Southwest Florida Astronomical Society, Inc.
SWFAS

The Eyepiece
October 2019

Contents:

A MESSAGE FROM THE PRESIDENT

Fall is finally here. Let's hope the weather is good as we have a lot of events coming up in the next few months.

We have 3 major events in a little over 10 days. The annual Cub Scout Extravaganza is on Friday the 18th. We will need help with the observing there. Then that Sunday the 20th is Ding Darling Days out on Sanibel. This is a solar event with handouts. Then the next weekend on the 27th is the Cape Coral Kiwanis KidsFest at SunSplash. This is another Solar event with handouts.

Mike McCauley is handling a school event.

We will have a planetarium show as our program and then after the meeting we plan to start on looking at the Nature Center's telescopes and starting to get them organized so that they can be sold off.

John MacLean reported that the Seahawk Star Party was good event.

Brian

Program this Month

A planetarium program will be shown (TBD).

The program will begin promptly at 7:30pm with the regular monthly business meeting following immediately thereafter.

Michael J. McCauley
VP/Program Coordinator SWFAS

Star Party Schedule 2019

SeaHawk Park – Nov 30th

Caloosahatchee Regional Park – Oct 26th, Nov 2nd, Dec 21st

We have scheduled some of the Seahawk Park nights to coincide with the moon being a crescent to 1st quarter stage to allow for lunar observing.

Ideas for Using Outreach Funds

SWFAS would like to hear from members for any suggestions for applying outreach funds.

Members' Recommended Reading & News Links

Members are encouraged to submit to the editor links to recommended articles and books that might be of interest to Club members.

Each Weekly Newsletter of S&T has a 60-second news section. The general link for S&T Astronomy News is https://www.skyandtelescope.com/astronomy-news/ .

Sky and Telescope has a new free introductory E-book "Stargazing: Getting Started" if you sign up with your email. https://skyandtelescope.com

"Will Amateurs Be Able to See the New Interstellar Comet?", *By Bob King, September 18, 2019, Sky & Telescope Weekly, September 20, 2019. Abstract: We're all crossing our fingers we'll see the new comet in our telescopes. Here are some tips making the best of this rare apparition.*

For NASA-JPL News see https://www.jpl.nasa.gov/ .

In the Sky this Month

Moon:– 1st Quarter – October 5; Full – October 13; Apogee – October 10; Last Quarter – October 21 (EDT); Perigee - October 26; New– October 28

Mercury (dusk) for most of the month is above and to the left of Venus. Its magnitude is at 0 for the month, while hard to see being low at twilight. It sets less than an hour after the Sun. On the evening of the 31st, it is about 2½° below Venus, low in the southwest. It quickly fades while approaching solar transit on November 11.

Venus (dusk) sets ½ hour after sunset at the beginning of the month and an hour afterwards by the end. Its magnitude is -3.9 in the first half of the month and -3.8 during the second half. During the second half of October, it is almost fully lit, but almost at its minimum arc of 10".

Mars (dawn, looking East) emerges from solar glare during the third week, after being out of view since July. It rises less than an hour before the Sun on the 1st and nearly two hours before on the 31st. Its brightness is merely a 1.8 magnitude and its disk size is about the same as the much more distant Uranus. Note that next year this month Mars will be at its next opposition and appear six times wider. On the 7th, it moves southward in Virgo over the celestial equator and its northern hemisphere has its summer solstice.

Jupiter (dusk - evening, Southwest) is just southeast of the Moon on the 3rd and northwest of Antares at dusk.. It dims a little more this month in magnitude from -2.0 to -1.9, and sets 3½ hours after sunset at the beginning of October and about 2½ hours afterward at the end. See the detailed charts on page 51 in Sky & Telescope, or page 41 of Astronomy, September 2019, showing observation times for Jupiter's moons.

Saturn (dusk - evening, South) is nearly 30° above the horizon early in October, and about 90° east of the Sun on the 7th . With the rings tilted at just over 25°, this position from the Sun gives the planet and rings a 3D look. At the beginning of the month it sets at about midnight and at about 10 p.m. by the end of the month. It continues to dim, changing magnitude from +0.5 to +0.6, and its size decreases from 16.8" to 16".

Uranus, (East-evening; West-morning) high in Aires, reaches its highest point for the year between October 27/28, at opposition, and visible all night. Its midmonth magnitude is +5.7 and spans 3.7". See https://is.gd/urnep for a finder chart.

Neptune, (Southeast-evening; Southwest-morning) in Aquarius, was at opposition on 10 September, so visible most of the night. See https://is.gd/urnep for a finder chart.

International Space Station: The ISS is visible second week of October (7th-24th) around 8 p.m., the third week 20th-25th) around 6 a.m. See this link for specific times and routes for the ISS: http://www.heavens-above.com

The **Hubble Space Telescope** will be visible early evening (7-9 p.m.) the first half of October, and between 6 & 7 a.m. from the last week of the month. See this link for specific times and routes for the HST: http://www.heavens-above.com

Minutes of the Southwest Florida Astronomical Society – September 5, 2019

The regular monthly business meeting of the Southwest Florida Astronomical Society was called to order at 7:32 pm by president Brian Risley in the Calusa Nature Center Planetarium.

Twenty-one people were present, including five visitors.

Scott Flaig presented the program on "The Theory of Everything."

At 8:11 pm the business meeting resumed.

The past events listed in the printed agenda were reviewed.

Upcoming events listed in the printed agenda were discussed.

The annual club liability insurance premium of $401 is due. Treasurer John MacLean is trying to find an option to reduce that cost. Tony Heiner made a motion, seconded by Bill Francis, to approve the expense. The motion passed by a voice vote

Tom Segur made a motion, seconded by Sean Dey, to approve the minutes of the August meeting as contained in the September newsletter. The motion passed on a voice vote.

Treasurer John MacLean presented the August treasurer's report, showing an ending balance of $2242.18. Tony Heiner made a motion, seconded by Mary Vilbig, to approve the report. The motion passed on a voice vote.

Librarian Maria Berni asked for members to please return books that have been checked out when finished with them.

Equipment Coordinator Brian Risley reported that several telescopes are available for checkout.

Astronomical League coordinator John MacLean stated that the "Reflector" digital magazine can be downloaded from the AL website.

Brian Risley and Scott Flaig will be working to put together the Planetarium's surplus telescope equipment so that it could be available for sale. Help is needed to complete this project. Contact Brian.

Volunteers will be needed to help with the next Babcock Ranch observing event on November 29.

The business meeting was adjourned at 8:39 pm.

Submitted by Don Palmer, secretary

Southwest Florida Astronomical Society, Inc.
Event Schedule for 2019/2020

Date	Event	Location	Time/Note
October 3rd	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
October 9th	School Event – Mike McCauley Coord	Cape Coral Charter School	
October 12th	Solar Observing	Bayshore Live Oak Park Port Charlotte	9:00 am - Noon
October 18th	Cub Scout Extravaganza	Camp Miles – Bermont Rd & SR31 Punta Gorda	6:30 pm
October 20th	Ding Darling Days	Ding Darling National Wildlife Refuge Sanibel	10:00 am – 3:00 pm
October 25th	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
October 26th	Kiwanis KidsFest Cape Coral	SunSplash Cape Coral	9:00 am – 3:00 pm
October 26th	Monthly Star Party	Caloosahatchee Regional Park	Dusk
November 2nd	Monthly Star Party	Caloosahatchee Regional Park	Dusk
November 7th	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
November 9th	Solar Observing	Gilchrist Park Punta Gorda	9:00 am - Noon
November 9th	Private Event	Forest Country Club – Mike McCauley Co-ord.	Dusk
November 11th	Transit of Mercury	FSW Moore Observatory Punta Gorda Campus	8am-1pm
November 16th	Girl Scout Event	Camp Calusa of SR31 NFM	6:00pm
November 22nd	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
November 29th	Sky Watch Cruise	Babcock Ranch – Fee for participation	Dusk Mike McCauley
November 30th	Monthly Star Party	Seahawk Park	Dusk
December 5th	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
December 14th	Solar Observing	Ponce De Leon Park Punta Gorda	9:00 am - Noon
December 21st	Monthly Star Party	Caloosahatchee Regional Park	Dusk
December 21st	Big Cypress Observing	Big Cypress Preserve Ochopee	7:00 pm
Dec 27th, 2019	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk

January 2nd, 2020	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
January 11th, 2020	Solar Observing	Bayshore Live Oak Park Port Charlotte	9:00 am - Noon
January 24th, 2020	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
January 25th, 2020	Astronomy Swap Meet	El Joe Bean –Charlotte County	TBD
January 25th, 2020	Big Cypress Observing	Big Cypress Preserve Ochopee	7:00 pm
February 6th, 2020	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
February 8th, 2020	Solar Observing	Gilchrist Park Punta Gorda	9:00 am - Noon
Feb 22nd, 2020	Big Cypress Observing	Big Cypress Preserve Ochopee	7:00 pm
Feb 28th, 2020	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
March 5th, 2020	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
March 14th, 2020	Solar Observing	Ponce De Leon Park Punta Gorda	9:00 am - Noon
March 21st, 2020	Big Cypress Observing	Big Cypress Preserve Ochopee	7:00 pm
March 27th, 2020	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
April 2nd, 2020	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
April 11th, 2020	Solar Observing	Bayshore Live Oak Park Port Charlotte	9:00 am - Noon
April 24th, 2020	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk
May 7th, 2020	Monthly Meeting	Calusa Nature Center Planetarium	7:30pm
May 9th, 2020	Solar Observing	Gilchrist Park Punta Gorda	9:00 am - Noon
May 22nd, 2020	Public Observing	FSW Moore Observatory Punta Gorda Campus	Dusk

All observing events are Weather Permitting.

If it is cloudy or a chance of rain, we may not setup at all.

There may be no way to provide advance notice of cancellation.

Events may be cancelled several hours before scheduled time based on observed conditions and forecasts at that time and weather may change.

Monthly Star Parties: These are held at either Seahawk Park in Cape Coral or at Caloosahatchee Regional Park (CRP) off SR78 7 miles east of SR31. Other than park fees noted, these are free and open to the public. Those wanting to learn how to use equipment can bring it to the monthly star parties or the monthly meetings. We are always glad to help people learn how to use their telescopes. It is also a great way to learn about different telescopes and try some out before making a purchase.

Seahawk Park is in North Cape Coral off Wilmington Blvd. (Nelson Rd or Chiquita Blvd are the nearest cross streets.) There is a brown sign in the center median at the entrance to the park. (GPS may not get you to the park, as some of the local roads have been closed.) You will make a big J hook before getting to the parking area. Seahawk Park is managed by the *Cape Coral* R/*Seahawks* Club for Radio Controlled Planes and they have priority. They are usually done by sunset but may be there before sunrise. Park in the lot and transport your equipment to the concrete staging area before the runway. This park is handicap capable as there is level concrete leading from parking to the staging area.

CRP has a gate that closes at dusk, you can check the county's website for current gate closing times and the status of the park's Northside entrance as that is where we observe from. (They may close the area if there are issues with the trails.) There is a parking fee of $1/hr or $5/day at CRP. Park in the main Northside parking lot. We sometimes setup down the dirt road that goes to the east. That area is grassy and may not be level, so one should walk on the dirt road as much as possible and watch their step.

Big Cypress: The Big Cypress Visitor Center is located off US41 5 miles east of SR29 about 25 miles east of Naples. Big Cypress has earned a Dark Sky Park designation. They hold observing events down the road that extends south of the Welcome Center during the winter months. This is a real dark sky site. Their observing events are free.

Solar Events: We have daytime solar events where one can safely look at the Sun. Things such as sunspots and prominences may be visible. These are free unless tied to another event that may have an entrance fee. There are seasonal monthly events held at different parks around Charlotte County as well as at other major public events in SW FLA.

Rotary Park Star Party: This is a free public star party held at Rotary Park at the south end of Pelican Blvd in South Cape Coral. Park to the west of the main building and walk to where we are setup to the east of the main building.

Moore Observatory, FSW Punta Gorda Campus: The campus is located off Airport Rd just east of I-
75. Go to the right around the lake and park. The observatory is located down the path along the lake. Besides the telescope in the observatory, additional scopes may be setup around the observatory. This is a free event.

Star Party Etiquette: Bright white flashlights are not welcome. We use red flashlights to preserve our night vision. At the parks, please use just your parking lights if possible. As there may be cords and tripod legs that are hard to see in the dark, we ask that all children be well behaved and cautious around the telescopes. If you need help in moving around in the dark, just ask. Someone will be happy to guide you with a red light. If you have a telescope and need help with it, just ask. Someone will be glad to show you how to use it.

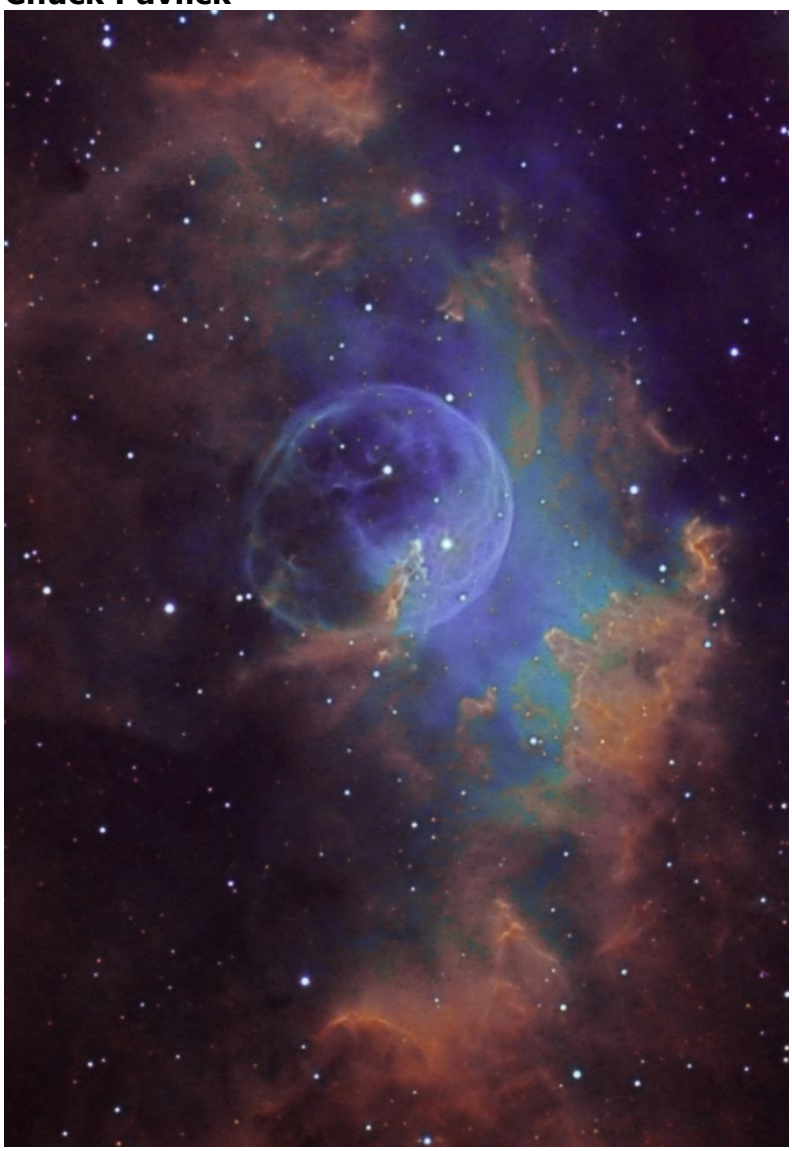
Golden Rules to Telescope Observing: Move your eye to the telescope, don't try to move the telescope to your eye! Ladders/chairs are there for your support, the telescopes do not provide support and should not be touched.

Website: www.theeyepiece.org Check us out on Facebook too.

Membership Photos

Matthew Knight – Saturn:
Celestron Nexstar 5SE with a ZWO ASI120MC-S

Chuck Pavlick



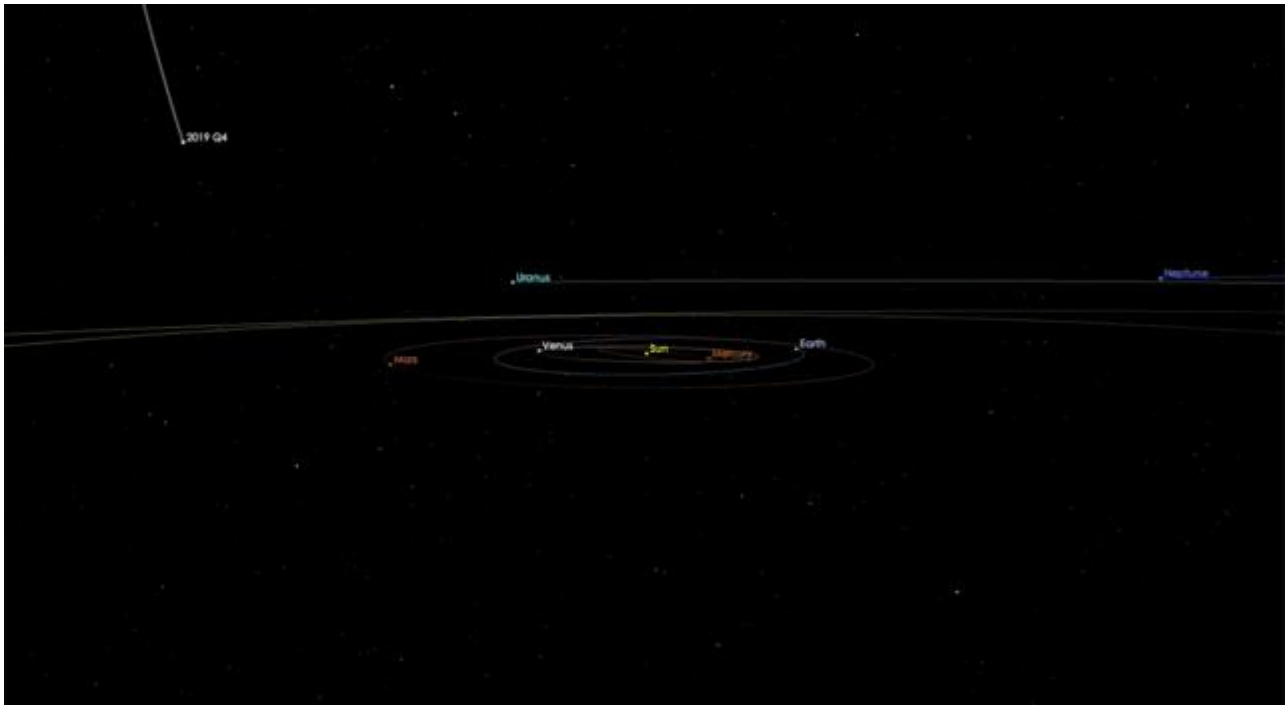
Bubble Nebula in Hubble Color Palette.

Chuck Pavlick

Newly Discovered Comet Is Likely Interstellar Visitor

JPL-News Weekly, September 12, 2019

https://www.jpl.nasa.gov/news



This illustration depicts Comet C/2019 Q4's trajectory. Deemed a possible interstellar object, it will approach no closer to Earth than about 190 million miles (300 million kilometers). Credit: NASA/JPL-Caltech

A newly discovered comet has excited the astronomical community this week because it appears to have originated from outside the solar system. The object - designated C/2019 Q4 (Borisov) - was discovered on Aug. 30, 2019, by Gennady Borisov at the MARGO observatory in Nauchnij, Crimea. The official confirmation that comet C/2019 Q4 is an interstellar comet has not yet been made, but if it is interstellar, it would be only the second such object detected. The first, 'Oumuamua, was observed and confirmed in October 2017.

The new comet, C/2019 Q4, is still inbound toward the Sun, but it will remain farther than the orbit of Mars and will approach no closer to Earth than about 190 million miles (300 million kilometers).

After the initial detections of the comet, Scout system, which is located at NASA's Jet Propulsion Laboratory in Pasadena, California, automatically flagged the object as possibly being interstellar. Davide Farnocchia of NASA's Center for Near-Earth Object Studies at JPL worked with astronomers and the European Space Agency's Near-Earth Object Coordination Center in Frascati, Italy, to obtain additional observations. He then worked with the NASA-sponsored Minor Planet Center in Cambridge, Massachusetts, to estimate the comet's precise trajectory and determine whether it originated within our solar system or came from elsewhere in the galaxy.

The comet is currently 260 million miles (420 million kilometers) from the Sun and will reach its closest point, or perihelion, on Dec. 8, 2019, at a distance of about 190 million miles (300 million kilometers).

"The comet's current velocity is high, about 93,000 mph [150,000 kph], which is well above the typical velocities of objects orbiting the Sun at that distance," said Farnocchia. "The high velocity indicates not only that the object likely originated from outside our solar system, but also that it will leave and head back to interstellar space."

Currently on an inbound trajectory, comet C/2019 Q4 is heading toward the inner solar system. On Oct. 26, it will pass through the ecliptic plane - the plane in which Earth and the other planets orbit the Sun - from above at roughly a 40-degree angle.

C/2019 Q4 was established as being cometary due to its fuzzy appearance, which indicates that the object has a central icy body that is producing a surrounding cloud of dust and particles as it approaches the Sun and heats up. Its location in the sky (as seen from Earth) places it near the Sun - an area of sky not usually scanned by the large ground-based asteroid surveys or NASA's asteroid-hunting NEOWISE spacecraft.

C/2019 Q4 can be seen with professional telescopes for months to come. "The object will peak in brightness in mid-December and continue to be observable with moderate-size telescopes until April 2020," said Farnocchia. "After that, it will only be observable with larger professional telescopes through October 2020."

Observations completed by Karen Meech and her team at the University of Hawaii indicate the comet nucleus is somewhere between 1.2 and 10 miles (2 and 16 kilometers) in diameter. Astronomers will continue collect observations to further characterize the comet's physical properties (size, rotation, etc.) and also continue to better identify its trajectory.

The Minor Planet Center is hosted by the Harvard-Smithsonian Center for Astrophysics and is a sub-node of NASA's Planetary Data System Small Bodies Node at the University of Maryland. JPL hosts the Center for Near-Earth Object Studies. All are projects of NASA's Near-Earth Object Observations Program and elements of the agency's Planetary Defense Coordination Office within NASA's Science Mission Directorate.

More information about asteroids and near-Earth objects can be found at:
https://cneos.jpl.nasa.gov
https://www.jpl.nasa.gov/asteroidwatch

For more information about NASA's Planetary Defense Coordination Office, visit:
https://www.nasa.gov/planetarydefense

For asteroid and comet news and updates, follow AsteroidWatch on Twitter:
twitter.com/AsteroidWatch

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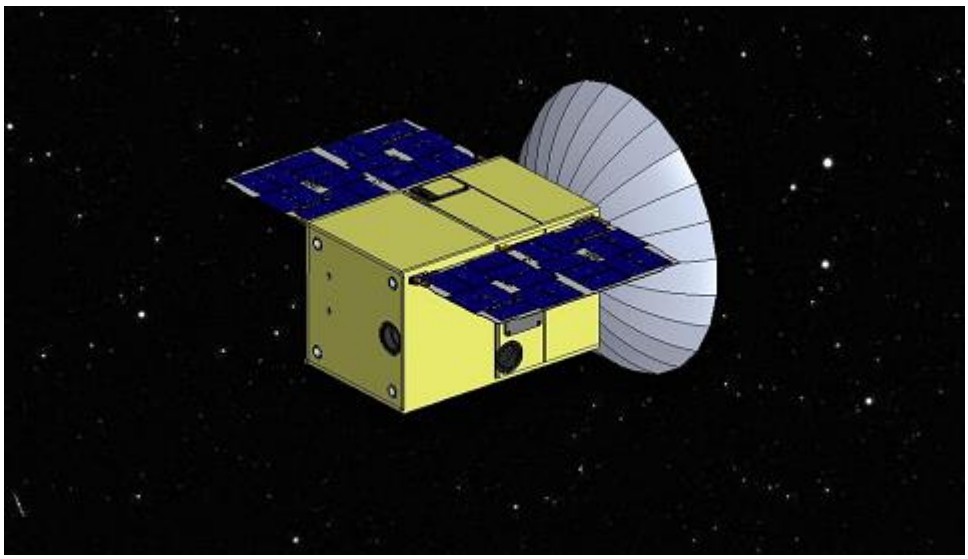
2019-185

[See Recommended Reading about amateur viewing tips of this comet]

CubeSat to Blaze a Trail for Lunar Gateway

David Dickson,Sky & Telescope Weekly, September 17, 2019

NASA's proposed Capstone mission could enter lunar orbit in late 2020.



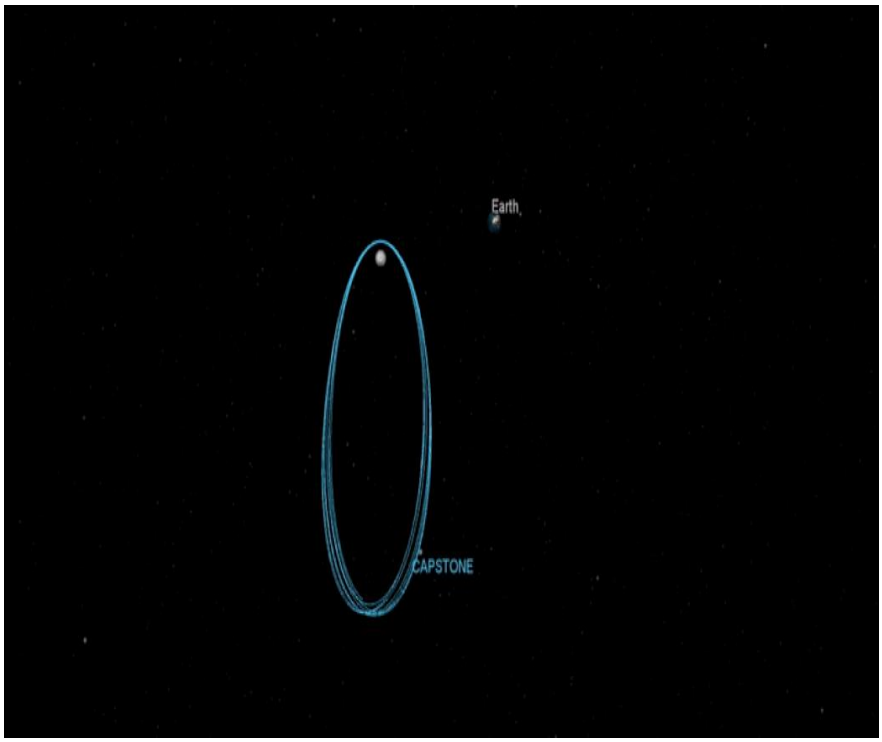
An artist's impression of Capstone.
Tyvak Nano-satellite Systems

A future CubeSat pathfinder is set to explore a unique orbital path that will be used later by humans exploring the Moon.

Last week, NASA awarded a $13.7 million contract [https://www.nasa.gov/press-release/nasa-funds-cubesat-pathfinder-mission-to-unique-lunar-orbit] to Advanced Space, based in Boulder, Colorado, to develop the Cislunar Autonomous Positioning System Technology Operations and Navigation Experiment (Capstone). The mission consists of a 12U CubeSat the size of a microwave oven, and it could launch in late 2020.

NASA plans to return to the Moon with its Artemis[https://www.skyandtelescope.com/astronomy-news/nasas-budget-boost-artemis-moon-initiative/] program, sister to the Apollo program of the 1960s and 1970s. As part of this program, NASA is building a Lunar Gateway outpost, which will be placed in a *near-rectilinear halo orbit* around the Moon.From this unique vantagepoint, the Lunar Gateway will eventually be dispatching crewed missions on expeditions to the lunar polar regions. Capstone will test the viability of this unique orbit.

The near-rectilinear halo orbit is extremely elliptical, which presents unique challenges. Capstone, and eventually the Lunar Gateway, will travel from a perilune of 1,600 kilometers (1,000 miles) to a distant apolune of 70,000 kilometers from the Moon's surface. Capstone will serve as a rapid lunar flight demonstrator, showing how to transition into and operate from this orbit. This knowledge is necessary not only for the Gateway's construction but also for the later logistics of transferring crew and supplies.



A near-rectilinear halo orbit around the Moon.
Advanced Space
[See the article for animation]

"This is an exciting opportunity for NASA to aggressively push forward towards the Moon in partnership with several American small businesses as a vanguard to Artemis," says Jim Reuter (NASA's Space Technology Mission Directorate) in a recent press release [*See Artemis website above].* "This mission is highly ambitious in both cost and schedule—and taking that deliberate risk is part of the objective of this mission."

Communicating with Capstone

Capstone will come equipped with its own communications and propulsion system. Once in lunar orbit, Capstone will communicate with the Lunar Reconnaissance Orbiter, which has been circling the Moon since 2009, to measure its position. This is a technology demonstration for the Gateway, which could then determine its position without relying on Earth-based tracking.

Lunar communications: past, present and future.
Advanced Space

Capstone will be only the third CubeSat to operate beyond Earth orbit, after the Marco-A and Marco-B missions that hitched a ride [https://www.skyandtelescope.com/astronomy-news/mars-cube-one-cubesat-launch-with-mars-insight/] with Mars InSight last year,

The mission will launch either as part of a lunar rideshare mission or as the prime payload on a smaller launcher. The Space Launch System (SLS) rocket will also be carrying several CubeSats to the Moon [https://www.skyandtelescope.com/astronomy-news/infographic-back-to-the-moon/] as part of the first Artemis mission, but as Clare Skelly (NASA Goddard Space Flight Center) notes, Capstone has been developed so quickly, it did not exist yet when those payloads were determined. "NASA has requested information from U.S. industry on commercial launch options for the Capstone CubeSat," Skelly adds.

This year has been a busy year for lunar exploration, with the first ever soft-landing on the farside of the Moon by China's Chang'e 4 [https://www.skyandtelescope.com/astronomy-news/chinas-change-4-mission-lands-on-the-lunar-farside/] mission, two soft landing attempts by SpaceIL's Beresheet [https://www.skyandtelescope.com/astronomy-news/israels-beresheet-mission-crashes-moon/] and India's Vikram [https://www.skyandtelescope.com/astronomy-news/india-chandrayaan-2-loses-contact-vikram-lunar-lander/] landers, and India's Chandrayaan 2 [https://www.skyandtelescope.com/astronomy-news/india-moon-chandrayaan-2/] entering lunar orbit. And more activity is afoot: The core module for the Lunar Gateway is currently set to launch as early as 2022.

If Capstone is successful, it will help guide the way for humans to visit lunar orbit.

The Astronomical League

As a member of the Southwest Florida Astronomical Society you are automatically also a member of the Astronomical League, a nationwide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you including receipt of The Reflector, the AL's quarterly newsletter, use of the Book Service, through which you can buy astronomy related books at a 10% discount. You can also participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others. To learn more about the Astronomical League and its benefit s for you, visit http://www.astroleague.org

Introduction to the Astronomical League Observing Programs

There are some 50 formal Observing Programs available to choose from covering the whole gamut of object types accessible to the amateur astronomer. In addition there are from time to time additional programs set up for special targets including comets, eclipses, transits and so forth. Certificates and pins are awarded for successful completion and submission of the required observations for a particular program. There is no time limit for completing observations. The programs are categorized by level of difficulty (Novice, Intermediate, and Advanced) and each program is also categorized by recommended equipment ranging from the naked eye through binoculars and telescope aperture. There are programs for Imagers and also for solar observers using H-alpha scopes. Visit http://www.astroleague.org/observing to obtain full details. Starting in February 2019, we will highlight one or two programs each month in the Newsletter.

Reflector Magazine

The email distribution system for the quarterly Reflector magazine is still not resolved. However they can be downloaded by going to the Astronomical League homepage https://www.astroleague.org/ and scrolling down the left hand side and clicking on the Reflector link. The direct link is: https://www.astroleague.org/reflector

The Astronomical League Open Cluster Observing Program

Last month we covered the Globular Cluster observing program. The League also supports an Open Cluster program with the goal of having the observing complete a challenging observing program while also learning the details of the Trumpler Open Cluster classification system.
There are two levels of awards:

Basic Program

- Observe any 100 of the 125 Open Clusters on the list
- Sketch any 25 of the 100 Open Clusters observed
- Classify all 100 observed clusters under the Trumpler system

Advanced Program

- Observe all 125 of the Open Clusters on the list
- Sketch any 50 of the 125 Open Clusters observed
- Classify all 125 observed clusters under the Trumpler system

For either level, all observing techniques can be used including Go-To, digital setting circles, and star-hopping, etc. To observe all detail possible, The Program Coordinator recommends a minimum aperture of 15 inches! However the Program Coordinator successfully completed the advanced program using an 8 inch instrument.
The "Open Star Clusters – A Guide for the Open Star Clusters Observing Program" pdf document is included on the website. This document provides the program requirements along with detailed instructions for assigning the correct Trumpler designation and also includes the listing of the 125 objects. The list was compiled from over 20 specialist catalogs along with the well-known Messier and NGC listings. The list of 125 targets includes 9 Messier List objects and 54 which are included in the NGC catalog.

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!

Find Strange Uranus in Aries

David Prosper

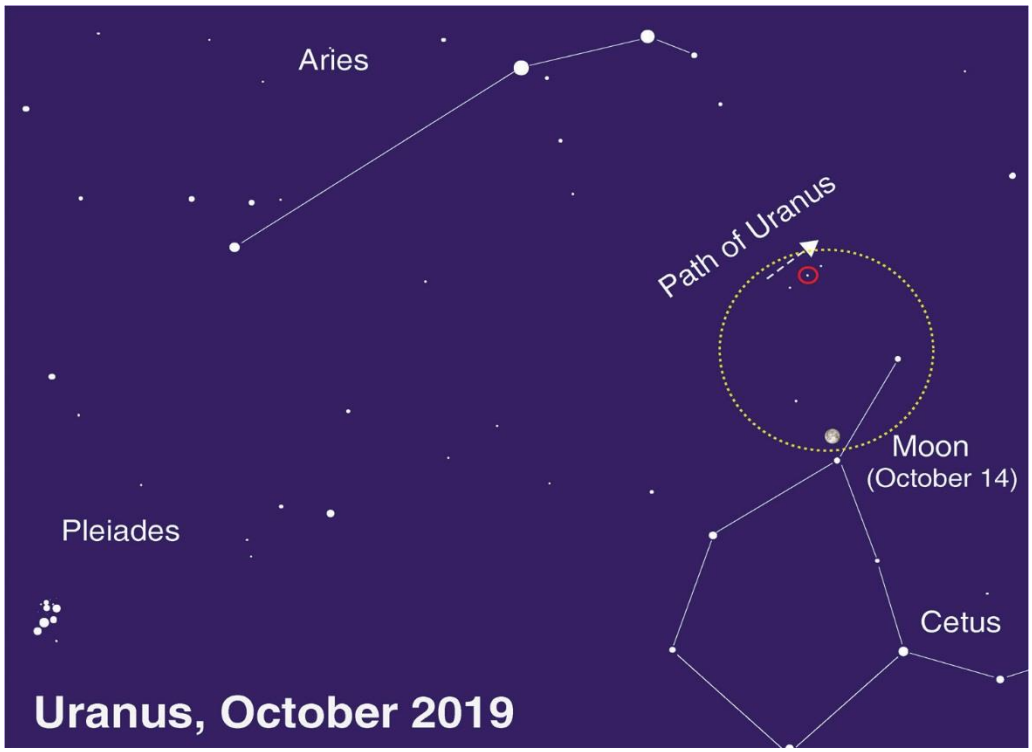
Most of the planets in our solar system are bright and easily spotted in our night skies. The exceptions are the ice giant planets: Uranus and Neptune. These worlds are so distant and dim that binoculars or telescopes are almost always needed to see them. A great time to search for Uranus is during its opposition on October 28, since the planet is up almost the entire night and at its brightest for the year.

Search for Uranus in the space beneath the stars of Aries the Ram and above Cetus the Whale. These constellations are found west of more prominent Taurus the Bull and Pleiades star cluster. You can also use the Moon as a guide! Uranus will be just a few degrees north of the Moon the night of October 14, close enough to fit both objects into the same binocular field of view. However, it will be much easier to see dim Uranus by moving the bright Moon just out of sight. If you're using a telescope, zoom in as much as possible once you find Uranus; 100x magnification and greater will reveal its small greenish disc, while background stars will remain points.

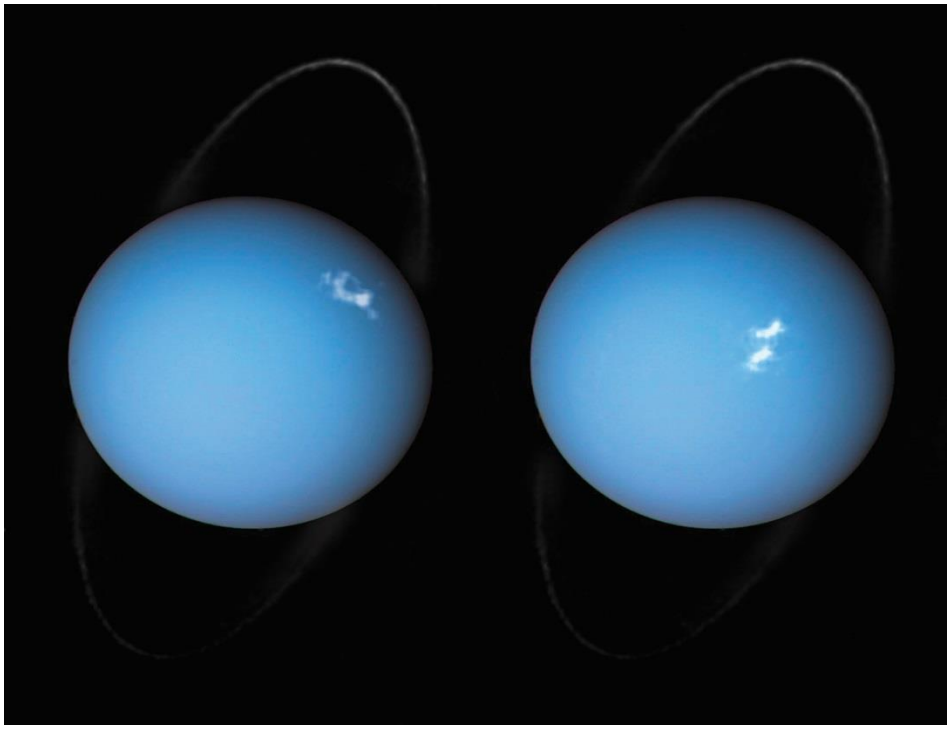
Try this observing trick from a dark sky location. Find Uranus with your telescope or binoculars, then look with your unaided eyes at the patch of sky where your equipment is aimed. Do you see a faint star where Uranus should be? That's not a star; you're actually seeing Uranus with your naked eye! The ice giant is just bright enough near opposition - magnitude 5.7 - to be visible to observers under clear dark skies. It's easier to see this ghostly planet unaided after first using an instrument to spot it, sort of like "training wheels" for your eyes. Try this technique with other objects as you observe, and you'll be amazed at what your eyes can pick out.

By the way, you've spotted the first planet discovered in the modern era! William Herschel discovered Uranus via telescope in 1781, and Johan Bode confirmed its status as a planet two years later. NASA's Voyager 2 is the only spacecraft to visit this strange world, with a brief flyby in 1986. It revealed a strange, severely tilted planetary system possessing faint dark rings, dozens of moons, and eerily featureless cloud tops. Subsequent observations of Uranus from powerful telescopes like Hubble and Keck showed its blank face was temporary, as powerful storms were spotted, caused by dramatic seasonal changes during its 84-year orbit. Uranus's wildly variable seasons result from a massive collision billions of years ago that tipped the planet to its side.

Discover more about NASA's current and future missions of exploration of the distant solar system and beyond at nasa.gov



Caption: The path of Uranus in October is indicated by an arrow; its position on October 14 is circled. The wide dashed circle approximates the field of view from binoculars or a finderscope. Image created with assistance from Stellarium.



Caption: Composite images taken of Uranus in 2012 and 2014 by the Hubble Space Telescope, showcasing its rings and auroras. More at bit.ly/uranusauroras Credit: ESA/Hubble & NASA, L. Lamy / Observatoire de Paris

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