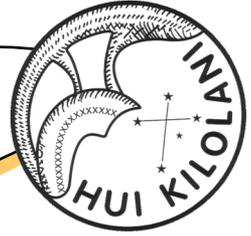


The Astronews



Volume 72, Issue 6

June 2022

www.hawastsoc.org

A word from your editor by Sapavith 'Ort' Vanapraks

As Hawaii COVID-19 case count daily average continues to stay high (800+), our HAS monthly meeting will continue to be an online meeting. Our public star party and school star party is also on hold. Let's hope that situation gets better by this summer so we can all go back to a similar life as 2019. At that time, we will announce it on our HAS website and in the AstroNews. Meanwhile, we will continue to have the club member only star party. We will be limiting the club party to the key master and 24 extra members. All attendees must be fully vaccinated. The monthly club meeting is now being done remotely via Zoom. Please check your email and website for an update.

May was an event full cloudy month. In early May, we had ETA Aquarids meteor shower peak on the morning of Friday, May 6, 2022. However, it was mostly cloudy that morning so we could not observe the shower. A partly cloudy forecasted for Sunday, May 8, 2022, morning. Tom and I decided to take a chance on ETA Aquarids. We were disappointed. At 4:30 AM, all we had was a cloudy morning. A little later, it cleared enough for us to be able to photograph the 4 planets (Jupiter, Venus, Mars, & Saturn)



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Upcoming Events:

- The next Board meeting is Sun., June 5th 3:30 PM. (**Zoom Meeting**)
- The next meeting is on Tue., June 7th at the Bishop Museum at 7:30 PM. —**Zoom Meeting**
- Bishop Museum's planetarium shows are every 1st Saturday of the month at 8:00 PM (**Online**) www.bishopmuseum.org/calendar

President's Message June 2022

Covid infections are very high in Hawaii now, but hospitalizations from it are relatively low. We will continue to monitor the situation, but at present we anticipate moving our monthly membership meeting to a hybrid format in August. We will resume meeting in the planetarium, but we will also hold the meeting on Zoom for those who wish to participate that way.

We are in good standing with Bishop Museum since we provided telescopes for an event there in May. Ort, Paul Lawler and I showed attendees the Moon, and Mark Watanabe showed up to operate the observatory telescope, but near-overcast conditions prevented us from showing any other celestial objects. We will wait until sometime after we begin our hybrid meetings in the planetarium to resume regular public star parties, but that should happen later this year.

Meteor showers occur regularly throughout the year, but it is rare to have a new one. Although touted as a "new meteor shower" by the press, the Tau Herculids, derived from debris from comet 73P Schwassmann-Wachmann, were first observed in 1930, only weeks after the comet's discovery. However, since 1995 73P has been disintegrating, and it has broken into many pieces.

What was new this year was that some fragments from the breakup have migrated far enough ahead of the comet to be in Earth's path when we passed nearest to the comet's orbit on May 30/31. It was unclear how fast the ejected debris was advancing ahead of the comet, so it was unknown whether an enhanced shower or even a meteor storm would occur. There was no storm, but a moderate number of meteors was seen by many mainland observers.

There was a narrow peak for the shower that occurred near sunset in Hawaii, so we were poorly placed. Also, gravitational perturbation has shifted the radiant to Bootes. The next enhanced Tau Herculid shower is expected in 2049, but continued disintegration of 73P may change that.

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Observer's Notebook—June 2022 by Ort

Planets Close to the Moon

Times are Hawaii Standard Time

- Jun 18, 6h, Moon 4.0° SE of Saturn; 122° from the Sun in the morning sky; magnitudes -11.2 and 0.7
- Jun 20, 10h, Moon 3.2° SE of Neptune; 94° from the Sun in the morning sky; magnitudes -10.2 and 7.9
- Jun 21, 7h, Moon 2.46° SE of Jupiter; 83° and 84° from the Sun in the morning sky; magnitudes -9.8 and -2.4
- Jun 22, 10h, Moon 0.86° SE of Mars; 70° from the Sun in the morning sky; magnitudes -9.2 and 0.5; occultation
- Jun 24, 13h, Moon 0.37° ENE of Uranus; 46° from the Sun in the morning sky; magnitudes -7.8 and 5.8; occultation
- Jun 25, 21h, Moon 2.60° NNW of Venus; 31° from the Sun in the morning sky; magnitudes -6.7 and -3.9
- Jun 26, 21h, Moon 3.9° N of Mercury; 20° from the Sun in the morning sky; magnitudes -5.8 and -0.4

Other Events of Interest

Times are Hawaii Standard Time

- Jun 4, 10h, Saturn stationary in longitude; starts retrograde motion
- Jun 5, 18h, Jupiter and Neptune at heliocentric conjunction; longitude 353.4°
- Jun 6, 23h, Daytime Arietid meteors; ZHR 30; near First Quarter Moon
- Jun 20, 14h, June (northern summer) solstice
- Jun 27, 16h, Neptune stationary in longitude; starts retrograde motion

Planets in June

 Mercury Best at end of month at mag. -0.6, rising 70 minutes before Sun.	 Venus Morning object. 7% waning crescent Moon nearby on morning of 26 June.	 Mars Appearing close to Jupiter at the start of June.
 Jupiter Morning planet, near Mars at the start of June. Last quarter Moon nearby on 21 June.	 Saturn Morning planet. Waning gibbous Moon nearby on the mornings of 18 and 19 June.	 Uranus Morning planet Uranus is not visible this month.
 Neptune is a morning planet, but not visible this month.	 Pluto (Dwarf Planet) is visible in the morning sky, becoming accessible around 23:25, when it reaches an altitude of 21° above your south-eastern horizon.	 4—Vesta (Asteroid) is visible in the dawn sky, rising at 23:47 (HST) and reaching an altitude of 53° above the southern horizon before fading from view as dawn breaks around 04:47.

Meeting Minutes

H.A.S. Secretary

May 3rd, 2022 7:30 PM (Zoom Meeting)

Andy Stroble

Meeting called to order at 7:32 pm. By President Chris Peterson. 17 participants were present.

Minutes from the March and April meetings were approved with minor changes.

Hybrid meetings at the Bishop Museum Planetarium will be put off until August when Joanna returns.

Reports on HAS participation at the Institute for Astronomy Open House (April 10th) and the Ellison Onizuka Day of Exploration (April 23rd) at Ford Island with the Boy Scouts were given. Sky was not cooperative for solar viewing at Ford Island.

Bishop Museum event on May 10 expects 100 in attendance. Volunteers to bring ‘scopes, Ort, Paul, and Mark.

Nick alerted us to an event in Kakaako at SALT parking garage roof, May 28th, expected to be over by 8:30 pm.

NASA news: Mars sample return mission, Ingenuity helicopter is well beyond planned missions.

Ort showed some photos of sun spots, taken after he returned from the Onizuka event. “Isn't that the way they say it goes?” Sorry, Jim Croce. Boy Scouts have a Merit badge in astronomy, so perhaps the club can provide some guidance.

President Chris Peterson shared a video of the Aurora Borealis.

Tom noted that the Tau Herculis are well placed for us decent folk. Plans for a viewing group?

Ort gave details on the total lunar eclipse that unfortunately will only be partial by the time the moon rises for us, on May 15.

Tom Giguere reported on the Lunar and Planetary Science Conference held on-line, and in Texas, March 7–11. Some discussion of Mars meteorites, future Lunar missions, and Lunar water.

Adjourned at 9:03 pm. There were 20 participants.
Faithfully submitted, James Andy Stroble, Secretary.

Hawaiian Astronomical Society
Event Calendar

June 2022						
◀ May						Jul ▶
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5 BoD Meeting 3:30 PM Zoom	6	7  1st Qtr 4:48 AM Club Meeting 7:30 PM Zoom	8	9	10	11
12	13	14 Flag Day  Full Moon 1:48 AM Strawberry Moon	15	16	17	18 Club Party 7:00 PM Dillingham Airfield Sunset 7:15 PM
19 Father's Day	20  3rd Qtr 5:10 PM	21 Start of Summer (Summer Solstice)	22	23	24	25 Club Party 7:00 PM Dillingham Airfield Sunset 7:16 PM
26	27	28  New Moon 4:52 PM	29	30	Notes:	

<<Upcoming Star Parties>>

Club Party-Dillingham June 18 —7:00 PM

Club Party Dillingham June 25 —7:00 PM

Public Party Geiger/Kahala June 4 — CANCELLED

Upcoming School Star Parties

NASA's Night Sky Notes

Solstice Shadows

By 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.

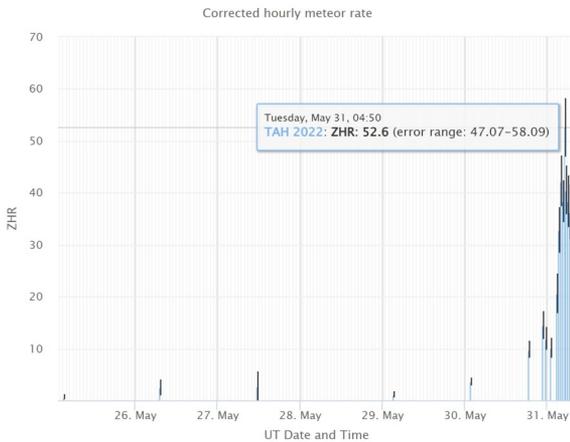
(Continued on page 9)

Tau Herculids (061 TAH) Field Report – Ort and I traveled to Mokulē‘ia Army Beach on the north shore, which is across from Dillingham Air Field, to view this meteor shower. The peak was predicted to be in the narrow window between 6:55pm and 7:17pm on May 30th. Unfortunately for our Hawaii location it wouldn’t be dark for another hour. We set up our cameras, watched the marvelous sunset and awaited the the event. The first meteor appeared around 8 o’clock. Ort had just bent down to check something, while I and a camper who had just wandered over saw it. The camper was estatic and was exclaiming how lucky we were to see this giant meteor. Indeed, it was a nice one, bright at about magnitude 1, orange in color and very slow. The Tau Herculids have the lowest velocity (16 km/sec) of all meteor showers; this is less than half of the velocity of the December Geminids (35 km/sec). Since this shower was expected to have a narrow peak we didn’t need to observe for a long time. We observed from 8 - 9:30 PM and counted 20 Tau Herculids from 8-9 pm with 2 Sporadics. Then, in the next half hour we saw 5 more Tau Herculids, Our total for the night, from 8-9:30 was 25 Tau Herculids and 2 Sporadics. The early reports from the International Meteor Organization (see graph) show that the shower had a short duration

τ Herculids 2022 ZHR Graph



(Continued on page 11)



The Tau Herculids ZHR leading up to the peak on May 30th HST as of 5/31/2022. The ZHR (Zenithal Hourly Rate) is the number of meteors an observer would see under a very dark sky with the radiant of the shower at the zenith. Compiled from 28 worldwide observers by the IMO.

Phases of the Moon (courtesy timeanddate.com)

New Moon	First Quarter	Full Moon	Last Quarter
June 28	June 07	June 14	June 20

Shower	Activity	Maximum		Radiant		V _∞ km/s	r	ZHR
		Date	λ _☉	α	δ			
Dayt. Ari-etids (171 ARI)	May 14 - Jun 24	Jun 07	76.6 °	44°	+24 °	38	2.8	30
June Bootids (170 JBO)	Jun 22 - Jul 02	Jun 27	95.7 °	224 °	+48 °	18	2.2	Var

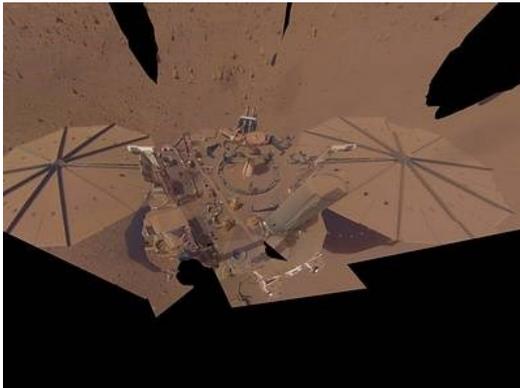
Observing new meteor showers helps our understanding of meteor showers in general ... Tom Giguere, 808-782-1408, thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737

Cash Flow - 4/11/2022 to 5/9/2022

Beginning Balance	\$4,709.99
Money into selected accounts comes from	
Total Money In	\$0.00
Money out of selected accounts goes to	
Total Money Out	
Difference	\$0.00
Ending Balance	\$4,709.99

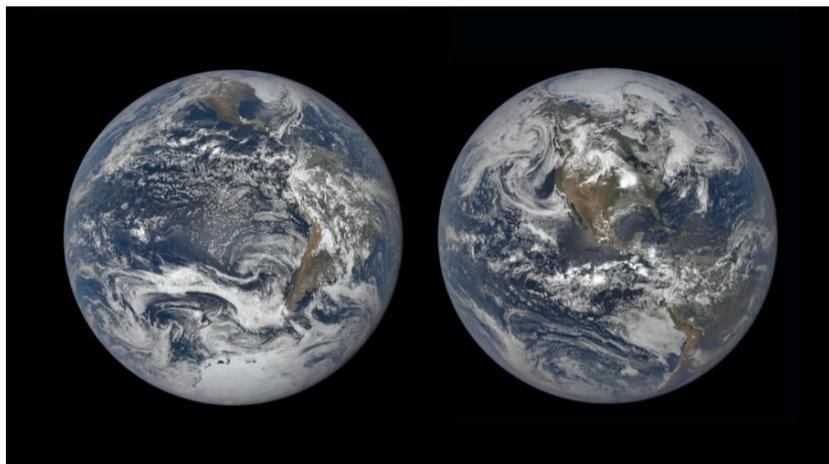
There was no bank activity for the period ending May 9. There will be quite a bit in the next one. I want to welcome all newcomers, and those who have renewed.

The Covid numbers keep going up. Even with the artificially depressed numbers over the Memorial Day weekend the daily average is 896 for Oahu. Last month, the numbers were 246. Hospitalizations are 141 (31 last month) for Oahu. ICU usage has gone up, but remains in single digits (8 as compared to 1 last month). Hang in there; protect yourselves; and enjoy the sky.



InSight's Final Selfie
NASA's InSight Mars lander took this final selfie on April 24, 2022, the 1,211th Martian day, or sol, of the mission. The lander is covered with far more dust than it was in its first selfie, taken in December 2018, not long after landing – or in its second selfie, composed of images taken in March and April 2019.

Image Credit: NASA/JPL-Caltech



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



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!

Credit & Source: Juan Velázquez / San Antonio Astronomy Club

Note to Editors: The images attached to March's "Embracing the Equinox" article can also be used with this article if desired, though slight updates to the captions might be desired to change to focus from equinox to solstice. You can find the archive at: <https://nightsky.jpl.nasa.gov/docs/PartnerArticleMarch2022.zip>

(Continued from page 1) Editor Note

alignment. Cloud returned and blocked the view of the early morning ISS solar transit. Another one bit the dust for me on ISS transit.

A week later on Sunday, May 15, 2022, we had an early evening partial Lunar Eclipse from the time that the Moon rose at 7:01 PM to 7:55 PM. Tom and I had selected Pu'uloa Beach Park at the very end of Fort Weaver Rd. to observe and shoot the Lunar Eclipse. At 6 PM that day at Hoalauna Dog Park in Ewa, it started to rain. My family and I drove to Pu'uloa Beach Park. It was not raining there. Tom showed up a few minutes later. We set up our gears. At 7:01 PM, we could not see the Moon. We did not see the Moon until 10 minutes later after it rose over Haleakala Mountain. We were able to get some photos until the Moon went into a low cloud layer at 7:40 PM.



On Thursday, May 26, 2022, there was a Lahaina Noon event in Hawaii. Lahaina Noon or Zero Shadow Day is happened to the area between the tropics of Cancer (23.5 degree north) and the tropic of Capricorn (23.5 degree south). At 12:29 PM in Honolulu, when the Sun was at the zenith, the mayor office had a celebration by Honolulu Hale at Sky Gate where it projected a perfect circle to the ground. I was not fortunate enough to go to Honolulu Hale so I took some photos around my office. (Center pole has no shadow.)

On Monday, May 30, 2022, there were two events that I planned to take photos of. First event was the ISS Solar transit at 1:20 PM by Nimitz Beach. At 1:19 PM, Sun popped out from the cloud for me to focus. However, at 1:20 PM, cloud rolled back in and blocked the Sun. A few minutes later when I packed my telescope, the Sun came back out and laugh at me. Luckily, the second event, Tau Hercurids meteor shower went successfully. I managed to capture some photos of the meteor. You can read more about it in Tom's Meteor Log on page 7.



Tau Hercurids photo taken by Ort at Mokuē'ia Army Beach facing South West. On Monday, 5/30/2022, at 8:15 PM

(Continued from page 7) *Meteor Logs*

and peaked at 6:50pm Hawaii time with 50+ ZHR. This peak time is remarkably close to the predicted peak time.

June meteor showers:

The Arietids radiant is located only about 30° west of the Sun, hence possibilities for optical observations are very limited. The low radiant elevation by the time morning twilight is too bright means the number of shower meteors recorded by individual video or visual observers is always low. Consequently, an ongoing IMO project to pool data on the shower using all techniques was initiated in 2014, to combine results from many independent observing intervals, even those periods which contain few, or even no ARI meteors. The currently available video data do not show a clear profile but a recognizable activity level (indicating an even higher ZHR as given above) over a week or so for which we show the radiant drift. Hence all contributions for this project will be most welcome! Since both the correction factor for radiant elevation and the observing conditions change rapidly in the approach to morning twilight in early June, it is recommended that visual observers break their watches into short intervals (of the order of about 15 minutes), determining the limiting magnitude frequently for each interval. Observers at latitudes south of about 30°N are better placed because of the significantly poorer twilight conditions further north in June.

The June Bootids (170 JBO) shower is listed since its unexpected return of 1998 (ZHR 50 – 100+ for more than half a day). Another outburst of similar length (ZHR ≈ 20–50) was observed on 2004 June 23. The return predicted in 2010 yielded a poorly established ZHR < 10 on June 23–24. Prior to 1998, only three more probable returns had been detected, in 1916, 1921 and 1927 (however, with different reliability). The orbit of the parent comet 7P/PonsWinnecke (orbital period about 6.4 years, last perihelion passage on 2021 May 27) currently lies around 0.24 astronomical units outside the Earth's at its closest approach. The 1998 and 2004 events resulted from meteoroids ejected from the comet in the past when the comet was still in a different orbit. For the 2022 return, there are no predictions of peculiar activity published.



Two Tau Herculid meteors, sourced to comet 73P/Schwassmann-Wachmann 3 (SW3), were captured on May 30, 2022. Left: 8:54pm, below the bowl of the big dipper; Right: 9:26pm, in Draco's head. Photo: Thomas Giguere, Mokuĕ'ia Army Beach.



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Partial Lunar Eclipse Transit

A plane taking off from The Daniel K. Inouye International Airport (HNL) transited the partial Lunar Eclipse as seen from Pu'uila Beach Park, Ewa Beach, Oahu, Hawaii on Sunday, 5/15/2022, 7:27 PM.

Image Credit: Ort