Celestial Observer

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CCAS Member Peter Bresler captures the Rosette Nebula. The cluster of stars is visible in binoculars and quite well seen in small telescopes while the nebula itself is more difficult to spot visually and requires a telescope with a low magnification and a dark site.

Next Meeting:

Thursday, Jan. 23rd with guest speaker Dr. Rick Pogge on *Chasing Oxygen,* 7pm. Free and open to the public!

Next Star Gazing:

Saturday, January 18th, at sunset at the new location at Santa Margarita Lake.

www.CentralCoastAstronomy.org/starparty

January 23rd Meeting: "Chasing Oxygen" with Prof. Rick Pogge from Ohio University

Wesley Room, 1515 Fredericks Street, San Luis Obispo

6:30pm Doors Open | 6:45 Refreshments | 7:00 Meeting Starts

Join us for a super-cool talk from our guest speaker, Dr. Pogge!

The Big Bang made only hydrogen and helium plus tiny traces of lithium and deuterium. This is why hydrogen and helium are the primary chemical elements that make up the universe today.

However, here on Earth, Oxygen is far and away the most abundant chemical element. Oxygen makes up about 46% of Earth's crust, 22% of the air we breathe, and 65% of mass of the human body. Where was all of the Oxygen made? How is it distributed throughout the Galaxy and eventually find its way into planets and people? This talk will explore the origin of the elements heavier than helium in the universe, and describe how astronomers measure and map the distribution of Oxygen in interstellar space.

Prof. Pogge's research has ranged from mapping the impact of active supermassive black holes on their host galaxies to searches for exoplanets.

Throughout his career he has worked on the design and construction of advanced astronomical instruments, including the development of software for image processing, spectral analysis, and instrument control and data acquisition.

Most recently, Prof. Pogge led the building and commissioning of Ohio State's twin Multi-Object Double Spectrographs for the Large Binocular Telescope. His current work uses the LBT to push the limits of precision spectrophotometry to measure element abundances in star formation regions and trace the chemical evolution history of galaxies, in particular the abundances of Oxygen and related elements.

This event is free and open to the public.

CCAS Turns 40!

At the end of 2019, CCAS celebrates its fortieth birthday. For us humans, 40 usually means the completion of a long journey, the age at which we are just now getting traction in our lives and moving forward with some amount of momentum and experience behind us. We're not making the same mistakes we did at 20!

The mission of the CCAS is to bring science and astronomy to the public, to inspire curiosity about the universe and provide a place to go to connect with people with the same interest in astronomy or space.

When the club started, people were inspired by the mere thought of an upcoming rocket launch, space mission, and astronomical event like a comet sighting or transit. These days however, anyone can flip to a website with stunning full-color images of the planets or nebulae, so it takes something away from what used to be incredibly special. It may appear that the public is no longer awed into wonder at these marvels that are now available everywhere.

The folks at CCAS know that the inspiration and awe and wonder is still there, and so they continue to volunteer their time on dark nights on hilltops, in school classrooms, and through countless astronomy events, lectures, and talks. Our astronomers work to cultivate that interest in others, even if it's just talking to a mom who brought her kids to a star party, or a student who wanted to borrow a telescope after listening to an astronomy lecture.

CCAS is entirely a volunteer-run organization that is always looking for more members to participate. If you've attended one of our star parties, that's fantastic! What is even better is to help our club by participating with any skills that you have to help us make a different. You can come to an event, talk to any member and they can get you on the right track to a great experience.
40 years is a long time for an astronomy club to exist, especially in a small town like ours! We are truly thankful to those who bring new energy to the club and are willing to share their excitement about astronomy and space with others to keep it moving forward and going for another 40 years!

Aurora Lipper
~CCAS, Interim-President

CCAS 2020 Events

Monthly Club Meetings with Guest Speaker:
Jan 23, Feb 27, Mar 26, April 23, May 28, June 25, July 23, Sept 24, Oct 22

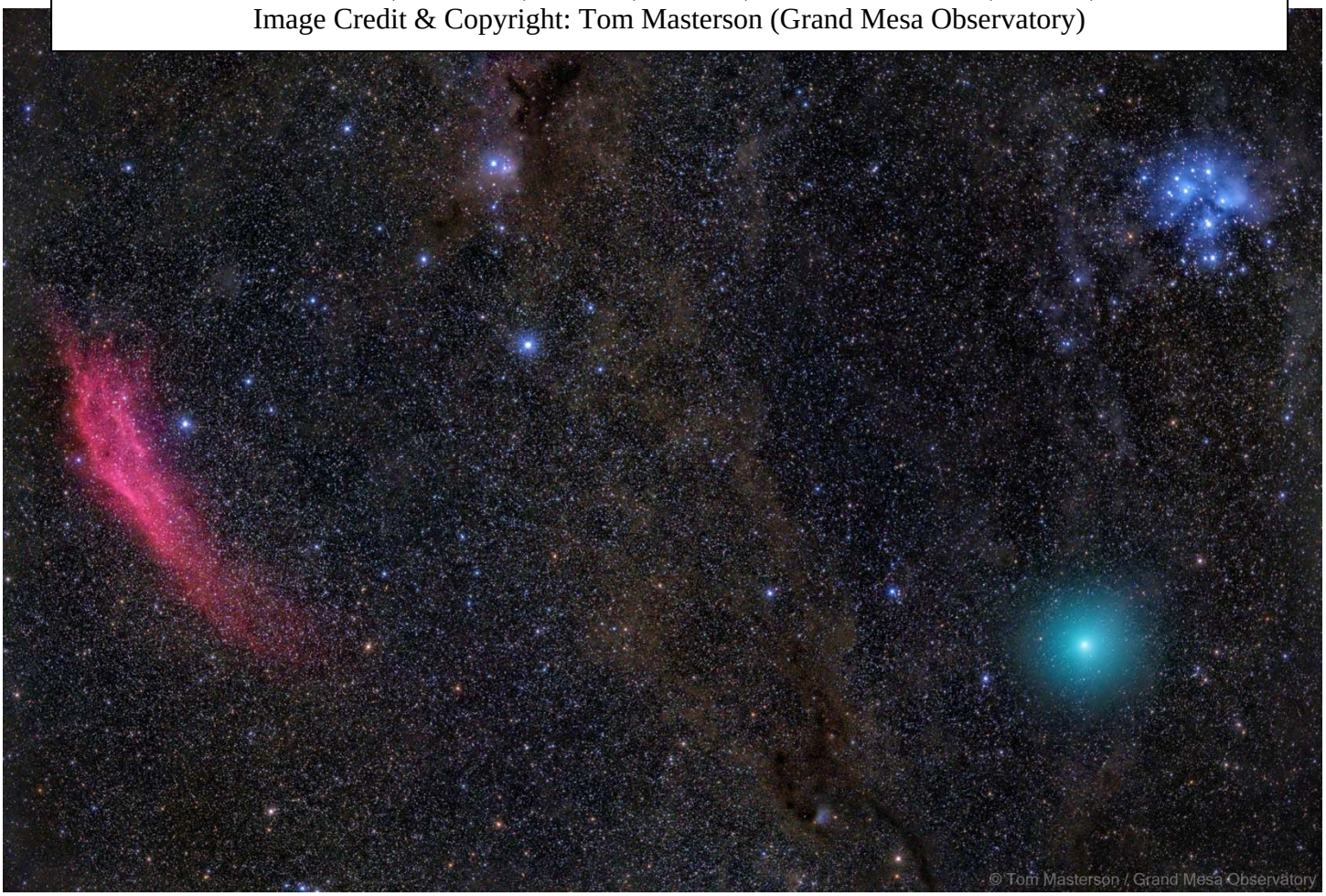
Star Gazing at Santa Margarita Lake:
Jan 18, Feb 15, Mar 21, Apr 18, May 23, June 20, July 18, Aug 15, Sept 19, Oct 17, Nov 14, Dec 12

REALLY BIG Public Summer Star Gazing Event Aug 22

Please refer to the CCAS Website Calendar Page and sign up on our email list for specific event times, location, and possible cancellation due to weather.

(www.CentralCoastAstronomy.org)

Red Nebula (NGC 1499), Green (Wirtanen) Comet, Blue Stars (Pleiades)
Image Credit & Copyright: Tom Masterson (Grand Mesa Observatory)



Next Star Gazing

Saturday, January 18th at sunset (5:20 PM) at the Santa Margarita Lake Our Sky Star Parties occur once a month, and are free and open to the public, and also weather-permitting. Check our website for all the details:

www.CentralCoastAstronomy.org/starparty

Scope for Sale!

Meade 10-inch SCT, Model 2110 with LX Pulse Drive.

Includes:

- Wheelie Bars
- 9x60 finder w/illuminated reticle
- Motofocus
- 2” diagonal w/1.25”adapter
- 26mm Plossl (1.25”)
- 32mm Erfle (2”)
- 50mm Plossl (2”)
- 2X Barlow (2”).

Scope used only once and in new condition. A steal at $1500!
For information, or to arrange to see scope located in Templeton, contact Lee Coombs at (805)466-2788 or lcoombs@calpoly.edu

Current Open Positions

Open CCAS Positions:
CCAS is an entirely volunteer-run organization that relies on the generous donation of time by its members toward running astronomy events for our members and for the public as well as managing club operations. Currently we have the following positions open that we are seeking help with from individuals willing to contribute to the success of CCAS:

Communications Officer
The communications officer is responsible for communication both incoming and outgoing for CCAS. This person will schedule and send out emails for astronomy events such as star gazing, handle incoming requests for astronomy events, and work with the Outreach / Activities team to fulfill these requests. About 3-5 hours per month.

Newsletter Editor
The newsletter editor is responsible for putting together the content for the monthly newsletter for CCAS, including identifying articles to include, images, and other relevant information. They will work with the Aurora to create each edition of the newsletter. Typically 4 hours per month.

Vice President: Meetings
The Vice President is responsible for carrying out / delegating the work to be done as directed by the officers and the president. It also includes setting up and conducting meetings if president is absent. About 6-10 hours per month.

CCAS Member's Work

Member Peter Bresler shares images of the Crab Nebula and M33 Hyperstar.

Member Dave Majors shares images of and M65-M66.

Spitzer Studies a Stellar Playground With a Long History

Credit: NASA JPL

This image from NASA's Spitzer Space Telescope shows the Perseus Molecular Cloud, a massive collection of gas and dust that stretches over 500 light-years across. Home to an abundance of young stars, it has drawn the attention of astronomers for decades.

Spitzer's Multiband Imaging Photometer (MIPS) instrument took this image during Spitzer's "cold mission," which ran from the spacecraft's launch in 2003 until 2009, when the space telescope exhausted its supply of liquid helium coolant. (This marked the beginning of Spitzer's "warm mission.") Infrared light can't be seen by the human eye, but warm objects, from human bodies to interstellar dust clouds, emit infrared light.

Infrared radiation from warm dust generates much of the glow seen here from the Perseus Molecular Cloud. Clusters of stars, such as the bright spot near the left side of the image, generate even more infrared light and illuminate the surrounding clouds like the Sun lighting up a cloudy sky at sunset. Much of the dust seen here emits little to no visible light (in fact, the dust blocks visible light) and is therefore revealed most clearly with infrared observatories like Spitzer.

On the right side of the image is a bright clump of young stars known as NGC 1333, which Spitzer has observed multiple times. It is located about 1,000 light-years from Earth. That sounds far, but it is close compared to the size of our galaxy, which is about 100,000 light-years across. NGC

1333's proximity and strong infrared emissions made it visible to astronomers using some of the earliest infrared instruments.

Perseus Molecular Cloud
This image from NASA'S Spitzer Space Telescope shows the location and apparent size of the Perseus Molecular Cloud in the night sky. Located on the edge of the Perseus Constellation, the collection of gas and dust is about 1,000 light-years from Earth and about 500 light-years wide.

In fact, some of its stars were first observed in the mid-1980s with the Infrared Astronomical Survey (IRAS), a joint mission between NASA, the United Kingdom and the Netherlands. The first infrared satellite telescope, it observed the sky in infrared wavelengths blocked by Earth's atmosphere, providing the first-ever view of the universe in those wavelengths.

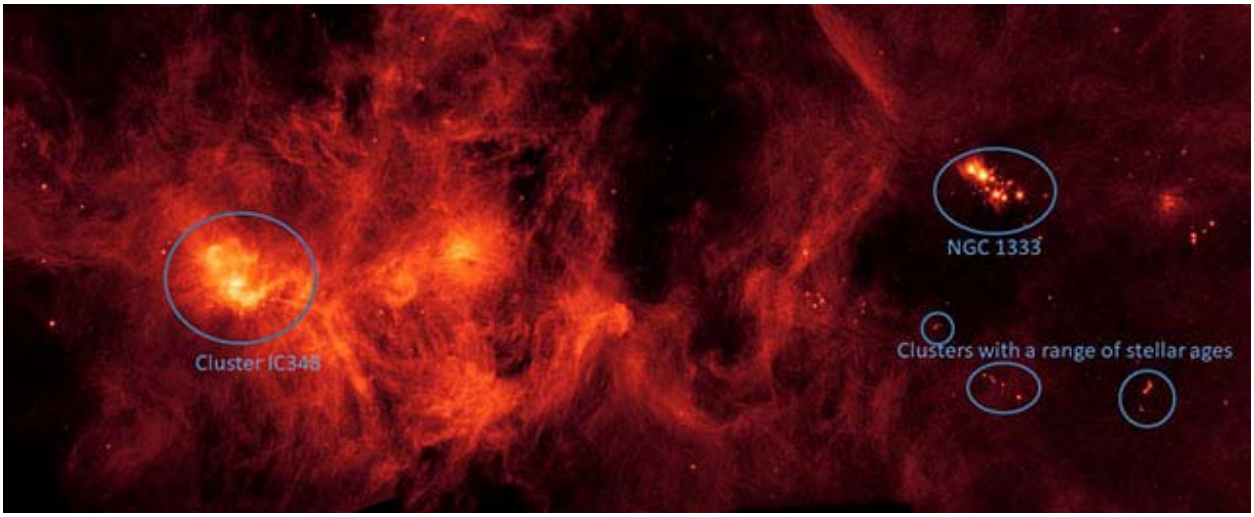
More than 1,200 peer-reviewed research papers have been written about NGC 1333, and it has been studied in other wavelengths of light, including by the Hubble Space Telescope, which detects mostly visible light, and the Chandra X-Ray Observatory.

Many young stars in the cluster are sending massive outflows of material - the same material that forms the star - into space. As the material is ejected, it is heated up and smashes into the surrounding interstellar medium. These factors cause the jets to radiate brightly, and they can be seen in close-up studies of the region. This has provided astronomers with a clear glimpse of how stars go from a sometimes-turbulent adolescence into calmer adulthood.

An Evolving Mystery

Other clusters of stars seen below NGC 1333 in this image have posed a fascinating mystery for astronomers: They appear to contain stellar infants, adolescents and adults. Such a closely packed mixture of ages is extremely odd, according to Luisa Rebull, an astrophysicist at NASA's Infrared Science Archive at Caltech-IPAC who has studied NGC 1333 and some of the clusters below it. Although many stellar siblings may form together in tight clusters, stars are always moving, and as they grow older they tend to move farther and farther apart.

This annotated image of the Perseus Molecular Cloud, provided by NASA's Spitzer Space Telescope, shows the location of various star clusters, including NGC 1333.



Finding such a closely packed mixture of apparent ages doesn't fit with current ideas about how stars evolve. "This region is telling astronomers that there's something we don't understand about star formation," said Rebull. The puzzle presented by this region is one thing that keeps astronomers coming back to it. "It's one of my favorite regions to study," she added.

Since IRAS's early observations, the region has come into clearer focus, a process that is common in astronomy, said Rebull. New instruments bring more sensitivity and new techniques, and the story becomes clearer with each new generation of observatories. On Jan. 30, 2020, NASA will decommission the Spitzer Space Telescope, but its legacy has paved the way for upcoming observatories, including the James Webb Space Telescope, which will also observe infrared light.

The Spitzer-MIPS data used for this image is at the infrared wavelength of 24 microns. Small gaps along the edges of this image not observed by Spitzer were filled in using 22-micron data from NASA's Wide-Field Infrared Survey Explorer (WISE).

To learn more about Spitzer and how it studies the infrared universe, check out the Spitzer 360 VR experience, now available on the NASA Spitzer channel on YouTube: http://bit.ly/SpitzerVR.

CCAS Contacts

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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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