NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

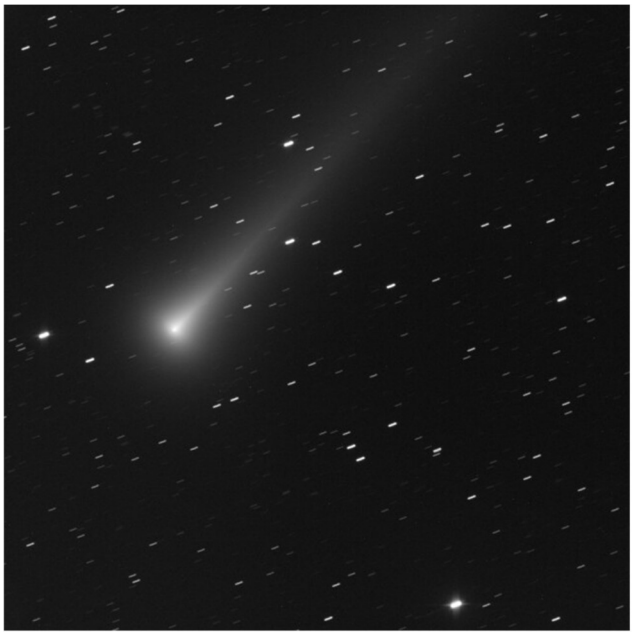
DECEMBER 2021

PRESIDENT'S NOTES

Happy holidays HACers!

I'm writing this too early to know whether comet 2021 A1 Leonard will be bright enough to be easily seen, but there are other objects to occupy our mornings and nights if it does fail to impress. Still, to be ready for action, I'll split this month into two separate viewing plans.

A CHRISTMAS COMET?



Source: Craig Anderson. December 3, 2021, RISS-Remote

The first third of the month (December 1-10) we will be active from let's say 4:00am 'til sunrise to monitor the comet as it continues inward towards the sun. After the tenth we will take some time (December 11-13) to transition over to viewing from sundown to midevening, so we are ready for the comet as it makes its reappearance. This comet isn't getting that close to the sun so I'm pretty sure (not 100%, of course) that it will make it around intact. It is, after all, warmer, moving faster and experiencing more centrifugal force than it has ever been through as it as it races around the sun.

I don't know how many of you make a habit of getting up in the wee-small hours of the morning, but it is usually a fine time to observe. By 2-3 a.m., city and neighbor lights are at a minimum, and all the tubes, mirrors, and other components of, and attached to, the telescope have reached equilibrium with the night's temperature. If you are just visiting this time of the day for the comet you can sleep another couple of hours and start observing around 4 a.m.

So, during the first third of the month, the comet is still coming in and getting brighter each morning. On the morning of the November 30, I was able to see the comet in 9x63 binoculars. I was not sure that I saw it in smaller binoculars (nor with my naked eyes). Ted Forte thought he may have seen it naked-eye and with a range of binoculars. Ted observes from a slightly more rural place than I so the difference in sky contrast is enough to make the difference between maybe and yep.

Speaking of binoculars, they may well be instrumental in finding this comet. At its predicted best, it will -- only just -- be naked eye. It is hard to beat a good 8x50 or 9x63 pair of binoculars.

[I should explain the notation I use. Let's use the pair of 8x50s for this example. The first number is the magnifying power of the binocular, and the second number is the diameter of the objective lens (the lens closest to the "object" or subject). So, a pair of 8x50 binoculars are really two 8-power telescopes, each with a 50-millimeter (2") objective lens.

There are other objects in the morning sky worthy of viewing. Here are three near the orbit of comet Leonard that will keep you close to the action. Messier 3 (M3), a globular star cluster in Canes Venatici (that's Latin for Latin for hunting dogs) at RA 13h 42.2m Dec. +28° 23', it's one of the brightest globular clusters seen from the northern hemisphere, at just about mag 6. So, quite bright. You can see it in small telescopes and even binoculars. This object is also good practice for finding the comet as they are similar size and brightness. M3 is quite concentrated at its core, with a wide range of star brightness. It is a showpiece. On the morning of December 3, the comet passed very close by M3.

Comet 2021 A1 Leonard Passing M3 on December 3, 2021

Source: David R 12-03-2021

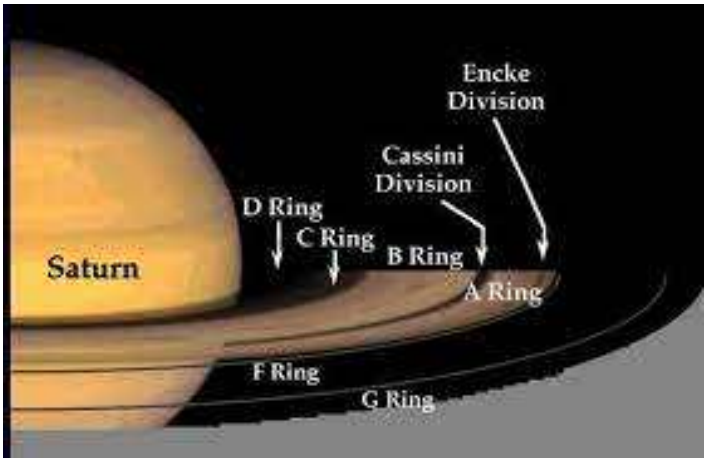
Farther south and a bit to the west of M3 floats the galaxy M64, also known as The Black Eye Galaxy, the Sleeping Beauty Galaxy, or Evil Eye Galaxy, and officially designated Messier 64, M64, or NGC 4826. Its coordinates are RA 12h 56m 44s Dec +21° 40′ 58″, that's in Coma Berenices. This galaxy is bright enough and large enough to be seen well in 8" telescopes, with larger scopes showing more contrast to the dark dust lane that gives it its distinguishing appearance. This is another showpiece object, especially seen from dark skies.

Farther south and back to the east but still in Coma Berenices are another couple of globular star clusters. Messier 53 (NGC 5024) and the smaller and dimmer New General Catalogue (NGC) 5053. The two are less than a degree apart, about the same distance from us, and there is said to be a tidal bridge between them (indicating there has been an interaction or altercation). M53 seems to have gotten the better of the outcomes as it looks intact, while NGC 5053 doesn't look as symmetrical as globular clusters usually appear.

All too soon we need to shift gears and time frames to the evening, as comet Leonard whips around the sun and we get a glimpse of it sometime around December 12-14. The first signs of the comet's return will be in bright skies just after sundown, so, while you're searching, do a little planet-hunting in the same area of sky. Luckily, we have a good line-up. Closest to the western horizon is Venus. You should see it as a slight crescent; it is now rushing towards an inferior conjunction in January 2022. If you have a violet filter, try it out on Venus to see whether it brings out features in the planet's cloud tops.

To the east, and much dimmer, Saturn sits with its rings tilted at about 20 degrees as we see them from Earth. The sky at sunset can be a little unsettled, making planet viewing less than optimal. Still, if the sky is calm, crank up the power on your scope and look for structure in the rings.

Saturn Ring System



Source: Names of Saturn's rings, courtesy science.nasa.gov

Here's a writeup from https://nineplanets.org/saturn/ on the ring system. Please don't expect to see everything. In fact, feel lucky to see make out the A, B, C Rings and the Cassini Division.

The ring system of Saturn is the largest and most complex in the entire Solar System. They are made out of ice and rock remnants from comets, asteroids, and moons.

These particles range in size from being as small as dust to as big as houses, or even mountains. The ring system is divided into 7 groups of rings: D Ring, C Ring, B Ring, A Ring, F Ring, G Ring, and E Ring.

Together, they are as wide as 4.5 Earths but only about two-thirds of a mile thick. The rings can extend up to 282.000 km / 175.000 mi from the planet. They stay intact and on track because of Saturn's smallest moons. These shepherding moons orbit between the rings and use their gravity to shape the ring material into circular paths.

Last up of the bright planets visible in the evening is the king of our planets, Jupiter. Most of you have been an orbit or two with Jupiter*. Of course, look for the four Galilean Moons, but don't neglect the cloud structures of the planet itself. Binoculars that are held steady are enough to see the two main belts, a 2-3" telescope is able to discern the Great Red Spot, ok, with the way it's been looking the last few years you might need a 4" telescope to get a glimpse of it. A well-tuned and focused 8" scope with good skies and a good eyepiece should begin seeing some waves and eddies in the zones and belts. Subtle color variations, as well as light and dark circular features along the edges between belts and zones, are also possible in moments of excellent seeing.

To get the most out of planet viewing it really helps to have trained eyes, and that takes a lot of eyepiece time to get comfortable and relaxed enough to see the subtler aspects. Even on nights of subaverage seeing there may be a few moments of excellent viewing. You'll likely miss that moment if you just take a quick look now and then. Oh, and that goes for deep sky faint fuzzies and comets as well.

So, get out there and stare.

*Jupiter has an orbital period of 12 Earth years.

HAC Holiday Party

There will be no general meeting in December. Instead, we will have a holiday party at the Patterson Observatory on December 10 starting at 6pm. The party will be catered by Olive Garden and members were asked to RSVP so that we could determine the amount of food required. Members contribute $10 per person. An anonymous donor is contributing 25% of the catering cost. The club picks up the rest. The University South Foundation is donating a limited amount of wine and beer (from Tombstone Brewery) to the event. Water and Ice tea will also be provided. Thanks to Gary Grue for organizing the event!

2022 Officers

Congratulations to the HAC board of directors for 2022: President David Roemer, Vice President Penny Brondum, Secretary Bert Kelher, Treasurer Ted Forte and members at large: Howard Day, Gary Grue, Ken Kirchner and Mark Orvek. Dwight Hoxie will remain on the board as past (Vice) President.

Ken Duncan and Bill Howard will be leaving the board. Thank you Ken and Bill for your past service.

2022 Dues

Thank you to everyone who have paid their 2022 dues. Those members that have memberships expiring this month should have received an email reminder. Dues are $35 Family ($25 active-duty military family), $25 Individual ($20 active-duty military) and $10 student. If you are unsure of your membership status, please 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

2022 Meeting Dates

HAC has reserved the community room in the Student Union building at Cochise College on the following dates:

January 14, February 18, April 15, May 6, and June 17

HAC meetings are generally held on the Friday closest to full moon. The May full moon date was unavailable. Meeting dates for the second half of the year will be established after the college firms up their fall schedule.

Meetings begin at 7pm. Programs will be announced on the HacAstro group and appear in the newsletter when available at publication. Meetings are open to the public.

2022 Patterson Public Nights

Public Night is the free public observing session held at the Patterson Observatory. Due to limited space, guests are asked to register on-line at www.universitysouthfoundation.com/patterson-observatory
HAC members do not need to register and are encouraged to attend. Public night begins a half hour after sunset on the following nights: January 6, February 3, March 10, April 7, May 5 and June 9.
Public nights are weather dependent and will be canceled if the weather dictates. Members and guests can check the recording at (520) 458-8278 extension 2214 after 4:30 pm on the day of the event for a cancellation message.

Public nights are not scheduled during the monsoon months of July and August. Fall dates will be promulgated later. The Patterson Observatory is located on the campus of the University of Arizona, Sierra Vista at 1140 N. Colombo Avenue. It is owned by the University South Foundation and operated by HAC volunteers. Contact Ted Forte if you would like to be more involved with the observatory.

JWST Launch Watch

The James Webb Space Telescope is scheduled to launch on December 22, 2021 at about 5:30a.m. MST. Ted will open the Patterson Observatory at 5 am on launch day and anyone that wants to watch the launch (on You Tube or NASA TV) at the observatory is invited. We'll make coffee and have breakfast snacks available. (Bring something to share if you like).

I hope you'll join us. This event will be rescheduled if the launch is postponed and the time is also subject to change. Watch HacAstro for updates.

NASA Night Sky Notes December 2021

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!

The James Webb Space Telescope: Ready for Launch!

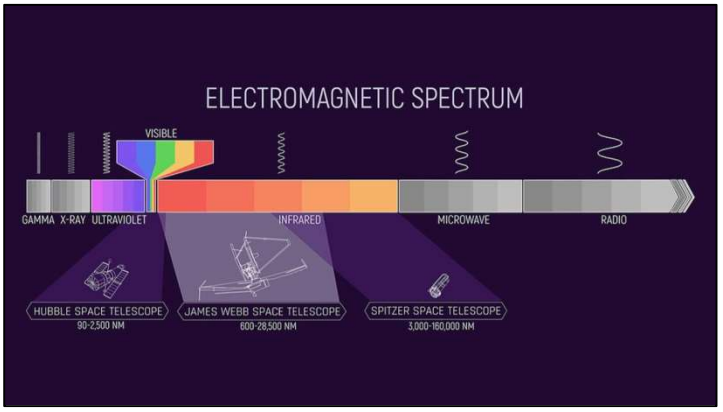
NASA's James Webb Space Telescope is ready for lift-off! As of this writing (November 15), the much-anticipated next-generation space telescope is being carefully prepared for launch on December 18, 2021, and will begin its mission to investigate some of the deepest mysteries of our universe.

The development of the Webb began earlier than you might expect – the concept that would develop into Webb was proposed even before the launch of the Hubble in the late 1980s! Since then, its design underwent many refinements, and the telescope experienced a series of delays during construction and testing. While frustrating, the team needs to ensure that this extremely complex and advanced scientific instrument is successfully launched and deployed. The Webb team can't take any chances; unlike the Hubble, orbiting at an astronaut-serviceable 340 miles (347 km) above Earth, the Webb will orbit about one million miles away (or 1.6 million km), at Lagrange Point 2. Lagrange Points are special positions where the gravitational influence between two different bodies, like the Sun and Earth, "balance out," allowing objects like space telescopes to be placed into stable long-term orbits, requiring only minor adjustments - saving Webb a good deal of fuel.

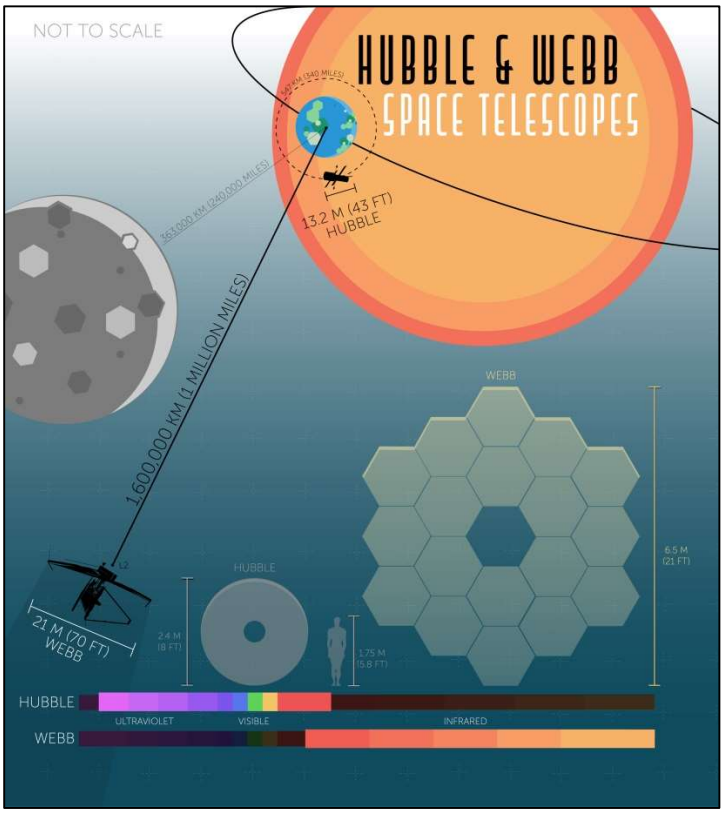
Since this position is also several times further than the Moon, Webb's sunshield will safely cover the Moon, Earth, and Sun and block any potential interference from their own infrared radiation. Even the seemingly small amount of heat from the surfaces of the Earth and Moon would interfere with Webb's extraordinarily sensitive infrared observations of our universe if left unblocked. More detailed information about Webb's orbit can be found at bit.ly/webborbitinfo, and a video showing its movement at bit.ly/webborbitvideo.

Once in its final position, its sunshield and mirror fully deployed and instruments checked out, Webb will begin observing! Webb's 21-foot segmented mirror will be trained on targets as fine and varied as planets, moons, and distant objects in our outer Solar System, active centers of galaxies, and some of the most distant stars and galaxies in our universe: objects that may be some of the first luminous objects formed after the Big Bang! Webb will join with other observatories to study black holes - including the one lurking in the center of our galaxy, and will study solar systems around other stars, including planetary atmospheres, to investigate their potential for hosting life.

Wondering how Webb's infrared observations can reveal what visible light cannot? The "Universe in a Different Light" Night Sky Network activity can help - find it at bit.ly/different-light-nsn. Find the latest news from NASA and Webb team as it begins its mission by following #UnfoldTheUniverse on social media, and on the web at nasa.gov/webb.



Webb will observe a wide band of the infrared spectrum, including parts observed by the Hubble - which also observes in a bit of ultraviolet light as well as visible - and the recently retired Spitzer Space Telescope. Webb will even observe parts of the infrared spectrum not seen by either of these missions! Credits: NASA and J. Olmstead (STScI)



Webb will follow up on many of Hubble's observations and continue its mission to study the most distant galaxies and stars it can - and as you can see in this comparison, its mirror and orbit are both huge in comparison, in order to continue these studies in an even deeper fashion! Credits: NASA, J. Olmsted (STScI)

Pictures by HAC Members

Comet C/2021 A1 (Leonard) by JD Maddy

M45 the Pleiades by Mark Orvek

NGC 1499 California Nebula by Mark Orvek

FOR SALE

Mark Orvek is selling his Celestron AVX Mount. He bought the mount in 2015. The mount is ~$999 new. He has the original shipping box and all of the original components including the NexStar+ hand controller, counterweight, power cable and instructions. He purchased an ACM dovetail, polar alignment scope and Celestron lithium battery pack separately which he will include in the sale. He'd be happy to deliver the mount to anyone in the general area (Sierra Vista, Bisbee, Benson, etc).

I own a Celestron NexStar 8 SE Schmidt-Cassegrain Computerized Telescope. A Celestron Power Tank. Eye pieces, and various other accessories. They are in excellent shape and am trying to sell the items. If anyone in your astronomy club is interested in purchasing please contact me at the email address below. I will provide photos to anyone interested. Contact Craig Riley Email: criley1974@yahoo.com

Patricia Houser has two telescopes to sell. Her husband was the astronomer, and can no longer pursue the hobby. She did not mention what the scopes are but would be open to potential buyers coming out to see them (Whetstone). That's all the information we have, so if you have questions please contact Ms. Houser directly at iamtennis@peoplepc.com

Celestron 6SE. (Schmidt Cassegrain) Includes two scope buggies for it. Also includes an equatorial tripod for the 2nd buggy. See pictures below

Contact JD Maddy at 602-672-2032 Will deliver

Club Officers and Contacts

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Secretary: Bert Kelher **Treasurer:** Ted Forte

Past Vice President: Bill Howard

Board Members-at-Large

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HAC December 2021 - Jan 2022 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
Dec 5	**6**	**7** Village Meadows Elementary 5-7 PM	**8**	**9** PAT Public Night 6PM	**10** **6:37PM** **Holliday Party at Patterson 6PM**	**11**
12	**13** Geminid meteors	**14** Geminid meteors	**15**	**16**	**17**	**18** **9:37PM** JWST Launch?
19	**20**	**21** Winter Solstice 8:59AM	**22** Webb Launch Watch at Patterson 5AM	**23**	**24** 	**25** 
26 **7:26 PM**	**27**	**28**	**29**	**30**	**31** 	
Jan 2 **11:33 AM**	**3**	**4** Quadrantid Meteors	**5** Quadrantid Meteors	**6** PAT Public Night 6PM	**7** Mercury E Elong	**8**
9 **11:13 AM**	**10**	**11**	**12**	**13**	**14** **HAC Meeting Student Union**	**15**
16	**17** **4:48 PM** **MARTIN LUTHER KING Jr. DAY**	**18**	**19**	**20**	**21**	**22**
23	**24**	**25**	**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

Watch the group for notice when in person events and meetings will resume