THE ASTRONEWS

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December 2023

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A word from your editor by Sapavith 'Ort' Vanapruks

There is no guest speaker for December. So, it is an open microphone night. If you have anything you would like to discuss or photos to share, you may do so.

This month, we have a couple of school star parties lined up. The first one is Waiahole Star Party on Friday, 12/15/2023, from 6:30 PM – 8:30 PM at Waiahole School Field. The second one is GLOW Homeschool Co-Op Star Party on Wednesday, 12/20/2023, from 6:30 PM – 8:00 PM at Halawa Beach Park. Mark Watanabe will be sending emails asking for help. If you can help, please sign up.

Our two-star parties at Dillingham Airfield for November 2023 did not go off as planned. The army had a large multinational training that needed to use the field. Our in-town star party on Saturday, 11/18/2023, was not too bad. Kahala Community Park had some clouds at the beginning, it cleared up. Quite a few people showed up there. At Geiger Community Park, Tom had his telescope up. I was there also ready to put mine up, but we had no visitor at all. Let's hope we have a better December.

In December, the Geminids Meteor Shower will be peaking on the night of

(Continued on page 11)

Inside this issue:

Upcoming Events:

- The next Board meeting is Sun., Dec. 3rd 3:30 PM. (**Zoom Meeting**)
- The next meeting is on Tue., Dec. 4th at the Bishop Museum at 7:30 PM. —**Hybrid (In person and Zoom) Meeting**
- Bishop Museum's planetarium show "The Star Tonight" is every 1st Saturday, 12/2/2023, of the month at 7:00 PM

President's Message
December 2023

One of the things I love about astronomy, and science in general, is that knowledge is always increasing. Sure, mistakes can be made, and sometimes we have to revise what we thought we knew, but science is self-correcting. Data, hypotheses, and reasoning are made public, and others are free to replicate research to discover errors.

Sometimes new observations produce interesting new data, such as spacecraft Lucy's recent flyby of asteroid Dinkinesh (while on its way to Jupiter to study its co-orbiting Trojan asteroids) that revealed that not only does Dinkinesh have a satellite, but one that is a contact binary, the first ever discovered orbiting another asteroid. Other advances are theoretical, such as the recent claim that remnants of Theia, the Mars-size or larger object that impacted the proto-Earth and created our Moon, left large portions of itself in Earth's lower mantle that have remained unmixed with the rest of the mantle for 4.5 billion years. While this idea has not yet gained universal acceptance, it is a reminder of how much we may still be able to learn in unexpected places.

While scientific findings are not always welcomed and are sometimes politically suppressed, we are far beyond the days when destruction of a library or other data archive could result in the lasting reduction of the planet's knowledge. Widespread duplication of digital versions of books and journals makes restricting knowledge much more difficult than it was in the past. I doubt that it will ever be possible, as long as civilization survives, to destroy the accumulated knowledge of our planet, even if such knowledge is not always sufficiently appreciated.

It is as difficult to imagine the end of learning as it is to imagine the size of the universe. We are fortunate to live in a time when so much is being learned so quickly and shared so freely. Our understanding of the universe will surely continue to grow.

It is not difficult to imagine what would happen to HAS without officers to run it: it would cease operating. We will elect board members at our December meeting. Please consider running for office. Nominations will be accepted until the votes are taken.

Hawaiian Astronomical Society
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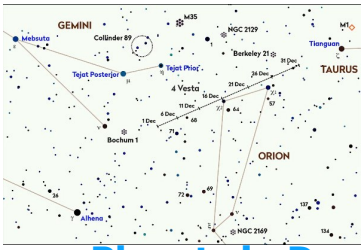
Observer's Notebook—December 2023 by Ort

Planets Close to the Moon
Times are Hawaii Standard Time

Dec 9, 5h, Moon 3.3° SSW of Venus; 42° from Sun in morning sky; magnitudes -7.7 and -4.1
Dec 11, 18h, Moon, Mars, and Antares within circle of diameter 4.99°; about 10° from the Sun in the morning sky; magnitudes -5, 1, 1
Dec 12, 0h, Moon 3.5° S of Mars; 8° and 7° from Sun in morning sky; magnitudes -4.8 and 1.4
Dec 13, 20h, Moon 4.4° S of Mercury; 17° and 16° from Sun in evening sky; magnitudes -5.8 and 0.6
Dec 17, 15h, Moon 2.30° SE of Saturn; 67° and 66° from Sun in evening sky; magnitudes -9.3 and 1.0
Dec 19, 5h, Moon 1.19° SE of Neptune; 88° from Sun in evening sky; magnitudes -10.2 and 7.9; occultation
Dec 22, 3h, Moon 2.39° NNW of Jupiter; 125° from Sun in evening sky; magnitudes -11.3 and -2.7
Dec 23, 4h, Moon 2.61° NNW of Uranus; 138° from Sun in evening sky; magnitudes -11.7 and 5.7

Other Events of Interest
Times are Hawaii Standard Time

Dec 7, 15h, Earliest sunset, at latitude 40° north
Dec 13, 14h, Geminid meteors; ZHR 150; 1 day after new Moon
Dec 21, 2h, Asteroid 4 Vesta at opposition in longitude; magnitude 6.4
Dec 22, 14h, Ursid meteors; ZHR 10; 3 days after first quarter Moon
Dec 24, 0h, Moon 1.00° SE of Pleiades; 148° from Sun in evening sky
Dec 28, 3h, Moon 1.71° S of Pollux; 162° from Sun in morning sky; magnitudes -12.2 and 1.2



Minor planet Vesta reaches opposition on 21 December 2023 when it will shine at mag. 6.3 against the stars of northern Orion. Credit: Pete Lawrence

Planets in December

☿ Mercury

Best in the morning sky on 31 December, Mercury is visible one hour before sunrise low above the southeast horizon.

♀ Venus

Bright morning planet, best at start of December when near Spica (Alpha (α) Virginis). The Moon is close on 9 December.

♂ Mars

Currently in the morning sky, but too close to the Sun to see well.

♃ Jupiter

Planet-spotting over christmas 2023? Jupiter is one of the best planets tonight. It's superbly bright in December. The Moon lies nearby on the evenings of 21 and 22 December.

♄ Saturn

Well-placed in early December, but loses altitude later in the month. The Moon is close on 17 December.

♅ Uranus

Well-placed evening planet, near Jupiter. 3º south of Botein (Delta (δ) Arietis).

♆ Neptune

Evening planet south of the Circlet. Loses altitude towards month end.

♇ Pluto (Dwarf Planet)

is not observable – it will reach its highest point in the sky during daytime and is no higher than 18° above the horizon at dusk.

4—Vesta (Asteroid)

is visible between 20:06 and 05:54. It will become accessible at around 20:06, when it rises to an altitude of 21° above your eastern horizon.

Meeting Minutes

H.A.S. Secretary

October 7th, 2023 7:30 PM (Bishop Museum Planetarium and Zoom Meeting)
Andy Stroble

Meeting called to order at 7:30pm by President Chris Peterson.

Elections are next month. Incumbents have all agreed to stand for re-election. New volunteers are encouraged, however. The club cannot run without a board. It may be your time to serve.

Attending for the first time were Eric the Red, and Vlad Pinich (apologies for spelling).

Star Party at Dillingham/Kawaihaupai Airfield on 11/ 4 was cancelled due to military exercises.

West Hawaii Astronomy Club club has extended an invitation to their November 14th meeting, where they will have Mirror expert, Carl Zambuto, as a speaker.

Our traditional December meeting potluck will be suspended for this year.

School Star Parties: Mark says we have enough volunteers for the Iolani school star party, but we have requests from Waihole Elementary, and a home-school consortium at Haleiwa Beach park on the 20th. Chris is still in contact with people from the Hickam Library, updates to be posted.

Finally, a motion was made to approve the minutes of the prior meeting, Seconded by someone, passed unanimously.

Tom Giguere announced he has some foam pads from a huge hard drive shipping box, which might be suitable for eyepiece boxes and so forth, if anyone wants them

Don Andere shared some images of the annular eclipse, using eyepiece projection.

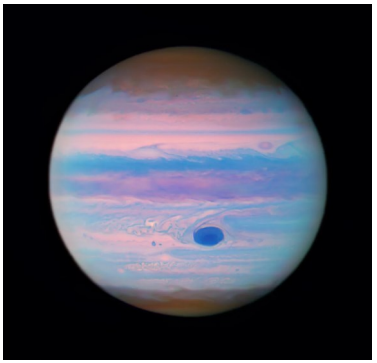
Our speaker for the evening was Tom Field, former contributing editor to Sky & Telescope Magazine, who enlightened (sorry, puns are in my nature) us about spectrography in amateur astronomy. Information can be found at his website, https://www.rspec-astro.com/ .

The board apologizes for the glitches in the speakers presentation, due to software shortfalls on our part.

Adjourned at 9:05pm HST.

There were 15 persons physically present, and 15 on Zoom (with no redundancy).

Faithfully submitted,
James Andy Stroble, Secretary.
Honolulu, Hawaii



Hubble Provides Unique Ultraviolet View of Jupiter

Jupiter looks iridescent in this ultraviolet image from the Hubble Space Telescope. The poles are a muted orange color, while swirls and stripes of pink, orange, blue, and purple cover the rest of the planet. Jupiter's "Great Red Spot" appears a deep blue here

Image Credit: NASA, ESA, and M. Wong (University of California – Berkeley); Processing: Gladys Kober (NASA/Catholic University of America)

December 2023

◄ Nov | Jan ►

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 Public Party Dillingham Airfield 7:00 PM
3 BoD Meeting Zoom 3:30 PM	4  3rd Qtr 7:49 PM	5 General Meeting Bishop Museum Hybrid 7:30P	6	7	8	9 Club Party Dillingham Airfield 7:00 PM
10	11	12  New 1:32 PM	13	14	15 Waiahole Star Party Waiahole School 6:30 PM - 8:30 PM	16 Public Party Kahala / Geiger 7:00 PM
17	18	19  1st Qtr 8:39 AM	20 GLOW Star Party Haleiwa Beach 6:30 PM - 8:00 PM	21 Start of Winter (Winter Solstice)	22	23
24	25 Christmas	26  Full 2:33 PM	27	28	29	30
31	Notes:					

<<Upcoming Star Parties>>

Public Party-Dillingham December 2 — 7:00 PM
Club Party Dillingham December 9 —7:00 PM
Public Party Geiger/Kahala December 16 — 5:48 PM

Upcoming School Star Parties

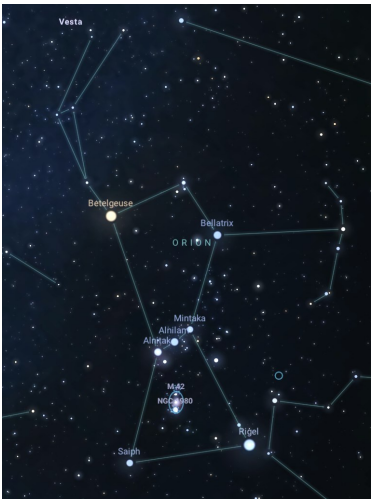
Date	Time	Location
Dec 15	6:30 PM	Waiahole Elementary School
Dec 20	6:30 PM	GLOW Home School

NASA's Night Sky Notes

A Flame in the Sky – the Orion Nebula

By Kat Troche

It's that time of year again: winter! Here in the Northern Hemisphere, the cold, crisp sky offers spectacular views of various objects, the most famous of all being Orion the Hunter.



Credit: Stellarium Web

As we've previously mentioned, Orion is a great way to test your sky darkness. With your naked eye, you can easily spot this hourglass-shaped constellation. Known as an epic hunter in Greco-Roman, Orion and all its parts have had many names and meanings across many cultures. In Egyptian mythology, this constellation represented the god Sah. The Babylonians referred to it as The Heavenly Shepard. In most cultures, it is Orion's Belt that has many stories: Shen in Chinese folklore, or Tayamnicankhu in Lakota storytelling. But the Maya of Mesoamerica believed that part of Orion contained The Cosmic Hearth – the fire of creation.

1,500 light years away from Earth sits the star-forming region and crown jewel of Orion – Messier 42 (M42), the Orion Nebula. Part of the "sword" of Orion, this cloud of dust and gas sits below the first star in Orion's Belt, Alnitak, and can easily be spotted with the naked eye under moderate dark skies. You may also use binoculars or a telescope to resolve even more details, like the Trapezium: four stars in the shape of a baseball diamond. These young stars make up the core of this magnificent object.

Of course, it's not just for looking at! M42 is easily one of the most photographed nebulae around, by astrophotographers here on the ground, large ground-based observatories, and space telescopes alike. It has long been a place of interest for the Hubble, Spitzer, and Chandra X-ray Space Telescopes, with James Webb Space Telescope joining the list in February 2023. Earlier this year, NASA and the European Space Agency released a new photo of the Orion Nebula taken from JWST's NIRCam (Near-Infrared Camera), allowing scientists to image this early star forming region in both short and long wavelengths.

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Meteor Log—December 2023

by Tom Giguere

The month of December features the Geminid meteor shower. This shower, the most productive of the year, is the favorite of the Meteor Group for its reliability and high rates of meteors per hour. The Geminid (004 GEM) radiant is well north of the celestial equator and rises about sunset, reaching a usable elevation from the local evening hours onwards. Best views occur after midnight.

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Geminid meteor observing site at Mokulē'ia Army Beach

Phases of the Moon (courtesy timeanddate.com)

First Quarter	Full Moon	Last Quarter	New Moon
December 19	December 26	December 4	December 12

Shower	Activity	Maximum		Radiant		V_∞	*r*	ZHR
		Date	λ⊙	α	δ	km/s		
Phoenicids (254 PHO)	Nov 28 - Dec 09	Dec 02	250°	18°	-53°	18	2.8	Var
Puppid/ Velids (301 PUP)	Dec 01 - Dec 15	Dec 07	255°	123°	-45°	40	2.9	10
Monoce-rotids (019 MON)	Dec 05 - Dec 20	Dec 09	257°	100°	+08°	41	3.0	3
σ-Hydrids (016 HYD)	Dec 03 - Dec 20	Dec 09	257°	125°	+02°	58	3.0	7
Geminids (004 GEM)	Dec 04 - Dec 20	Dec 14	262.2°	112°	+33°	35	2.6	150
Comae Ber-enicids (020 COM)	Dec 12 – Feb 04	Dec 16	264°	158°	+30°	64	3.0	3
Ursids (015 URS)	Dec 17 - Dec 26	Dec 23	270.7°	217°	+76°	33	2.8	10

The Geminids will put on a great show this month – don't miss it! For more info: Thomas Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737. Thanks to the IMO and the AMS for observing information.

Treasurer's Report

by Peter Besenbruch

Cash Flow - 10/10/2023 to 11/9/2023

Beginning Balance	**$5,636.28**
Money into selected accounts comes from	
Donation	$162.00
Membership - Electronic	$226.00
Membership - Family	$16.00
Membership - Paper	$78.00
Membership - Paper - Student	$32.00
Subscription - Astronomy	$68.00
Total Money In	**$582.00**

Money out of selected accounts goes to	
Total Money Out	**$0.00**

Difference	$582.00

Ending Balance	**$6,218.28**

Here are the financials up through November 9.

Thanks to everyone who paid, renewed, and donated.

Covid cases have risen on the mainland, but not so much here in Hawaii. Wastewater reporting stations report either small decreases, or small increases on Oahu. The CDC is tracing the JN1 variant of the BA2.86. BA2.86 was a "variant of concern" in France, but it fizzled this Fall. Then it mutated, and the JN1 variant is spreading rapidly on the mainland. The bad news is that it has the ability to avoid some of the antibodies produced by the latest vaccines. Earlier vaccines are not effective is stopping this one. JN1 hasn't hit us in large numbers yet, but give it time.

See you under the stars, if the military quiets down and the rains quit.

Seeing Sagittarius C in a New Light

A star-forming region, named Sagittarius C (Sgr C), is seen in exceptional detail in this image from Nov. 20, 2023, thanks to the Near-Infrared Camera instrument on NASA's James Webb Space Telescope. An estimated 500,000 stars shine in this image of the Sgr C region, along with some never-before-seen features astronomers have yet to explain.

Image Credit: NASA, ESA, CSA, STScI, and S. Crowe (University of Virginia)

ESA/Webb, NASA, CSA, M. Zamani (ESA/Webb), PDRs4ALL ERS Team

But stars aren't the only items photographed here. In June 2023, JWST's NIRCam and MIRI (mid-infrared instrument) imaged a developing star system with a planetary disk forming around it. That's right – a solar system happening in real time – located within the edges of a section called the Orion Bar. Scientists have named this planet-forming disk d203-506, and you can learn more about the chemistry found here. By capturing these objects in multiple wavelengths of light, we now have even greater insight into what other objects may be hiding within these hazy hydrogen regions of our night sky.

In addition to our Dark Sky Wheel, a fun presentation you can share with your astronomy club would be our Universe Discovery Guide: Orion Nebula, Nursery of Newborn Stars activity. This will allow you to explain to audiences how infrared astronomy, like JWST, helps to reveal the secrets of nebulae. Or, you can use public projects like the NASA-funded MicroObservatory to capture M42 and other objects.

Learn more about what to spy in the winter sky with our upcoming mid-month article on the Night Sky Network page through NASA's website!

Details from Webb's Cameras Reveal Crabby Composition

The James Webb Space Telescope captures new details of the Crab Nebula, 6,500 light-years away, in this image released on Oct. 30, 2023. While these remains of an exploded star have been well-studied by multiple observatories, including the Hubble Space Telescope, Webb's infrared sensitivity and resolution offer new clues into the makeup and origins of this scene

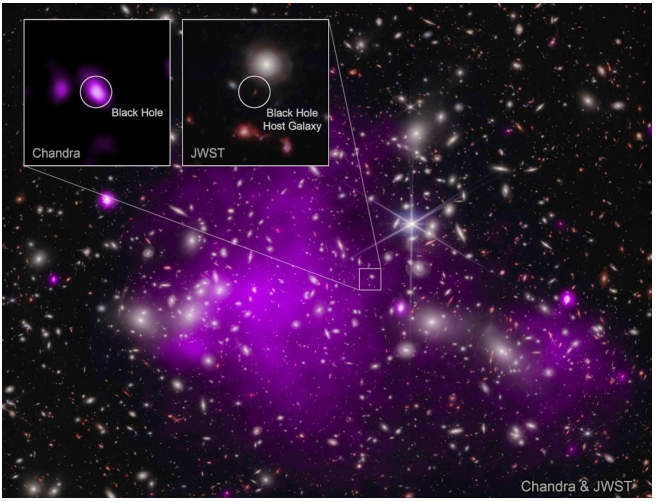
Image Credit: NASA, ESA, CSA, STScI, T. Temim (Princeton University)

(Continued from page 7) - Meteor Log

The peak has shown little variability in its timing in recent years, with the more reliably-reported maxima during the past two decades all having occurred within $\lambda = 261.^\circ5$ to $262.^\circ4$, that is 2023 December 14, 03h to 24h UT. During high activity, observers should report their count data [to the IMO or AMS] for short intervals (no longer than 15 minutes).

Geminid Observing Session – Interested meteor observers are welcome to join the group on Oahu's north shore. Details: Dec 13/14 (Wed/Thu), dusk-to-dawn at Mokulē'ia Army Beach (see picture, green arrow). For more information contact Tom at the phone/email at the end of this article. If you independently observe, pls send me your observations.

Just before (and during?) the Geminid maximum there is a chance to observe meteors released from comet 46P/Wirtanen (the initial target of the Rosetta comet exploring mission) on December 12, around 11h20mUT ($\lambda = 260.^\circ11$). Vaubaillon writes: this is the first time I see a trail of this comet is crossing the Earth's orbit. The 1974 trail is quite young and we have no clue concerning the flux density. Most interestingly, the radiant is split in two very different regions in the sky – something requiring detailed data and analysis. Most of the activity should be related to a radiant about 10° north of α Phoenicis in Sculptor, the other radiant is between α Pegasi and γ Piscium. Meteors should be very slow with $V\infty = 10$km/s and $V\infty = 13$km/s, respectively.



UHZ1: Distant Galaxy and Black Hole

Explanation: Dominated by dark matter, massive cluster of galaxies Abell 2744 is known to some as Pandora's Cluster. It lies 3.5 billion light-years away toward the constellation Sculptor. Using the galaxy cluster's enormous mass as a gravitational lens to warp spacetime and magnify even more distant objects directly behind it, astronomers have found a background galaxy, UHZ1, at a remarkable redshift of Z=10.1. That puts UHZ1 far beyond Abell 2744, at a distance of 13.2 billion light-years, seen when our universe was about 3 percent of its current age. UHZ1 is identified in the insets of this composited image combining X-rays (purple hues) from the spacebased Chandra X-ray Observatory and infrared light from the James Webb Space Telescope. The X-ray emission from UHZ1 detected in the Chandra data is the telltale signature of a growing supermassive black hole at the center of the ultra high redshift galaxy. That makes UHZ1's growing black hole the most distant black hole ever detected in X-rays, a result that now hints at how and when the first supermassive black holes in the universe formed.

Image Credit: X-ray: NASA/CXC/SAO/Ákos Bogdán; Infrared: NASA/ESA/CSA/STScI;
Image Processing: NASA/CXC/SAO/L. Frattare & K. Arcand

(Continued from page 1) - *word from your editor*
Wednesday, 12/13/2023. It will reach Zenith around 2:20 AM. Moon is one day after new so it will not affect the shower. Tom has more details in Meteor Log on page 7. Let's hope we have a clear night. Also if you have any photo of Geminids Meteor, please have it ready to share in January. You can also email photo to AstroNews at astronews@hasastsoc.org.

On Friday, 11/17/2023, the night was clear enough so I went out with my Sky Watcher SkyMax 127mm MAK and my Canon 90D on a RA only mount. I took about 2 minutes video of Saturn and Jupiter. I used PIPP to convert the video to AVI and stack it with AutoStakkert. The result is below. My focus was not as sharp as I wanted to.

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Planet Earth from Orion

One year ago a Space Launch System rocket left planet Earth on November 16, 2022 at 1:47am EST carrying the Orion spacecraft on the Artemis I mission, the first integrated test of NASA's deep space exploration systems. Over an hour after liftoff from Kennedy Space Center's historic Launch Complex 39B, one of Orion's external video cameras captured this view of its new perspective from space.

Image Credit: NASA, Artemis I