

# Celestial

Volume 44 Issue 2



# Observer

April - June 2024



*CCAS member Dane Tiemeier took this photo of the International Space Station passing over Paso Robles, CA in mid March. The ISS generally makes several visible passes every month, so keep your eyes to the sky. To see when it will be visible to you, sign up for alerts at [spotthestation.nasa.gov](https://spotthestation.nasa.gov).*

## **Join us for stargazing and meetings!**

CCAS has both live online and in person stargazing events that are scheduled throughout the year, and quarterly in-person meetings! Find dates and more information about all of our events on our calendar:

[CentralCoastAstronomy.org/Calendar](https://CentralCoastAstronomy.org/Calendar)

## **Join us for virtual Stargazing!**

Take you on a tour of the night sky on May 10th via a livestream on YouTube!

[CentralCoastAstronomy/stargaze](https://CentralCoastAstronomy.org/stargaze)

# Central Coast Astronomical Society Events

## **In-Person Star Parties at Santa Margarita Lake Park**

Take advantage of Spring's temperate nights and join other astronomers and night sky enthusiasts monthly at Santa Margarita Lake Park to mingle and view the night sky. Bring your own telescope or binoculars, or enjoy looking through others'. 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 all dates, directions and star party etiquette and guidelines, visit our website:

[www.CentralCoastAstronomy.org/calendar/category/in-person-star-party/](http://www.CentralCoastAstronomy.org/calendar/category/in-person-star-party/)

Upcoming Events - Saturdays monthly (Arrive before sunset):

- May 4th • June 8th • July 6th • August 3rd • September 7th • October 5th

## **In-Person Club Meetings**

Held quarterly at the United Methodist Church in San Luis Obispo, meet other CCAS members and enjoy the guest speaker presentation on a wide range of topics surrounding astronomy and the cosmos. For dates and guest speaker details, visit our website.

[www.CentralCoastAstronomy.org/calendar/category/in-person-club-meeting](http://www.CentralCoastAstronomy.org/calendar/category/in-person-club-meeting)

Upcoming Events:

- Thursday, July 18th - 7:00pm - 9:00pm
- Thursday, October 17th - 7:00pm - 9:00pm

## **Virtual Stargazing Live Streams**

CCAS President Aurora Lipper joins NASA Solar System Ambassador and CCAS officer Brian P. Cox to take you on a tour of the night sky via a livestream on YouTube! You'll learn about objects visible naked-eye, through binoculars, and through a telescope; plus the event will include live telescope views of visible objects (Live views are weather permitting, but the event will happen rain or shine!). Then, using the tools you learn during the presentation, you'll be able to stargaze from the comfort of your own home! Download a free sky chart and find out more details and future dates on our website. If you can't join us live, you can access the stream on-demand after the event.

[www.CentralCoastAstronomy.org/calendar/category/virtual-stargazing/](http://www.CentralCoastAstronomy.org/calendar/category/virtual-stargazing/)

Upcoming Events:

- Friday, May 10th - 9:00pm - 10:00pm



# Peering Into the Tendrils of NGC 604 With NASA's Webb

by NASA JPL



*This image from Webb's NIRCам (Near-Infrared Camera) of star-forming region NGC 604 shows how stellar winds from bright, hot, young stars carve out cavities in surrounding gas and dust. Credit: NASA, ESA, CSA, STScI*

**A well-studied hotbed of star formation is revealed in new detail by two of the telescope's instruments, including MIRI, which was managed through launch by JPL.**

The formation of stars and the chaotic environments they inhabit is one of the

most well-studied, but also mystery-shrouded, areas of cosmic investigation. The intricacies of these processes are now being unveiled like never before by NASA's James Webb Space Telescope.

Two new images from Webb's NIRCам (Near-Infrared Camera) and

MIRI (Mid-Infrared Instrument) showcase star-forming region NGC 604, located in the Triangulum galaxy (M33), 2.73 million light-years away from Earth. In these images, cavernous bubbles and stretched-out filaments of gas etch a more detailed and complete tapestry of star birth than seen in the past.

Sheltered among NGC 604's dusty envelopes of gas are more than 200 of the hottest, most massive kinds of stars, all in the early stages of their lives. These types of stars are B-types and O-types, the latter of which can be more than 100 times the mass of our own Sun. It's quite rare to find this concentration of them in the nearby universe. In fact, there's no similar region within our own Milky Way galaxy.

This concentration of massive stars, combined with its relatively close distance, means NGC 604 gives astronomers an opportunity to study these objects at a fascinating time early in their life.

In Webb's near-infrared NIRCам image, the most noticeable features are tendrils and clumps of emission that appear bright red, extending out from areas that look like clearings, or large bubbles in the nebula. Stellar winds from the brightest and hottest young stars have carved out these cavities, while ultraviolet radiation ionizes the surrounding gas. This ionized hydrogen appears as a white and blue ghostly glow.

The bright orange-colored streaks in the Webb near-infrared image signify the presence of carbon-based molecules known as polycyclic aromatic hydrocarbons, or PAHs. This material plays an important role in the interstellar medium and the formation of stars and planets, but its origin is a mystery. As you travel farther from the immediate clearings of dust, the deeper red signifies molecular hydrogen. This cooler gas is a prime environment for star formation.

Webb's exquisite resolution also provides insights into features that previously appeared unrelated to the main cloud. For example, in Webb's image, there are two bright, young stars carving out holes in dust above the central nebula, connected through diffuse red gas. In visible-light imaging from NASA's Hubble Space Telescope, these appeared as separate splotches.

Webb's view in mid-infrared wavelengths also illustrates a new perspective into the diverse and dynamic activity of this region. In the MIRI view of NGC 604, there are noticeably fewer stars. This is because hot stars emit much less light at these wavelengths, while the larger clouds of cooler gas and dust glow. Some of the stars seen in this image, belonging to the surrounding galaxy, are red supergiants – stars that are cool but very large, hundreds of times the diameter of our Sun. Additionally, some of the background galaxies that appeared in the NIRCам image also fade. In the MIRI image, the blue tendrils of material signify the presence of PAHs.

NGC 604 is estimated to be around 3.5 million years old. The cloud of glowing gases extends to some 1,300 light-years across.

## **More About the Mission**

The James Webb Space Telescope is the world's premier space science observatory. Webb is solving mysteries in our solar system, looking beyond to distant worlds around other stars, and probing the mysterious structures and origins of our universe and our place in it. Webb is an international program led by NASA with its partners, ESA (European Space Agency) and the Canadian Space Agency.

MIRI was developed through a 50-50 partnership between NASA and ESA. NASA's Jet Propulsion Laboratory led the U.S. efforts for MIRI, and a multinational consortium of European astronomical institutes contributes for ESA. George Rieke with the University of Arizona is the MIRI science team lead. Gillian Wright is the MIRI European principal investigator.

The MIRI cryocooler development was led and managed by JPL, in collaboration with Northrop Grumman in Redondo Beach, California, and NASA's Goddard Space Flight Center in Greenbelt, Maryland.

To learn more about Webb, go here:  
<https://webbtelescope.org/home>

## **CCAS Contacts**



President           Aurora Lipper  
Vice President   Tom Frey  
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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Website: [CentralCoastAstronomy.org](http://CentralCoastAstronomy.org)

Facebook: [facebook.com/CentralCoastAstronomicalSociety](https://facebook.com/CentralCoastAstronomicalSociety)



*CCAS member Dane Tiemeier took this photo of the Flame (top) and Horsehead Nebula (bottom). Located approximately 1,500 light-years from Earth and too faint to be seen through binoculars, these objects are even challenging to see clearly through a telescope.*





*CCAS member Catherine Hyde took this photo of the Seagull Nebula (IC 2177), with Thor's Helmet (NGC 2359) appearing to the bottom right. This photo clearly shows the reasoning for the naming of these nebulae. The Seagull Nebula is located approximately 3,650 light-years from Earth, while Thor's Helmet is much further away at 15,000 light-years away.*