NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB
THE HAPPY NEW YEAR ISSUE

JANUARY 2021

PRESIDENT'S NOTES

Happy New Year, HACers, Things to Remember and Things to Begin

2020 leaves us warn down a bit -- but not out -- and for many of us, we've been able to spend more hours at the eyepiece or hunched over a hot computer monitor than in many past years. We ended the year with a close pairing of Jupiter and Saturn that was 400 years in the waiting. I've had the Moon and Saturn in a telescope eyepiece before, Venus and the Moon close as well, but the two biggies? Nope. That was extremely cool, and technology (in the form of ZOOM and Google Meet) allowed me to share the experience with distant friends and complete strangers (visiting the local Hauser Museum).

We as a club will also be ZOOMing into 2021, as we begin HAC virtual HAC meetings Jan 29,2021 at 7pm. Our first speaker will be our own, world renown Tom Kaye. He will be speaking on the upgrading of the Patterson's 20" telescope, and it first long-term research project. Stay tuned for more information including practice sessions on using ZOOM that we will be having before the actual virtual meeting.

Mars was amazing, the best viewing I've ever had of the red planet. Over the season of its close scrape with Earth I was able to eyeball and image its whole globe without any obscuring dust storms (that have bedeviled me in the past).

We also got a wonderful comet that blazed its way across the morning and evening sky. It was brighter than Comet 1P Halley was back in 1986, and we could all see it from our backyards instead of travelling down to Australia. Comet C/2020F3-NEOWISE was a public sensation and sets everybody up for the next comet flop. Yep, NEOWISE was a comet to remember and a comet that is big enough and bright enough to reset the "Comet Whining Clock" for the next "Comet of the Decade." And yes, that is a thing we comet watchers do (both reset a clock and complain endlessly).

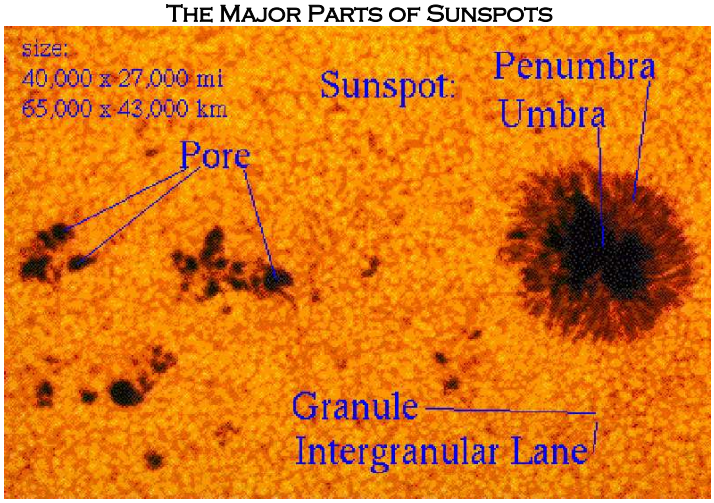
COMETS THAT WERE FOR STARING: COMET C/2020F3 NEOWISE 8 JULY 2020 (TOP) AND COMET C/1P HALLEY 1986 (BOTTOM)

Source: David R.

There were other dazzling events to remember from 2020, but now let's look forward to 2021.

First in my book of things to watch in 2021 is the Sun. At the end of 2020 there were a few hints that the Sun may really be starting its sunspot cycle. Several small sunspot groups in November and December graced us with their presence rather than the near clean slate of star we have had for a long time.

THE MAJOR PARTS OF SUNSPOTS



Sunspots are composed a dark umbra and lighter penumbra. Very tiny spots with no penumbrae are called pores. A close-up of the Sun's photosphere shows a finely granulated texture. Granules are cells of roiling hot gas about the size of Texas that rise from below, cool and sink. Each lasts from 8 to 20 minutes. Credit: NASA

I'm saying solar cycle 24 has ended (good riddance) and cycle 25 has begun, so dust off the solar filters, wedges and eyepieces, and get ready to start watching our daytime star in 2021. Another of the nice things about sunspots is the technology to view them is relatively cheap to acquire. Sunspots are features of the photosphere that can be seen in normal, full spectrum, white light (greatly dimmed by filters, of course!). There is no need for expensive Hydrogen-Alpha filters or single purpose solar telescopes to see these things! Full aperture mylar solar filters are inexpensive, easily obtained; a little fragile but easy to care for. Glass filters are more expensive, breakable and can possibly insert more distortion than the mylar filters White light filters will reveal the major attributes of the spots and some of the finer solar photosphere phenomena. The above image from NASA gives you a primer of those features.

Looking for a nice web reference for solar features? Check the NASA Solar Physics site. For example, this page describes structures of the photosphere: https://solarscience.msfc.nasa.gov/feature1.shtml .

Looks like the space I allow myself to hog in the newsletter is up, so until next time here's wishing you and yours a happy new year, and as always to you, get out there and stare.

Announcing a "Dues Holiday" for current HAC members

The HAC board of directors recognizes that this 2020 was an exceptionally odd, and for some, quite a difficult year. The club has been mostly inactive since March and it is assumed that many of our members have experienced some financial challenges during the COVID lockdowns.

Therefore, we are announcing a "Dues Holiday" for all current members. Everyone's HAC membership will be automatically extended to December 2021 or twelve months from their current membership expiration date whichever is LONGER. In November, the treasurer will be sending out emails to members notifying them of their new expiration dates.

In lieu of dues, we will graciously accept donations. Think of it as a year's worth of voluntary dues payment, but if you find yourself a little strapped this year, there is no need to pay dues to remain a member through 2021.

Any donation amount will be appreciated, of course, but if you wish to make a donation equivalent to your owed dues, please do so. Normal family membership is $35, individual membership is $25. Active duty military would normally pay $25 family and $20 individual.

To make a donation, you can pay by check made out to Huachuca Astronomy Club and mailed to PO Box 922, Sierra Vista, 85636. You can pay on line with your credit card or PayPal account at www.hacastronomy.org – the "Donate" button is in the right-hand column. If you have a Pay Pal account, you can use PayPal Direct to send your payment to paypal@hacastronomy.org and if you have a Zelle account with your bank, you can make your donation to HAC by transferring funds to twforte@powerc.net

Research Commencing at the Patterson Observatory

Tom Kaye will be using the 20-inch RC telescope at the Patterson Observatory to continue his participation in a Pro-AM research team. HAC members Tom Kaye and Bruce Gary collaborate with different professional groups from MIT, Austin, and Europe. They have been doing fast follow-ups on unusual detections and lately have been concentrating on white dwarf exoplanets and triple star candidates initially found by TESS.

Until now, Tom has been using the 32-inch RC at Junk Bond Observatory (JBO) in Hereford. But JBO has been sold and is being dismantled and relocated. Tom is nearing completion on his own 1.1-meter telescope, but until that comes online (June 2021 or later) he is without a telescope to continue the project.

The University South Foundation board of directors enthusiastically granted their approval to engage the Patterson telescope in the project. Tom, with help from Max Mirot and Ted Forte, has been working to achieve remote operation of the telescope and as of this writing has most of the bugs worked out. The scope will be in almost constant use for the next several months and will not be available for outreach events. Once live events resume at the Paterson Observatory, we will use smaller telescopes for public

engagement for the time being. When Tom moves his research to his own observatory later this year, we will be left with a more capable telescope and will be able to offer remote access to other members. Thanks also to HAC member Ken Kirchner for his donation of security cameras for the observatory.

Support the Patterson Observatory

You can support the Patterson Observatory by purchasing a "star". Your name, inscribed on a star plaque will be displayed in the Patterson classroom for a $100 donation to the University South Foundation.
Visit https://www.universitysouthfoundation.com/how-to-give and click on "Sponsor a Star".

HAC Members Join the Foundation's Board

HAC members Penny Brondum and Matt Lieber have joined the board of directors of the University South Foundation. Ted Forte, who has been HAC's representative on the Foundation's board since 2013 will remain on the board as well.

Penny and Matt were nominated by Ted and were unanimously approved at the Foundation's December 9 meeting. Their three-year terms begin this month.

In addition to supporting the students, faculty and staff of the University of Arizona, Sierra Vista, the Foundation owns the Patterson Observatory. HAC and the USF have a long, mutually beneficial, association and the increased presence of HAC members on the board will be of benefit to both organizations. Besides representing HAC, Penny brings a great deal of expertise in the management of non-profits to the table and demonstrated a sincere desire to improve educational opportunities for our area. Matt brings the perspective of an active duty solider, a much-valued connection to Ft Huachuca, and a strong desire to involve himself in the management of the Patterson Observatory.

The HAC board of directors wishes to express their appreciation to these members for stepping up and serving.

HAC Members Resolve to do the Planetary Nebula Program

Ted Forte sends kudos to Ken Cameron and Craig Gundy for announcing their intention to complete the Astronomical League's Planetary Nebula Program. Ken announced their plans on the hacastro list and included a call (should we call it a challenge) to other members to join the effort. We know that HAC president David Roemer is working through the list of planetaries and sharing his images on the group, but not too many members are known to be working on the visual program.

Ted is the coordinator of the Planetary Nebula Program and is available to answer questions or provide help. You can follow a year-long, month by month exploration of the objects in the program by visiting the files section on the hacastro group and downloading: Obs PNe Each month.pdf. Or, contact Ted (tedforte 511 at gmail.com) and he can send it to you. The program's rules and observing list are available on the Astronomical League website under the "Observe" tab.

Why not make doing the PN Program your New Year's resolution?

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PLEASE NOTE THIS CHANGE Regarding Calendars for 2021:

In past years, Astronomy has offered their Deep Space Mysteries Calendar to club members at half price only when purchased through the club, by the treasurer. But now, members can just go online and get their discount by visiting MyScienceShop.com/ASYClubs and using the code CAL50 at checkout.

Therefore, we will not be making a group order for calendars this year. If you would like a discounted calendar, just go online and purchase it.

NASA Night Sky Notes JANUARY 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!

Check Your Sky's Quality with Orion! David Prosper

Have you ever wondered how many stars you can see at night? From a perfect dark sky location, free from any light pollution, a person with excellent vision may observe a few thousand stars in the sky at one time! Sadly, most people don't enjoy pristine dark skies – and knowing your sky's brightness will help you navigate the night sky.

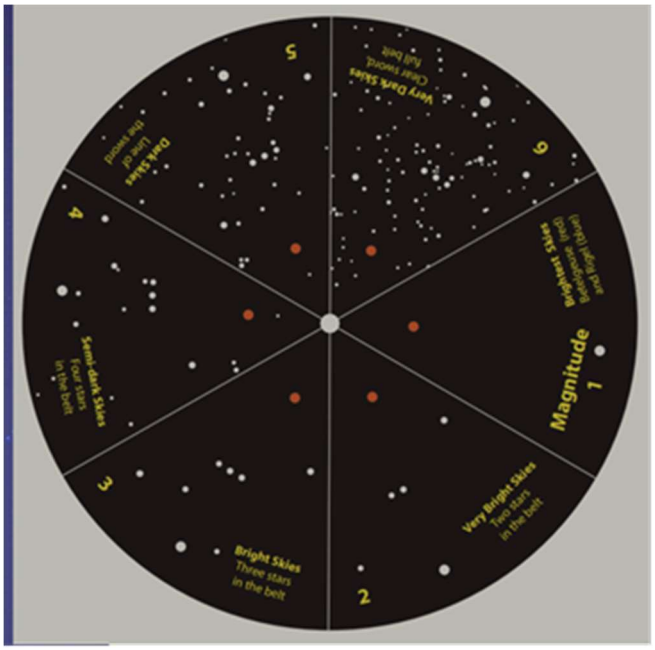
The brightness of planets and stars is measured in terms of apparent magnitude, or how bright they appear from Earth. Most visible stars range in brightness from 1st to 6th

magnitude, with the lower number being brighter. A star at magnitude 1 appears 100 times brighter than a star at magnitude 6. A few stars and planets shine even brighter than first magnitude, like brilliant Sirius at -1.46 magnitude, or Venus, which can shine brighter than -4 magnitude! Very bright planets and stars can still be seen from bright cities with lots of light pollution. Given perfect skies, an observer may be able to see stars as dim as 6.5 magnitude, but such fantastic conditions are very rare; in much of the world, human-made light pollution drastically limits what people can see at night.

Your sky's limiting magnitude is, simply enough, the measure of the dimmest stars you can see when looking straight up. So, if the dimmest star you can see from your backyard is magnitude 5, then your limiting magnitude is 5. Easy, right? But why would you want to know your limiting magnitude? It can help you plan your observing! For example, if you have a bright sky and your limiting magnitude is at 3, watching a meteor shower or looking for dimmer stars and objects may be a wasted effort. But if your sky is dark and the limit is 5, you should be able to see meteors and the Milky Way. Knowing this figure can help you measure light pollution in your area and determine if it's getting better or worse over time. And regardless of location, be it backyard, balcony, or dark sky park, light pollution is a concern to all stargazers!

How do you figure out the limiting magnitude in your area? While you can use smartphone apps or dedicated devices like a Sky Quality Meter, you can also use your own eyes and charts of bright constellations! The Night Sky Network offers a free printable Dark Sky Wheel, featuring the stars of Orion on one side and Scorpius on the other, here: bit.ly/darkskywheel. Each wheel contains six "wedges" showing the stars of the constellation, limited from 1-6 magnitude. Find the wedge containing the faintest stars you can see from your area; you now know your limiting magnitude! For maximum accuracy, use the wheel when the constellation is high in the sky well after sunset. Compare the difference when the Moon is at full phase, versus new. Before you start, let your eyes adjust for twenty minutes to ensure your night vision is at its best. A red light can help preserve your night vision while comparing stars in the printout.

Did you have fun? Contribute to science with monthly observing programs from Globe at Night's website (globeatnight.org) and check out the latest NASA's science on the stars you can - and can't - see, at nasa.gov.



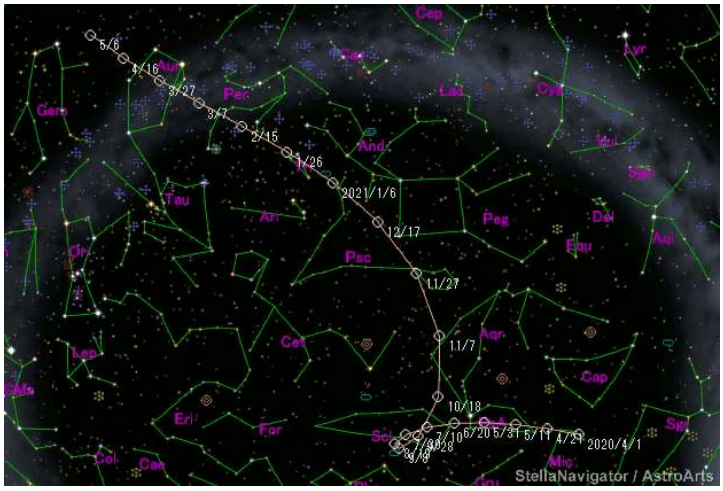
The Dark Sky Wheel, showing the constellation Orion at six different limiting magnitudes (bottom), and a photo of Orion (top). What is the limiting magnitude of the photo? For most observing locations, the Orion side works best on evenings from January-March, and the Scorpius side from June-August.

Comet 156P Russell LINEAR

By David Roemer

This periodic comet is returning as a small, fairly bright (about Mag 10), very picturesque object. Craig Anderson and I have been following it for several weeks. Me using the Meade 14" for visual and high-power imaging and the 11" RASA for widefield imaging. Craig Anderson from his warm seat in Virginia has been using the RISS Remote Observatory and his relatively new and seemingly wonderful 14" CDK PlaneWave for extended Hi-Res shots of the comet. While it isn't a naked eye wow, it is a very nice telescopic comet, and you should try to see it in the coming weeks.

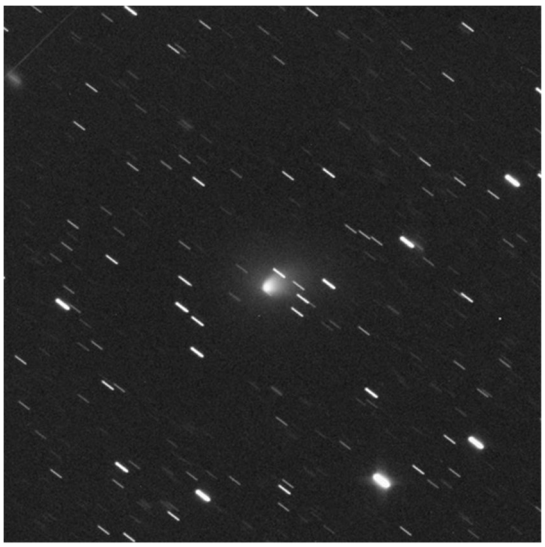
Here's a chart for your star hopping adventure.



The first image is of the comet taken with the 11" RASA on the night of 12/26 showing a a small curved tail and an extended halo.

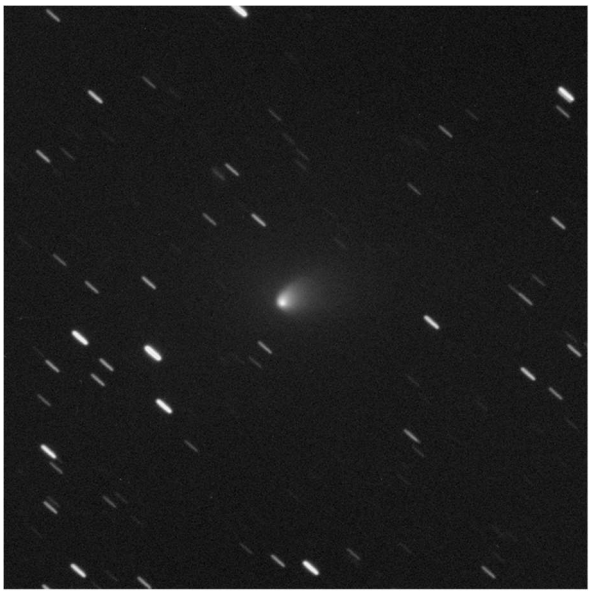
The second image is a from RISS Remote's 14" PlaneWave.

The 20m unguided exposure was taken using tracking rates set to match the comet. Thin clouds and Moon, interfered a bit but Craig was pleased with the orbital tracing. This is a cropped image with using just a bit of noise reduction.



The last is of the comet again, and is a very cropped image, where you can see the extended coma in front of the comet core.

This is a 15m Luminance 2x2 unguided using orbital tracking rate offsets taken with the 14" PlaneWave on 12/30.



Pictures from HAC Members

Jupiter and Saturn by Rik Hill

Jupiter and Saturn by Max Mirot

Jupiter and Saturn by Mike Shade

The Moon by David Roemer

Club Officers and Contacts

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HAC Jan/Feb Calendar of Events

SU	MO	TU	WE	TH	FR	SA
3 Jan Quadrantid Meteors	**4** **No in-person events are scheduled**	**5**	**6** 2:38 AM	**7**	**8**	**9**
10	**11** Venus 1.5° N of Moon	**12** 10:02 PM	**13**	**14**	**15**	**16**
17	**18** 	**19**	**20** 2:03 PM	**21** Patterson Public Night (tentative)	**22**	**23**
24	**25**	**26**	**27**	**28** 12:18 PM	**29** HAC Meeting (Zoom)	**30**
31	**1 Feb**	**2**	**3**	**4** 10:38 AM	**5**	**6**
7	**8**	**9**	**10**	**11** 12:08 PM	**12**	**13**
14 	**15** 	**16**	**17**	**18** Patterson Public Night (tentative)	**19** 11:49 AM	**20**
21	**22**	**23**	**24**	**25**	**26** HAC Meeting (Zoom)	

All times local MST

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Send an email to: HACAstro+subscribe@groups.io

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