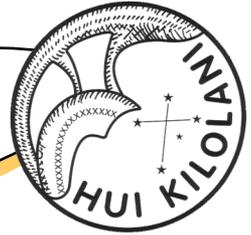


THE ASTRONEWS



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April 2022

www.hawastsoc.org

A word from your editor by Sapavith 'Ort' Vanaprucks

HAS have decided to cancel public HAS events for the time being for both public star party at Dillingham and in town star parties at Kahala and Geiger. These cancellations will continue until Honolulu C&C and State of Hawaii lift restriction on Oahu. 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.

I have been very this past month helping my daughter fixing up her place. I did not have a chance to do any astrophotography. In the last several months, I took photos of the Moon at the max libration that show me Mare Oreintale. On April 18, Moon will be at minimum libration. I will try to shoot the Moon that day and see how close Grimaldi is to the western edge of the moon. Meanwhile, enjoy the photo of Hawaii Air National Guard F22 Raptor took off from HN L on Tuesday, 3/29/2022, at around 9 AM..



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Upcoming Events:

- The next Board meeting is Sun., April 3rd 3:30 PM. (**Zoom Meeting**)
- The next meeting is on Tue., April 5th 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 April 2022

New COVID cases in Hawaii have dramatically declined, but they are hovering around 100 per day, the maximum number the HAS Board of Directors has chosen as our target for resuming in-person meetings. I am writing this before our board meeting, so we have not yet decided whether to have a hybrid meeting (Zoom and in person) in April. If we decide to meet in person, we will announce it on the website.

Meanwhile, we are beginning to resume some of our public activities. We will participate in the IfA Open House on April 10th. We will ask for volunteers at our April meeting. We have also been asked to participate in the Ellison Onizuka Day of Exploration on Ford Island in Pearl Harbor on April 23rd. If the board votes to accept the invitation, we will also ask for volunteers for this event.

We can anticipate a return to public star parties in the near future as well, but we haven't yet made that decision. We don't want to restart them only to have to stop again soon if a new surge of cases occurs, so we will probably wait a little while longer to see if new COVID case numbers remain low.

The James Webb Space Telescope continues to make good progress. It has now been fully focused, and a test image of its target star shows background galaxies as well. The spacecraft continues to cool to its final operating temperature, and there will probably be some final tweaks to the mirror segments after that temperature is reached in June.

After it does begin operating, one newly discovered target may be the most distant star (or perhaps a binary pair of stars) ever seen, identified by the Hubble Space Telescope. Hubble used gravitational lensing to image the star as it existed only 900 million years after the Big Bang. An exciting new era in astronomy is about to begin.

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THE ASTRONEWS is the monthly newsletter of the Hawaiian Astronomical Society. Some of the contents may be copyrighted. We request that authors and artists be given credit for their work. Contributions are welcome. Send them to the Editor via e-mail. The deadline is the 15th of each month. We are not responsible for unsolicited artwork.

Observer's Notebook—April 2022 by Ort

Planets Close to the Moon

Times are Hawaii Standard Time

- Apr 3, 9h, Moon 0.61° SE of Uranus; 29° from the Sun in the evening sky; magnitudes -6.7 and 5.9; occultation
- Apr 24, 14h, Moon 4.3° SE of Saturn; 71° from the Sun in the morning sky; magnitudes -9.3 and 0.9
- Apr 25, 16h, Moon 3.6° SE of Mars; 57° and 58° from the Sun in the morning sky; magnitudes -8.6 and 0.9
- Apr 26, 20h, Moon 3.4° SE of Venus; 43° from the Sun in the morning sky; magnitudes -7.7 and -4.1
- Apr 26, 21h, Moon 3.4° SE of Neptune; 42° and 43° from the Sun in the morning sky; magnitudes -7.7 and 7.9
- Apr 27, 2h, Moon 3.3° SE of Jupiter; 40° from the Sun in the morning sky; magnitudes -7.5 and -2.1

Other Events of Interest

Times are Hawaii Standard Time

- Apr 2, 13h, Mercury at superior conjunction with the Sun; 1.340 AU from Earth; latitude -4.07°
- Apr 18, 20h, Moon shows minimum libration for the year, 1.75°
- Apr 22, 9h, Lyrid meteors; ZHR 18; 1 day before Last Quarter Moon
- Apr 26, 20h, Moon, Venus, and Neptune within circle of diameter 3.40°; about 43° from the Sun in the morning sky; magnitudes -8, -4, 8
- Apr 26, 23h, Moon, Venus, and Jupiter within circle of diameter 4.12°; about 41° from the Sun in the morning sky; magnitudes -8, -4, -2
- Apr 26, 23h, Moon, Jupiter, and Neptune within circle of diameter 3.88°; about 41° from the Sun in the morning sky; magnitudes -8, -2, 8
- Apr 30, 12h, Venus 0.23° SE of Jupiter; 43° from the Sun in the morning sky; magnitudes -4.1 and -2.1

Planets in April

 <h3>Mercury</h3> <p>Impressive in evening, sets over 2 hours after sunset by end of April.</p>	 <h3>Venus</h3> <p>Bright morning planet, low before sunrise. Near Mars and Saturn at start of month, close to Jupiter at end.</p>	 <h3>Mars</h3> <p>Morning planet. 19 arcminutes from Saturn on 5 April. Rises 90 minutes before sunrise at end of April.</p>
 <h3>Jupiter</h3> <p>On 30 April, morning planets Jupiter and Venus appear 40 arcminutes apart, rising one hour before sunrise.</p>	 <h3>Saturn</h3> <p>Morning object, never gaining much height. Mars is 19 arcminutes away on morning of 5 April.</p>	 <h3>Uranus</h3> <p>Evening planet, just visible at start of April, then rapidly lost. Crescent Moon close on 3 April.</p>
 <h3>Neptune</h3> <p>Morning planet, but not viable for observation this month.</p>	 <h3>Pluto (Dwarf Planet)</h3> <p>– is visible in the dawn sky, rising at 01:34 (HST) and reaching an altitude of 39° above the south-eastern.</p>	 <h3>4—Vesta (Asteroid)</h3> <p>is visible in the dawn sky, rising at 02:34 (HST) – 3 hours and 36 minutes before the Sun</p>

Meeting Minutes

H.A.S. Secretary

March 1st, 2022 7:30 PM (Zoom Meeting)

Andy Stroble

Meeting called to order at 7:31pm by President Chris Peterson with 11 participants. The AstroNews not being distributed, the minutes of the last meeting were not approved.

State Science fair is to take place with judging between March 13-25. The usual HAS awards are to be awarded. Volunteers for judging, Chris, Andy, Marufa, and Paul Montanero.

IfA is planning to hold its first Open House post-pandemic, April 10th. We will have a table. Some discussion about who is holding our table cloth/banner and other

Virgin Galactic has released a price list, for Space travel. Starting at only \$450, 000!

James Webb Space Telescope continues calibration and collimation.

New people: We were joined by Edward Kaneshiro, who Googled us (6" Newt) and Aaron Wright, member of the Navy Band (8" Dob). Welcome.

Ort shared some pictures of the Mare Orientalis, only visible when the libration of the moon makes it possible. He also had some shots of the Zodaical light, taken from Dillingham Airfield, and a wide view of the Orion constellation, showing Barnard's Loop.

Member at large Marufa Ba presented some ideas for a HAS T-shirt. There seemed to be a consensus that the design should include Hōkūle'a (Arcturus) for the spring, at least. Further detail to be worked out. Approximately 21 members expressed an interest in acquiring a shirt.

Treasurer Peter Besenbruch shared recent developments in astronomy, from Chinese Mars Rovers, to Galaxies shorn of dark matter. And it seems a rocket stage is going to crash into the Moon.

Tom Giguere contributed to a poster session at the 53rd Lunar and Planetary Science Conference on Lacus Mortis and crater floor fractures on the Luna, and shared some details with us.

Adjourned at 9:07pm. At the peak, there were 21 participants.

Faithfully submitted,
James Andy Stroble, Secretary.
March 30, 2022



Artemis I First Rollout

NASA's Space Launch System (SLS) rocket with the Orion spacecraft aboard is seen atop a mobile launcher in High Bay 3 of the Vehicle Assembly Building.

Image Credit: NASA/Joel Kowsky

Hawaiian Astronomical Society Event Calendar

April 2022						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 Club Party Dillingham Airfield 7:00 PM
3 BoD Meeting Zoom 3:30 PM	4	5 Club Meeting Zoom 7:30 PM	6	7	8  1st Qtr 8:47 pm	9
10	11	12	13	14 Holy Thursday	15 Good Friday	16  Full Moon 8:55 am
17 Easter	18 Tax Day (Taxes Due)	19	20	21	22 Earth Day	23  3rd Qtr 8:55 am
24	25	26	27 Administrative Professionals	28	29 Arbor Day	30  New Moon 10:28 am Club Party Dillingham Airfield 7:00 PM

<<Upcoming Star Parties>>

Club Party-Dillingham April 2 —6:46 PM

Club Party Dillingham April 30 —6:56 PM

Public Party Geiger/Kahala April 9 — **CANCELLED**

Upcoming School Star Parties

NASA's Night Sky Notes

Springtime Catspotting: Lynx and Leo Minor

By David Prosper



Many constellations are bright, big, and fairly easy to spot. Others can be surprisingly small and faint, but with practice even these challenging star patterns become easier to discern. A couple of fun fainter constellations can be found in between the brighter stars of Ursa Major, Leo, and Gemini: Lynx and Leo Minor, two wild cats hunting among the menagerie of animal-themed northern star patterns!

Lynx, named for the species of wild cat, is seen as a faint zigzag pattern found between Ursa Major, Gemini, and Auriga. Grab a telescope and try to spot the remote starry orb of globular cluster NGC 2419. As it is so distant compared to other globular clusters - 300,000 light years from both our solar system and the center of the Milky Way - it was thought that this cluster may be the remnants of a dwarf galaxy consumed by our own. Additional studies have muddied the waters concerning its possible origins, revealing two distinct populations of stars residing in NGC 2419, which is unusual for normally-homogenous globular clusters and marks it as a fascinating object for further research.

Leo Minor is a faint and diminutive set of stars. Its “triangle” is most noticeable, tucked in between Leo and Ursa Major. Leo Minor is the cub of Leo the Lion, similar to Ursa Minor being the cub to the Great Bear of Ursa Major. While home to some interesting galaxies that can be observed from large amateur scopes under dark skies, perhaps the most intriguing object found within Leo Minor’s borders is Hanny’s Voorwerp. This unusual deep-space object is thought to be a possible “light echo” of a quasar in neighboring galaxy IC 2497 that has recently “switched off.” It was found by Hanny van Arkel, a Dutch schoolteacher, via her participation in the Galaxy Zoo citizen science project. Since then a few more intriguing objects similar to Hanny’s discovery have been found, called “Voorwerpjes.”

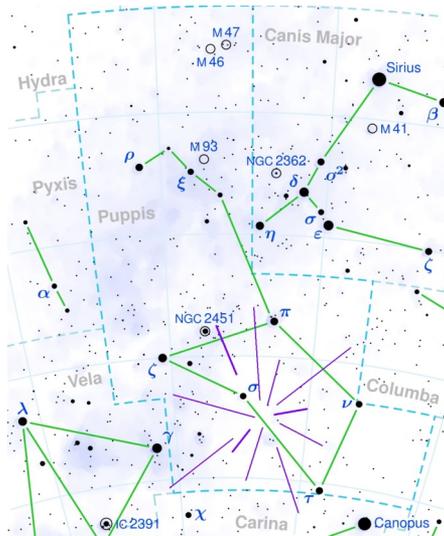
Lynx and Leo Minor are relatively “new” constellations, as they were both created by the legendarily sharp-eyed European astronomer Johannes Hevelius in the late 1600s. A few other constellations originated by Hevelius are still in official use: Canes Venatici, Lacerta, Scutum, Sextans, and Vulpecula. What if your eyes aren’t quite as sharp as Johannes Hevelius – or if your weather and light pollution make searching for fainter stars more difficult than enjoyable? See if you can spot the next Voorwerp by participating in one of the many citizen science programs offered by NASA at science.nasa.gov/citizenscience! And of course, you can find the latest updates and observations of even more dim and distant objects at nasa.gov.

(Continued on page 9)

A meteor shower double header! The month of April hosts two back-to-back showers with peaks only one day apart: Lyrids (006 LYR) and the π -Puppids (137 PPU). Admittly, the π -Puppids is a minor shower.

The Lyrids (006 LYR, also called April Lyrids) reach their maximum just before the last quarter Moon which means that the hours with a high radiant elevation are moonlit. The peak is due on April 22, 19h UT ($\lambda = 32.32$). Meteors emanate from the long-period comet C/1861 G1 (Thatcher), which last passed the Earth's orbit (0.335 AU or 50.1 million km) in 1861. The comet returns to our vicinity in 2283. This shower is the oldest know shower and was first chronicled in 687 BC by Zuo Zhuan and later “discovered” by A. E. Thatcher. Carl Wilhelm Baeker also independently found this comet. C/1861 G1 is listed as a long-

(Continued on page 10)



The Pi Puppid meteor shower radiant is South southwest of Sirius in Canis Major (modified after figure by Torsten Bronger)

Phases of the Moon (courtesy timeanddate.com)

First Quarter	Full Moon	Last Quarter	New Moon
April 08	April 16	April 23	April 30

Shower	Activity	Maximum		Radiant		V_{∞} km/s	r	ZHR
		Date	λ_{\odot}	α	δ			
Lyrids (006 LYR)	Apr 14– Apr 30	Apr 22	32.32°	271°	+34°	49	2.1	18
π -Puppids (137 PPU)	Apr 15– Apr 28	Apr 23	33.5°	110°	-45°	18	2.0	Var

Cash Flow - 2/10/2022 to 3/9/2022

Beginning Balance	\$4,159.99
Money into selected accounts comes from	
Donation	\$166.00
Membership – Electronic	\$220.00
Membership - Electronic - Student	\$12.00
Membership - Family	\$14.00
Membership - Paper	\$104.00
Subscription - Astronomy	\$34.00
Total Money In	\$194.00
Money out of selected accounts goes to	
Total Money Out	
Difference	\$194.00
Ending Balance	\$4,353.99

Here are the financials up through March 9.

Thanks for the membership renewals (and donations) and a welcome to the new folks.

We are doing fine, financially. Covid-wise we aren't doing as well as hoped. As I write this, the Oahu daily average for the last week has just been reported as 99 cases per day, up from 64 per day the week previous. Hang in there everyone.

We have had two good star parties in March, with the earlier one on the 5th bordering on the fantastic. Attendance has been up, and we all had a good time.

I will be rather busy in April and May, off island for a large chunk of that, so I am not sure if there will be a treasurer's report next month.

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A View of the Red Planet (in Blue)

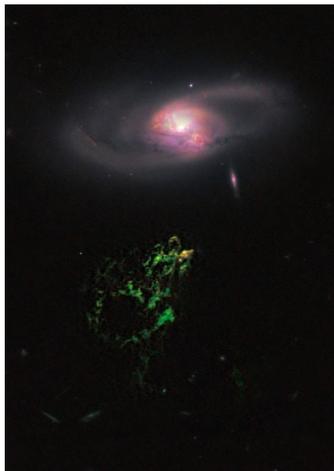
Ch'al-Type Rocks at Santa Cruz

NASA's Perseverance Mars rover snapped this view of a hill in Mars' Jezero Crater called "Santa Cruz" on April 29, 2021, the 68th Martian day, or sol, of the mission.

Image Credit: NASA/JPL-Caltech/ASU/MSSS



Map of the sky around Lynx and Leo Minor. Notice the prevalence of animal-themed constellations in this area, making it a sort of celestial menagerie. If you are having difficulty locating the fainter stars of Leo Minor and Lynx, don't fret; they are indeed a challenge. Hevelius even named the constellation as reference to the quality of eyesight one needs in order to discern these faint stars, since supposedly one would need eyes as sharp as a Lynx to see it! Darker skies will indeed make your search easier; light pollution, even a relatively bright Moon, will overwhelm the faint stars for both of these celestial wildcats. While you will be able to see NGC 2419 with a backyard telescope, Hanny's Voorwerp is far too faint, but its location is still marked. A few fainter constellation labels and diagrams in this region have been omitted for clarity. Image created with assistance from Stellarium



Hanny's Voorwerp and the neighboring galaxy IC 2497, as imaged by Hubble. Credits: NASA, ESA, W. Keel (University of Alabama), and the Galaxy Zoo Team Source: hubblesite.org/contents/news-releases/2011/news-2011-01.html

(Continued from page 7) Meteor Log

period "non-periodic comet" because it has not yet been observed at two perihelion passages. When it is seen to come back around 2283, it should receive the P/ designation.

The moon is not an issue to observe the π -Puppids (137 PPU) as the radiant is in the evening sky and the maximum time is at April 24, 00h UT ($\lambda = 33.^\circ 5$). The pi Puppids are a meteor shower associated with the comet 26P/Grigg-Skjellerup. The meteor stream is viewable around April 23 but only in years around the parent comet's perihelion date, the last being in 2003. However, as the planet Jupiter has now perturbed the comet's perihelion to beyond Earth's orbit it is uncertain how strong the shower will be in the future. The pi Puppids get their name because their radiant appears to lie in the constellation Puppis, at around Right ascension 112 degrees and Declination -45 degrees. This southerly radiant is visible from Hawaii. The shower was discovered in 1972 and has been observed about every 5 years - at each perihelion passage of the comet - but often at very low rates per hour. April 2022 is likely have low rates, with an increase possible for 2023.

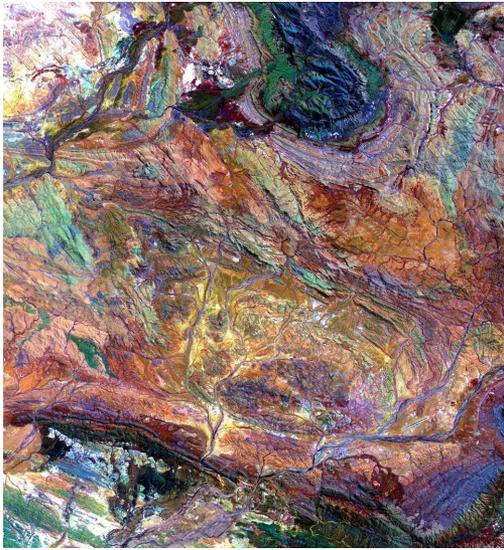


Artemis I in Moonlight

The Moon rises behind NASA's Space Launch System rocket and Orion spacecraft.

Earth's Moon is seen rising behind NASA's Space Launch System (SLS) rocket with the Orion spacecraft aboard atop a mobile launcher as it rolls out to Launch Complex 39B for the first time, Thursday, March 17, 2022, at NASA's Kennedy Space Center in Florida.

Image Credit: NASA/Aubrey Gemignani



3.6 Billion Years in Pastel Colors

Pilbara, NW Australia

The Pilbara in northwestern Australia exposes some of the oldest rocks on Earth, over 3.6 billion years old. The iron-rich rocks formed before the presence of atmospheric oxygen, and life itself.

Image Credit: NASA/METI/AIST/Japan Space Systems, and U.S./Japan ASTER Science Team



What's New on the Moon ... After 50 Years

A close-up of Apollo 17 lunar core sample 73001 being taken out of its drive tube for the first time since it was collected by Apollo astronauts in December 1972 at NASA's Johnson Space Center in Houston.

Image Credit: NASA/Robert Markowitz



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Cygnus Cargo Craft at the Space Station

The Cygnus space freighter attached to the space station

This February 2022 image of Northrop Grumman's Cygnus cargo craft is pictured attached to the International Space Station after delivering 8,300 pounds of new science experiments, crew supplies, and station hardware to replenish the Expedition 66 crew.

Image Credit: NASA