Huachuca Astronomy Club of Southeastern Arizona

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

JUNE 2023

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June's speaker is HAC member Ted Forte. His presentation will recap the OSIRIS REx Asteroid Sample Return Mission and the September 24, 2023 landing of the sample return capsule.

Ted has been a NASA Solar System Ambassador since 2013 and has been part of the OSIRIS REx community engagement team since 2015.

He is HAC's treasurer, ALcor, and outreach coordinator. He is a contributing editor for *Sky & Telescope* Magazine, the director of the Patterson Observatory, coordinator for the Astronomical League's Planetary Nebula Observing Program, a docent for the Planetary Science Institute, the volunteer astronomy programs coordinator for Kartchner Caverns State Park, the "Backyard Astronomer" columnist for the Herald/Review, and the "Astronomer's Corner" columnist for Currents magazine.

Ted's been doing visual astronomy since 1983 and astronomy outreach since 1995. He's been a HAC member since 2012. He has earned the Astronomical League's Master Observer and Master Outreach awards and has completed 32 A.L. observing programs. His Desert Coyote Observatory is home to a 30-inch computer controlled Dobsonian.

WELCOME OUR NEW MEMBERS

Kathleen Lewis and her husband Robert Taylor who are new to our area, and Chris and Ashley Saltzman, all from Sierra Vista, joined the club in May. Welcome, we are glad you joined.

HACASTRO GROUP ON GROUPS.IO

Are you on the group? The HACAstro group is how we keep in touch with members. On the group, you'll find schedule reminders, observing opportunity alerts, club and astronomy news, astrophotos and observing reports and a place where you can ask and answer questions about astronomy, telescopes, observing and space science. The calendar on HACAstro is where we maintain our schedule of events.

To join the group, send an email to main+subscribe@HACAstro.groups.io or contact Ted Forte (tedforte511 at gmail dot com) and he'll send you an invitation that you can click. Once there you can select to receive individual email, digests, special notices or no email. You can post or read messages from your email server or from the home page at https://hacastro.groups.io/g/main

It is a good way to stay informed and be more involved with your club. Don't miss out, join today.

SAVE THE DATE

This year's Dine Under the Stars scholarship fundraiser for the University South Foundation is Saturday, September 23 from 6 to 9 p.m. The foundation is the owner of the Patterson Observatory and has enjoyed a long symbiotic relationship with HAC. The event includes dinner by Mimosa Pizzeria and music by Desert Fever. There will be a silent auction as well as a live auction. Live auction items include a "ride-along" with Sheriff Mark Dannels and a half grass-fed steer from Hangar Ranch. The Emcees for the event are Jeff Davenport and Sheriff Mark Dannels.

The Patterson Observatory will be open during the event which is held in a Marquee Tent adjacent to the observatory. Viewers will be treated to views of a first quarter moon,

Saturn and Jupiter. Adult tickets are $65 and all proceeds go toward providing scholarships to UArizona students attending classes in Cochise County.

We hope that all HAC members will support the event by purchasing a ticket and attending, donating items for the silent auction, or by operating a telescope at the Patterson. Tickets will go on sale 1 August. See https://www.usfaz.org

HAASP Observatory: Kartchner

Planning is proceeding on the proposed observatory at Kartchner caverns State Park. There is the possibility that the State Parks hierarchy might ultimately decide to take over management of the project in which case all of the current plans are moot.

In any case nothing can proceed until the Parks administration signs off on the plans.

If the current plan goes forward with Kartchner personnel building the structure, it will have a 20-foot by 40-foot footprint. The north end will be an enclosed 20 x20 ft room with a flat roof. The south end will be a 20-foot by 20-foot roll off roof structure. The roof will slide back over the north room with no overhang. A sliding glass door will connect the two rooms. The south wall will open like a barn door. To permit access to the horizon.

The structure will be steel, on a 4-inch concrete bed with a continuous 12-inch footing around the circumference. There will be an ADA compliant door or doors. It will have one telescoping pier (donated by David Roemer along with the 14-inch SCT to go on it). The site will have a 60-amp three phase electrical supply. There will be a large (~100-foot diameter) circular arena on the west side for an outdoor science area that will be enclosed with a short wall and bisected east-west by a 10-foot-wide sidewalk with multiple power stations. It is estimated that construction would take three months in a best-case scenario (no competing assignments or admin delays) once all of the approvals are acquired from Phoenix.

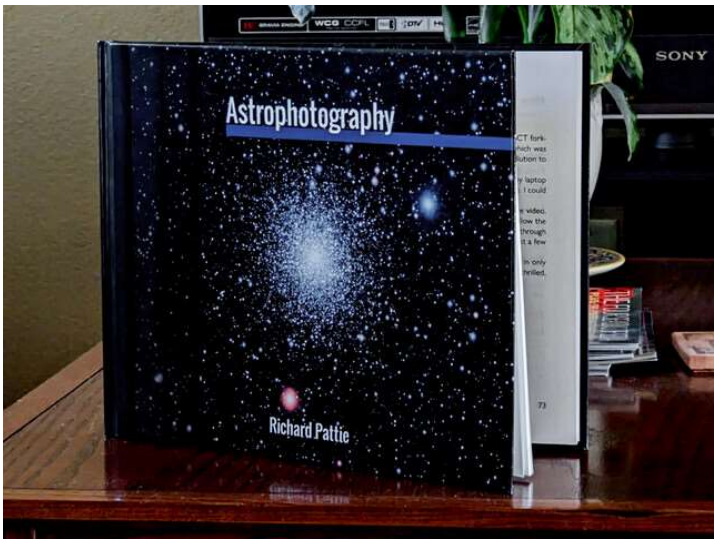
Book of Astro Photos

By Richard Pattie

I have published a book of some of my astro photos. This edition is not for sale, but is just for my personal distribution. I would like to make the book freely available to any of you who might be interested.

I will be bringing a box or two of the books to the June 2nd meeting. If you're unable to make the meeting but would like a book, please email me at exmedia123@gmail.com with your snail-mail address and I'll be happy to send you a copy.

Even though this is a book of astro photos, it is definitely not meant exclusively for astrophotographers. The descriptions and discussions accompanying the images are written in a way to give non-astrophotographers a look into what we do and how we do it.

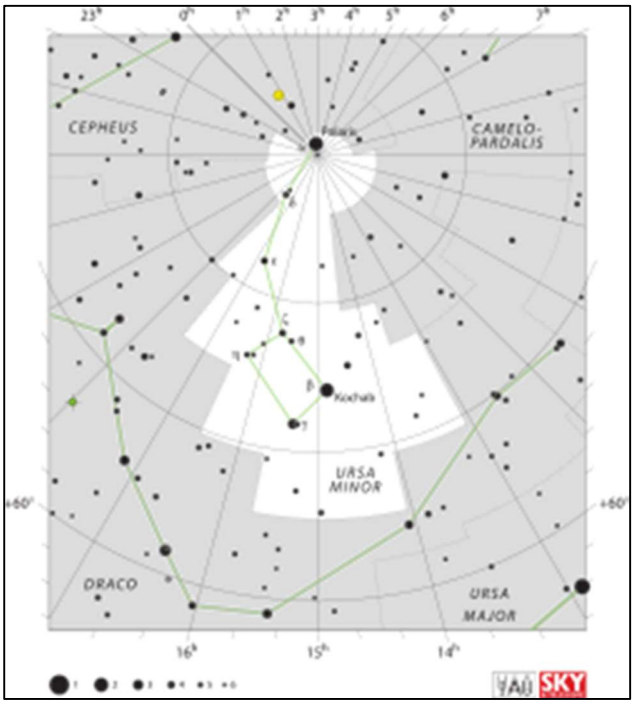


I've put together some of the images in a video accompanied by Aaron Copland's, "Fanfare for the Common Man" at this YouTube link:
https://youtu.be/uTDcGkXKDBA

President's Note

Sticking with the same area of the sky we have been exploring let's look at something we see all the time, to learn something new.

Ursa Minor (Lesser or Little Bear), is a constellation located in the far northern sky. As with the Great Bear, the tail of the Little Bear may also be seen as the handle of a ladle, hence the North American name, "Little Dipper": seven stars with four in its bowl like its partner the Big Dipper. Ursa Minor was one of the constellations listed by the 2nd-century astronomer Ptolemy.



Ursa Minor is bordered by Camelopardalis, Draco, and Cepheus. It covers 256 square degrees, is ranked 56th in size. The star at the end of the dipper handle is Polaris.

Because Ursa Minor consists of seven stars, the Latin word for "north" (i.e., where Polaris points) is septentrio, from septem (seven) and triones (oxen), from seven oxen driving a plough, which the seven stars also resemble. (This name has also been attached to the main stars of Ursa Major.) Planets have been detected orbiting four of the stars in the little Bear, Ursa Minor.

In the Babylonian star catalogues, Ursa Minor was known as the "Wagon of Heaven" also associated with the goddess Damkina. It is listed in the MUL.APIN catalogue, compiled around 1000 BC. Diogenes identified the use of the constellation of Ursa Minor by the Phoenicians for navigation at sea. It was also named Phoinikē. "Phoenician Bear".

The ancient name of the constellation is Cynosura, “dog’s tail". The origin of this name is unclear (Ursa Minor being a "dog's tail" would imply that another constellation nearby is "the dog", but no such constellation is known). Another archaic interpretation of Ursa Major was that of a cow, forming a group with Boötes as herdsman, and Ursa Minor as a dog.

Ursa Minor has traditionally been important for navigation, particularly by mariners, because of Polaris being the north pole star but its position in the far northern celestial hemisphere means that the whole constellation is visible only to observers in the northern hemisphere.

In classical antiquity, the entire constellation was taken to indicate the northern direction. Since the medieval period, it has become convenient to use Alpha Ursae Minoris (or "Polaris") as the North Star. In Inuit astronomy, the three brightest stars—Polaris, Kochab and Pherkad—were known as Nuutuittut “never moving".

Polaris, the brightest star in the constellation, is the brightest Cepheid variable star in the night sky, ranging in apparent magnitude from 1.97 to 2.00 over a period of 3.97 days. Polaris can be found by following a line through the two stars—Alpha and Beta Ursae Majoris, popularly called the Pointers—that form the end of the "bowl" of the Big Dipper, for 30 degrees (three upright fists at arms' length) across the night sky.

Polaris, or Alpha Ursae Minoris, is located around 432 light-years away from Earth and has around 6 times the Sun's mass, 2,500 times its luminosity, and 45 times its radius. Polaris is the brightest Cepheid variable star visible from Earth. It is a triple star system, the supergiant primary star having two yellow-white main-sequence stars that take 42,000 years to complete one orbit.

The four stars constituting the bowl of the Little Dipper are of second, third, fourth, and fifth magnitudes, respectively, and provide an easy guide to determining what magnitude stars are visible, useful for city dwellers or testing one's eyesight.

Ursa Minor is rather devoid of deep-sky objects but it does contain an isolated neutron star, Calvera, the hottest white dwarf yet discovered, with a surface temperature of 200,000 K and the Ursa Minor Dwarf galaxy, a spheroidal galaxy, that was discovered by Albert George Wilson of the Lowell Observatory in the Palomar Sky Survey in 1955 and confirmed by a Hubble Space Telescope survey in 1999. The Ursa Minor Dwarf galaxy had a single burst of star formation that took place around 14 billion years ago and lasted around 2 billion years, which makes the galaxy probably as old as the Milky Way itself.

There is one meteor shower associated with Ursa Minor: the Ursids, a prominent meteor shower which peaks between December 18 and 25.

I hope that over the next few weeks, before the monsoons arrive, you will look way up and appreciate Ursa Minor.

The Bucket List –June 2023

by Vince Sempronio

This column highlights interesting non-seasonal nighttime, and sometimes daytime sky events that the reader may not be aware of and may wish to observer. I’ll cover one-off events that are special, rare or uncommon.

You might notice some changes to the graphics I use to help convey the events that are happening in the night sky. I recently was granted permission to use the graphics generated at the website www.earthsky.org . Please check out their site as they have some good articles related to astronomy.

Term of the Month

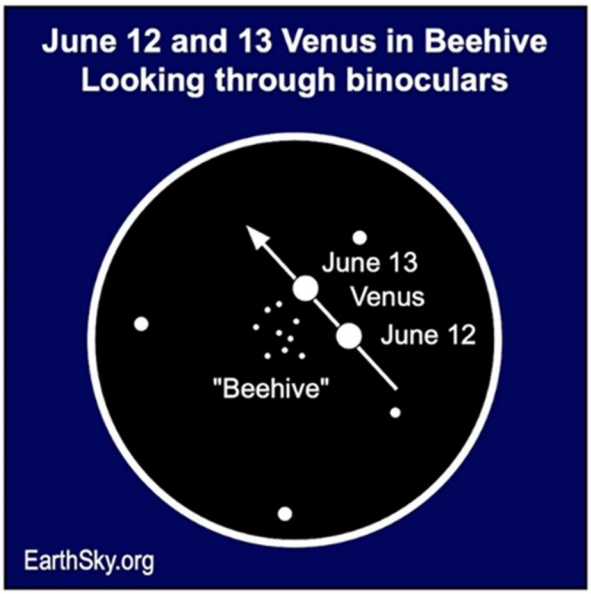
This month we will discuss a term that is well known but is sometimes misused. I speak of Asterisms. The most common misconception is that constellations are asterisms. Asterisms represent a more general concept since constellations are already officially designated, and many Asterisms can span multiple constellations. The easiest way to describe an asterism is a group of stars that aren’t a constellation. By far, the most common mistake people make is the opposite, such as calling the Big Dipper a constellation. The 7 stars of the Big Dipper is probably the most widely known asterism, though it isn’t universally called a dipper. In parts of Europe, it is known as the plough. There are several asterisms that borrow stars from multiple constellations, one of the most famous is the Summer Triangle. This lovely large triangle marks the beginning of summer as it rises after sunset in the East. It is composed of the stars Vega in Lyra, Deneb in Cygnus, and Altair in Aquila. Most asterisms are smaller groups of stars, either parts of constellation, such as the previously mentioned Big Dipper, the Fishhook in Scorpio, or even Orion’s Belt. I recall explaining the concept to a group and was asked by one very smart youngster if “that” (pointing to the Pleiades) was an asterism. I explained that it goes by many names, but if terms like the Seven

Sisters or what I like to call it, “The Measuring Cup” are used, then yes, it can be referred to as an asterism. There are many telescopic asterisms such as Kemble’s Cascade or the Coat Hanger. Search online for lists of asterisms and see how many you can observe.

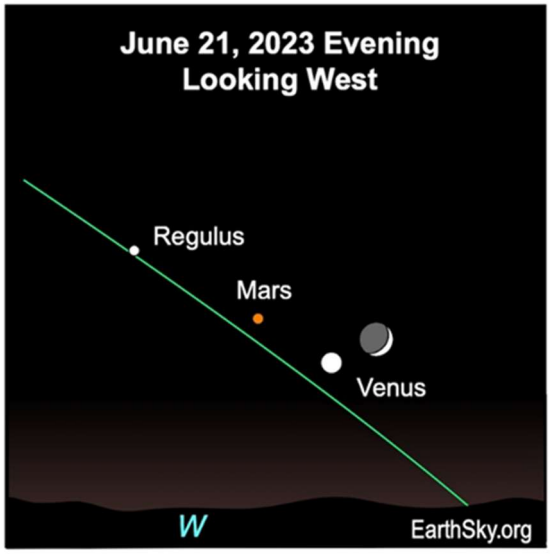
Upcoming Events

June 1st and 2nd, 8:30pm – A planet hides in an open cluster. This evening, Mars attempts to hide in the Beehive Cluster, also known as M44 in the constellation Cancer. The cluster is 610 light years distant while Mars is only 1.67 AUs. The cluster is large, around three times the diameter of the Moon and contains ~1,000 stars. M44 is around 650 million years old. Through a telescope, Mars will appear as the brightest object in the cluster. Here is an eyepiece view of Mars and M67 on June 2nd.

On the nights of June 12th and the 13th, Venus gets its turn to pose with the M67 open cluster. Just turn your scopes on Venus after twilight ends and enjoy the brightest planet surrounded by its adoring stellar fans!



On the evening of the solstice, June 21st at 8:30pm – A gathering of the planets Venus, Mars, the star Regulus, and the Moon are in the western sky after sunset. The crescent moon always looks nicer when it has company.



Trivia Question

Above, we described what asterisms are, but there are also asterisms in asterisms. Name the well-known asterism that is part of the Big Dipper.

NASA Night Sky Notes June 2023

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Look Up in the Sky - It’s a Bird

Theresa Summer

Bird constellations abound in the night sky, including Cygnus, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there’s so much to see and even some things that can’t be seen. To locate Cygnus, start with the brightest star, Deneb, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. “Deneb" is an Arabic word meaning the tail. Then travel into the triangle until you see the star Albireo,

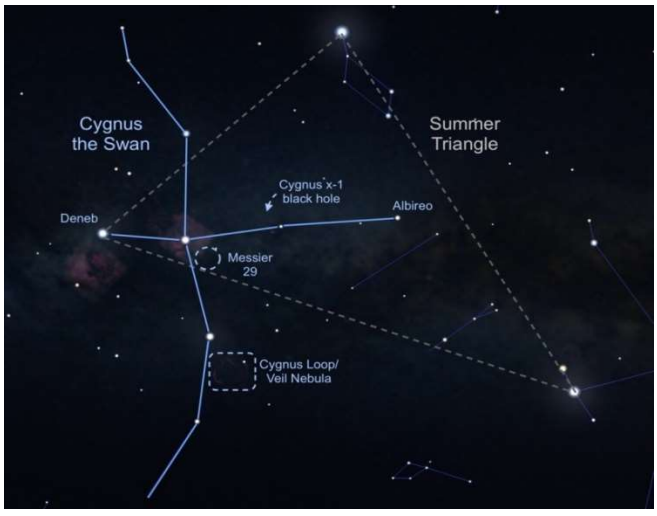
sometimes called the “beak star” in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan’s wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the Milky Way. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated Messier 29, found just south of the swan’s torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let’s go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There’s another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the Veil Nebula, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan’s eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can’t see with our eyes or backyard telescopes, but that is detectable by NASA‘s Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star’s life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA’s latest methods for studying black holes at www.nasa.gov/black-holes.



Look up after sunset during summer months to find Cygnus! Along the swan’s neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org

(Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)

While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist’s conception of the black hole pulling material from its massive blue companion star.

Outreach at Stevenson Elementary

By Ted Forte

Even though clouds prevented any stargazing, Thomas, Penny, Vince and I managed to have a successful evening of it. While Penny managed a constellation building activity (marshmallows and spaghetti) and I oversaw the constellation word search activity, Thomas and Vince displayed telescopes focused on hanging posters and an artificial star generator that Vince brought.

We think we had about 180 mothers and sons (the theme of the event) to interact with and the PTSA made a very generous donation to the club in appreciation, so all in all a rather fruitful event.

This is the first time (to my knowledge) that the club has participated at this Douglas school. I assume we'll be back, and next time maybe we'll get to use the scopes on the sky.

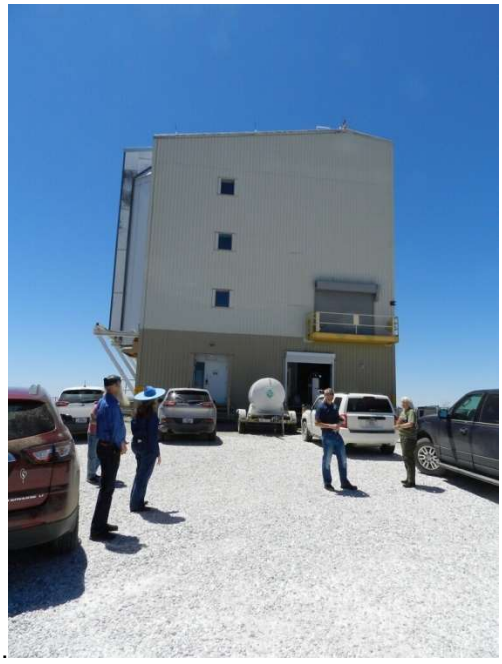
While we're on the subject of outreach - congratulations to Richard Lighthill and Jim Reese for completing the requirements of the A.L. Outreach Award and to Vince Sempronio who has logged enough events for the Master Outreach level. There are many more HAC members that are eligible for these outreach awards, and whether they submit their logs for recognition or not, HAC can be proud of its dedicated outreach volunteers! I know I am.

Trip to the MMT

By Vince Sempronio

The visit to the Whipple Obs was a long drive, a long day, but well worth it.

Dr. Grant Williams was a great host and I can probably speak for all who attended in saying thanks to him for giving up his day to provide us with a enjoyable tour of the facilities



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The MMT is a marvel of engineering. They originally packed a huge scope into a cube, then made the scope bigger and resized the cube to accommodate it. The mirror is 6.5m across, that is over 20ft!

Getting a private tour has its perks; we were able to see the azimuth base of the telescope drive. A couple of humans provide the scale (LOL).

For those of you who didn't know, the entire building surrounding the MMT moves when the scope moves. The building is not big enough to rotate around the scope, so they have to dance together to insure the scope doesn't bump into

the walls of the building. What could possibly go wrong!! Dr. Grant did state that they have touched, but without damage.

All in all, a great day at 8000ft.

For Sale

Celestron CPC 800 with tripod and level, SkyAlign technology, Schmidt Cassegrain FL 2000 F10 lens, star diagonal 1.25 right angle viewfinder. Starlight laser scope for alignment (from StarArizona), remote hand control/readout for auto tracking. Scope still with box. Works well. Asking $1000.

Contact Jim Reese 520-226-7754.

Pictures from HAC Astro

Supernova 2023ixf in M101 (Before and After) by Richard Lighthill

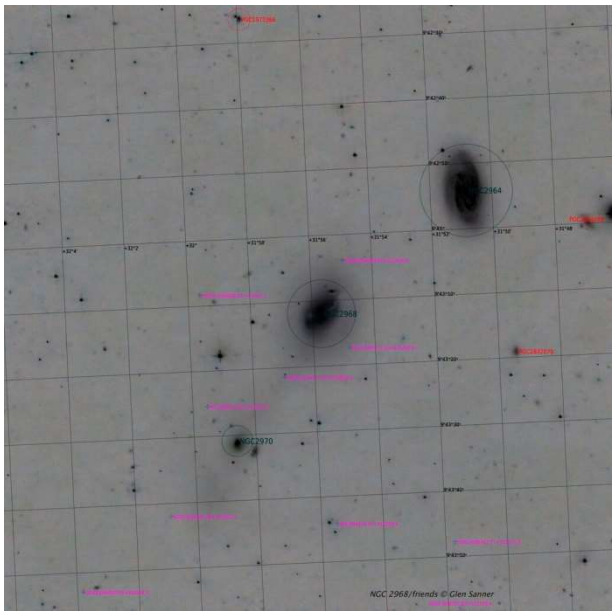
Supernova 2023ixf in M101 by JD Maddy

Supernova 2023ixf in M101 by Craig Anderson

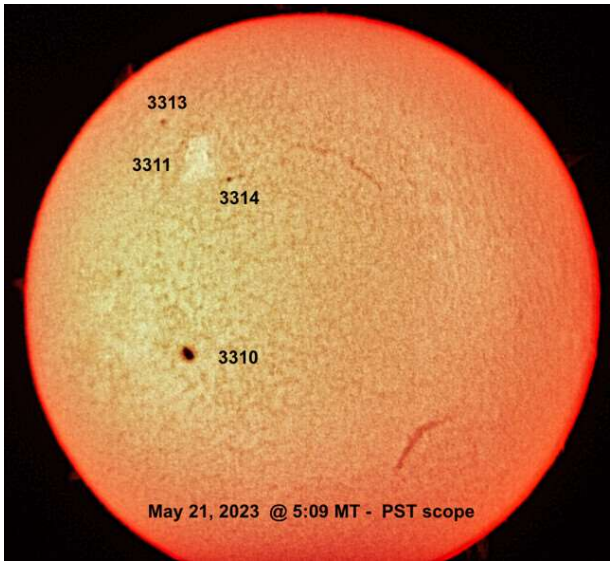
M20 Trifid Nebula by Leonard Amburgey

NGC 3938 by Glen Sanner

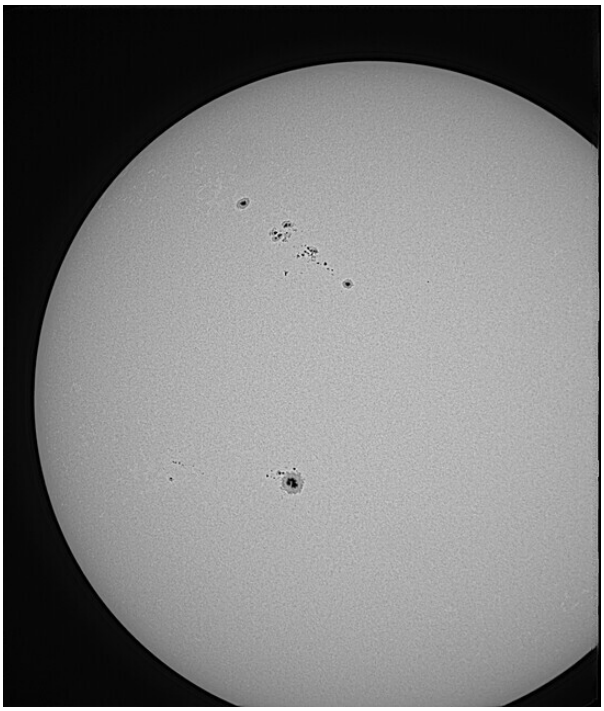
NCG 2968, 2964 and 2970 by Glen Sanner



NCG 2968, 2964 and 2970 inverted by Glen Sanner



Sun in H-Alpha by Richard Lighthill



Sunspots by Richard Lighthill

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Facebook: http://www.facebook.com/HuachucaAstronomyClub

Email: info@hacastronomy.org

HAC Jun Jul 2023 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
28	29 	30 Venus /Pollux 4°	31	1 June	2 HAC Meeting Room A102 7PM	3 8:42PM
4	5	6	7	8	9 Saturn/Moon 3°	10 12:31PM Solar Saturday 9-11 AM Patterson
11	12	13	14  Jupiter/Moon1.5°	15	16 Mercury/moon 4°	17 9:37PM
18 	19	20	21 **Summer Solstice 7:58 AM**	22 Patterson Public Night 8:00 PM	23	24
25	26 12:50AM	27	28	29	30	1 Jul
2	3 4:39AM	4 	5	6 Saturn/Moon 3°	7 HAC Meeting Room A102 7PM Venus at greatest brillancy	8 Neptune/Moon 1.7°
9 6:48PM	10 Mars/Regulus 0.7°	11 Jupiter Moon 2°	12 Uranus Moon 2°	13	14	15
16	17 11:32AM	18	19	20	21 Pluto opposition	22
23	24	25 3:07PM	26	27	28	

All times local MST
Join HacAstro to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: HACAstro+subscribe@groups.io