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CCAS member David Majors took this photo of M47 (NGC2422). This open cluster, located about 1,600 light years away, is located in the constellation Puppis and is about 78 million years old. This image was taken at prime focus on an 8", 2000 mm fl f/10 Schmidt-Cassegrain telescope, with an exposure of about 4 minutes at ISO 800.

Next Star Gazing: ONLINE!

Saturday, April 10th at 7pm PT

CCAS Astronomer Kent Wallace and President Aurora Lipper will be taking you on a virtual tour of the night sky, so you can stargaze right from home!

Connect here:

CentralCoastAstronomy.org/stargaze

Virtual Member Hangout:

Thursday, April 15th at 8pm PT

Connect with other CCAS members virtually! Chat about all things astronomy, view and share astrophotography, ask questions, and enjoy!

Details here:

CentralCoastAstronomy.org/hangoutapr2021

Next Stargazing: ONLINE! Invite friends!!

Saturday, April 10th at 7pm PT

On April 10th, CCAS Astronomers Kent Wallace and Brian P. Cox will join President Aurora Lipper to take you on a virtual tour of the night sky. You'll be able to interact, ask questions, and gain insight on the best objects to view this time of year. Using the tools you've learned, you'll be able to stargaze from the comfort of your own home. You can download your handout to follow along, as well as a free sky chart on our website at the below link. Anyone can join, we'll be showing objects visible naked-eye, through binoculars, and through a telescope.



Invite all your friends! Anyone with the link can join our free online stargazing session. All that's needed is an internet connection. Join the stream using any tablet, personal computer, or YouTube enabled TV. Can't join us live? The video will be available on demand on our YouTube channel. Check our website for all the details:

CentralCoastAstronomy.org/stargaze

NASA's Perseverance Drives on Mars' Terrain for First Time

by NASA / JPL



This image was taken during the first drive of NASA's Perseverance rover on Mars on March 4, 2021.

Credit: NASA/JPL-Caltech

The first trek of the agency's largest, most advanced rover yet on the Red Planet marks a major milestone before science operations get under way.

NASA's Mars 2020 Perseverance rover performed its first drive on Mars March 4, covering 21.3 feet (6.5 meters) across the Martian landscape. The drive served as a mobility test that marks just one of many milestones as team members check out and calibrate

every system, subsystem, and instrument on Perseverance. Once the rover begins pursuing its science goals, regular commutes extending 656 feet (200 meters) or more are expected.

"When it comes to wheeled vehicles on other planets, there are few first-time events that measure up in significance to that of the first drive," said Anais Zarifian, Mars 2020

Perseverance rover mobility test bed engineer at NASA's Jet Propulsion Laboratory in Southern California. "This was our first chance to 'kick the tires' and take Perseverance out for a spin. The rover's six-wheel drive responded superbly. We are now confident our drive system is good to go, capable of taking us wherever the science leads us over the next two years."

The drive, which lasted about 33 minutes, propelled the rover forward 13 feet (4 meters), where it then turned in place 150 degrees to the left and backed up 8 feet (2.5 meters) into its new temporary parking space. To help better understand the dynamics of a retrorocket landing on the Red Planet, engineers used Perseverance's Navigation and Hazard Avoidance Cameras to image the spot where Perseverance touched down, dispersing Martian dust with plumes from its engines.

More Than Roving

The rover's mobility system is not only thing getting a test drive during this period of initial checkouts. On Feb. 26 – Perseverance's eighth Martian day, or sol, since landing – mission controllers completed a software update, replacing the computer program that helped land Perseverance with one they will rely on to investigate the planet.

More recently, the controllers checked out Perseverance's Radar Imager for Mars' Subsurface Experiment (RIMFAX) and Mars Oxygen In-Situ Resource Utilization Experiment

(MOXIE) instruments, and deployed the Mars Environmental Dynamics Analyzer (MEDA) instrument's two wind sensors, which extend out from the rover's mast. Another significant milestone occurred on March 2, or Sol 12, when engineers unstowed the rover's 7-foot-long (2-meter-long) robotic arm for the first time, flexing each of its five joints over the course of two hours.

"Tuesday's first test of the robotic arm was a big moment for us," said Robert Hogg, Mars 2020 Perseverance rover deputy mission manager. "That's the main tool the science team will use to do close-up examination of the geologic features of Jezero Crater, and then we'll drill and sample the ones they find the most interesting. When we got confirmation of the robotic arm flexing its muscles, including images of it working beautifully after its long trip to Mars – well, it made my day."

Upcoming events and evaluations include more detailed testing and calibration of science instruments, sending the rover on longer drives, and jettisoning covers that shield both the adaptive caching assembly (part of the rover's Sample Caching System) and the Ingenuity Mars Helicopter during landing. The experimental flight test program for the Ingenuity Mars Helicopter will also take place during the rover's commissioning.

Through it all, the rover is sending down images from the most advanced suite of cameras ever to travel to Mars. The mission's cameras have already sent about 7,000 images. On Earth, Perseverance's imagery flows through

the powerful Deep Space Network (DSN), managed by NASA's Space Communications and Navigation (SCaN) program. In space, several Mars orbiters play an equally important role.

"Orbiter support for downlink of data has been a real gamechanger," said Justin Maki, chief engineer for imaging and the imaging scientist for the Mars 2020 Perseverance rover mission at JPL. "When you see a beautiful image from Jezero, consider that it took a whole team of Martians to get it to you. Every picture from Perseverance is relayed by either the European Space Agency's Trace Gas Orbiter, or NASA's MAVEN, Mars Odyssey, or Mars Reconnaissance Orbiter. They are important partners in our explorations and our discoveries."

The sheer volume of imagery and data already coming down on this mission has been a welcome bounty for Matt Wallace, who recalls waiting anxiously for the first images to trickle in during NASA's first Mars rover mission, Sojourner, which explored Mars in 1997. On March 3, Wallace became the mission's new project manager. He replaced John McNamee, who is stepping down as he intended, after helming the project for nearly a decade.

"John has provided unwavering support to me and every member of the project for over a decade," said Wallace. "He has left his mark on this mission and team, and it has been my privilege to not only call him boss but also my friend."

Touchdown Site Named

With Perseverance departing from its touchdown site, mission team scientists have memorialized the spot, informally naming it for the late science fiction author Octavia E. Butler. The groundbreaking author and Pasadena, California, native was the first African American woman to win both the Hugo Award and Nebula Award, and she was the first science fiction writer honored with a MacArthur Fellowship. The location where Perseverance began its mission on Mars now bears the name "Octavia E. Butler Landing."

Official scientific names for places and objects throughout the solar system – including asteroids, comets, and locations on planets – are designated by the International Astronomical Union. Scientists working with NASA's Mars rovers have traditionally given unofficial nicknames to various geological features, which they can use as references in scientific papers.

"Butler's protagonists embody determination and inventiveness, making her a perfect fit for the Perseverance rover mission and its theme of overcoming challenges," said Kathryn Stack Morgan, deputy project scientist for Perseverance. "Butler inspired and influenced the planetary science community and many beyond, including those typically under-represented in STEM fields."

"I can think of no better person to mark this historic landing site than Octavia E. Butler, who not only grew up next door to JPL in Pasadena, but she also inspired millions with her visions of a

science-based future,” said Thomas Zurbuchen, NASA associate administrator for science. “Her guiding principle, ‘When using science, do so accurately,’ is what the science team at NASA is all about. Her work continues to inspire today’s scientists and engineers across the globe – all in the name of a bolder, more equitable future for all.”

Butler, who died in 2006, authored such notable works as “Kindred,” “Bloodchild,” “Speech Sounds,” “Parable of the Sower,” “Parable of the Talents,” and the “Patternist” series. Her writing explores themes of race, gender, equality, and humanity, and her works are as relevant today as they were when originally written and published.

More About the Mission

A key objective of Perseverance’s mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet’s geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith.

Subsequent NASA missions, in cooperation with ESA (European Space Agency), would send spacecraft to Mars to collect these sealed

samples from the surface and return them to Earth for in-depth analysis.

The Mars 2020 Perseverance mission is part of NASA’s Moon to Mars exploration approach, which includes Artemis missions to the Moon that will help prepare for human exploration of the Red Planet.

JPL, which is managed for NASA by Caltech in Pasadena, built and manages operations of the Perseverance rover.

For more about Perseverance:

<https://www.nasa.gov/perseverance>

and

<https://mars.nasa.gov/mars2020>

For more information about NASA’s Mars missions, go to:

<https://www.nasa.gov/mars>

To see images as they come down from the rover and vote on the favorite of the week, go to:

<https://go.nasa.gov/perseverance-raw-images>

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CCAS Information

Founded in 1979, the Central Coast Astronomical Society (CCAS) is an association of people who share a common interest in astronomy and related sciences.

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CCAS Officer Lee Coombs took this closeup photo during the 9 day Moon on March 22nd. He used a 6" refractor telescope and a 3X teleconverter.