



JANUARY 2020

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

PRESIDENT'S NOTES

January 2020? Happy New Decade everybody! A new year, a new decade, a clean slate, time to start on those resolutions you made back in 2019 or was it 2016? Remember that idea of yours to join in an astronomical program partnership or, was it to begin recording occultations, start doing outreach no, it was to observe all the Herschel 400 catalog, yeah or was it just to learn to use that telescope you bought a few years ago. Well whatever it was or for another year is, remember we are more than just club, we share your new hobby, your recent keen interest, or your lifelong obsession and we are here to help in your quest.

Now that my club commercial is out of the way let's talk a bit about the year ahead. While there are no total eclipses or meteor storms locally in 2020 (that we know of) there will be several interesting observing events throughout the new year (weather, geometry and physics permitting).

Let's start early in the year and simple to see. On February 10, Mercury will be at its greatest eastern elongation (at 18.2 degrees) from the Sun. This will be a favorable time to view Mercury since it will be at its highest point above the western horizon just after sunset. Mercury will have a first quarter phase (like the Moon).

Mercury's orbit is short (88 days) so it doesn't take long for it to transition to its greatest western elongation (at 27.8 degrees) from the Sun. This happens on March 24. This is the bookend view of Mercury from February 10. Mercury will have a last quarter phase (like the Moon) as you view it predawn sky just above the eastern horizon. If you saw some of the Mercury transit last November, you saw the "new phase" of Mercury and you add that phase to these two phases you have all three we can see from Earth. A full Mercury will be on the far side of the sun. Oh, sure you can see crescent Mercury but I'm not advising you to train your unfiltered telescope that close to the sun.

What would a year be like without trying to see a meteor shower? I don't know as I always try to see at least one. This year we have four pretty good chances. The Lyrids Meteor shower runs annually from April 16-25. It peaks this year on the night of the night of the 22nd and morning of the 23rd. Lyrid meteors can yield bright dust trails. The nearly new moon will mean dark skies for what should be a good show this year.

Jupiter usually gives a good view but if you want to see it at its closest, brightest, a watch it all night then look on July 14, Jupiter will be at its closest approach to Earth (at Opposition) and its face will be fully illuminated by the Sun. A medium-sized telescope should be able to show you some of the details in Jupiter's cloud bands, but I give no guarantees on you seeing the great red spot.

Just a few nights later, on July 20, everybody's favorite, Saturn will be at its closest approach to Earth. It too will be brighter than any other time in the year and will be visible all night. An 8" telescope will allow you to see Saturn's rings and maybe six or seven of its brightest moons.

Back to meteors during the fall and winter. The Orionids meteor shower has a long run annually from October 2 to November 7. It peaks this year on the night of October 21 and the morning of October 22. Go out after midnight when the moon has set to see 20 or more meteors an hour.

Don't put the lawn chair away just yet. The Leonids Meteor Shower runs from November 6-30. It peaks on the night of November 17 and morning of the 18th. The moon will set early in the evening leaving dark skies for what should be 15 or so meteors an hour. Consider the Orionids and Leonids as a warmup for the December Geminids.

The Geminids meteor shower this year peaks on the night of December 13, and morning of the 14th. But there is some speculation the morning of the 15th could also be nearly as active this year. The Geminids are considered by many to be the best meteor shower, producing up to 120 per hour at its peak. If you cannot make those dates this annual shower is active from December 7-17 so you have some leeway. This year we have a nearly new moon so we should be able to see a lot them (no promises).

Finally, people love optical illusions. So, I'll highlight a very close conjunction of Jupiter and Saturn on December 21. The two bright planets will appear only 7 arc minutes of each other in the night sky. They will appear to be so close that they will appear to make a bright double planet. Look to the west just after sunset for this impressive and rare planetary pairing but repeat after me, "It's only an illusion."

And always remember, anytime it's clear get out and stare.

PLEASE WELCOME OUR NEW MEMBERS

Daniel Bonser of Sierra Vista and his dad Charles joined as a family membership at the holiday potluck. Daniel was one of Dwight Hoxie's astronomy students. Also joining in December was Connie Sardelis of Hereford. Welcome! We are glad you joined.

AT THE JANUARY MEETING



The January meeting of the Huachuca Astronomy Club will be held on Friday January 10 at 7 p.m. in the community room of the Student Union building at Cochise College.

Our speaker is Dennis Zaritsky, a Professor of Astronomy and Deputy Director of Steward Observatory at the University of Arizona. He has published over 250 papers on an array of

topics from dark matter to the nature of stars. His work has been recognized with a variety of honors and awards, including Sloan, Packard, and Guggenheim Fellowships and the Pierce Prize from the American Astronomical Society. He is currently serving as the Chairman of the Science Advisory Committee for the Giant Magellan Telescope project.

Dennis will deliver a Status Report on the Giant Magellan Telescope: a 25-meter Optical Telescope with Adaptive Optics describing the motivation, technical challenges, current status, and science opportunities of what would be today's largest optical telescope. The mirrors are being produced at the University of Arizona for the \$1B+ project that promises to revolutionize astronomy.

We will take Dennis to dinner at the Outback Steakhouse before the meeting (5 p.m.) You should RSVP to Ted Forte tedforte511@gmail.com if you would like to join us for dinner.

Going into the new year, it's sometimes instructive to look back at the old. Here's a summary of our outreach activities in 2019:

OUTREACH

As should be apparent, we do a lot (most) of our outreach at the Patterson Observatory but we have also done public events at Kartchner Caverns State Park, the Sierra Vista and Huachuca City Libraries, Veterans Memorial Park, Rune Winery and a few schools. I would also count our member star parties as outreach and so should mention Gary Grue's Blue Marvel observatory and the Junk Bond Observatory. All in all, we conducted more than 60 events and interfaced with over 3,000 people. At least 31 HAC members volunteered time at one or more outreach events in 2019.

No doubt 2020 will be another big year for outreach, we already have a number of events on our schedule. If you are anything like me, you'll discover that outreach is very

rewarding. It is also very important to the future of our hobby and our club. It is through public outreach events that we share our enthusiasm and encourage others to enjoy observing. The people we inspire become allies in the effort to protect our dark skies and many become new members.

We all too often see the same few faces at our outreach events and we would welcome those of you that don't participate as much. Why not make it your New Year's resolution to give outreach a try this year?

2020 DUES

Don't forget to pay your 2020 dues. There are several memberships in arrears (you know who you are). Actually, if you are not sure about your membership's status, please contact the treasurer (Ted Forte tedforte511@gmail.com). We hate to lose members, but it's a given that a few will leave us. If you are someone that has decided not to renew, please inform Ted so we can remove you from the roster.

Dues are \$35 family (\$25 for active duty military family), \$25 regular individual (\$20 military) and \$10 for students with a valid student ID.

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



NASA NIGHT SKY NOTES JANUARY 2020

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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!

Spot the Young Stars of the Hyades and Pleiades

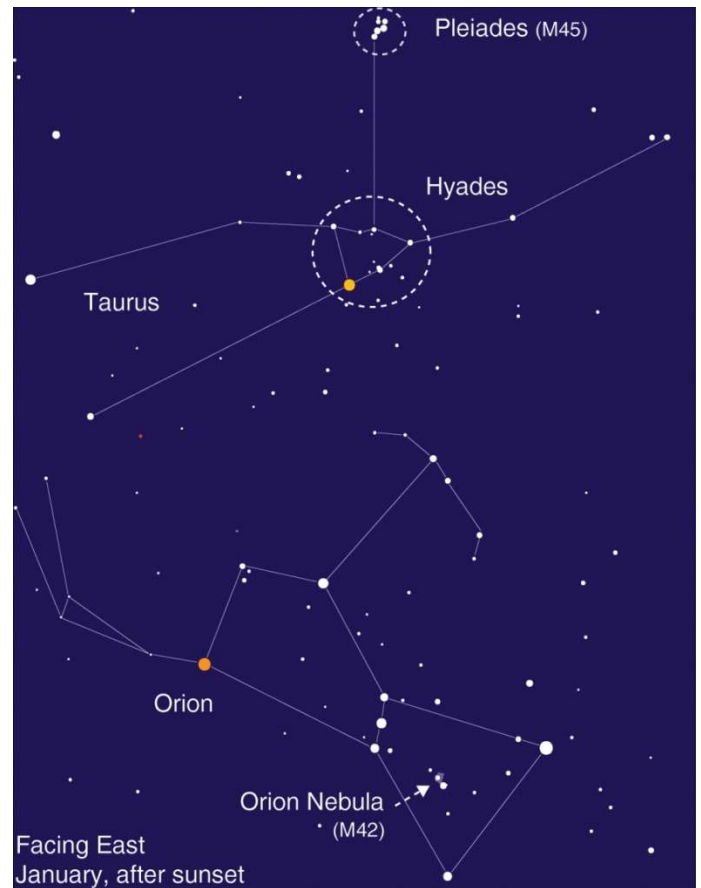
David Prosper

Orion is the last of a trio of striking star patterns to rise during the late fall and early winter months, preceded by the diminutive Pleiades and larger Hyades in Taurus. All three are easily spotted rising in the east in early January evenings, and are textbook examples of stars in different stages of development.

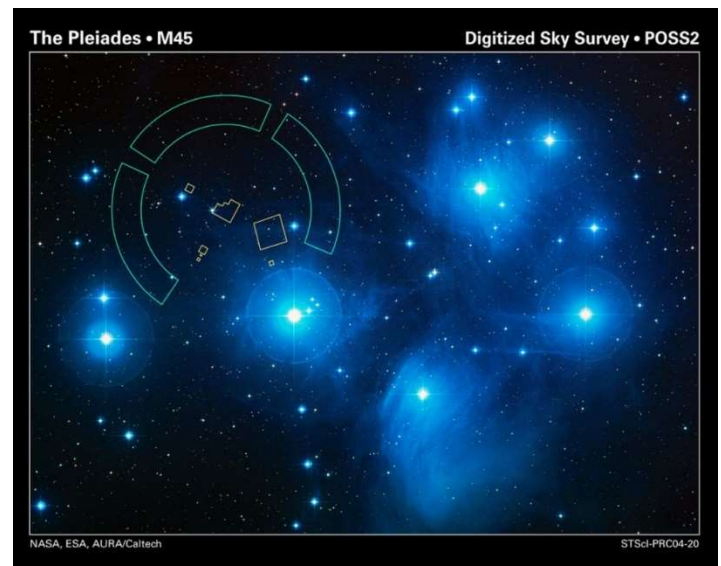
As discussed in last month's Notes, the famous Orion Nebula (M42), found in Orion's "Sword," is a celestial nursery full of newly-born "baby stars" and still-incubating "protostars," surrounded by the gas from which they were born. Next to Orion we find the Hyades, in Taurus, with their distinctive "V" shape. The Hyades are young but mature stars, hundreds of millions of years old and widely dispersed. Imagine them as "young adult" stars venturing out from their hometown into their new galactic apartments. Bright orange Aldebaran stands out in this group, but is not actually a member; it just happens to be in between us and the Hyades. Traveling from Orion to the Hyades we then find the small, almost dipper-shaped Pleiades star cluster (M45). These are "teenage stars," younger than the Hyades, but older than the newborn stars of the Orion Nebula. These bright young stars are still relatively close together, but have dispersed their birth cocoon of stellar gas, like teenagers venturing around the neighborhood with friends and wearing their own clothes, but still remaining close to home - for now. Astronomers have studied this trio in great detail in order to learn more about stellar evolution.

Figuring the exact distance of the Pleiades from Earth is an interesting problem in astrometry, the study of the exact positions of stars in space. Knowing their exact distance away is a necessary step in determining many other facts about the Pleiades. The European Space Agency's Hipparcos satellite determined their distance to about 392 light years away, around 43 light years closer than previous estimates. However, subsequent measurements by NASA's Hubble Space Telescope indicated a distance of 440 light years, much closer to pre-Hipparcos estimates. Then, using a powerful technique called Very Long Baseline Interferometry (VLBI), which combines the power of radio telescopes from around the world, the distance of the Pleiades was calculated to 443 light years. The ESA's Gaia satellite, a successor to Hipparcos, recently released its first two sets of data, which among other findings show the distance close to the values found by Hubble and VLBI, possibly settling the long-running "Pleiades Controversy" and helping firm up the foundation for follow-up studies about the nature of the stars of the Pleiades.

You can learn more about the Pleiades in the Universe Discovery Guide at bit.ly/UDGMarch, and find out about missions helping to measure our universe at nasa.gov.



Caption: Locate Orion rising in the east after sunset to find the Orion Nebula in the "Sword," below the famous "Belt" of three bright stars. Then, look above Orion to find both the Hyades and the Pleiades. Binoculars will bring out lots of extra stars and details in all three objects, but you can even spot them with your unaided eye!



Caption: Close-up of the Pleiades, with the field of view of Hubble's Fine Guidance Sensors overlaid in the top left, which helped refine the distance to the cluster. The circumference of the field of view of these sensors is roughly the size of the full Moon. (Credit: [NASA](http://nasa.gov), [ESA](http://esa.eu) and AURA/Caltech)

PICTURES FROM HAC MEMBERS

We start the new decade with some incredible images

NGC 2032 and abundant companions in the Large Magellanic Cloud Alex Woronow



Dark Shark Nebula Glen Sanner



Van den Bergh catalog of nebula 18 Mike Shade



Sprites

Max Mirot



CLUB OFFICERS AND CONTACTS

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For more information on products and contact information, their websites are:

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

Starizona <http://starizona.com/>

HAC Jan Feb Calendar of Events

SU	MO	TU	WE	TH	FR	SA
29	30	31 	Jan 1 2020 	2  9:45 PM	3 Quadrantid meteors	4 Quadrantid meteors
5	6	7	8	9 School Visit to Patterson 9:30 AM	10  12:21 PM Hac Meeting Student Union	11
12	13	14	15	16	17  5:58 AM	18
19	20  Martin Luther King, Jr. Day	21	22	23	24  2:42 PM	25
26	27	28	29 School Visit to Patterson 9:30AM	30 Patterson Public Night 6:30 PM	31	1 Feb  6:42 PM
2	3	4	5	6	7 HAC Meeting Patterson Obs.	8
9  12:33AM	10	11	12	13	14  Happy Valentines Day	15  3:17PM
16	17  Presidents' Day	18	19	20	21	22
23  8:32AM	24 School Visit to Patterson 9:30AM	25 School Visit to Patterson 9:30AM	26	27 Patterson Public Night 7:00 PM	28	

WISHING HAC A HAPPY AND HEALTHY NEW YEAR IN 2020

Join [HacAstro](#) to keep up to date with all of the Huachuca Astronomy Club events

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