ASTROFILES

Auburn Astronomical Society Newsletter

December 2018 *Newsletter Editor — John Wingard — jwin1048@gmail.com*

Moon Phases

December 29 — 3rd Quarter

January 5 — New Moon

January 14 — 1st Quarter

January 21 — Full Moon

January 27 — 3rd Quarter

February 4 — New Moon

February 12 — 1st Quarter

February 19 — Full Moon

Stay in touch with us

http://www.auburnastro.org

https://www.facebook.com/groups/79864233515/

Next AAS Meeting

The next scheduled AAS meeting will be Friday, February 1, 2019 in Auburn at our usual meeting location, Room 2015 of Davis Hall (Aerospace Engineering) on the AU Campus. 7:45 PM CT. Meeting reminders will be sent to all members in advance of the meeting

Did You See the Christmas Comet?

I hope that everyone has had an opportunity to see Comet 46P/ Wirtanen as it cruised through our vicinity this month. In fact, as I am writing this it is still favorably placed for viewing although after it's closest approach to us on December 12th, it is rapidly receding from view. It may still be visible with small telescopes for a while longer but will not be nearly as bright. Unfortunately for me, between other responsibilities and a scarcity of clear nights at my location I have not had a chance to catch it. However, AAS member Mike Lewis did manage to photograph it on the evening of December 11th from his Alexander City, AL location. (Photo below)

For those that may have missed it, here is the official release from Auburn University that describes a unique opportunity for an AU professor to study comet 46P/Wirtanen using not one, but three major telescopes.

Auburn professor using Hubble Space Telescope to observe comet passing Earth

Published: December 12, 2018
Miranda Nobles | Office of Communications and Marketing

One of the closest comets in modern times is passing by Earth – but don't worry, there's no danger of it hitting us. It will come relatively close in scientific terms – seven million miles away. For the average person, the comet will be visible with the naked eye and will provide a rare sky-watching event. For researchers, the proximity of the Comet 46P/Wirtanen to earth will offer a chance to collect data on comets and learn more about the building blocks of the solar system.
Auburn University researcher and astrophysicist Dennis Bodewits will perhaps get the best view of all. He's been awarded time to simultaneously use three of NASA's telescopes during the comet event: the Hubble Space Telescope, the Chandra X-ray Observatory and the Neil Gehrels Swift Observatory. He will be researching what ices make up the comet and how chemical processes change the gas around it. "These observations are like a space mission in reverse because the comet flies by us," Bodewits said.

Bodewits said this sky-watching event will provide important context to the Rosetta and Deep Impact missions. In the Deep Impact mission, NASA launched a space probe in 2005 to study the interior of a comet by releasing an impactor that collided with the comet's nucleus to emit material from below its surface. It continued its journey through the solar system to snap detailed pictures of a second comet, Hartley 2. Rosetta was a space probe built by the European Space Agency that followed comet Churyumov-Gerasimenko for more than two years around the Sun.

"Because the comet comes very close to Earth, we can investigate the inner 200 kilometers around the nucleus, a region we cannot resolve for most comets. The comet appears to be a close twin to comet Hartley 2, the second target of the Deep Impact mission. Hartley 2 puzzled astronomers because it releases much more gas than was expected from its size. Comparing two will allow us to learn more about how comet activity works," Bodewits said.
Bodewits explained the Rosetta mission taught scientists more about the makeup of a comet's nucleus and the origin of our solar system.

"It unexpectedly found a lot of molecular oxygen gas and discovered that electron collisions can change the comet gas," he said. "These are both important because they inform us what ices made up the building blocks of our solar system, and how they were altered by light and radiation from the Sun."

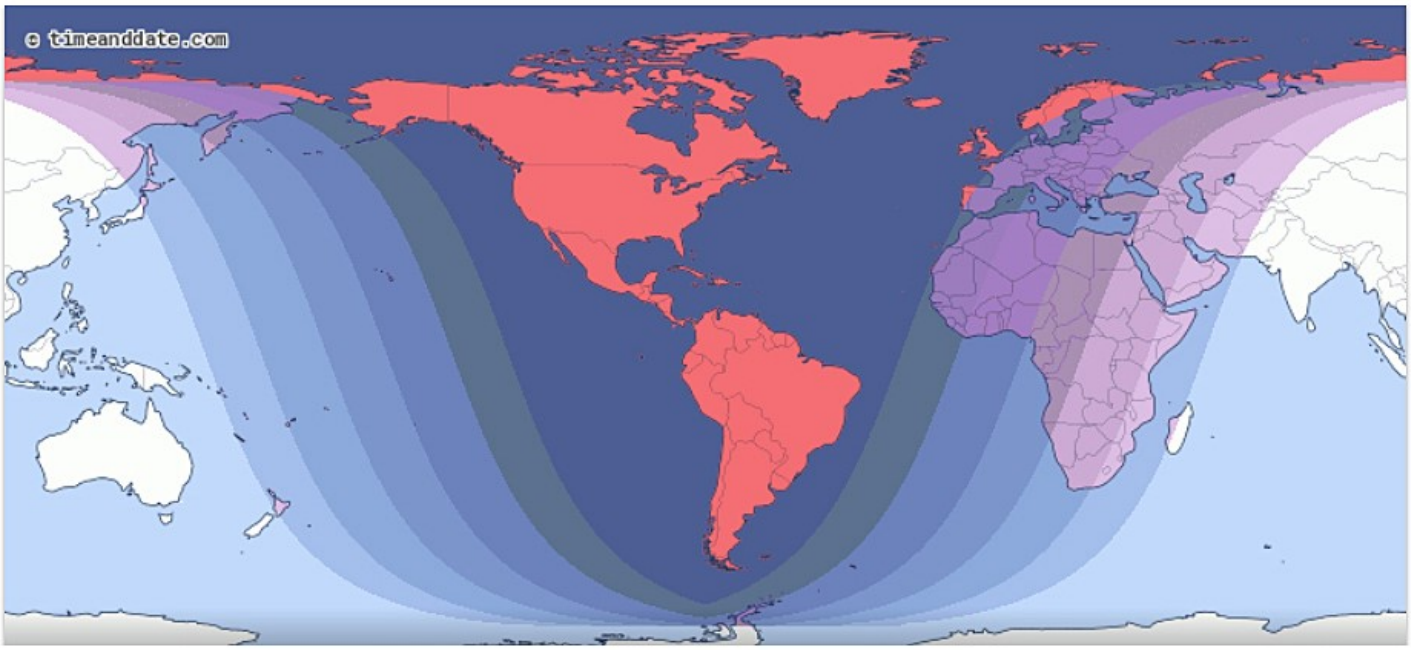
Because of the significance of this comet's proximity for learning more about the solar system, Bodewits is using as many resources as he can to study it. "We're going to be observing Comet 46P/Wirtanen with as many telescopes as we can get our hands on," he said. "The timing of this comet could not be better as our observations will allow us to apply all we learned from Rosetta to a completely different comet."

Bodewits is also looking at another mission that could take NASA back to Rosetta's comet to learn even more. The proposed CAESAR mission (Comet Astrobiology Exploration Sample Return) is a space mission that will go back to Churyumov-Gerasimenko to bring comet material back to Earth so it can be analyzed in laboratories around the world.

Lunar Eclipse Coming in January 2019

Unlike solar eclipses, lunar eclipses are relatively common but in a lot of cases they occur at less than ideal times and are sometimes not very favorable to our specific locations. However, we are in luck next month with a lunar eclipse that will be easily visible in its entirety from virtually anywhere in North America. So make your plans to see it and hope that those pesky clouds stay away. Also unlike their solar counterparts, lunar eclipses happen at a much more leisurely pace. The beginning stage of this eclipse will begin at approximately 10:36 PM ET on January 20th and the moon will steadily darken for about another couple of hours until the beginning of the total eclipse phase at about 12:41 AM on the 21st. The moon will remain in total eclipse for about another hour, peaking at 1.12 AM ET. The process will then reverse itself and the moon should totally leave Earth's shadow at 3:48 AM ET. Since this will be on a weekday night, it may prevent school-age children from seeing it, or those that have to go in early for work. Otherwise, dress warmly and make sure you have plenty of coffee or hot chocolate! The diagram below clearly shows that we are clearly in the best place to view this eclipse.

Lunar Eclipse - January 20-21, 2019



The entire eclipse is visible from start to end.

The entire partial and total phases are visible. Misses part of penumbral phase.

The entire total phase is visible. Misses part of partial & penumbral phases.

Some of the total phase is visible. Misses part of total, partial & penumbral phases.

Some of the partial phase is visible. Misses total phase and part of partial & penumbral phases.

Some of the penumbral phase is visible. Misses total & partial phases.

The eclipse is not visible at all.

Now this is really, really *far-out*!

Washington, DC— A team of astronomers has discovered the most-distant body ever observed in our Solar System. It is the first known Solar System object that has been detected at a distance that is more than 100 times farther than Earth is from the Sun.
The new object was announced on Monday, December 17, 2018, by the International Astronomical Union's Minor Planet Center and has been given the provisional designation 2018 VG18. The discovery was made by Carnegie's Scott S. Sheppard, the University of Hawaii's David Tholen, and Northern Arizona University's Chad Trujillo.

2018 VG18, nicknamed "Farout" by the discovery team for its extremely distant location, is at about 120 astronomical units (AU), where 1 AU is defined as the distance between the Earth and the Sun. The second-most-distant observed Solar System object is Eris, at about 96 AU. Pluto is currently at about 34 AU, making 2018 VG18 more than three-and-a-half times more distant than the Solar System's most-famous dwarf planet.

2018 VG18 was discovered as part of the team's continuing search for extremely distant Solar System objects, including the suspected Planet X, which is sometimes also called Planet 9. In October, the same group of researchers announced the discovery of another distant Solar System object, called 2015 TG387 and nicknamed "The Goblin," because it was first seen near Halloween. The Goblin was discovered at about 80 AU and has an orbit that is consistent with it being influenced by an unseen Super-Earth-sized Planet X on the Solar System's very distant fringes.

The existence of a ninth major planet at the fringes of the Solar System was first proposed by this same research team in 2014 when they discovered 2012 VP113, nicknamed Biden, which is currently near 84 AU. 2015 TG387 and 2012 VP113 never get close enough to the Solar System's giant planets, like Neptune and Jupiter, to have significant gravitational interactions with them. This means that these extremely distant objects can be probes of what is happening in the Solar System's outer reaches. The team doesn't know 2018 VG18's orbit very well yet, so they have not been able to determine if it shows signs of being shaped by Planet X.

"2018 VG18 is much more distant and slower moving than any other observed Solar System object, so it will take a few years to fully determine its orbit," said Sheppard. "But it was found in a similar location on the sky to the other known extreme Solar System objects, suggesting it might have the same type of orbit that most of them do. The orbital similarities shown by many of the known small, distant Solar System bodies was the catalyst for our original assertion that there is a distant, massive planet at several hundred AU shepherding these smaller objects." "All that we currently know about 2018 VG18 is its extreme distance from the Sun, its approximate diameter, and its color," added Tholen "Because 2018 VG18 is so distant, it orbits very slowly, likely taking more than 1,000 years to take one trip around the Sun."

The discovery images of 2018 VG18 were taken at the Japanese Subaru 8-meter telescope located atop Mauna Kea in Hawaii on November 10, 2018.

What telescope is best for me?

The best telescope for you is the one that you will use!

1 Consider trying binoculars first.

- Easy to use, easy to store, ultra-portable.
- Can see large sections of the sky at once.
- Can use them for daytime activities.

An excellent size is 10 x 50:
10 = magnification
50 = the diameter in millimeters of the front lens.

2 Before you buy a telescope, ask yourself these questions...

- How well do you know the night sky? Finding objects is not easy without practice. A quality "go-to" computerized telescope is costly and its operation must be mastered.
- How hard is the scope to assemble? If it is too complicated, you won't use it.
- Where will you do most of your observing? A city resident will likely need to cart it to a dark site.
- Where do you think you'll be in the hobby in three years? If you really like astronomy, you'll outgrow a small scope in six months.
- Will you eventually pursue astrophotography? You'll need a sturdy, motor driven mount that tracks accurately.

Telescope Diameter Dilemma

Since most sky objects are relatively dim, a telescope needs to gather large amounts of light. Therefore, larger diameter telescopes are better than smaller ones. However, they are also bulkier – and less likely to make it outside in cold weather!

3 Telescope and observing tips:

- Magnification – low power is used for most objects.
- Finder scope – a small one is nearly useless.
- The larger the telescope's diameter, the better views it gives, but the less portable it is.
- If the scope has poor optics or a wobbly mount, it will be frustrating to use. Hence, it won't be used.
- Finding celestial objects requires practice and patience.
- Never point the telescope at the sun without the proper filter installed ON THE FRONT of the scope.
- Don't expect what you see in the eyepiece to closely resemble what you see in photographs.

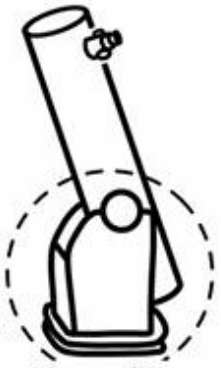
4 Visit your local amateur astronomy club!

- You can see and try the various sizes and types of telescopes.
- Some clubs have programs for lending telescopes.
- Members will be happy to guide you through the scope selection process.

Common Telescope Designs

Reflector

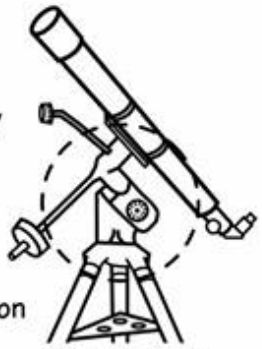
- Easy to use
- Least expensive scope design
- Great for clusters, nebulae, and galaxies
- Can be bulky
- Generally not suitable for astroimaging



Shown with a Dobsonian Mount

Refractor

- Easy to use
- Tend to be costly
- Not suitable for dim objects
- Can be used for astroimaging
- Great for the moon and planets



Shown with an Equatorial Mount

Schmidt-Cassegrain

- Portable, but heavy
- Tend to be costly
- Good for astroimaging
- All purpose scope

ASTRONOMICAL LEAGUE
www.astroleague.org/outreach

Auburn Astronomical Society

Membership Application Form

Name:

_____

Address:

_____

City: _____ **State:** _____ **Zip:** _____

Phone: _____ **Date of Application*** _____/_____/_____

E-mail:

_____

Telescope(s):

_____

_____

Area(s) of special interest:

_____

_____

Enclose: $20.00 for regular membership, payable in January. *Full-Time* student membership is half the Regular rate.

If you are a NEW member joining after the first of the year, refer to the prorated table below

Jan $20.00	Feb $18.33	Mar $16.66	Apr $14.99	May $13.33	Jun $11.66
Jul $10.00	Aug $8.33	Sep $6.66	Oct $4.99	Nov $2.33	Dec $1.66

Make checks payable to: Auburn Astronomical Society and return this application to:

Auburn Astronomical Society
c/o John Wingard, Secretary/Treasurer
#5 Wexton Court
Columbus, GA 31907

For questions about your dues or membership status, contact: jwin1048@gmail.com

Thank you for supporting the Auburn Astronomical Society!