NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

JUNE 2022

President's Message

We completed a very busy outreach month in May with well-attended public night May 5th, National Astronomy Day solar viewing at the SV library May 7th, and the Lunar Eclipse May 15th. We received a lot of praise from the attendees for our helpfulness and for making astronomy accessible to the community. Thank you to the many HAC members who brought their scopes and /or expertise to these events.

May 13th at our member meeting we learned a lot about occultations from member Vince Sempronio who has spent decades tracking and documenting occultations. We got to apply our new knowledge just 2 days later during the lunar eclipse when the moon occulted a star. Fun stuff.

At the May meeting Mark Orvek asked if there was interest in a workshop on PixInsight, a software used in astrophotography. As a result, he has organized a working session Jun 26, 6-9 p.m. (see separate flyer). Stacy Chitwood brought samples of braille plaques she is creating for the constellations to help with special needs outreach. In addition, Stacy and Vince volunteered to research ways to make HAC logo products available for members and guests. They will give us an update on their findings at our next meeting. I truly appreciate members seeing a need and working to create a solution. Thank you.

May was also the month for HAC to pay annual dues to the Astronomical League. As mentioned by Ted Forte, treasurer, those members who were not current on their dues were dropped. As a result, HAC has 95 members in 2022. This is down 17 from last year, which is about double the drop we normally see year to year. However, in 2021 HAC suspended our dues collection because we had no meetings [Covid], so overall the loss is about average. Most of the drops were among our elderly members, those that relocated out of the area, or joined on impulse but never attended a meeting. I want to thank Ted Forte for his dedicated work as treasurer to file the necessary tax documents, handle membership and coordinate our outreach program to name just a few of the tasks he does that keeps HAC running.

Our last public viewing night for Spring will be June 9th. We typically do not support public viewing in July and August due to the unpredictability of the monsoon weather.

See you under the stars.

Welcome our New Members

Sandra Calhoun of Sierra Vista joined the club this month. Sandra is the office manager for the University South Foundation. Also joining in June are Gregory and Rebekah Root. Welcome! We are glad you joined.

HAC Star Party Coordinator

Gary Grue was appointed the official HAC Member Star Party coordinator. He has been doing the job for the past several years and offering his home for HAC club night sky viewing events. This month we got to see Alpha Centauri thru his 24-inch telescope.

Gary will be reaching out to HAC members for night and solar viewing ideas and locations after the monsoon months. There has been discussion of other members who have observatories to host a HAC viewing event so that we can see the solutions to viewing that members have implemented in their backyard observatories.

July member Star Party

New members Esther and Kavi McGee have invited JAC members Sunday, June 26th to a Member Star Party at their home in Hereford. They invite HAC members to bring their own telescopes to view the night sky starting at 7:30 p.m. of course this event is weather dependent since we are heading into monsoon season. If we have rain, it will be rescheduled to July.

If you plan to attend, call or text Esther at 520 732 6947 for address and directions. They do have a lot of space and parking on and around their property but be warned: don't wear open shoes, cause it's scorpion and spider season.

Refreshment Request

June 9th will be the last public viewing night before the monsoons. We will however have member meetings in July and August. We need a volunteer(s) to bring refreshments for the meetings in July and August. Contact Karen Madtes ckmadtes3@yahoo.com if you can help.

Volunteer Opportunity

Even though we will not have a public night, we continue to do community outreach. We will host the Fort Huachuca Accommodation Schools summer field trip to the Patterson Observatory and the Discovery Gardens on Jun 28 and 29 from 8:30 a.m.-10:30 a.m. They have almost 200 kids grades K-5 (the kids listed as "K" are kids that have finished kindergarten) with about 100 kids/day with 6 to 8 adult instructors to assist.

We will be doing hands-on 30-minute activities at multiple "stations". We will use the prepared activities kits we have on-hand but need people to man the stations. We will need as many HAC volunteers as are available. You don't need to have expertise.

Contact Ted Forte if you are willing to help.

New HAC Outreach cards

This spring HAC initiated using an outreach card for Patterson Observatory Public Nights. They have been a great success. So, based on member suggestions we have updated the cards to include space for members to add their name or other contact info if desired and the HAC website. We encourage all HAC members who interact with the public individually or in a HAC outreach event to have a few on hand.

Student Field Trip to Patterson Observatory

We will be hosting large groups of students from the Fort Huachuca Accommodation School on Tuesday June 28 and Wednesday June 29 from 8:30 am and 10:30 am. There will be as many as 100 students each day that will be split by age groups into three rotations of 30-40 minutes each. (Classroom / Observatory / Discovery Gardens).

We need volunteers to help with the event. HAC has a closet full of Outreach Tool kits from both the Night Sky Network and National Informal Stem Education Network that just need a leader to conduct them. If interested in helping with this Outreach Event, contact Ted Forte.

Webb First Images

NASA has announced that the public release of the first science images from the James Webb Space Telescope will occur on July 12. We plan to have a community event at Patterson that day. It's expected that the images will be revealed during an expert panel that will be presented to designated sites (like Patterson) at 3pm MST. Watch your email and the hacastro group for more details as they become available.

Speaker for June Meeting – Dean Frazeur: Star Gazing for Grounded Living

Who is Dean Frazeur? Why should I listen to Him?

Dean and Carol Frazeur arrived 'out West' from 'back East' (VA.) three years ago, fulfilling one of his boyhood dreams. Their resident family members are two rescued K-9s, three dozen outdoor fish, and various wildlife wandering through their palatial estate in Hereford.

Dean's continuing professional experiences span four arenas: business management, higher education (community colleges), consultancy/counseling, and non-profit organizations. He earned four college degrees in pursuit of related calling competencies. He is passionate about Carol, college basketball and football, classical rock & roll, astronomy, and lifelong learning.

He enjoys engaging in relaxed 'what makes life worth living?' conversations with individuals and groups over meals, using recent neuroscience and human development research studies. Dean likes to quote guitarist Joe Walsh's (the Eagles) lyric from the song by the same name, "Life's Been Good (to Me So Far)," 1978.

NASA Night Sky Notes June 2022

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!

Solstice Shadows

David Prosper

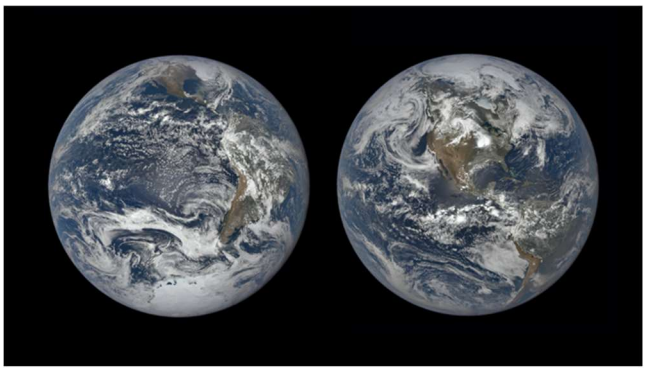
Solstices mark the changing of seasons, occur twice a year, and feature the year's shortest and longest daylight hours - depending on your hemisphere. These extremes in the length of day and night make solstice days more noticeable to many observers than the subtle equality of day and night experienced during equinoxes. Solstices were some of our earliest astronomical observations, celebrated throughout history via many summer and winter celebrations.

Solstices occur twice yearly, and in 2022 they arrive on June 21 at 5:13 am EDT (9:13 UTC), and December 21 at 4:48pm EST (21:48 UTC). The June solstice marks the moment when the Sun is at its northernmost position in relation to Earth's equator, and the December solstice marks its southernmost position. The summer solstice occurs on the day when the Sun reaches its highest point at solar noon for regions outside of the tropics, and those observers experience the longest amount of daylight for the year. Conversely, during the winter solstice, the Sun is at its lowest point at solar noon for the year and observers outside of the tropics experience the least amount of daylight- and the longest night – of the year. The June solstice marks the beginning of summer for folks in the Northern Hemisphere and winter for Southern Hemisphere folks, and in December the opposite is true, as a result of the tilt of Earth's axis of rotation. For example, this means that the Northern Hemisphere receives more direct light from the Sun than the Southern Hemisphere during the June solstice. Earth's tilt is enough that northern polar regions experience 24-hour sunlight during the June solstice, while southern polar regions experience 24-hour night, deep in Earth's shadow. That same tilt means that the Earth's polar regions also experience a reversal of light and shadow half a year later in December, with 24 hours of night in the north and 24 hours of daylight in the south. Depending on how close you are to the poles, these extreme lighting conditions can last for many months, their duration deepening the closer you are to the poles.

While solstice days are very noticeable to observers in mid to high latitudes, that's not the case for observers in the tropics - areas of Earth found between the Tropic of Cancer and the Tropic of Capricorn. Instead, individuals experience two "zero shadow" days per year. On these days, with the sun directly overhead at solar noon, objects cast a minimal shadow compared to the rest of the year. If you want to see your own shadow at that moment, you have to jump! The exact date for zero shadow days depends on latitude; observers on the Tropic of Cancer (23.5° north of the equator) experience a zero shadow day on the June solstice, and observers on the Tropic of Capricorn (23.5° south of the equator) get their zero shadow day on December's solstice. Observers on the equator experience two zero shadow days, being exactly in between these two lines of latitude; equatorial zero shadow days fall on the March and September equinoxes.

There is some serious science that can be done by carefully observing solstice shadows. In approximately 200 BC, Eratosthenes is said to have observed sunlight shining straight down the shaft of a well during high noon on the solstice, near the modern-day Egyptian city of Aswan. Inspired, he compared measurements of solstice shadows between that location and measurements taken north, in the city of Alexandria. By calculating the difference in the lengths of these shadows, along with the distance between the two cities, Eratosthenes calculated a rough early estimate for the circumference of Earth – and also provided further evidence that the Earth is a sphere!

Are you having difficulty visualizing solstice lighting and geometry? You can build a "Suntrack" model that helps demonstrate the path the Sun takes through the sky during the seasons; find instructions at stanford.io/3FY4mBm. You can find more fun activities and resources like this model on NASA Wavelength: science.nasa.gov/learners/wavelength. And of course, discover the latest NASA science at nasa.gov.

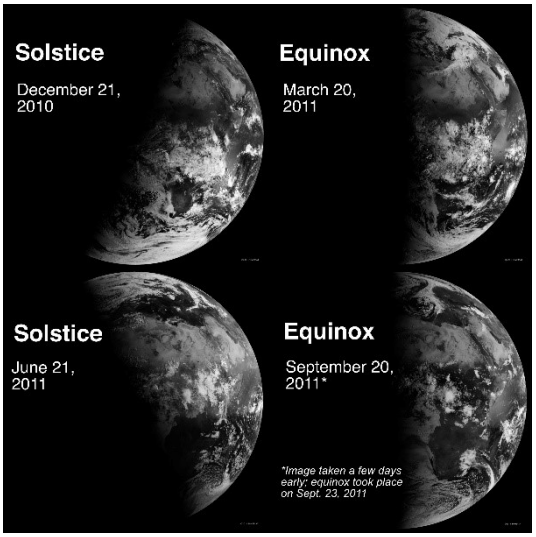


Credit: NASA/DSCOVR EPIC Source: https://www.nasa.gov/image-feature/goddard/2021/summer-solstice-in-the-northern-hemisphere

These images from NASA's DSCOVR mission shows the Sun-facing side of Earth during the December 2018 solstice (left) and June 2019 solstice (right). Notice how much of each hemisphere is visible in each photo; December's solstice heavily favors the Southern Hemisphere and shows all of South America and much of Antarctica and the South Pole, but only some of North America. June's solstice, in contrast, heavily favors the Northern Hemisphere and shows the North Pole and the entirety of North America, but only some of South America.

Credit & Source: Juan Velázquez / San Antonio Astronomy Club

A presenter from the San Antonio Astronomy Club in Puerto Rico demonstrating some Earth-Sun geometry to a group during a “Zero Shadow Day” event. As Puerto Rico lies a few degrees south of the Tropic of Cancer, their two zero shadow days arrive just a few weeks before and after the June solstice. Globes are a handy and practical way to help visualize solstices and equinoxes for large outdoor groups, especially outdoors during sunny days!



Scenes of Earth from orbit from season to season, as viewed by EUMETSAT. Notice how the terminator - the line between day and night - touches both the North and South Poles in the equinox images. See how the shadow is lopsided for each solstice, too: sunlight pours over the Northern Hemisphere for the June solstice, while the sunlight dramatically favors the Southern Hemisphere for the December solstice.

Source: bit.ly/earthequinox Images: NASA/Robert Simmon

Pictures from HAC Members

Omega Centauri by Mark Orvek

Globular Cluster NGC 6712 and Planetary IC 1295 by David Roemer

Occultation During Lunar Eclipse by JD Maddy

Galaxies M65 M66 NGC3628 by Mike Shade

Antennae Galaxies by Mark Orvex

Comic Found by Karen Madtes

Club Officers and Contacts

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HAC Jun-Jul 2022 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
5 Jun	**6**	**7** 7:48 AM	**8**	**9** Patterson Public Night 8:00PM	**10**	**11**
12	**13**	**14** 4:52 AM	**15**	**16**	**17** HAC Meeting 7PM Room A102	**18**
19 	**20** 8:11 PM	**21** Pixinsight workshop Patterson 6-9 p Summer Solstice 2:14 AM	**22**	**23**	**24**	**25**
26	**27**	**28** 7:52PM Ft Huachuca Accom School at Patterson	**29** Ft Huachuca Accom School at Patterson	**30**	**1 Jul**	**2**
3 Earth at aphelion	**4** 	**5**	**6** 10:55AM	**7**	**8**	**9**
10	**11**	**12** Webb First Images Community Event	**13** 11:37 AM Moon at perigee	**14**	**15** HAC Meeting 7PM Room A102	**16**
17	**18** Jupiter 2 d north of moon	**19**	**20** 7:18AM	**21**	**22**	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