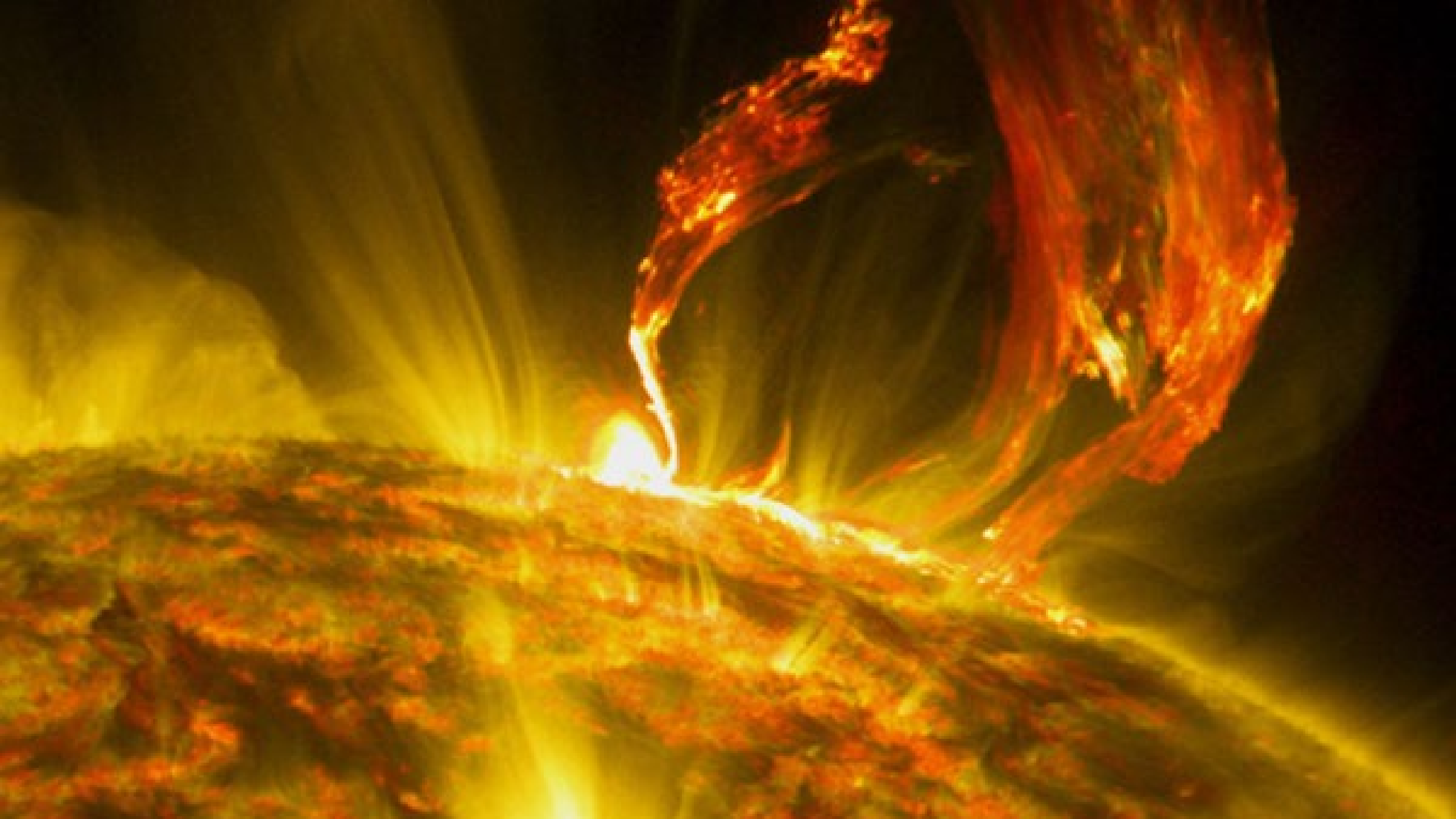
<http://www.sci-news.com/astronomy/dust-cloud-betelgeuse-great-dimming-09772.html>

- ▶ Betelgeuse, which is located roughly 724 light-years away in the constellation of Orion, is the second-closest red supergiant to Earth. From November 2019 to March 2020, this star experienced a historic dimming of its visible brightness. Usually having an apparent magnitude between 0.1 and 1, its visual brightness decreased to 1.6 magnitudes around 7-13 February 2020 — an event referred to as Betelgeuse's Great Dimming. New research, published in the journal *Nature*, reveals that the star was partially concealed by a cloud of dust, a discovery that solves the mystery of the Great Dimming event.




# Alien Astronomers around 2,034 Nearby Stars Have Front-Row Seat to See Earth as Transiting Exoplanet

- ▶ <http://www.sci-news.com/astronomy/earth-transiting-exoplanet-09793.html>
- ▶ A team of astronomers from Cornell University and the American Museum of Natural History has identified 1,715 stars within 100 parsecs (326 light-years) from the Sun that are in the right position to have spotted life on a transiting Earth since early human civilization (about 5,000 years ago), and additional 319 stars that will enter this special vantage point in the next 5,000 years; among these stars are seven known exoplanet-hosting stars, including Ross-128, which saw Earth transit the Sun in the past, and Teegarden's Star and TRAPPIST-1, which will start to see it in 29 and 1,642 years, respectively; human-made radio waves have already swept over 75 of the closest stars on the team's catalog.



# Extreme space weather: Predicting and protecting against solar storms

- ▶ <https://astronomy.com/news/2021/06/extreme-space-weather-predicting-and-protecting-against-solar-storms>
- ▶ The nature of space weather hasn't changed much. But society has, and understanding and predicting space weather is more important than ever.
- ▶ These explosions, known as coronal mass ejections (CMEs), lift off from the Sun's outer atmosphere — the corona, and can cause intense geomagnetic storms, and negatively affect astronauts, satellites, and spacecraft.
- ▶ Geomagnetic storms happen when the Earth's magnetic field is disturbed. The most extreme geomagnetic storms are driven by CMEs.
- ▶ CMEs really energize the Earth's magnetic field, says James Spann, Space Weather Lead at NASA. "The impact of a CME on a magnetized body like the Earth can be very catastrophic depending on its size and speed."
- ▶ One of the most intense CMEs is believed to have taken place on September 1, 1859 (the Carrington Event), reaching Earth 17.5 hours later and setting off a large geomagnetic storm. Auroras were seen as far south as the Caribbean and telegraph lines caught fire as communications were disrupted at various locations across the world.

- 
- ▶ In a new study, a team of researchers led by Mathew Owens, a space physics professor at the University of Reading in the U.K., have found that the most extreme CMEs are also more likely to occur during peak solar activity.
  - ▶ During a geomagnetic storm, changes in magnetic fields induce currents along power lines that can damage transformers and cause power outages. The most serious event happened on March 13, 1989, and left six million people without power in Québec, Canada for nine hours.
  - ▶ Earlier this year, NASA observed a CME lift off the Sun on April 17 that was predicted to hit Mars when the Ingenuity Mars Helicopter would be conducting its second flight.
  - ▶ “We were happy that we could provide the warning that something was coming. We have done a lot to protect our satellites and spacecraft, but this was a new type of technology, so you never really know it is going to be perfect until it is tested in the field,” says Alexa Halford, a space physics researcher at NASA.



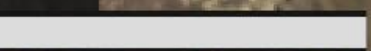
Perseverance's Location

Sol 122 | Distance Driven 0.48 miles / 0.78 km

Rover Position: 122 (sol)



Scale ↶



200m

Longitude

# Where is Perseverance?

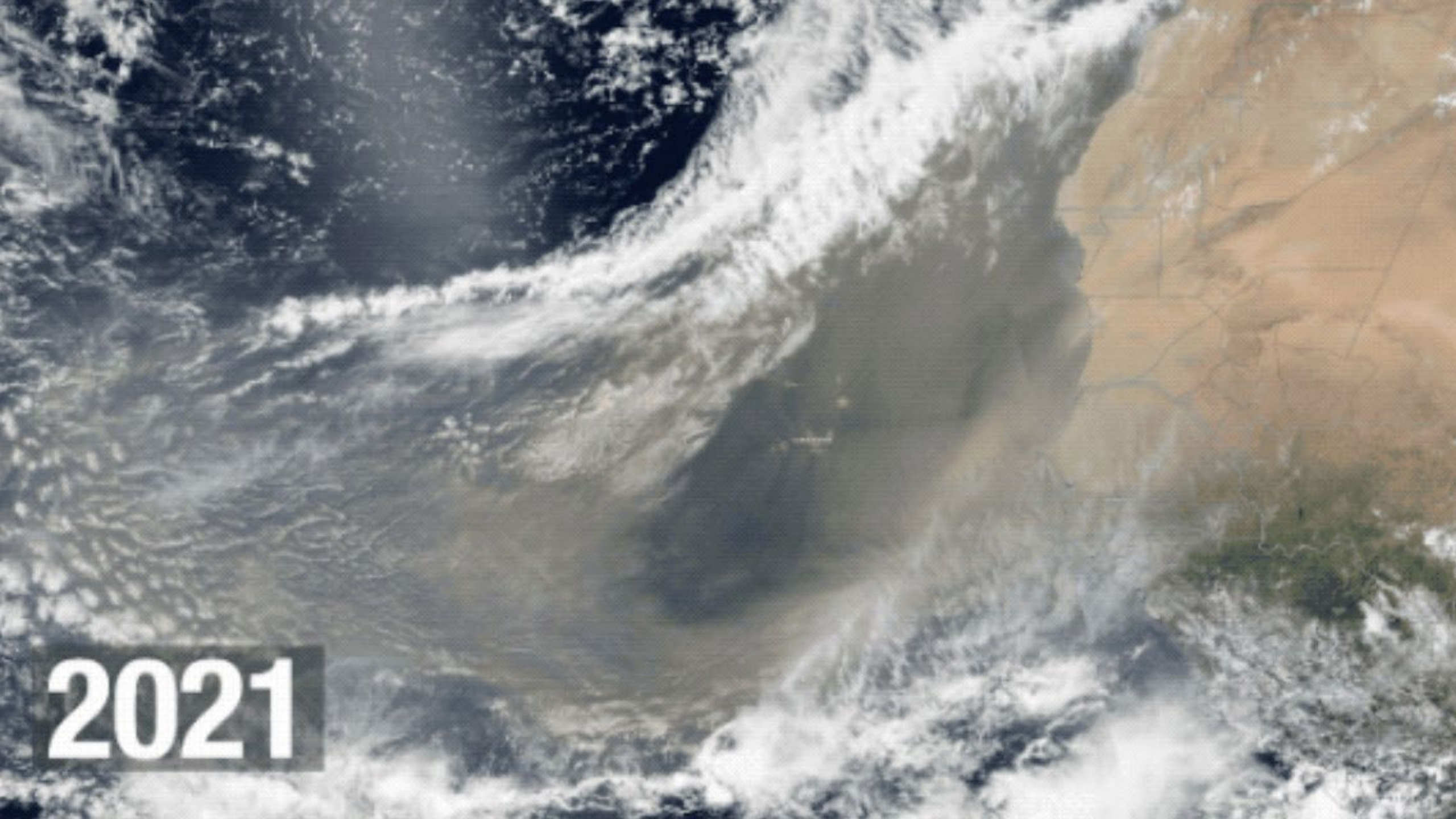
- ▶ <https://mars.nasa.gov/mars2020/mission/where-is-the-rover/>
- ▶ Scroll and pan around this map to see the latest location and traverse path for the Mars Perseverance rover at Jezero Crater. The goal of the mission is to seek signs of ancient life and collect samples of rock and regolith (broken rock and dust) for possible return to Earth.
- ▶ This map is composed of two layers: a grayscale Jezero Crater map, and a true-color base map. The grayscale base map was created with images from the HiRISE camera on NASA's Mars Reconnaissance Orbiter, while the color base map is from the European Space Agency Mars Express High Resolution Stereo camera. Some color processing has been applied to highlight surface features. The original image can be found [here](#). A high-resolution Digital Elevation Model was created from the images to provide critical information for rover drivers, who need to know how steep the hills are as they plan a path forward through this rocky terrain.
- ▶ Engineers created this experience with software used by the mission team who decide where Perseverance will explore, and how to get there. Each dot represents the end point of a drive and is labeled with the day, or sol, on Mars, that the rover stopped.



# Image of the Week

## Mars Perseverance Sol 114: Left Mastcam-Z Camera

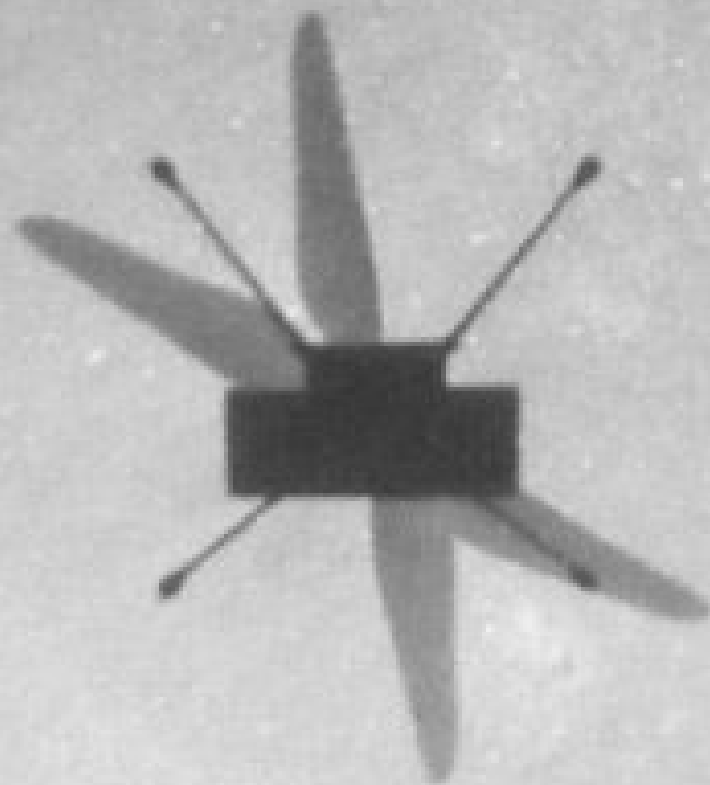
- ▶ [https://mars.nasa.gov/mars2020/multimedia/raw-images/ZL0\\_0114\\_0677061553\\_832EBY\\_N0041062ZCAM08094\\_0630LM](https://mars.nasa.gov/mars2020/multimedia/raw-images/ZL0_0114_0677061553_832EBY_N0041062ZCAM08094_0630LM)  
J
- ▶ This photo was selected by public vote and featured as "Image of the Week" for Week 18 (Jun. 13 - Jun. 19, 2021) of the Perseverance rover mission on Mars.
- ▶ NASA's Mars Perseverance rover acquired this image using its Left Mastcam-Z camera. Mastcam-Z is a pair of cameras located high on the rover's mast.
- ▶ This image was acquired on Jun. 15, 2021 (Sol 114) at the local mean solar time of 12:44:02.
- ▶ Image Credit: NASA/JPL-Caltech/ASU



**2021**

# Massive plume of Saharan dust crosses the Atlantic

- ▶ <https://www.space.com/34-image-day.html>
- ▶ Thursday, June 24, 2021: A massive plume of Saharan dust stirred up by strong winds in western Africa in early June is finding its way across the Atlantic towards Florida, as can be seen in this image captured by the NASA-NOAA Suomi NPP Satellite.
- ▶ The dust storm comes about a year after the largest cloud of Saharan dust in two decades hit the Caribbean Sea, dimming skies over several states of the U.S. Southeast. At that time, sensors on NASA's Earth-observing satellites measured record concentrations of dust in the atmosphere.
- ▶ Transport of dust from the African desert to the Americas takes place on a regular basis. Every year, more than 180 million tons of Saharan dust get carried across the Atlantic by winds. The size of the plumes from the past two years is, however, quite exceptional, NASA said in a blog post.



# Oops, Ingenuity did it again...

- ▶ <https://www.space.com/34-image-day.html>
- ▶ Tuesday, June 22, 2021: The Ingenuity helicopter captured its own shadow during its 8th successful flight on Mars, which took place on Monday (June 21). The 4-lb. (1.8 kilograms) drone flew for 77.4 seconds during the flight, crossing a distance of 160 meters, and landed in a new landing spot about 133.5 meters from the Perseverance rover, NASA said on Twitter.
- ▶ The helicopter, which traveled to Mars attached to the belly of Perseverance, had its original "Wright Brothers" moment on Mars in April and has since gradually increased the distance travelled as well as the complexity of its maneuvers. The 8th flight covered the third longest distance but was the fourth shortest of the flights performed so far. -- Tereza Pultarova



# 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



Questions?