



Butterfly Nebula Image by CCAS Member Lee Coombs. IC 1318 in Cygnus. 3.25 min. @ ISO 1600 through an 80mm f/4.8 APO refractor using a Canon T2i DSLR

Next Meeting: Thursday, Oct 27 at 7pm. Dr. John Keller is our guest speaker presenting his work on the RECON Occultation Project!

Next Star Gazing: Saturday, Oct 1 & Oct 29 at sunset at the Santa Margarita KOA. See inside for directions and a map.

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M13 Hercules Globular Cluster by CCAS Member Robin White. Exposures: 7 x 30 seconds, ISO 1600 W/Darks, Telescope: Celestron 80mmED-APO F7.0, Camera: Canon EOS T3i, Processed: Images Stacked & combined in Nebulosity, Final Process: Adobe Lightroom.

Upcoming Meeting

Wesley Room, 1515 Fredericks Street, San Luis Obispo

6:30pm Doors Open | 6:45 Refreshments & Solar Telescope Viewing | 7:00 Meeting Starts

Oct 27, 2016

RECON: Occultation Project

by Dr. John Keller



Our September guest speaker is Dr. John Keller from the Physics Department at Cal Poly State, speaking about his work with determining the sizes of trans-Neptunian objects using stellar occultations.

Have you ever wondered what's found in the outer reaches of our solar system? It turns out many, many objects orbit the sun out past Neptune. Called trans-Neptunian objects (TNOs), these frozen bodies were formed at the same time as the rest of our solar system – making them close to four and a half billion years old. Determining the sizes of these objects will help us better understand their formation and composition, and could tell us a great deal about the origins of our solar system. One population of these objects is called the Kuiper Belt.

Pluto was the first Kuiper Belt Object (KBO) discovered in 1930. Since 1992, we have discovered over a thousand KBOs and it is estimated that there are more than 100,000 objects larger than 100km in diameter in this region of our solar system. Our goal is to measure the sizes of a particular category of these objects known as “cold classical KBOs.” These objects are in nearly circular orbits around the sun that have likely not been altered since the formation of the solar system.

To measure the size of a TNO, we use the shadow it casts on Earth as the TNO moves in front of a distant star – an event called an occultation. We intend to determine the sizes of a sample of cold classical KBOs using this occultation method because these objects have been particularly difficult to measure using other techniques.

Making precise measurements of an occultation event from different, nearby locations on Earth, we can determine the size of the object. During predicted occultations, every observation site points their scope to a specific target star in the night sky and records the star using the camera system. As the KBO moves in front of the star, observers within the path of the KBO shadow will witness the star light be blocked during the occultation.

The RECON (Research and Education Collaborative Occultation Network) project currently consists of a linked network of over 54 telescope sites stretching from Oroville, Washington to Yuma, Arizona.



Dr. John Keller is a planetary scientist and astronomy educator in the Physics Department at Cal Poly in San Luis Obispo. A former high school and middle school teacher, John is also Co-Director of the Cal Poly Center for Excellence in Science and Mathematics Education (CESAME), which focuses on teacher recruitment, preparation, and retention, and runs STAR – the STEM Teacher and Researcher Program. Dr. Keller also does research work in planetary science and astronomy education as well. He received his Ph.D. in Planetary Science at the University of Arizona in 2006.

Our meetings are at 7pm at the United Methodist Church. We're at the Wesley Building. The address for the UMC is 1515 Fredericks Ave, San Luis Obispo.

We're also going to have a short presentation from one of our members on their current scope work in addition to our main content. Our meetings include time for show-and-tell, telescope setup questions, special introductory content for newcomers, socializing time, and in-depth astronomy content for our more experienced members... in short, something for everyone!

The info you need to attend this free public astronomy event is here:

<http://www.centralcoastastronomy.org/>

Next Star Gazing

Oct 1st & 29th at sunset
(7pm) at the Santa
Margarita KOA

Our Sky Star Parties occur once a month, and are free and open to the public, and also weather-permitting.



If you'd like to join us, park at the bottom of the hill and walk up to the telescopes just before sunset. If you're got a large, bulky telescope, please arrive *before* sunset to set up.

If you arrive after dark (you need headlights to see the road), DO NOT drive toward the telescopes! Park at the bottom of the hill and walk up. We welcome students and supervised children to our events.

Please no smoking or pets, and do not bring white flashlights.

You might want to bring your own set of binoculars, hot cocoa, and a warm coat!



Member's Work

Here's a quick snapshot of events we've done recently that showcase our members in action!

CCAS Member Robin White has been busy with his astrophotography efforts! Here are images using this SkyWatcher 80mm Refractor F5.1 piggybacked on Lx200GPS 10" using a Canon EOS T2i.

Clockwise from the top left: M16, IC 1396, IC 5146, and IC 5070 (Pelican Nebula).



Outreach Events

Here's a quick snapshot of events we've done recently that showcase our members in action!

On August CCAS members met at Judkins School in Pismo Beach for an attempted viewing of Mercury on August 18. Attending were CCAS members Dave Majors, Ron Setina and his wife Carol, Scott McMillan, Joseph Carro and several friends and acquaintances of Scott. The event was fogged out and we got nary a glimpse of the sky that evening- much less Mercury.

So we did the next best thing. We did some archaeoastronomy by exploring Serpent Rock on the Judkins School property. These are a set of rock formations laid down during the last episode of active volcanism along the central coast- roughly 20-25 million years ago. This is the set of eruptions that created the Seven Sisters ranging from a submerged peak out past Morro Bay to Islay Hill in San Luis Obispo.

In addition to these peaks there are numerous rock formations that are made out of tuff- the original volcanic ash that has since hardened into rock. The old sea stack in the middle of Highway 101 in Pismo Beach is best example. All that is left of these volcanoes is the remains of the inner piping and the hardened volcanic ash.



The rocks on the school property are also made of volcanic tuff and were used by the Chumash Indians for religious and astronomical purposes. Located throughout the formation are holes dug out aligned with various local terrain marking Solstice and Equinox points. There are several of these rocks on the school property and those of us willing to brave the ubiquitous poison oak had a good time being given the tour by Norman Hammond- himself having published several papers on Archaeoastronomy along the Central Coast. ~Dave Majors

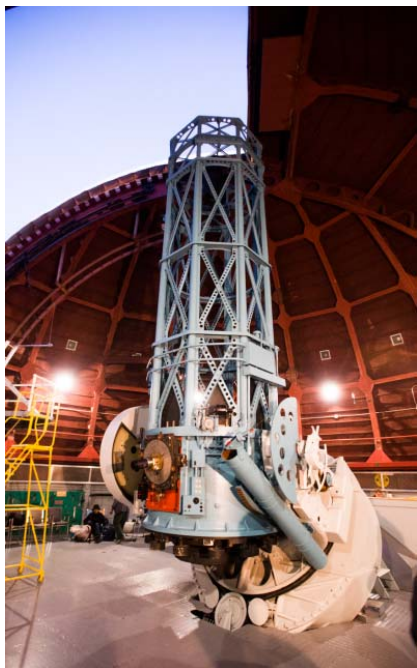


CCAS members attend an outreach located at Los Flores Ranch Park Saturday the 3rd of September. Present were Steve Williams, Glen Smeltzer, Joesph Carro, Scott McMillan and Ron Setina. We had 2 astronomer from

the Vandenberg club, Vince and Craig a snack well.

The astronomer set up telescopes in the hope the overcast skies would clear, but unfortunately this did not happen. Although we could not see any stars, the crowds came anyway. There must have been close to 3 dozen people at the first event starting at 8pm. Even with the clouds obscuring the sky the guests stayed and had many questions. Joseph Carro greeted the guests and began giving a lecture on various topics. Ron put together a slideshow on his Ipad of the Messier objects. Craig, who does astrophotography, presented many of the photos he has taken, and Glen passed handouts to the guests. Steve, Scott and Vince answered questions from the attendees. In all it was a successful event. ~Ron Setina





Astronomy Road Trip!

Visit Mt. Wilson and stay up all night observing with us!

Would you be interested in going on a star gazing trip to Mt Wilson this year? CCAS is planning a trip on Nov 5. The trip cost will be approximately \$150 per person for CCAS members, \$195 for non-members and includes transportation both ways on a hired (and comfortable) bus. We leave around noon on Nov. 5 and return by noon on Nov. 6th.

Space for this trip is limited to 25 people ages 18 and over. If you are interested in attending, please send an email to Aurora at aurora@CentralCoastAstronomy.org right away, as we only have 5 spots left! (Images shown here are from last year's trip!)



CCAS Officers

Feel free to connect with us!



President: Aurora Lipper

Vice President: Tom Frey

Vice President: Joseph Carro

Outreach Coordinator: Dave Majors

Treasurer: Lee Coombs

Celestial Advisor: Kent Wallace

Webmaster: Joe Richards

This Is Your Chance!

Join our officer team and help us provide our club with leadership and new energy from people like you! By working with us 2-4 hours per month, you can help us make a difference to our community and help our club grow and expand.

Email Aurora to request an invitation to our annual officer's meeting!

CCAS Contact 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

PO Box 1415

San Luis Obispo, CA 93405

Website: www.centralcoastastronomy.org

Facebook: www.facebook.com/CentralCoastAstronomicalSociety

Lectures & Star Parties

MONTHLY MEETING & LECTURE

On the fourth Thursday of the month (Jan-May, Aug-Oct), we often have world-renowned professionals and amateurs in astronomy speak about their projects during our monthly meetings. The talks are informal and questions are invited.

Meetings begin at 7:30 p.m. in San Luis Obispo. For location and directions, visit our website: www.sloastro.org

OUTREACH PROGRAM

We offer a limited number of outreach programs where we bring our star party to you. These custom events include a talk about current topics in space science. After the lectures, we make our telescopes available for your group to observe the wonders of the night sky.

STAR-GAZING EVENTS

Join us for a star-gazing evening by observing the dark skies through club members' telescopes. It begins just before sunset on one Saturday each month. The Star Party is hosted in Santa Margarita. (See website www.sloastro.org for dates, times and locations).

Need help operating your telescope? Bring your telescope one hour early for help on how to work your telescope by our friendly astronomers.



Why Join CCAS?

BENEFITS OF MEMBERSHIP

- Subscription to *Celestial Newsletter*, our monthly bulletin of articles and events
- Interaction with world class speakers as they present cutting edge astronomical research
- Discounts on *Sky & Telescope* and *Astronomy* magazines
- Social events, such as our annual Star-B-Que
- Club telescopes – use one of the club's loaner scopes, complete with instructional lessons
- Access to 'Members Only' are of the website containing observing tips, scope tricks, and educational articles for all levels
- Field trips – to observatories and other locations of scientific interest, such as Mt. Wilson Observatory in Pasadena, Chabot, Space and Science Center, Fremont Peak, and the Stanford Linear Accelerator Center (registration fee may be requested)
- Extended observing hours on public nights and private observing sessions exclusively for CCAS members
- Assistance from club members, and other "how-tos" to help you best enjoy amateur astronomy and astrophotography

Questions about membership or other events?
Call Lee Coombs at (805) 466-2788 or visit our website at:

www.sloastro.org

How to Join

MEMBERSHIP APPLICATION

Membership is annual for each upcoming year, beginning when you first sign up. You can sign up online or mail in this form.

Membership Categories (Check one):

- ☐ \$15 Youth/Student
☐ \$15 Seniors
☐ \$20 Individual/Family

Magazine subscriptions Add specified amount to membership fee for a 1-year subscription.

☐ *Sky & Telescope* (+ \$33) only in September
☐ *Astronomy* (+ \$34) only available in September

Information: (PRINT CLEARLY!)

Name(s) _____

Address _____

City _____

State, Zip _____

Home Phone _____

E-Mail _____

Newsletter Subscription:

You can choose E-Mail (recommended) or hard copy delivery for *Celestial Observer*. (check one)

- ☐ E-Mail (full color)
☐ Hard Copy (black & white)

Please make checks payable to **Central Coast Astronomical Society** and mail to **P.O. Box 1415, San Luis Obispo, CA 93405.**