

Celestial



Observer

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October - December 2024



CCAS member Corrina Jones captured this photo of M27 (Dumbbell Nebula) while trying out their new astrophotography telescope this Summer. M27 is a Planetary Nebula visible high in the sky at sundown this time of year. Located within the constellation Vulpecula, it is 1,200 light-years from Earth.

Final Star Parties for the year: **November 2nd & November 30th**

CCAS hosts star parties at Santa Margarita Lake Park (weather dependent). Come learn and enjoy the sky while the nights get colder and longer.

Club Meeting: Thursday, Oct. 17th at 7^{pm} (in-person only)

Speaker: Dr. Jodi Christiansen

Topic: Blazars, the most energetic particle accelerators in the universe

Find dates and more information about all of our events on our calendar:

CentralCoastAstronomy.org/Calendar

Central Coast Astronomical Society Events

In-Person Club Meeting: Thursday, October 17th - 7:00pm-9:00pm

Topic: Blazars, the Most Energetic Particle Accelerators in the Universe, by Jodi Christiansen

Most galaxies harbor a supermassive black hole (SMBH) at their core. Although black holes by themselves do not radiate light, and cannot be seen by any telescope, many of these SMBH collect material around them that creates extreme environments. This material typically forms an accretion disk and a jet of particles. When the jet of particles is tipped toward the earth, astronomers call it a Blazar. The particles in the jet radiate light at all wavelengths.

In this talk, Dr. Jodi Christiansen will outline the formation of a supermassive black hole and their extreme environment. She will then talk about the telescopes needed to measure all the wavelengths, including the VERITAS telescope which she worked on in Arizona. By combining the results from all of the telescopes, we are able to measure the physical properties of the jets.

Meetings are held at: United Methodist Church, Wesley Room. 1515 Fredericks Street, San Luis Obispo, CA 93405

For directions and guest speaker details, visit:

www.CentralCoastAstronomy.org/calendar/category/in-person-club-meeting

In Person Star Parties at Santa Margarita Lake Park:

Final events for the year (arrive before sunset):

- Saturday, November 2nd
- Saturday, November 30th

Join other amateur astronomers and night sky enthusiasts at Santa Margarita Lake Park to mingle and view the night sky. Bring your own binoculars or telescope, or enjoy looking through others' equipment. These events are weather dependent, but are scheduled monthly on the weekend closest to the new moon (when possible), and in conjunction with certain holidays. For directions, more information, and best practices visit:

www.CentralCoastAstronomy.org/calendar/category/in-person-star-party/

Visit our YouTube channel: Did you know that Central Coast Astronomical Society has a YouTube channel that has virtual stargazing videos for every month of the year, lectures, astronomy tutorials and more? Further your learning by visiting our channel and watching educational videos any time you'd like!

www.YouTube.com/@CentralCoastAstronomy



September 2023 Virtual Stargazing with Central Coast Astronomy
488 views • 1 year ago



Stargazing Tour for November
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Astronomy Book for Kids by Aurora Lipper, Supercharged Science
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August Online Stargazing Session with Central Coast Astronomy
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CCAS Stargazing July
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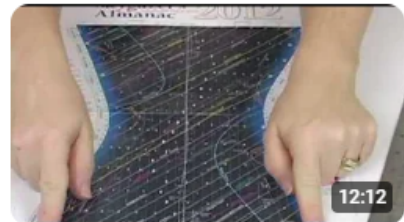
Roll Off Roof Observatory Tour with Lee Coombs
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Binocular Chair Tour with Tom Frey
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NASA Turns Off Science Instrument to Save Voyager 2 Power

by NASA JPL



Engineers work on NASA's Voyager 2 at JPL in March 1977, ahead of the spacecraft's launch that August. The probe carries 10 science instruments, some of which have been turned off over the years to save power. Credit: NASA

The mission has been working to postpone the shut-off as long as possible. Four other instruments aboard the interstellar spacecraft continue to operate.

Mission engineers at NASA have turned off the plasma science instrument aboard the Voyager 2

spacecraft due to the probe's gradually shrinking electrical power supply.

Traveling more than 12.8 billion miles (20.5 billion kilometers) from Earth, the spacecraft continues to use four science instruments to study the region outside our heliosphere, the protective bubble of particles and

magnetic fields created by the Sun. The probe has enough power to continue exploring this region with at least one operational science instrument into the 2030s.

Mission engineers have taken steps to avoid turning off a science instrument for as long as possible because the science data collected by the twin Voyager probes is unique. No other human-made spacecraft has operated in interstellar space, the region outside the heliosphere.

The plasma science instrument measures the amount of plasma (electrically charged atoms) and the direction it is flowing. It has collected limited data in recent years due to its orientation relative to the direction that plasma is flowing in interstellar space.

Both spacecraft are powered by decaying plutonium and lose about 4 watts of power each year. After the twin Voyagers completed their exploration of the giant planets in the 1980s, the mission team turned off several science instruments that would not be used in the study of interstellar space. That gave the spacecraft plenty of extra power until a few years ago. Since then, the team has turned off all onboard systems not essential for keeping the probes working, including some heaters. In order to postpone having to shut off another science instrument, they also adjusted how Voyager 2' voltage is monitored.

Monitoring Results

On Sept. 26, engineers issued the command to turn off the plasma science instrument. Sent by NASA's Deep Space Network, it took 19 hours to reach Voyager 2, and the return signal took another 19 hours to reach Earth.

Mission engineers always carefully monitor changes being made to the 47-year-old spacecraft's operations to ensure they don't generate any unwanted secondary effects. The team has confirmed that the switch-off command was executed without incident and the probe is operating normally.

In 2018, the plasma science instrument proved critical in determining that Voyager 2 left the heliosphere. The boundary between the heliosphere and interstellar space is demarcated by changes in the atoms, particles, and magnetic fields that instruments on the Voyagers can detect. Inside the heliosphere, particles from the Sun flow outward, away from our nearest star. The heliosphere is moving through interstellar space, so at Voyager 2's position near the front of the solar bubble, the plasma flows in almost the opposite direction of the solar particles.

The plasma science instrument consists of four "cups." Three cups point in the direction of the Sun and observed the solar wind while inside the heliosphere. A fourth points at a

right angle to the direction of the other three and has observed the plasma in planetary magnetospheres, the heliosphere, and now, interstellar space.

When Voyager 2 exited the heliosphere, the flow of plasma into the three cups facing the Sun dropped off dramatically. The most useful data from the fourth cup comes only once every three months, when the spacecraft does a 360-degree turn on the axis pointed toward the Sun. This factored into the mission's decision to turn this instrument off before others.

The plasma science instrument on Voyager 1 stopped working in 1980 and was turned off in 2007 to save

power. Another instrument aboard Voyager 2, called the plasma wave subsystem, can estimate the plasma density when eruptions from the Sun drive shocks through the interstellar medium, producing plasma waves.

The Voyager team continues to monitor the health of the spacecraft and its available resources to make engineering decisions that maximize the mission's science output.

For more information about NASA's Voyager missions, visit:

<https://science.nasa.gov/mission/voyager>

Thank you everyone, for your astrophotography submissions to be included in the newsletter each quarter! We enjoy seeing all of the photos, and wish we could include them all. In January, we will be featuring multiple photos and would love to showcase as many of our members as possible. Please choose your favorite photos and submit them as attachments to Newsletter@CentralCoastAstronomy.org. With each photo, please include your name, a brief description of what's in the photo, equipment used, plus any other fun facts you'd like to include. These photos are not limited to what's in the night sky at the time of publishing.

Submission deadline: December 29th. Happy stargazing!



CCAS Member Larry Vickman captured this photo on South Bay Blvd in Los Osos, California, of the September 5th Falcon 9 launch from Vandenberg Space Force Base.

CCAS Contacts

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Treasurer Lee Coombs
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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.

Central Coast Astronomical Society

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