NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

AUGUST 2019

PRESIDENT'S NOTES

If it's August, then where are the Perseids? Well, they're already here. The grains space dust has been popping into the Earth's atmosphere since mid-July, but they don't hit their peak until the night of August 12. Earth passes through the debris path of Comet Swift-Tuttle from July 17 to August 24. So even after the August 12 peak the number of meteors per hour don't fall abruptly, rather they trail off over the next week or so. I mention the wide window with which to view Perseid meteors because this year the peak comes just a few days away from the full Moon. Bummer. So why not try to see some of the interlopers in the week before or after the peak when the Moon doesn't disturb the entire night? Sure, there will be fewer meteors per hour, but at least you may see some meteors, and the Perseids can be amazing. Many Perseids are fireballs with long lasting smoke trails.

If you must see the shower on the peak night you still may have a chance, one meteor expert, Peter Jenniskens of the SETI Institute, predicts a strong pulse of Perseids might appear near 2h UT on August 13. For Sierra Vista that comes early in the evening of August 12. I'm not sure how long this pulse will last, maybe a few minutes to an hour, but what the heck, just look off to the northeast after dark and stare for a while. You should be out there anyway (if it is clear) looking at Jupiter, Saturn and, well, the Moon. While both Jupiter and Saturn are low in the south and the Moon is nearly full, they still are beautiful object to view.

August is also the prime time to view objects within the summer Milky Way, and here in the dark skies of Cochise County you don't need a telescope. Binoculars or your eyes will do just fine to see these large-scale objects. On moonless nights, maybe after a monsoon shower, the star clouds in Sagittarius and Scutum can seem as dense as the rain clouds. When you look at these bright fuzzies you are looking in towards the dense core of our galaxy. The trick to looking at the Milky Way is understanding just what you are looking at. The Milky Way is a galaxy just like Andromeda or countless others we can see in telescopes, but we are not looking into we are looking from within. Those star clouds are portions of our galaxy's central bulge and neighboring spiral arms. The dark areas between the star clouds are also clouds but of obscuring dust and gas. Within these large-scale star and dust structures are hundreds of smaller objects, enough for many years of exploration, no matter what type of telescope you use.

THE SOUTHERN HALF OF THE SUMMER MILKY WAY

Source: https://www.skyandtelescope.com/observing/a-trip-down-the-great-rift

Map: Bob King; Source: Stellarium

Although distance is a relative concept, the objects you will encounter here in the Milky Way star clouds are, yes, relatively close. I don't know the exact distances (they are known but, not by me) but if we are about two thirds of the way out from the galactic core, then you are able to look about a third of the way in towards the center before there are too many stars and too much gas and dust to see through (that is, if you are using a telescope working in the visible spectrum). If you are traipsing through the universe using a radio telescope that can see through much of the dust … why haven't you hosted a member star party? Hmmm? Anyway, the core itself is shrouded in dust but the star clouds we can

see still give an idea of our galaxy's central bulge. I've included a wide field illustration from Sky and Telescope magazine of the bright and dark areas of the summer Milky Way to get you oriented.

If you become enthralled with our local galaxy and all the objects contained therein and want to start observing them for yourself, you might need a guidebook. In that case, may I suggest, "The Night Sky Observer's Guide Volume 4," written by our own HAC member Robert "Bob" Kepple. A wonderful reference that goes well beyond those little phone sky apps. It can be your road map and tour guide to all the light and dark bits of our Milky Way (batteries not included).

In any case, be it by eye, binocs, baud rate, or book, get out there and stare.

Welcome our new members

John Cassella of Safford and Dwight Hoxie of Sierra Vista joined the club at the July meeting. John is a returning member and former officer of HAC. Dwight is the new astronomy instructor at Cochise College. Christopher, Mariela, and Oliver White also joined in July; they are our newest military family members.

Welcome! We are glad you joined.

At the August meeting

The August meeting of the Huachuca Astronomy Club will be held on Friday August 16 in the Library Commons at Cochise College. (The Student Union community room is unavailable). The meeting is at 7 pm.

Our speaker will be Dr. Daniel Apai of the University of Arizona's Lunar and Planetary Laboratory. Dr. Apai's research focuses on exoplanetary systems, including planet formation, planetary atmospheres, exoplanet discovery and characterization. His work covers habitable and non-habitable small exoplanets, gas giant exoplanets, and brown dwarfs.

Dine Under the Stars

This year's Dine Under the Stars fundraiser for the University South Foundation will be held on Saturday, October 5, 2019 from 6-9 pm adjacent to the Patterson Observatory. The event features dinner, music, live entertainment and stargazing at Patterson. There will be a live auction, a silent auction and a 50/50 raffle. All proceeds go toward scholarships for UA South students.

HAC members are asked to staff the observatory, but, more importantly, HAC members are asked to purchase tickets to the event. Your purchase of an adult ticket for $50 not only supports the foundation's efforts to provide scholarships, it also helps our representative to the foundation's board of directors (Ted Forte) fulfil his ticket sales obligation and maintain good standing on the board. See Ted at the meeting to purchase or reserve your tickets.

Your ticket gets you dinner, entertainment, two drinks, and the satisfaction that comes from helping a local student continue their education. You'll also be helping to maintain the club's access to the Patterson Observatory.

The foundation is the owner of the Patterson Observatory and HAC's symbiotic relationship with the University South Foundation is key to the club's autonomous use of the observatory. The Patterson Observatory serves as the focal point for astronomy outreach in our community and is the base of operations for the club. We store our property there, and hold meetings, events, and parties at Patterson free of charge.

The long-standing cooperative arrangement between the club and the foundation serves both organizations, is essential to the continued operation of the observatory, and is a great benefit to our community. Please support it and purchase a ticket if you can. You can also support the Dine Under the Stars event with cash donations (any amount is appreciated) and/or the donation of items for the silent auction (curios, gift baskets, artwork, jewelry, etc.)

The University South Foundation is a 501c3 charitable organization. 100% of the proceeds from Dine Under the Stars goes toward the foundation's charitable purpose!

Astronomy Class at Cochise College

Cochise College will be offering its introductory astronomy course this fall semester 2019. The instructor is new HAC member Dwight Hoxie who received his PhD in astronomy from the University of Arizona in 1969. His main astronomical interest is stellar structure and evolution and his PhD dissertation dealt with determining the minimum mass at which proto-stars can generate sufficient energy internally to maintain hydrostatic equilibrium and be full-fledged Main Sequence stars (about 0.7 times the mass of the Sun). He was a postdoctoral fellow at the State University of New York at Stony Brook and went on to join the Department of Physics and Astronomy at the University of Nebraska-Lincoln. In Nebraska, he heard the siren song of geology and joined the U.S. Geological Survey (USGS) as a groundwater hydrologist. His specialty was computer modeling of groundwater flow and he worked in Wyoming, Colorado, New Mexico and Nevada. After 30 years with the USGS he retired in 2003 to Tucson and in 2014 he moved to Nuevo Casas Grandes, Chihuahua, Mexico where he remained until moving to Sierra Vista in December 2019.

NASA Night Sky Notes August 2019

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!

Chill Out: Spot an Ice Giant in August

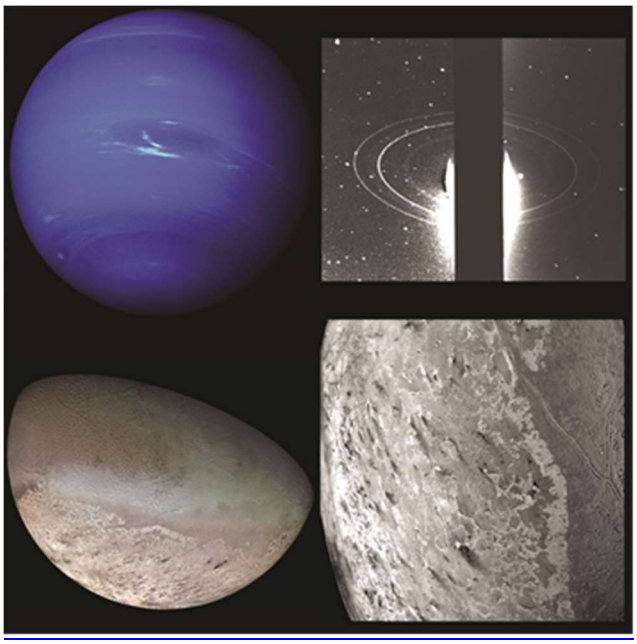
By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system's ice giants: **Neptune**! It's the perfect way to commemorate the 30th anniversary of Voyager 2's flyby.

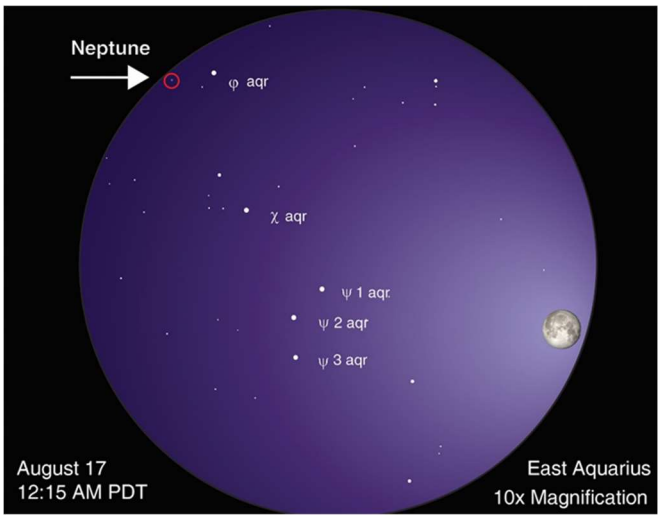
Neptune is too dim to see with your unaided eye, so you'll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won't change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars, but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon's glare overwhelms Neptune's dim light, you can still use its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope's eyepiece to zoom in as much as possible. Is the suspect blue "star" now a tiny disc, while the surrounding stars remain points of white light? You've found Neptune!

Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune's atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The "ice" in "ice giant" refers to the mix of ammonia, methane, and water that makes up most of Neptune's mass, located in the planet's large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA's Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet's surprisingly strong internal heating. Triton, Neptune's largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled "cantaloupe" terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet's rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA's past, present, and future missions, at nasa.gov



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune's rings; Triton and its famed icy cantaloupe surface; close of up Triton's surface, with dark streaks indicating possible cyrovolcano activity. Find more images and science from Voyager 2's flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL

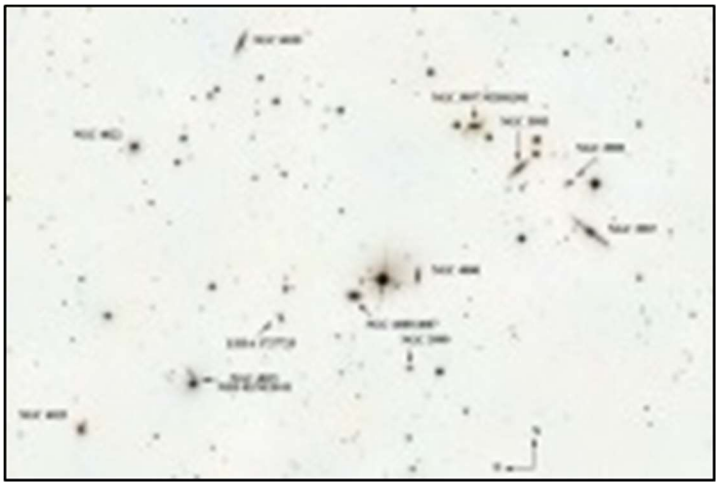


Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium.

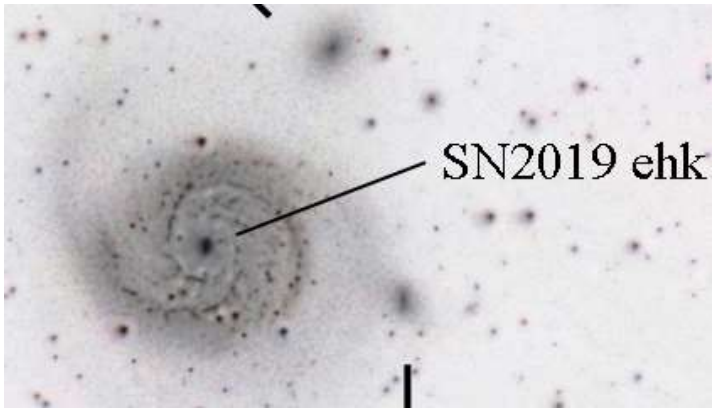
Pictures from HAC Members

M99 and M100 in Coma Berenices by Glen Sanner

M99 and M100 Inverted by Glen Sanner



Supernova 2019 ehk in M100 by Glenn Sanner



NGC 253 - Sculptor Galaxy Processed by Alex Woronow

Want Ads

FOR SALE: A nearly unused ZWO 1600 with CFW and filters, and an ASA 12" Astrograph

Contact Mike Mirot

FOR SALE: Nikon camera gear and lenses

Nikon D750 w/24-120 lens, five batteries, stock charger, Nikon mc-dc-2 remote cable release, box, manual, lens and body caps $1500
Nikon 80-400 zoom, lens caps, soft case $1275
Nikon 70-200 f/4, lens caps $900
Nikon 50mm f/1.8 G, 85mm f/1.8 G, lens caps $385 set
Tamron 15-30, lens caps, $775
Nikon D7200, Nikon 18-140 lens, Nikon 18-300 lens, Nikon mc-dc-2 cable release, two batteries, stock charger, manual, $1100 as a set

Contact Mike J. Shade at mshade@q.com

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HAC Aug/Sep Calendar of Events

SU	MO	TU	WE	TH	FR	SA
4 Aug	**5**	**6**	**7** 10:31 AM	**8**	**9** Jupiter 2° from moon Mercury western elongation	**10**
11 Jupiter stationary	**12** Saturn .04° N of Moon. Pluto 0.1° S of Moon Perseid Meteors	**13** Perseid Meteors	**14** Perseid Meteors	**15** 5:29 AM	**16** HAC Meeting Library Commons	**17**
18	**19**	**20**	**21**	**22**	**23** 7:56 AM	**24**
25	**26**	**27**	**28**	**29**	**30** 3:37 AM	**31**
1 Sep	**2** 	**3**	**4**	**5** 8:10 PM Patterson Public Night 7PM	**6** Jupiter 2° S of Moon	**7**
8 Saturn.04° N of moon Pluto 0.08° S of moon	**9**	**10** Neptune opposition	**11**	**12**	**13** 9:33PM HAC Meeting Student Union	**14**
15	**16**	**17**	**18** Saturn is stationary	**19**	**20**	**21** 7:41PM
22	**23** Autumnal Equinox 12:50AM	**24**	**25**	**26**	**27**	**28** 11:26 AM Mercury/Spica 1.4°
29	**30**	**1 Oct**	**2**	**3**	**4**	Huachuca Astronomy Club of Southeastern Arizona

All event times MST. Join **HacAstro** to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: HACAstro+subscribe@groups.io