NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

DECEMBER 2022

DEC 2022 PRESIDENT'S NOTE

I hope you are enjoying the longer nights as we move into December, and are out enjoying the clearer skies going ooh and aah as we look thru telescopes or image new sights. The challenge of dodging clouds has almost disappeared, with longer time between dusk and dawn.

December contains the winter solstice, the longest night of the year. It was once celebrated as "Yule" by Northern Europeans and marked by feasting. The Romans celebrated a week of Saturnalia and the day of Sol Invictus with games, merriment and giving of gifts. All over the world, in every culture, the winter solstice was immensely important.

The term "midwinter" is synonymous with the winter solstice. The midwinter festival was the last feast celebration, before deep winter began. Many cattle and other livestock were slaughtered so they would not have to be fed during the winter, it was almost the only time of year when a plentiful supply of fresh meat was available. The majority of wine and beer made during the year was finally fermented and ready for drinking at this time.

The winter solstice has clearly been important historically. Perhaps in a few hundred years, human settlers will be celebrating winter solstice on Mars. Mars has seasons like earth does. Mars also experiences a precession of the equinoxes, but the precession period is less stable than Earth's. This means that any future Mars colonists who wish to recreate the winter solstice "festivities" would have to get used to celebrating in different Martian seasons.

In the meantime, I wish you and yours a joyous, healthy Winter Solstice with great feasting and merriment.

HAC 2023 Election Results

President: Penny Brondum
Vice Pres. Karen Mates
Secretary: Katherine Zellerbach
Treasurer: Ted Forte
Past President: David Roemer

Board Members-at-large
Richard Lighthill
Vince Sempronio
Mark Orvek
Gary Grue.

HAC Special Assignments: Outreach Coordinator: Ted Forte, Nightfall Editor: Cynthia Shomenta; Webmaster: Ken Kirchner; Facebook Editor: Richard Lighthill and Member Star Party Coordinator: Gary Grue.

HAC Representatives on University South Foundation Board of Directors: Ted Forte, Penny Brondum, and Jim Reese.

Welcome our new members

Michel Perron of Benson and his daughter Cadic joined at the November meeting and Greg and Lucy Schultz of Sierra

Vista joined on-line in November. Welcome, we are glad you joined.

2023 HAC Dues

Thank you to all of you that have paid your dues early. For almost everyone else, your HAC membership expires in December. If you joined the club this year, your first renewal will be due on the anniversary of your joining. At that time, you will be asked to pay a prorated amount to adjust your membership expiration to December.

Annual dues are $35 family, $25 Regular (Active duty military pay $25 and $20). Students with valid ID pay $10

If you are unclear about your membership status, contact the treasurer, Ted Forte.

HAC dues payment options

1. You can pay your dues in person by cash or check made out to Huachuca Astronomy Club. See the treasurer, Ted Forte, at a meeting or event.
2. You can mail your dues check to the Huachuca Astronomy Club PO Box 922, Sierra Vista AZ 85636
3. You can pay online by visiting www.hacastronomy .org and pulling down the membership menu. You'll be directed to Pay Pal where you can use your Pay Pal account OR your credit card.
4. If you have a Pay Pal account, you can use PayPal Direct to send your payment to paypal@hacastronomy.org
5. If you have a Zelle account with your bank, you can make a dues payment by transferring funds to twforte@powerc.net

Outreach and the Patterson Observatory

Why not make 2023 the year you get involved with outreach? HAC has an active outreach program that involves events at the Patterson Observatory, Kartchner Caverns State Park, Veterans Memorial Park, the Sierra Vista Library, and area schools and churches. We have two recurring events at the Patterson Observatory – Public Night which is usually held the Thursday closest to first quarter moon and starts a half hour after sunset and Solar Saturday held the second Saturday each month from 9 to 11 a.m. and, we generally get three or more requests for special events such as school field trips.

You don't need to be an expert and you don't even need to bring a telescope – all that is required is to bring your enthusiasm.

The Patterson Observatory, located on the campus of the University of Arizona at 1140 N Columbo Avenue, is owned by the University South Foundation and is made available to HAC free of charge in return for our 'sweat equity' in maintaining and operating the facility. If you would like to get more involved in the Patterson, please let Ted Forte know.

NOTICE: There are upcoming opportunities for HAC members to get involved in doing some valuable science at Patterson. Volunteers will need to undergo training in the procedures for operating the scope remotely and collecting data and will be expected to have considerable time to devote to the project. The effort will be managed by Tom Kaye. If you are interested, please contact Ted.

Astronomical League News

The Astronomical League has asked their member societies to approve a number of changes to the league's By-Laws.
The AL Bylaws Committee under the direction and with the input of the AL Council, has completed a major and much-needed overhaul of the League's badly flawed and outdated 2007 Bylaws.
Council has reviewed these Revised Bylaws in multiple meetings over the last year, including the Council meeting in Albuquerque, and has voted unanimously to recommend these Revised Bylaws to the full AL member body.
The HAC board of directors, both incoming and outgoing, have been reviewing the changes and we will likely cast our single (weighted) vote to approve them in total.
HAC is a member society of the league; therefore, all HAC members are also league members. Among the benefits derived from membership is the Reflector Magazine that you receive quarterly https://www.astroleague.org/reflector . You are also eligible for observing awards (see: https://www.astroleague.org/al/obsclubs/AlphabeticObservingClubs.html),a discounted book service (see https://www.astroleague.org/al/bookserv/bookserv.html) and discounts from several vendors (see https://www.astroleague.org/celestial-savings). A major benefit that the club as a society enjoys is access to liability insurance that is tailored to astronomy clubs and provided at an affordable price.

Your Astronomical League dues are part of your HAC dues and are paid by the club annually.

Sports Lighting By Karen Madtes

They're making progress on readying the field (Howard Field?) by Veteran's Park just East of the Skate Park. I've attached some photos I took yesterday of the lights on the poles awaiting infrastructure. The poles look to be about 70' long. I included pix of the support/base and the photo with no lights in it is to help visualize the location. The building in the left background is Lowes and the greenish buildings on the right next to the dirt piles are school district properties. I was driving by at night this past week and the lights on the skate park were on. It was very encouraging to see that they seem to be well directed with minimal glare/overspill. The new lights are supposed to be the same as the skate park lights. SOOO thankful for those who gave input in the right place at the right time to protect our uncommon skies!!

Pie & Sky by Amie Esteves

I wanted to reach out because we at the Bisbee Science Lab have restarted our Pie & Sky astronomy nights, which have been taking place on the first Thursday of each month, 6:00 - 8:00 pm. Our wonderful volunteer astronomers, Tom and Winston, set out telescopes in the backyard and help direct people to different celestial bodies, we offer free pizza, astronomy games, and virtual reality experiences!

We have a special Pie & Sky coming up on Thursday, December 1st, 6:00-8:00 which will feature virtual reality footage of a bat emergence, a live bat, and plenty of fun activities. I wanted to reach out to see if anyone from your club would be interested in joining us for not only this upcoming Pie & Sky, but subsequent ones as well. We've been very successful with these events, and saw over 100 participants at our first Pie & Sky back in October. We're at the point where we could use more astronomers manning telescopes if you're interested! We have about 5 telescopes here at the lab, and unfortunately Tom and Winston cannot be in so many places at once (although we would clone them if we could). We would love to have someone from your club present if anyone is open and interested!

Twas the night before T'day

BY VINCE SEMPRONIO

Twas the night before T'day
And all through the sky
the stars were a'twinkle
good seeing a lie
my attempts to split doubles
was mostly in vain
the seeing was nasty
oh, what a pain.

I took my friend from L.A. out again, this time we went east of town near the shooting range (and the cows) and the sky was nice and clear.

The sky was transparent but the seeing was terrible. I couldn't split the double-double with my C8 and could only occasionally see each of the pairs as elongated blobs. The air was very busy, looking like boiling water. It was just a reminder that just because we are at 4000ft+ elevation, in a dry desert, with pretty dark skies....the seeing isn't always that good. I have split the D/D with a C5 easily in the past.

Transparency was excellent though. Using this scale from the Astro League...

Transparency: How clear is the sky?

Transparency is a measure of what you can see in the nighttime sky in spite of dust, smoke, haze, humidity, or light pollution. An easy way to measure this is to use the magnitude of the faintest star you can see. Ideally, this would be looking straight up at zenith. But, to make life simpler, you can use the Little Dipper (Ursa Minor) if you can see it. Here is the scale.

- 1 - If you can't see Polaris.
- 2 - If you can only see Polaris.
- 3 - If you can see the two stars on the end of the bowl of the Little Dipper (Kochab and Pherkad).
- 4 - If you can see any of the stars in the handle of the Little Dipper.
- 5 - If you can see 6 of the 7 stars in the Little Dipper.
- 6 - If you can see all 7 stars in the Little Dipper.
- 7 - If you can see stars near the Little Dipper that are not part of the stick figure. (I envy your young eyes...)

Transparency was 5.

Seeing, using this scale was 4ish.

But I get ahead of myself....

anyways, we got there at sunset so we could have enough light to set up. I had my CPC800 and my friend his C6 and 25x70 binos. He also took some wide angle milky way photos (I haven't seen the results of those yet). My friend was ripping though the Celestron Tour objects while I was mostly testing remote control features by connecting my laptop to the scope. That technology kind of/sort of works, it definitely isn't reliable as the wifi connection disconnects now and then and it doesn't seem to want to recover requiring a complete restart and loss of alignment.

It was the first time my friend saw Uranus and Neptune, and although dots, they can now be checked off his bucket list!

But I did look at some objects. M31 was nice, I was able to see a lot more detail than we can see from Patterson. We tried M1 which was close to the horizon and it was invisible in the C6 and only slightly visible in my C8.

My "seeing" test object is NGC 188 (Caldwell 1), a very dim open cluster near Polaris. Since it is always in the same area of the sky, it provides a consistent test object. it is about 1/2 the size of the full moon and most of its star members are dimmer than 10th magnitude. I usually judge the sky by how many of the stars I can resolve. It is also a good test object for my science camera for the same reasons since most of the occultation stars are from 10th to 13th magnitude.

https://en.wikipedia.org/wiki/NGC_188

I looked at a few other Caldwell objects. For you Celestron (maybe Meade too) hand controller users, the catalog is available on the "Deep Sky" menu. A couple of club member favorites are on the Caldwell list (all Caldwell objects are NOT in the Messier catalog). Caldwell 14 is the Double Cluster in Perseus, and #13 is Karen's favorite, NGC 457, the Owl Nebula. Another favorite, the Helix Nebula is C63. The catalog is ordered from most northerly to the south, so only the first 80 are visible from our latitudes. There are many deeper magnitude objects so the list in general is more challenging, but has some surprises (I'll save those for another thread). It is nice to have dark enough skies to see some of the dimmer galaxies.

We didn't stay out long enough to see Orion, the 40F temps got to use after a few hours so we packed it up.

We were out Tuesday night as well (see Karen's thread) and there were a number of sporadic meteors, but I didn't see any on Wednesday.

Oh, what a difference location makes. Tuesday's location was just north of Kartchner to the east a 1/2 mile down a bad dirt road on public trust land (I have a permit). Bortle 2.6 like Kartchner, but being further north and east, the light dome from Tucson is more apparent. The lights from Sierra Vista to the south were apparent, mostly from the airport but we were at a slightly lower elevation, so not that bad. Wednesday's site was from the road going to the shooting range. The lights from SV are easily seen (we were at higher elevation) to the west, strung out from Hereford to the airport, but since we started observing in twilight, we didn't really point our scopes that way anyway. The Tucson dome was barely visible. That site is Bortle 2.6 as well. I forgot to bring my SQM meter both nights which would provide a better measurement of how dark it really is.

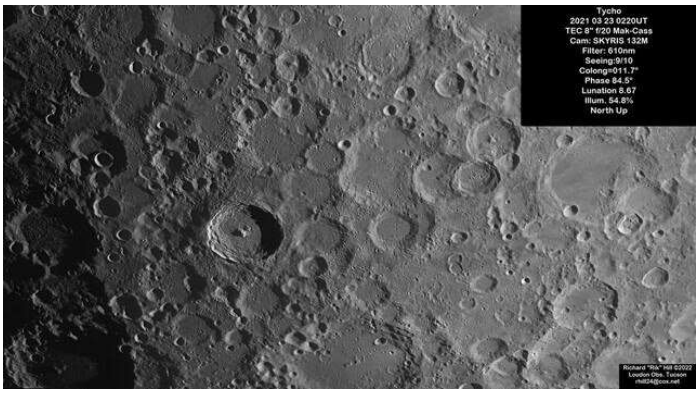
Brahe's Greatest Hit by Rik Hill

At the focus of the bright rays that encircle the whole Moon is the young (< 1 billion years old) crater Tycho (88km dia.) named after the famed astronomer Tycho Brahe seen here just left of center in this image. Prominent in the southern highlands it is a feature most lunar observers learn about early on. You don't see the rays here because the Sun is just rising on this moonscape while the rays are best seen with high sun, especially at full Moon. But here we can enjoy oft missed features of topography. First notice the region surrounding Tycho about width of the crater diameter where many of the features look soft, almost out of focus. This is from the material that was ejected from the crater during impact. Other material, of larger size, formed secondary craters like the cluster seen just above Tycho. There are more such small fresh craters to the right of the Tycho as well.

The flat-bottomed crater just right of center is Saussure (56km) and between it and Tycho is Pictet (65km). Notice how the left half of Pictet is softened by ejecta while the right half is much better defined. Above and further right from Saussure are two overlapped craters Nasireddin (54km) the lower one and Miller (77km) the upper. The very large flat floored crater to the right of them is Stofler (129km). Here is a place where you can see a bit of the rays from Tycho splayed out on the floor of Stofler. Once you see them here you can trace them back and see more south of Nasireddin.

The large crater south of Tycho is Maginus (168km) with its unusual central peak and on its northern wall is Proctor (54km). On the left side of Tycho, on the edge of this image is Wilhelm (111km) and below it Is Longomontanus (150km). Just north of Tycho is the landing site for Surveyor 7, the last in that spectacular series of lunar landers. It began operations on the moon on Jan. 10, 1968 and ended on Feb. 21 from battery failure having sent back over 21,000 images. Before we leave Tycho, one more treat. Notice the trail of secondary craters from the northwest wall of Tycho stretching over two crater diameters farther to the northwest. I have not seen this catena at high sun but it is fairly easy to find at a low sun angle like this image.

While this image has very good resolution, around 1-1.5km, I still did not find the obelisk!



This montage was made from 2 1800 frame AVIs stacked with AVIStack2 (IDL) stitched together with Microsoft ICE and finally processed with GIMP and IrfanView.

Gambart by Rik Hill

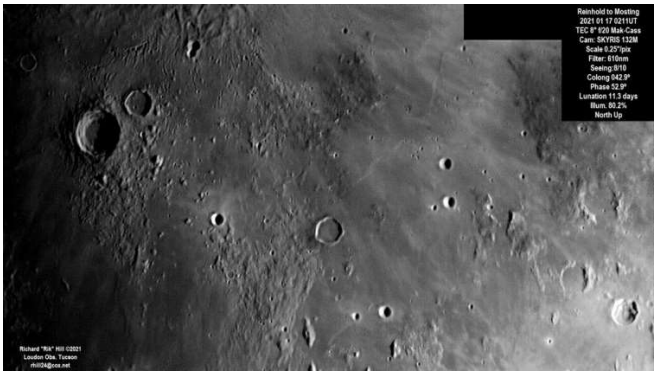
This overlooked region is southeast of the great crater Copernicus. On the left side of the image is the beautifully terraced crater Reinhold (diam. 49km). Just above and right of Reinhold is the ring crater Reinhold (24km) and further on the smaller twin craters Fauth (12km) and below it Fauth A (8km). Normally I wouldn't bother with craters of this size but these two figured prominently in the foreground of the famous New York Times "Picture of the Century" on Nov.24, 1966. A restored copy of that Lunar Orbiter 2 image can be seen at donaldedavis.com/2004%20new/COPERNho.gif.

I looked these craters up right away in 1966 when I first saw the Orbiter image.

Dead center in this image is another very old ghost or ring crater Gambart (26km) of Pre-Imbrian age (3.85-4.55 billion years old) flooded with ejecta from the many large nearby impacts. Then on the right edge of this image is the crater Mosting (27km) with Sommering (29km) the ghost crater just to the left of it the same age as Gambart as the flooding might indicate. Above these two is the ruined crater Schroter (35km) Between and above a line between Sommering and Gambart and are two vertically aligned relatively recent craters of similar size. The uppper is Gambart C (12km) and below it is Gambart B (11.5km). Between them and just to the left you can just make out 2 of the Domes Gambart, the left one sporting a nice central pit. Another dome can be seen south of Gambart itself by first spotting the small clear crater, Gambart N (5 km) well seen in this image. Below and to the left is a slightly brighter portion of the mare and you may see the small pit there in the center of the bright region in its own dark patch. This is Gambart 1. Look and the curious mountain further south and left. It has a crater in its summit but it is not volcanic. There are a number of such features on the Moon.

Before leaving this region, be sure to enjoy the hummocky terrain to the southeast of Reinhold. Then above Reinhold you can see a lot of the ejecta and secondary cratering from Copernicus. This is very interesting when on the terminator.

This is an image from a single 1800 frame AVI stacked with AVIStack2 (IDL) and further processed with GIMP and IrfanView.



NASA Night Sky Notes December 2022

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!

Binoculars: A Great First Telescope

David Prosper

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

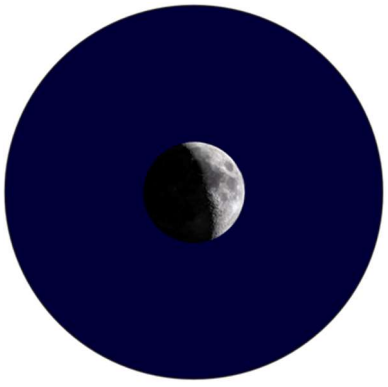
Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at bit.ly/nsnclubsandevents, and inspire your binocular stargazing sessions with NASA's latest discoveries at nasa.gov.

The two most popular types of binocular designs are shown here: roof-prism binoculars (left) and porro-prism binoculars (right). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.

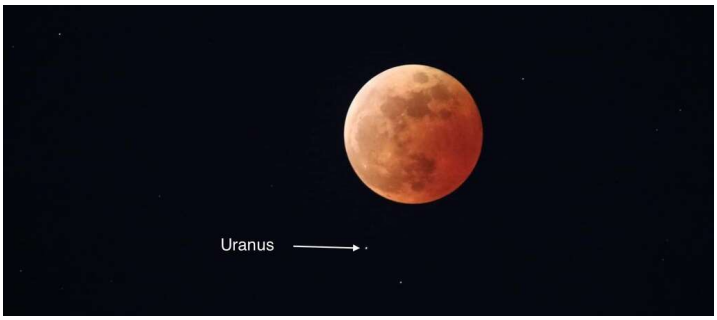


A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The "Can You See the Flag On the Moon?" handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. Moon image courtesy Jay Tanner

Pictures from HAC Astro

Total Lunar Eclipse by Ted Forte

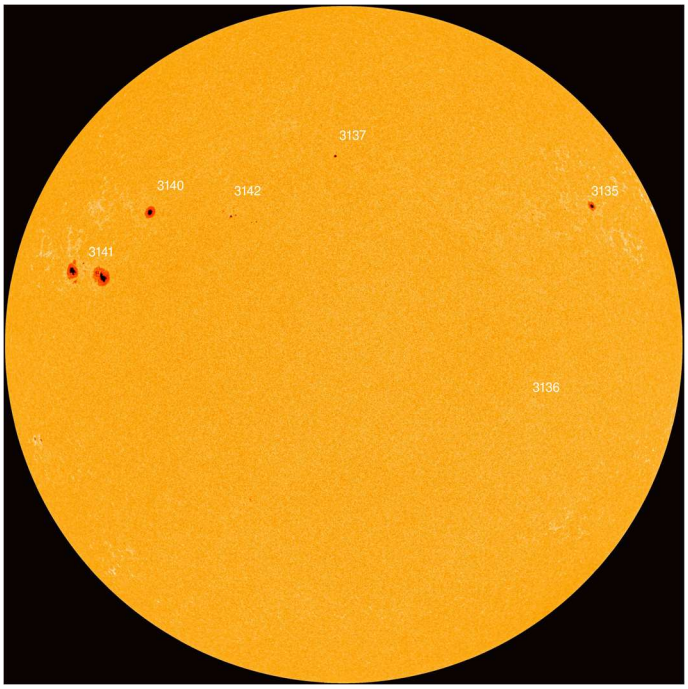
Eclipse and Uranus by Shawn Sanner (Glen's son)



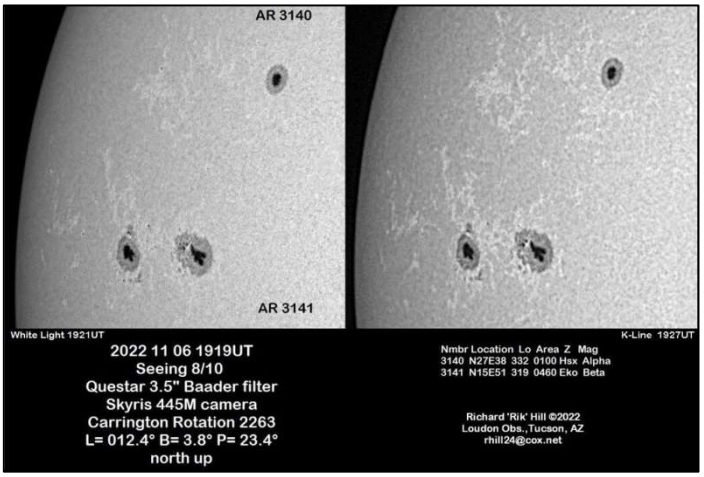
Eclipse by JD Maddy

Eclipse by Rik Hill

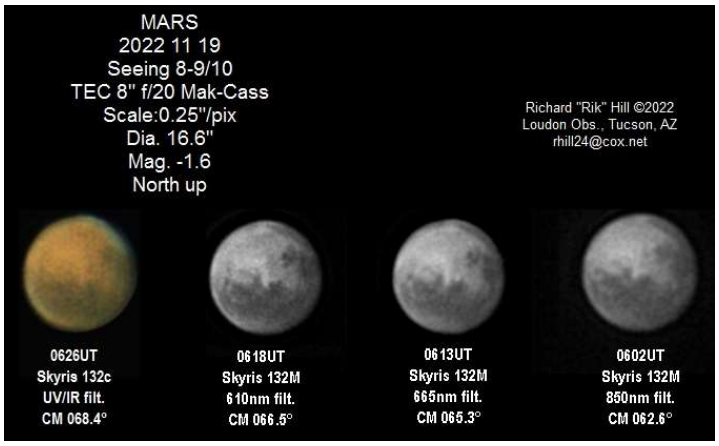
Sunspots by Vince Sempronio



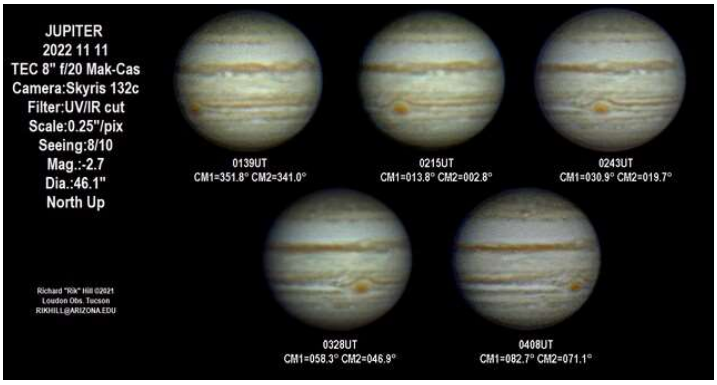
Sunspots by Rik Hill



Mars by Rik Hill



Jupiter by Rik Hill



M33 by Leonard Amburgey

NGC 891 by Leonard Amburgey

M45 by Leonard Amburgey

For Sale

For Sale - Orion 09007 Space Probe 130ST EQ and books. Lightly used. If interested contact Ruth Ranch at ruthandarlie@cox.net and make an offer.

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Farpoint Astronomy http://www.farpointastro.com/

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HAC Dec '22 / Jan '23 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
27	28	29 Concious Child Pre-school Family Night at Patterson 6PM	30 7:36 AM	1 DEC Patterson Public Night 6PM Jupiter 3 d N of Moon	2 Home School Group at Patterson 9am-11am	3
4	5	6	7 9:08 PM Mars at Opposition Occultation	8	9 **HAC Holiday Party @ The Brondum's**	10 Solar Saturday 9-11 AM Patterson
11	12	13 Cocoa with Santa 6PM Geminid meteors	14 Geminid meteors	15	16 1:56 AM	17
18	19	20	21 Winer Solstice 2:48PM	22	23 3:17 AM	24
25 	26	27	28	29 6:20 PM Patterson Public Night 6PM	30	31 
1 Jan 2023 **HAPPY NEW YEAR**	2	3 Mars/Moon .5°	4 Quadrantid Meteors	5	6 4:08 PM **HAC Meeting**	7
8 Pallas Opposition	9	10	11	12	13	14 7:10 PM Solar Saturday 9-11AM Patterson
15	16 	17	18	19	20	21 1:53 PM
22 Venus/Saturn 0.4° Conjunction	23 Saturn/Moon/ Venus Conj.	24	25 Jupiter/Moon 1.8°	26 Patterson Public Night 6:30 PM	27	

All times local MST
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