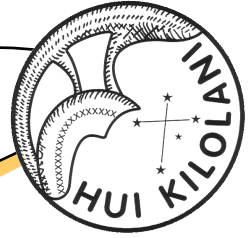


# THE ASTRONEWS



Volume 73, Issue 7

July 2023

[www.hawastsoc.org](http://www.hawastsoc.org)

## A word from your editor by Sapavith 'Ort' Vanapraks

This month's speaker is Tom Giguere. He will give a presentation entitled "**Understanding lunar volcanic processes and mare surface age-dating via remote sensing: Volcanic processes in the Gassendi region**", which is the first chapter from his recent UH dissertation.

On Monday, June 5th, 2023, Susan Wright from Becker Communications, Inc. contacted us and ask if we would like work with Consolidated Theater on Saturday, July 1st, 2023, at 10 AM while they played E.T. at Ward, Pearlridge, Mililani, & Kapolei. I decided why not. We could promote the club. While we were doing this, the 4 theaters played 1 minute of HAS PSA throughout the whole weekend. We set up 2 stations at Kapolei Theater. Station 1 showed the Sun and discussed types of telescopes. It was manned by Steven & I. We moved under cover due to clouds and rain. Station 2 covered the Moon. Tom manned that station with 3D Moon photos & swags from LROC. We have quite a few people at this station.



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## Upcoming Events:

- The next Board meeting is Sun., Jul. 9<sup>th</sup> 3:30 PM. (**Zoom Meeting**)
- The next meeting is on Tue., Jul 11<sup>th</sup> 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, 7/1/2023, of the month at 7:00 PM

## President's Message June 2023

One problem with searching for other life in the universe is that we only have one example to extrapolate from. All life on Earth is thought to be related, so we don't know how other life might operate if it's very different from us. Therefore, we look at what seems to be essential for Earth life and examine the conditions in other places to determine whether they have the potential for life as we know it to develop.

On Earth, all life uses six elements: carbon, hydrogen, oxygen, nitrogen, phosphorus, and sulfur. Of these, phosphorus is least detected in our solar system. Now data from the Cassini mission has produced evidence that phosphorus is present in Saturn's moon Enceladus.

Saturn's tenuous E ring is thought to derive from material ejected by geysers on Enceladus. As Cassini passed repeatedly through the E ring, the mission's Cosmic Dust Analyzer collected data indicating the presence of phosphorus. This makes the subsurface ocean on Enceladus a leading candidate location for the possible development of life.

Not all icy moons are so generous in distributing their innards for our spacecraft to detect, but we will surely be looking for phosphorus in other places now that we've detected it at Enceladus.

Of course, the presence of phosphorus does not guarantee that life has emerged there, just as the absence of phosphorus does not exclude that possibility. Life may figure out a way to develop without it. However, it seems more likely that life could get started where all the elements common to all Earth life exist, so it is logical to concentrate our searches in those places.

It is also worth noting that the data used in the research that produced these conclusions was collected years ago by Cassini. Science often depends on new data to make advances, but the data are not necessarily collected in order to make those specific advances. The legacy data that we are accumulating with each space mission can be used years or decades later as new analytical techniques are developed or new questions arise. That is one reason that some of the samples returned from the Moon by the

*(Continued on page 4)*

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# Observer's Notebook—July 2023 by Ort

## Planets Close to the Moon

### Times are Hawaii Standard Time

- Jul 6, 20h, Moon 2.44° SE of Saturn; 127° and 128° from Sun in morning sky; magnitudes -11.4 and 0.8
- Jul 8, 6h, Moon 1.54° SE of Neptune; 108° and 109° from Sun in morning sky; magnitudes -10.8 and 7.9
- Jul 11, 11h, Moon 2.09° NNW of Jupiter; 68° from Sun in morning sky; magnitudes -9.1 and -2.3
- Jul 12, 7h, Moon 2.17° N of Uranus; 58° from Sun in morning sky; magnitudes -8.6 and 5.8
- Jul 19, 2h, Moon 3.3° NNE of Mercury; 20° and 19° from Sun in evening sky; magnitudes -5.8 and -0.4
- Jul 20, 5h, Moon 7.3° NNE of Venus; 32° and 31° from Sun in evening sky; magnitudes -6.8 and -4.4
- Jul 20, 22h, Moon 2.97° NNE of Mars; 39° and 38° from Sun in evening sky; magnitudes -7.3 and 1.8

## Other Events of Interest

### Times are Hawaii Standard Time

- Jul 6, 6h, Earth at aphelion; 1.0167 AU from the Sun
- Jul 7, 10h, Venus shows greatest illuminated extent, 294 square seconds
- Jul 9, 8h, Venus brightest; magnitude -4.47°
- Jul 9, 21h, Venus, Mars, and Regulus within circle of diameter 4.65°; about 41° from the Sun in the evening sky; magnitudes -4, 2, 1
- Jul 22, 16h, Venus stationary in longitude; starts retrograde motion
- Jul 29, 14h, Southern Delta Aquarid meteors; ZHR 25; 3 days before full Moon

All month: Noctilucent cloud display season continues










All month: Ninth magnitude Comet C/2020 V2 ZTF favourable

12 July: Early morning Jupiter near the Moon

13 July: Early morning Moon near the Pleiades cluster, M45

27 July: 'Jewelled handle' clair obscur effect visible on this evening's Moon

## Planets in July

 <h3>Mercury</h3> <p>Poorly positioned evening planet, best seen mid-month, but low in the west-northwest as the sky darkens.</p>	 <h3>Venus</h3> <p>Best at the start of July, as by the end of the month it is setting before the Sun. Currently in a very thin crescent phase.</p>	 <h3>Mars</h3> <p>Well positioned evening planet, which is low in the west as twilight darkens. Mars is near Venus at the start of July.</p>
 <h3>Jupiter</h3> <p>Improving morning planet, best at the end of the month. There is a waning crescent Moon nearby on 12 July.</p>	 <h3>Saturn</h3> <p>Morning planet, best at the end of July. The Moon is close on 7 July.</p>	 <h3>Uranus</h3> <p>Morning planet, best at the end of July. Jupiter is relatively close.</p>
 <h3>Neptune</h3> <p>Morning planet, southeast of the Circlet asterism. Best at month end.</p>	 <h3>Pluto (Dwarf Planet)</h3> <p>is visible between 21:35 and 04:39. It will become accessible around 21:35, when it rises to an altitude of 21° above your south-eastern horizon.</p>	 <h3>1—Ceres (Asteroid)</h3> <p>will become visible around 20:14 (HST), 47° above your western horizon, as dusk fades to darkness. It will then sink towards the horizon, setting at 23:44.</p>

# Meeting Minutes

H.A.S. Secretary

*June 6<sup>th</sup>, 2023 7:30 PM (Bishop Museum Planetarium and Zoom Meeting)*

*Andy Stroble*

Meeting called to order at 7:32pm by President Chris Peterson.

Minutes of the May meeting were adopted.

A telescope donated to HAS has been sold for \$175.

The Supernova in M101 (SN2023ixf) was mentioned, and types of supernovae were discussed, with the “standard candles” technique for measuring interstellar, and intergalactic, distances.

Consolidated Theatres will be showing E.T. on July 1st, and has contacted the club about doing public outreach from 10am at four theatres, and screening a 30 second PSA about HAS. Volunteers requested.

Attending for the first time was Kelley H., who possesses a Saturn telescope by Meade.

Steve Chun and Bill Barr reported on an astrophotography expedition to the Big Island at the Mauna Kea Visitor’s Center. They shared comparisons of equipment, results, and how to dress for 35° F conditions. Beautiful pictures of Eta Carina and its nebula were presented.

Romee manned the Planetarium, and gave us tour, including how to find Messier 101, the Pinwheel galaxy, and Omega Centauri.

Shemaur shared a time-lapse video.

Meeting adjourned at 8:59.

There were about 10 persons in person, and 17 participants on Zoom.

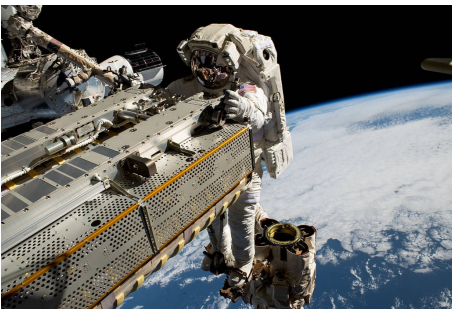
Faithfully submitted,  
James Andy Stroble, Secretary.

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*(Continued from page 2) President’s Message*

Apollo missions have remained unexamined until now. Who knows what discoveries await the analysis of data long in hand? Undoubtedly, many do.

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Spacewalker Woody Hoburg rides the Canadarm2 robotic arm

During a spacewalk on June 9, 2023, NASA astronaut and Expedition 68 Flight Engineer Woody Hoburg rides the Canadarm2 robotic arm while maneuvering a roll-out solar array toward the International Space Station's truss structure 257 miles above the Pacific Ocean.

Image Credit: NASA/Frank Rubio

**Hawaiian Astronomical Society**  
**Event Calendar**

July 2023							Aug ▶
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
						1	
2	3  Full Moon 1:38 AM	4 <i>Independ. Day</i>	5	6	7	8  Public Star Party Dillingham Airfield Gate Close 7:00	
9  3rd Qtr 3:47 PM BoD Meeting Zoom 3:30 PM	10	11  Club Meeting Hybrid 7:30 PM	12	13	14	15  Lahaina Noon 12:37 PM Club Star Party Dillingham Airfield Gate Close 7:00	
16  Lahaina Noon 12:37 PM	17  New Moon 8:31AM	18	19	20	21	22  Public Star Party Geiger/Kahala Sunset 7:14 PM	
23	24	25  1st Qtr 12:06PM	26	27	28	29	
30	31	Notes:					

**<<Upcoming Star Parties>>**

- Public Party-Dillingham July 8 —7:00 PM**
- Club Party Dillingham July 15 —7:00 PM**
- Public Party Geiger/Kahala July 22 — 7:00 PM**

Upcoming School Star Parties


# NASA's Night Sky Notes

## Find A Ball of Stars

Linda Shore, Ed.D



French astronomer Charles Messier cataloged over 100 fuzzy spots in the night sky in the 18th century while searching for comets – smudges that didn't move past the background stars so couldn't be comets. Too faint to be clearly seen using telescopes of the era, these objects were later identified as nebulae, distant galaxies, and star clusters as optics improved. Messier traveled the world to make his observations, assembling the descriptions and locations of all the objects he found in his Catalog of Nebulae and Star Clusters. Messier's work was critical to astronomers who came after him who relied on his catalog to study these little mysteries in the night sky, and not mistake them for comets.

Most easily spotted from the Southern Hemisphere, this “faint fuzzy” was first cataloged by another French astronomer, Nicholas Louis de Lacaille in 1752 from Southern Africa. After searching many years in vain through the atmospheric haze and light pollution of Paris, Charles Messier finally added it to his catalog in July of 1778. Identified as Messier 55 (M55), this large, diffuse object can be hard to distinguish unless it's well above the horizon and viewed far from city lights.

But July is great month for getting your own glimpse of M55 – especially if you live in the southern half of the US (or south of 39°N latitude). Also known as the “Summer Rose Star,” M55 will reach its highest point in northern hemisphere skies in mid-July. Looking towards the south with a pair of binoculars well after sunset, search for a dim (mag 6.3) cluster of stars below the handle of the “teapot” of the constellation Sagittarius. This loose collection of stars appears about 2/3 as large as the full Moon. A small telescope may resolve the individual stars, but M55 lacks the dense core of stars found in most globular clusters. With binoculars, let your eyes wander the “steam” coming from the teapot-shaped Sagittarius (actually the plane of the Milky Way Galaxy) to find many more nebulae and clusters.

As optics improved, this fuzzy patch was discovered to be a globular cluster of over 100,000 stars that formed more than 12 billion years ago, early in the history of the Universe. Located 20,000 light years from Earth, this ball of ancient stars has a diameter of 100 light years. Recently, NASA released a magnificent image of M55 from the Hubble Space Telescope, revealing just a small portion of the larger cluster. This is an image that Charles Messier could only dream of and would have marveled at! By observing high above the Earth's atmosphere, Hubble reveals stars inside the cluster impossible to resolve from ground-based telescopes. The spectacular colors in this image correspond to the surface temperatures of the stars; red stars being cooler than the white ones; white stars being cooler than the blue ones. These stars help us learn more about the early Universe. Discover even more: <https://www.nasa.gov/feature/goddard/2023/hubble-messier-55>

The Hubble Space Telescope has captured magnificent images of most of Messier's objects. Explore them all:

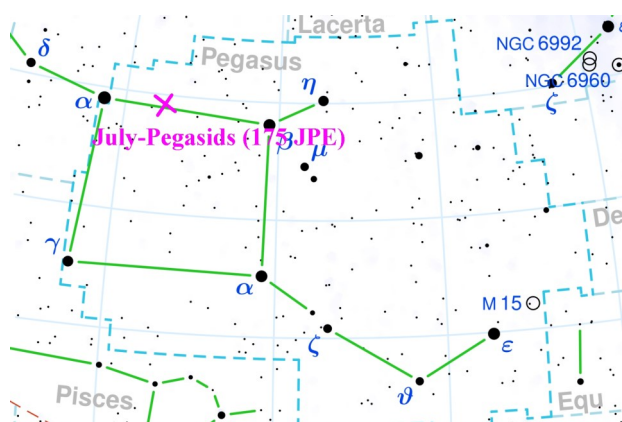
<https://www.nasa.gov/content/goddard/hubble-s-messier-catalog/>

*(Continued on page 9)*

Several meteor showers appear in the July skies and the Southern  $\delta$ -Aquariids (005 SDA) are the best of breed. All of the showers in July are affected by moonlight.

For about a week around July 10, low activity may be observed from the July-Pegasids (175 JPE), with slight interference from the waning Moon. The Radiant of the Pegasids is in the constellation of Pegasus, around 5 degrees to the west of the star  $\alpha$  Pegasi. The origin of this meteor shower is probably the comet C/1979 Y1 (Bradfield). C/1979 Y1 has an orbital period of 300 years. Later in July the minor  $\alpha$ -Capricornids (001 CAP) peak with their lower apparent velocity. The stronger and faster Southern  $\delta$ -Aquariids (005 SDA) should be distinguishable from the slower  $\alpha$ -Capricornids. The radiant of the Piscis Austrinids (183 PAU) is the most southerly of the July meteor showers at  $-30^\circ$ . The highest rates are due on July 28 (PAU) and July 30 (CAP, SDA), respectively, although recent data hints at a later PAU-

*(Continued on page 10)*



**Phases of the Moon** (courtesy timeanddate.com)

<b>New Moon</b>	<b>First Quarter</b>	<b>Full Moon</b>	<b>Last Quarter</b>
July 25	July 03	July 09	July 17

Shower	Activity	Maximum		Radiant		$V_\infty$ km/s	$r$	ZH R
		Date	$\lambda$	$\alpha$	$\delta$			
July Pegasids (175 JPE)	Jul 04-Jul 14	Jul 10	107.5°	340°	+15°	61	3.0	5
Piscis Austrinids (183 PAU)	Jul 15-Aug 10	Jul 28	125°	341°	-30°	35	3.2	5
July $\gamma$ -Draconids (184 GDR)	Jul 25-July 31	Jul 28	125.3°	280°	+51°	27	3.0	5
South. $\delta$ -Aquariids (005 SDA)	Jul 12-Aug 23	Jul 30	127°	340°	-16°	41	2.5	25
$\alpha$ -Capricornids (001 CAP)	Jul 03-Aug 15	Jul 30	127°	307°	-10°	23	2.5	5

Many showers, plenty of observing options this month! Credit to the IMO for our meteor shower information. For more info contact: Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.

# Cash Flow - 4/10/2023 to 6/11/2023

<b>Beginning Balance</b>	\$5,452.96
<b>Money into selected accounts comes from</b>	
Membership - Electronic	\$240.00
Membership - Electronic - Student	\$12.00
Membership - Family	\$24.00
Subscription - Astronomy	\$34.00
<b>Total Money In</b>	<b>\$310.00</b>
<b>Money out of selected accounts goes to</b>	
Astronomical League	\$400.00
Subscription - Astronomy	\$34.00
<b>Total Money Out</b>	<b>\$434.00</b>
Difference	-\$124.00
<b>Ending Balance</b>	<b>\$5,328.96</b>

Here are the financials up through June 11.

Thanks to everyone who paid, renewed, and donated.

As you can see, we had the yearly expense of our dues to the Astronomical League. Dues went up, because we reported more members. What do we get for that? Reduced liability insurance, and copies of The Reflector magazine for each family. Other checks haven't come back as of June 11, but they are fairly small.



Hubble Checks in on a Galactic Neighbor

A large, bright, diffuse galaxy. Center is brighter and bluer, fading to a pale, faint, gray halo. An arm on one side that curls around the top. Threads of dark dust cross the center. Many stars shine around the galaxy, on a black background.

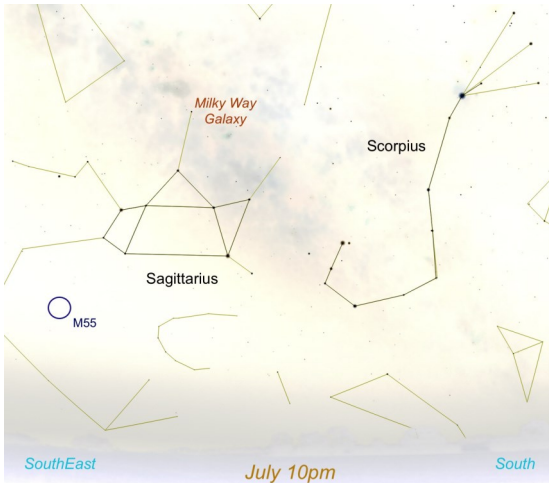
Image credit: ESA/Hubble & NASA, R. Tully





The large image shows just the central portion of M55 taken by the Hubble Space Telescope. Above Earth's atmosphere, this magnificent view resolves many individual stars in this cluster. How many can you count through binoculars or a backyard telescope?

Original Image and Credits: NASA, ESA, A. Sarajedini (Florida Atlantic University), and M. Libralato (STScI, ESA, JWST); Smaller image: Digital Sky Survey; Image Processing: Gladys Kober

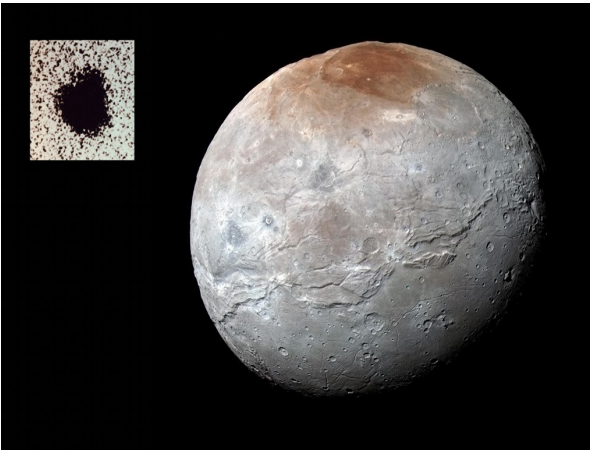


Look to the south in July and August to see the teapot asterism of Sagittarius. Below the handle you'll see a faint smudge of M55 through binoculars. More "faint fuzzies" can be found in the steam of the Milky Way, appearing to rise up from the kettle.

(Continued from page 7) - Meteor Log

maximum (perhaps August 08) with a radiant about  $5^\circ$  north of the previously listed declination. Full Moon on August 1 badly affects optical observations of the showers with their maxima at the end of July.

On 2016 July 28 at 00h07m UT ( $\lambda = 125.^\circ 132$ ) the July  $\gamma$ -Draconids (184 GDR) produced an outburst detected by radar and video observations (Molau et al., 2016b). The same position is reached again on 2023 July 28 near 19h UT – worth checking although there was no extra activity observed in 2017 – 2021. SonotaCo net observations indicate that the  $\gamma$ -Draconids is an annual shower with a sharp but variable maximum from year to year (Koseki, 2020). The radiant is at  $\alpha = 280^\circ$ ,  $\delta = +51^\circ$ , and the meteors have low speed ( $V_\infty = 27$  km/s).



Charon: Moon of Pluto

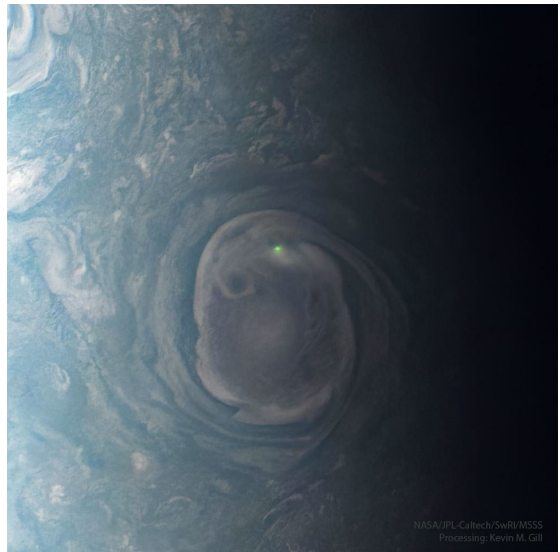
Explanation: A darkened and mysterious north polar region known to some as Mordor Macula caps this premier high-resolution view. The portrait of Charon, Pluto's largest moon, was captured by New Horizons near the spacecraft's closest approach on July 14, 2015.

Image Credit: NASA, Johns Hopkins Univ./APL, Southwest Research Institute, U.S. Naval Observatory

### Lightning on Jupiter

Images and data from NASA's Jupiter-orbiting Juno spacecraft bolster previous speculation that Jovian lightning is also created in clouds containing water and ice. In the featured Juno photograph, an optical flash was captured in a large cloud vortex near Jupiter's north pole. During the next few months, Juno will perform several close sweeps over Jupiter's night side, likely allowing the robotic probe to capture more data and images of Jovian lightning.

Image Credit: NASA/JPL-Caltech/SwRI/MSSS; Processing & License: Kevin M. Gill



NASA/JPL-Caltech/SwRI/MSSS  
Processing: Kevin M. Gill

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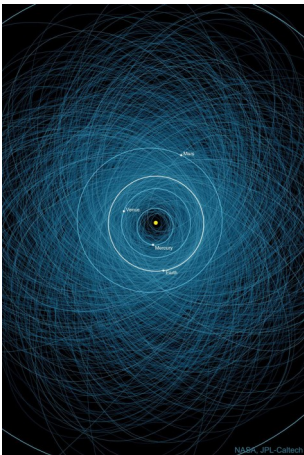
Since January, Hawaiian Astronomical Society has reopened public star parties for both in-town (Geiger Community Park & Kahala Community Park) and dark site (Dillingham Airfield). HAS June star parties at Dillingham Airfield had been very successful with very favorable weather. Our public star party on Sat, Jun 10, 2023, started out as a cloudy evening. However, when we got completely dark, the sky cleared up. We had 11 members and 18 visitors this evening. Seeing was very good. Sue and I enjoyed our Dwarf II that evening. We had quite a few DSO shots that night. Our club star party on Sat, June 17, 2023, was just as good. There were many Astro-photographers that evening. Members stayed until 11:30 PM.



Leo Triplet using Dwarf II by Sue Girard from June 17,2023 at Dillingham Airfield

Our in-town public star parties on June 24 were not as lucky. There was a report of rain in Kahala. Geiger was mostly cloudy until around 8:15 PM. We have 1 member with a telescope and 2 visitors. Venus and Moon were available early in the evening. I was able to show Omega Centauri Globular Star Cluster and Albireo Double Stars.

There will be two more Lahaina Noon events on Oahu this month. They are on July 15 - 16, 2023 at 12:37 PM. You can get 2023 Lahaina Noon from [Lovebigisland.com](http://Lovebigisland.com). (Lahaina Noon in Hawai'i: When and Where to BEST see it (2023) ([lovebigisland.com](http://lovebigisland.com)))



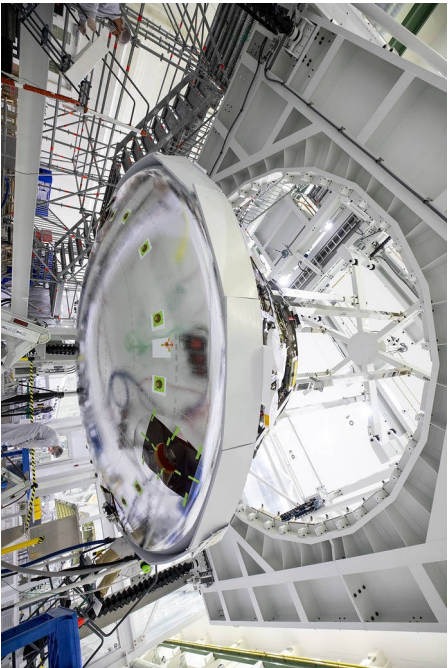
#### Orbits of Potentially Hazardous Asteroids

Pictured here are the orbits of the over 1,000 known Potentially Hazardous Asteroids (PHAs). These documented tumbling boulders of rock and ice are over 140 meters across and will pass within 7.5 million kilometers of Earth -- about 20 times the distance to the Moon. Although none of them will strike the Earth in the next 100 years -- not all PHAs have been discovered, and past 100 years, many orbits become hard to predict.

Illustration Credit: NASA, JPL-Caltech



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**Artemis II Heat Shield Installed**

Teams install the heat shield on the Artemis II Orion spacecraft inside the high bay of the Neil Armstrong Operations and Checkout Building at NASA's Kennedy Space Center in Florida on June 22, 2023.

Image Credit: NASA/Cory Huston