NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

OCTOBER 2021

PRESIDENT'S NOTES

October,

If you're listening, we're ready for clear, clean, smokeless night skies.

P.S. A bright comet would be nice as well… just saying.

Ok, with that out of the way let's get down to business.

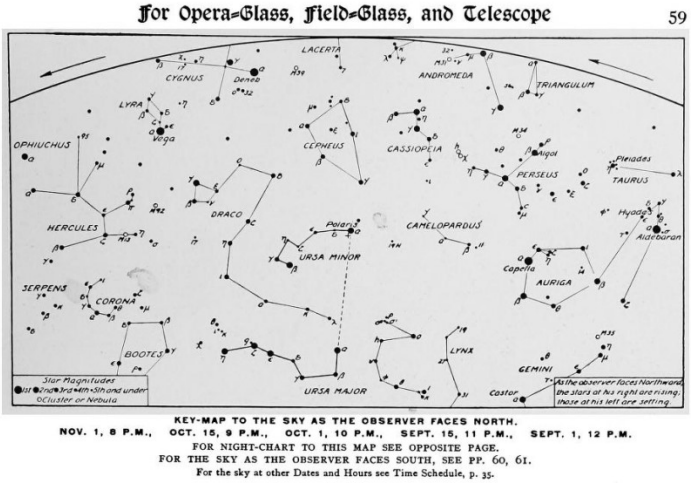
Welcome to October, HACers. Hope springs eternal they say, so keep your hopes up for Comet C/2021 A1 Leonard. Astronomer Greg Leonard discovered the comet on January 3, 2021, at the Mount Lemmon Observatory. What will probably be the brightest comet this year may even be a bit brighter just after New Year 2022. C/2021 A1 will make its closest pass to Earth at 0.233 AU (34.9 million km) and will make its closest approach to the sun on January 3, 2022. It should be a naked-eye comet in December and may be as bright as mag 4. I'll put together viewing charts for the November newsletter when the comet is in better placement for viewing.

We've just about gotten through the mechanics of our Star-Book. The last four pages of night charts and key maps (pp. 58-61) bring us to the fall and winter seasons and the last of the book's charts. Looking north, the stars of Ursa Minor are well-positioned west of the zenith. At the tip of the handle of the Little Dipper is Polaris (the North Star). Above and to the east of Polaris you should see five brighter stars forming a wide "M" or an upside "W", those are the five brightest stars of the constellation Cassiopeia.

Cassiopeia is a wonderful constellation, harboring bright stars, dense star fields, open clusters, and a few small dim galaxies. Eta Cassiopeiae (η Cas) is a nice double star for small telescopes. It consists of a magnitude +3.4 yellow star, like our sun, and a fainter orange-red secondary star of magnitude +7.5. They are separated by 13 arc seconds.

Use 80x magnification or more split them; an 80mm or larger telescope should work. Both stars are variables. It is thought they fluctuate very slightly due to active chromospheres. Iota Cassiopeiae (ι Cas) is a triple star. About 120x with a 150mm diameter or larger telescope, will show a white primary star at mag. +4.6 along with a wide fainter red star of mag. +8.5, separated by 7.3 arc seconds. Also visible is the closer yellow star of magnitude +6.9. It is separated by 2.8 arc seconds from the primary.

KEY MAP FOR OCT-NOV



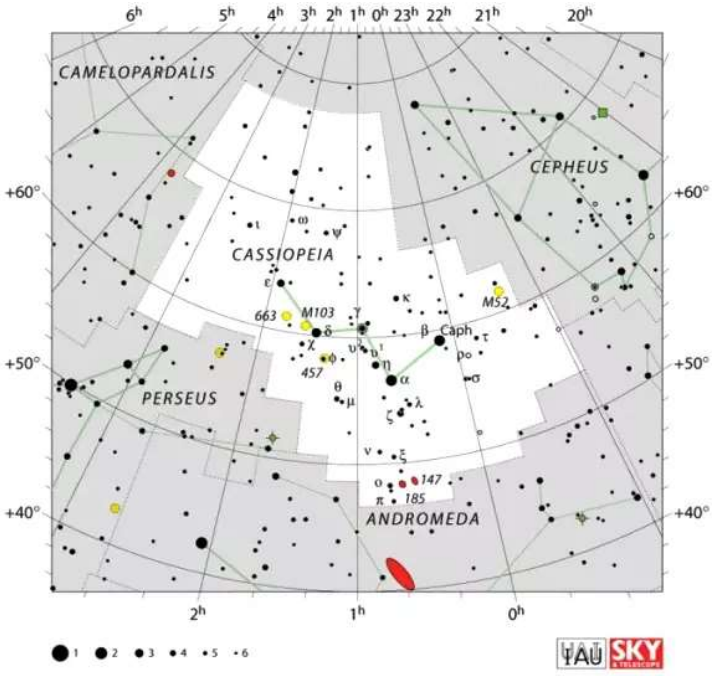
Source: A beginner's star-book; an easy guide to the stars and to the astronomical uses of the opera-glass, the field-glass and the telescope, Kelvin McKready, 1912-1929, p 59.

Two of the open clusters are in Messier's catalog M52 (NGC 7654) and M103 (NGC 581), and two further are NGC objects NGC 457 and NGC 663 (see the following Sky&Telescope sky chart). M 52 is quite bright and is composed of about 100 stars. M103 is much dimmer and has far fewer stars. If you count about 25 stars, consider you've caught them all. There are two more NGC objects in Cassiopeia worth mentioning, both are members of our Local Group of galaxies. NGC 185 is a magnitude 9.2 elliptical galaxy. Slightly dimmer NGC 147 is a magnitude 9.3 elliptical galaxy. These are faint fuzzies. Both look a bit like small, dim, slightly oval smudges or globular clusters, with no distinct stars. Although not in constellation of Andromeda, both are dwarf galaxies gravitationally bound to the Andromeda Galaxy.

Cassiopeia also serves as a signpost and a directional arrow to the Andromeda Galaxy (a family favorite), and only a constellation away. In a location with a dark sky, you can

site along Gamma and Alpha or Epsilon and Delta, and then aim south. If you use the distance between Gamma and Alpha, count off three of the distances between those guide stars and you should see a large dim fuzzy patch with your unaided eye. That patch is the galaxy of Andromeda. In brighter locations you may need to star-hop using more "baby steps," but the galaxy is quite bright. I can usually see it even from the back deck at the Patterson Observatory. The chart below from Sky & Telescope will serve you well for finding the brighter objects in and around Cassiopeia.

CASSIOPEIA TURNED RIGHT SIDE UP (NORTH) TO FORM A "W"



https://www.constellation-guide.com/constellation-list/cassiopeia-constellation/

There are other portions of the Star-Book worth your attention, although mostly as a foundation and to give context. Much of the information has been superseded in the ensuing years. The section on the moon may give you a nice introduction but beware imprinting any of the information into permanent memory. For example, there is mention of craters and volcanism. We now know vulcanism is very rare on the moon and that most craters are the result of impacts. As well, the planet section will give you context as I have said, but so much more is now known that it has been rendered moot. Still, look at the photographs made at professional observatories in that section and reflect on recent images of planets you've seen in amateur astronomy magazines. The current levels of resolution and the technology that achieve it are astounding.

That ends what I'd like to cover from our Beginner's Star-Book.

Rather than picking another book right away, I thought I'd start giving an overview of one constellation or object at a time using multiple sources, and then touching on one major astronomical subject if you don't mind. I won't be an expert in any of them, so I'll be learning about them along with you. Well, hopefully I'll learn about them before I write about them, but you know what I mean. Next month we'll start tackling the lives of stars.

So, until then take you telescope out on to your front yard for Halloween and give the gremlins a real treat, like Jupiter or Saturn. Of course, exercise proper precautions, be vaccinated, wear a good mask, and decontaminate your eyepiece and tube between treats. Oh, and between gremlins don't forget to take some time at the eyepiece to stare for yourself.

Welcome Our New Members

Constance Hendry of Bisbee joined in September after attending the September Public Night. Welcome, we are glad you joined!

AT THE OCTOBER 22 MEETING

Arizona's Huge Role in JWST – and JWST's Huge Role in Future Astronomy

Over the past 50 years, Infrared astronomy has opened new vistas on the Universe. It all started at the University of Arizona, with simple single-detector instruments on 60-Inch telescopes. The James Webb Space Telescope (JWST) is 250 inches in aperture and is due to be launched into space in December, after 20 years of development. Once there, its instruments boast of some 50 million detectors, each providing about 500 thousand times greater sensitivity than could be achieved 50 years ago. Dr George Rieke will outline the exciting journey over this advance, including describing the two instruments for JWST (out of four) that the University of Arizona has played central roles in developing, and touching on some of the breakthrough science we hope to achieve.

Dr. George Rieke is a Regents Professor of Astronomy and Planetary Sciences at the University of Arizona, and a member of the American Academy of Arts and Sciences and the National Academy of Sciences. He entered infrared astronomy from high energy gamma ray astronomy (which proved a scientific dead end) in 1970 and has participated in the growth of that field ever since, including as the Principal Investigator of the MIPS instrument on the Spitzer Space Telescope and as Science Team Lead for the Mid-Infrared Instrument for JWST. He has published more than 500 scientific papers and three books. His wife, Marcia, is the Principal Investigator of the Near Infrared Camera for JWST, so despite its awesome scope, the telescope is a family matter.

October 9 Kartchner Star Party.

The fall star party at Kartchner Caverns State Park is planned for Saturday, October 9. We will set up for solar observing around noon, enjoy a talk by Ted Forte on the James Webb Space Telescope in the Discovery Center at 5:30 pm followed by an evening of telescope observing (weather permitting).

HAC members participating as telescope operators or presenters for the star party are entitled to free admission to the park – just explain your purpose to the guard at the gate. There will be a volunteer log to record your arrival and departure, (see Ted) please be sure to sign in and out so the park can capture our contribution.

James Webb Community Events

October 15, Sierra Vista's City Star Party. The city-wide Webb celebration kicks off with this public observing event at Veterans Memorial Park. HAC members are encouraged to set up telescopes at the park from 6 to 8 PM. We'll have a waxing gibbous moon and the bright planets Jupiter and Saturn to share with guests. We'll set up at the southeast corner of the park (our usual Earth Day location).

October 16, A Build Your Own Spacecraft activity will be conducted at the Sierra Vista Library, 10AM to 12PM for children ages 6-12. HAC members who would like to volunteer to help with the "Design, Build and Test" and/or the "Stomp Rocket" activities should contact Ted Forte.

October 22, HAC General Meeting in the community room will feature guest speaker Dr. George Rieke, the University of Arizona's team lead on the MIRI instrument for the James Webb Space Telescope. Dr. Rieke's talk is titled "Arizona's Huge Role in JWST – and JWST's Huge Role in Future Astronomy"

October 23, JWST Launch Party will be held at the Patterson Observatory from 9am to 5 pm and will feature solar observing, activities, and JWST related programs including a presentation by Dr. Kate Su of the University of Arizona. There will be a display of NASA artifacts by HAC member Scott Schneeweis, Stacy Chitwood will lead a group activity to construct paper models of Webb. We plan to have a live JWST presentation in Spanish by Hector Swidzinski and an infrared camera demonstration by Charles Penny both from the University of Arizona.

Dr. Kate Su's research broadly focuses on dust around all different kinds of stars, especially in a disk form. She is a member of the JWST/MIRI Instrument/Science Team and will represent NASA at our Launch Party Event. She will be speaking in the Patterson classroom at 4 p.m. on October 23

October 27, Public Talk on JWST by Ted Forte at the Sierra Vista Library.

A full list of community events organized around the JWST can be found here: https://www.universitysouthfoundation.com/community-events. Contact Ted Forte if you would like to be involved.

The James Webb Space Telescope, a joint NASA/ESA/CSA mission, is scheduled to launch around 5 a.m. local time on Saturday, December 18 from Europe's Spaceport in French Guiana atop an Arianne 5 rocket. It's a four-week journey to the second Lagrange point where it will be stationed. The second Lagrange point is located 932,056 miles away from Earth. Webb will be the largest, most powerful and complex space telescope ever built and launched into space. It will fundamentally alter our understanding of the universe.

The 2022 Royal Astronomical Society of Canada (RASC) Observer's Handbook

Published annually by the Royal Astronomical Society of Canada, Observer's Handbook 2022 is the essential reference for professional astronomers, amateur skywatchers, teachers, and everyone who enjoys the night sky. This special USA Edition includes American usage and references to U.S. cities. The editors of Astronomy magazine use and recommend this comprehensive guide, which includes: Sun and moon rise and set times, locations of planets and brighter asteroids, eclipses and transits, periodic comets and times of meteor showers and sky events for each month of the year.

The treasurer (Ted Forte) will be taking orders for the 2022 handbook at the October and November meetings. You must pay $25 in advance to order your book. That price reflects an expected volume discount (Regular price is $28.95) Make checks payable to the Huachuca Astronomy Club.

Deep Space Mysteries Calendar from Astronomy Magazine Reminder

Astronomy club members are entitled to a 50% discount on calendars from Astronomy Magazine. Go to: https://myscienceshop.com/catalog/gifts/calendars and put

the coupon code CAL50 in at checkout. You'll pay $6.89 after tax.

2022 Dues

Most club memberships expire in December. It is not too early to pay your 2022 dues.

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

Most HAC memberships expire in December. Contact the treasurer, Ted Forte, at tedforte511@gmail.com to check your membership status and expiration date.

Dues amounts:

$35 for a family membership (active duty military pays $25)

$25 for a regular (individual) membership (active duty military pays $20)

$10 for a student membership (valid student ID required)

Memberships are for one year and are adjusted to coincide with the calendar year (to expire in December) at the first renewal. New members pay a full year's dues upon joining and then pay a prorated amount on their first joining anniversary to adjust their membership to a December expiration.

NASA Night Sky Notes

September 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!

Weird Ways to Observe the Moon

By David Prosper

International Observe the Moon Night is on October 16 this year– but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially polarized sunglasses! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble plastic bottle cap! John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

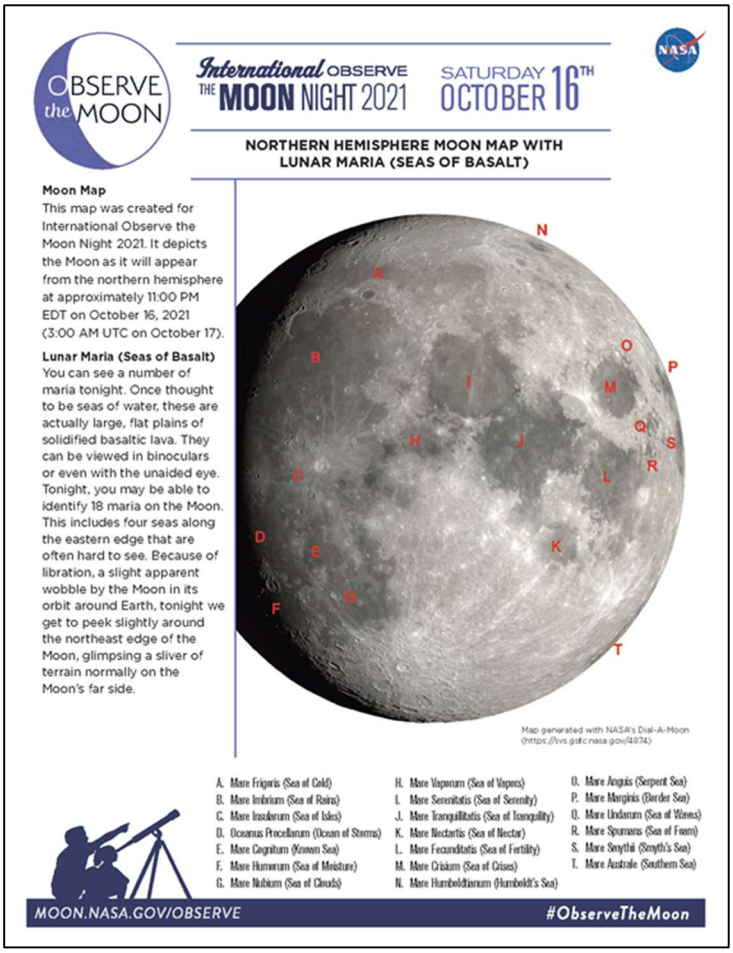
"The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can project the Moon! Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun– a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.

Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches).

Safety tip: NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.

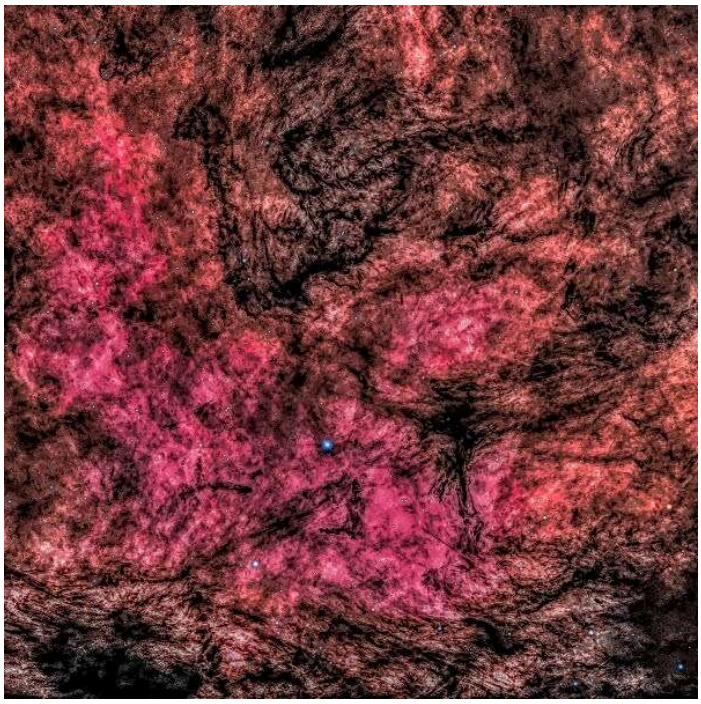


You can download and print NASA's observer's map of the Moon for International Observe the Moon Night! This map shows the view from the Northern Hemisphere on October 16 with the seas labeled, but you can download both this map and one of for Southern Hemisphere observers, at: bit.ly/moonmap2021 The maps contain multiple pages of observing tips, not just this one.

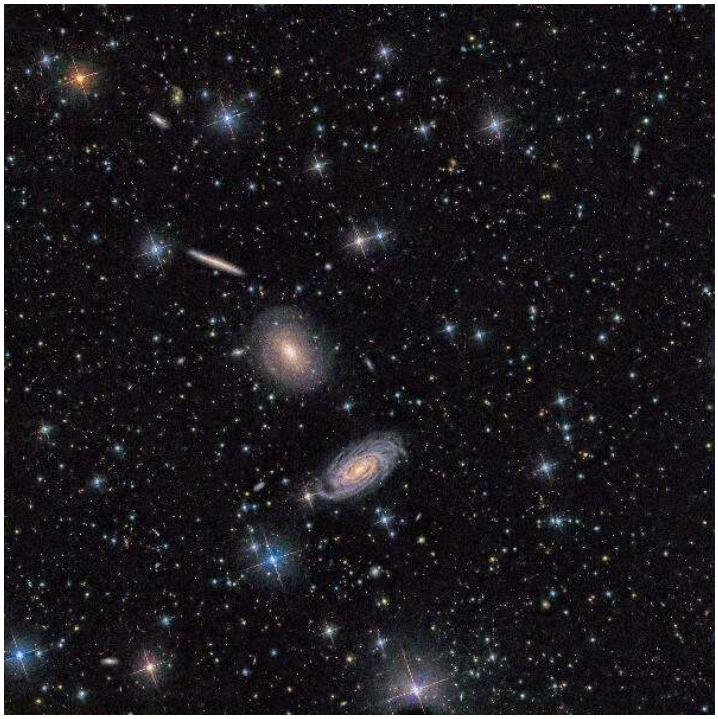
Pictures by HAC Members

Butterfly Nebula (NGC 6302) Northern Wing by Alex Woronow

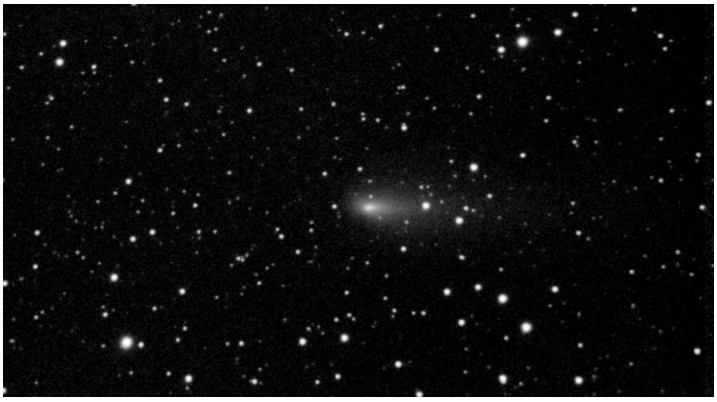
LBN 251 by Alex Woronow



Galaxy rich field in Draco by Alex Woronow



Comet 4P Faye by David Roemer



Sunset by JD Maddy

After sunset with sun pasted into setting position by JD Maddy

FOR SALE

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.
Contact JD Maddy at 602-672-2032 Will deliver

Club Officers and Contacts

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

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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 October/November 2021 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
3	4	5	6 4:05AM	7 Draconid Meteors	8 Draconid Meteors	9 Kartchner Star Party noon-9PM
10	11 Columbus Day	12 8:27PM	13	14 **Patterson Public Night 6:30PM**	15 City Star Party Vet Park 6-8PM	16 Stomp Rocket SV Library 10AM
17	18	19	20 7:57AM Orionid Meteors	21 Orionid Meteors	22 HAC Meeting Student Union (In -Person) 7PM	23 **JWST Launch Party 9AM-4PM**
24 Mercury west elongation 18 degrees	25	26	27	28 1:06PM JWST Talk SV Library 6PM	29	30
31	1 Nov	2	3	4 2:15PM BSA Troop 431 Patterson	5	6
7 Daylight Savings Time Ends	7	9	10	11 5:48PM **Pat Public Night 6PM**	12 Seniors at Patterson Daytime	13
14	15	16 Leonid Meteors	17 Leonid Meteors	18 Business at Twilight PAT open House	19 1:59AM **HAC Meet Library Commons**	20
21	22	23	24	25 	26	Huachuca Astronomy Club of Southeastern Arizona

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