

Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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www.cvas-utahskies.org

Meeting Announcement

Our November meeting will be held on the **third Wednesday in November, November 15, 2017 at 7pm in room 806/808 of the main BATC campus.** Enter on the east side of the building located at 1301 North 600 West. Our featured speaker will be CVAS member **Lyle Johnson**. He will be speaking to us about **“Backyard Astronomy for Beginners”**. We will learn how to do backyard astronomy using only a free sky map, how to observe with ordinary binoculars and how to choose and use a telescope.

This will be great information to help increase your enjoyment of the hobby. It will also be helpful if you or someone on your Christmas list is looking for binoculars or a telescope.

Announcement

The Executive Committee is interested in hearing from the membership concerning meeting dates for 2018 meetings. If you like the current meeting date (fourth Wednesday) or if you would like a different meeting date considered please email Dale Hooper at dchooper5@gmail.com.

The President’s Corner By Dell Vance, CVAS President



I always love October. It is always a very busy month for me. That is a good thing. My wife and I usually go for drives and hikes through the canyons with the fall colors. I love to see what nature can do each year. That is also why I enjoy astronomy so much. Even though the stars are basically the same, the conditions continually change. Also, I have good friends around me to point out some of the objects they are observing and how they are observing them. You never really run out of things to learn and to see.

In October, we had a very good meeting with a presentation by Layne Pedersen on “Saturn and the Cassini Mission”. He had some great pictures and videos from Cassini. It is amazing what we have the capability to do in the exploration of space. We also gave an astronomy presentation to the 6th graders at the River Heights Elementary School. They had some great questions and a lot of enthusiasm. That night CVAS had a star party for them. CVAS had 6 telescopes and 7 of our members there to field questions and show them the sights. I want to thank all those that turned out to support this event. The students and their families enjoyed themselves a lot. (The hot chocolate was extraordinary.)

CVAS also joined the NASA sponsored “Night Sky Network”. This is an opportunity to enhance our ability to make presentations to the public with some resources from their organization. They provide resources based on the activity of the group. The more out-reach events that we have the more resource kits they provide us to help us in our effort. All CVAS members will receive an invitation from them to fill out their personal profile on their website. You can put in as much information as you feel comfortable with onto their system. Once that is done, you can log your time and comments about the planned events. Their system keeps track of all these volunteer hours for each of us. I would like to encourage all our members to participate in this effort. Let me know if you have any questions about this new program. Garrett Smith is our coordinator for this effort. I certainly want to thank him for his willingness to serve in this assignment.

Our November meeting will be a great opportunity to bring our friends out to hear about “Backyard Astronomy for Beginners”. Lyle Johnson will be the presenter and he has a remarkable track record on making these presentations. The meeting is on the third Wednesday, November 15th at 7:00 PM. This is a change from our normal 4th Wednesday of the month meeting, due to the Thanksgiving Holiday this month.

It is getting colder, so take every opportunity you can to get out and observe before the weather gets too cold. I just got back from a trip to Yuba City, CA and their skies aren’t nearly as impressive as our

skies. Be sure to take advantage of them while we can.

Thanks again for your support.
Clear Skies!

CVAS Loaner Telescope



CVAS provides a 10 inch Dobsonian telescope to club members. Contact Garrett Smith to make arrangements to use this telescope. Garrett can be contacted by email at GarrettGillSmith@gmail.com.

Binocular Supports

The club now has available a number of mostly completed binocular supports. These supports are being sold to club members at cost. These supports just need the binocular attachment – which is tailored to the type of binocular being mounted.

Please contact Ned Miller or Dell Vance if you are interested in purchasing a binocular support. The images below show what they look like with binoculars attached as well as an image showing them folded for storage.



**Completed Binocular Support (with bins attached) -
Courtesy Ned Miller**



**Binocular support (folded for storage) - Courtesy Ned
Miller**

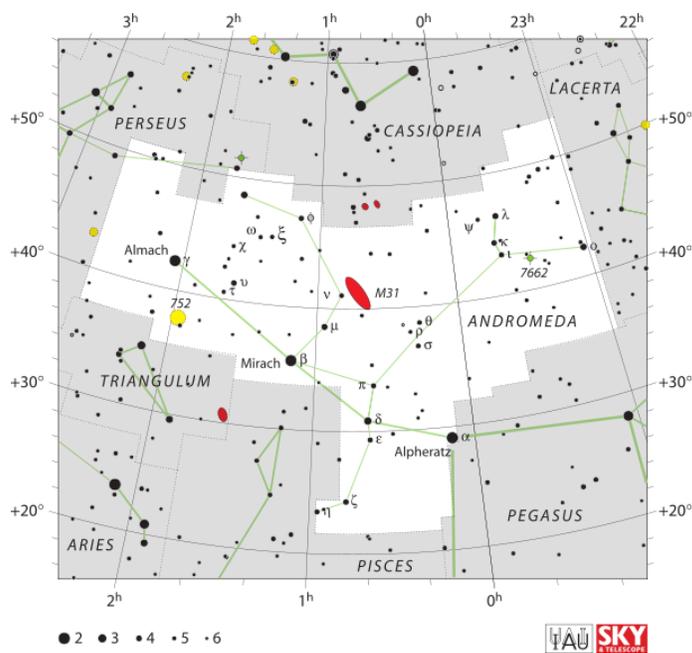
Spotlight on Andromeda, the Princess

By Dale Hooper

Andromeda, the Princess is one of the major mythological characters found in the northern skies in autumn. It is the home to what is typically the most distant object that can be observed with unaided eyesight, the Andromeda Galaxy, Messier 31 (2.5 million light-years distant). It also holds several other decent galaxies including (the rather elusive) NGC 891 and NGC 404 (Mirach's Ghost) and a very beautiful planetary nebula, the Blue Snowball (NGC 7662). The Andromeda Galaxy and its associated companion galaxies are great to observe with unaided eyes, binoculars, telescopes and are great to image. It can encompass many different observing projects. Since it is so large (approximately 3 degrees by 1 degree) it is easier to see the extent of the galaxy using binoculars.

Amateurs with large telescopes and astrophotographers can even observe globular clusters in M31. See for example, <http://www.astronomy-mall.com/Adventures.In.Deep.Space/gcm31.htm>

Objects which rank at least three stars in *The Night Sky Observer's Guide* (Andromeda is in Volume 1) have been included. As usual, the table is organized according to increasing Right Ascension values.



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg

| Object | R.A. | Dec. |
|------------------------------|----------|---------|
| Messier 110 (Galaxy mag 8.1) | 00h40.4m | +41°41' |
| Messier 32 (Galaxy mag 8.1) | 00h42.7m | +40°52' |
| Messier 31 (Galaxy mag 3.4) | 00h42.7m | +41°16' |
| NGC 252 (Galaxy mag 12.3) | 00h48.0m | +27°38' |
| 36 Andromedae (Double Star) | 00h55.0m | +23°38' |
| NGC 404 (Galaxy mag 10.3) | 01h09.4m | +35°43' |
| NGC 752 (Open cluster) | 01h57.8m | +37°41' |
| γ Andromedae (Multiple star) | 02h03.9m | +42°19' |
| NGC 891 (Galaxy mag 9.9) | 02h22.6m | +42°21' |
| NGC 7640 (Galaxy mag 11.3) | 23h22.1m | +40°51' |
| NGC 7662 (Planetary nebula) | 23h25.9m | +42°33' |
| NGC 7686 (Open cluster) | 23h30.2m | +49°08' |
| Σ 3050 (Double star) | 23h59.5m | +33°43' |

CVAS Minutes – October 2017

The October meeting of the Cache Valley Astronomical Society was held October 25th. Details for the upcoming River Heights Elementary school party were announced.

The time was then turned over to Layne Pedersen for a presentation about Saturn and the Cassini-Huygens mission. Layne provided us with a lot of great information about Saturn. Layne explained that Saturn is 888 million miles from the Sun, requires about 29.5 years to orbit the Sun, has a volume of

763 Earths, a mass of 95 years and it is less dense than water. In other words, if you had a large enough bath tub it would float. He also stated that Saturn is about 96% Hydrogen and 3.25% Helium.

Layne then provided information about past exploration of Saturn. Galileo thought that the rings were moons. Huygens proposed the ring theory and discovered Saturn's moon Titan. Cassini discovered more moons and performed a more detailed study of the rings.

Prior to 1979 there were only telescopic images of Saturn. In 1979, Pioneer 11 performed a flyby of Saturn. This was followed by the Voyager 1 flyby in 1980, which provided the first high resolution images. But, it still couldn't see the surface of Titan. Voyager 2 next performed a flyby of Saturn in 1981.

The Cassini-Huygens mission was designed to study many of the questions left by the Voyager probes. Cassini-Huygens was launched on October 15, 1997. Layne provided some interesting statistics about Cassini-Huygens. Cassini-Huygens executed 2.4 million commands, travelled 2.2 billion miles, orbited Saturn from 2004 to 2017, completed 243 orbits of the Saturn system and took 379,300 images! He also stated that 3,616 papers have been written about Cassini-Huygens – so far.

To get to Saturn, Cassini-Huygens required two Venus flybys, one Earth flyby, and one Jupiter flyby.

The Huygens probe landed on Titan January 14, 2005 and Cassini completed its primary mission in June 2008. In order to avoid contamination of Saturn's moons, Cassini completed its mission by entering Saturn's atmosphere on September 15, 2017.

Layne also showed us some amazing videos about Cassini-Huygens including the Huygens touchdown, Titan imagery, the north polar hexagon, ring grazing orbits and the grand finale orbits. Everyone in attendance learned a lot about Saturn from a very interesting presentation.

Upcoming Star Parties

*** Tentative End of Star Parties for 2017 ***

Upcoming Events

| | |
|--------|---|
| 02 Nov | Uranus 4° north of Moon Harlow Shapley born (1885) |
| 04 Nov | Full Moon |
| 05 Nov | Daylight Saving Time ends Aldebaran 0.6° south of Moon |
| 07 Nov | Election Day |
| 08 Nov | Edmond Halley born (1656) |
| 10 Nov | Last Quarter Moon |
| 11 Nov | Veterans Day Regulus 0.4° south of Moon (day time occultation) |
| 12 Nov | Mercury 2° north of Antares Voyager 1 flies past Saturn (1980) Philae lands on Comet 67P (2014) |
| 13 Nov | Venus 0.3° north of Jupiter Mariner 9 orbits Mars (1971) |
| 14 Nov | Mars 3° south of Moon |
| 15 Nov | William Herschel born (1738) |
| 16 Nov | Vesta 0.4° north of Moon Jupiter 4° south of Moon Leonid Meteors |
| 17 Nov | Leonid Meteors |
| 18 Nov | New Moon Leonid Meteors |
| 20 Nov | Saturn 3° south of Moon Edwin Hubble born (1889) |
| 23 Nov | Thanksgiving Day |
| 26 Nov | First Quarter Moon Neptune 1.2° north of Moon First Meteor photograph (1885) |
| 27 Nov | Mars 3° north of Spica |
| 28 Nov | Mercury 3° south of Saturn |
| 30 Nov | Uranus 4° north of Moon |

Small Asteroid or Comet 'Visits' from Beyond the Solar System

A small, recently discovered asteroid -- or perhaps a comet -- appears to have originated from outside the solar system, coming from somewhere else in our galaxy. If so, it would be the first "interstellar object" to be observed and confirmed by astronomers.

This unusual object – for now designated A/2017 U1 – is less than a quarter-mile (400 meters) in diameter and is moving remarkably fast. Astronomers are urgently working to point telescopes around the world and in space at this notable object. Once these data are obtained and analyzed, astronomers may know more about the origin and possibly composition of the object.

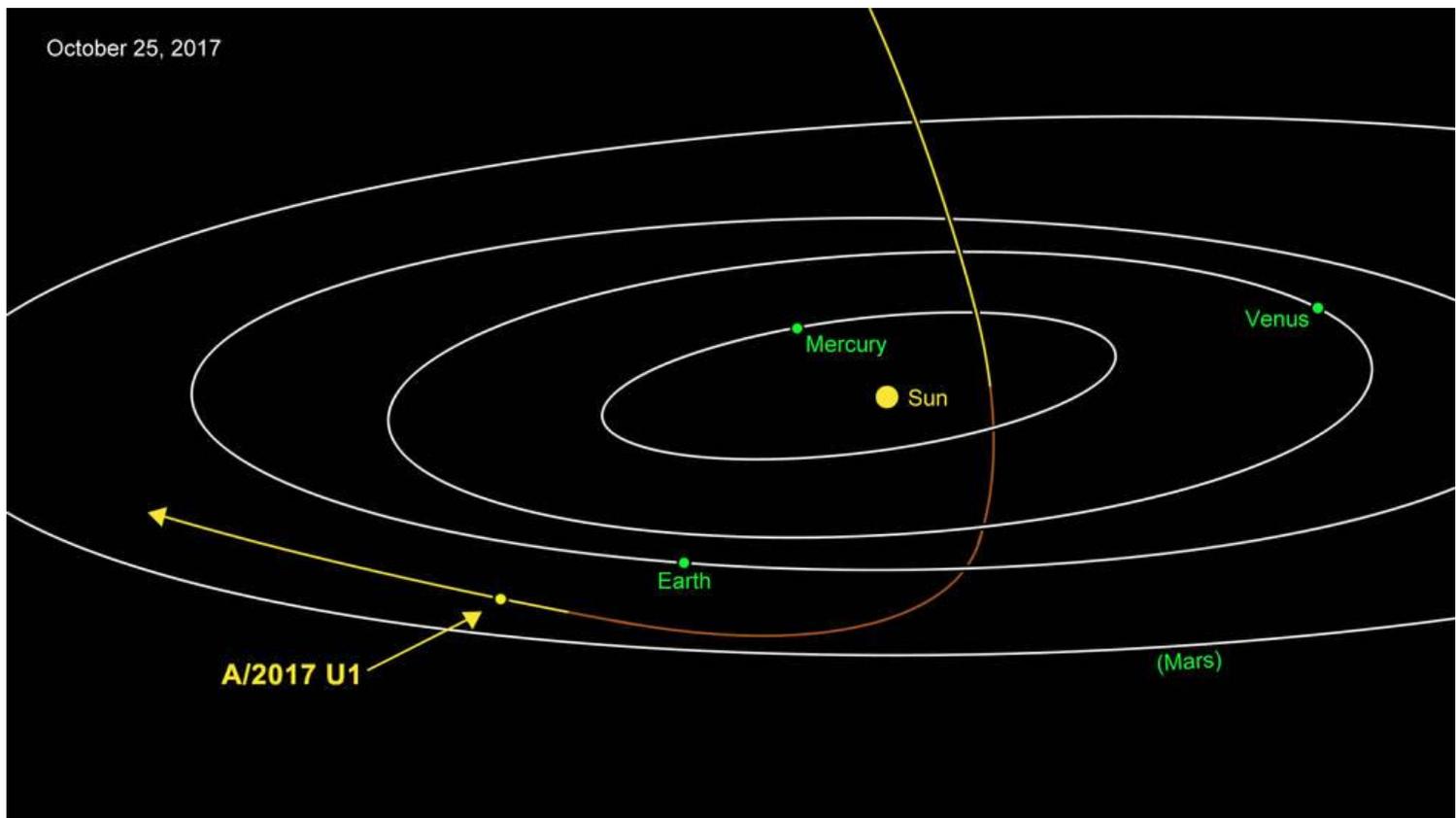
A/2017 U1 was discovered Oct. 19 by the University of Hawaii's Pan-STARRS 1 telescope on Haleakala, Hawaii, during the course of its nightly search for near-Earth objects for NASA. Rob Weryk, a postdoctoral researcher at the University of Hawaii Institute for Astronomy (IfA), was first to identify the moving object and submit it to the Minor Planet Center. Weryk subsequently searched the Pan-STARRS image archive and found it also was in images taken the previous night, but was not initially identified by the moving object processing.

Weryk immediately realized this was an unusual object. "Its motion could not be explained using either a normal solar system asteroid or comet orbit," he said. Weryk contacted IfA graduate Marco Micheli, who had the same realization using his own follow-up images taken at the European Space Agency's telescope on Tenerife in the Canary Islands. But with the combined data, everything made sense. Said Weryk, "This object came from outside our solar system."

"This is the most extreme orbit I have ever seen," said Davide Farnocchia, a scientist at NASA's Center for Near-Earth Object Studies (CNEOS) at the agency's Jet Propulsion Laboratory in Pasadena, California. "It is going extremely fast and on such a trajectory that we can say with confidence that this object is on its way out of the solar system and not coming back."

The CNEOS team plotted the object's current trajectory and even looked into its future. A/2017 U1 came from the direction of the constellation Lyra, cruising through interstellar space at a brisk clip of 15.8 miles (25.5 kilometers) per second.

October 25, 2017



A/2017 U1 is most likely of interstellar origin. Approaching from above, it was closest to the Sun on Sept. 9. Traveling at 27 miles per second (44 kilometers per second), the comet is headed away from the Earth and Sun on its way out of the solar system.

Credits: NASA/JPL-Caltech

The object approached our solar system from almost directly "above" the ecliptic, the approximate plane in space where the planets and most asteroids orbit the Sun, so it did not have any close encounters with the eight major planets during its plunge toward the Sun. On Sept. 2, the small body crossed under the ecliptic plane just inside of Mercury's orbit and then made its closest approach to the Sun on Sept. 9. Pulled by the Sun's gravity, the object made a hairpin turn under our solar system, passing under Earth's orbit on Oct. 14 at a distance of about 15 million miles (24 million kilometers) -- about 60 times the distance to the Moon. It has now shot back up above the plane of the planets and, travelling at 27 miles per second (44 kilometers per second) with respect to the Sun, the object is speeding toward the constellation Pegasus.

"We have long suspected that these objects should exist, because during the process of planet formation a lot of material should be ejected from planetary systems. What's most surprising is that we've never seen interstellar objects pass through before," said Karen Meech, an astronomer at the IfA specializing in small bodies and their connection to solar system formation.

The small body has been assigned the temporary designation A/2017 U1 by the Minor Planet Center (MPC) in Cambridge, Massachusetts, where all observations on small bodies in our solar system -- and now those just passing through -- are collected. Said MPC Director Matt Holman, "This kind of discovery demonstrates the great scientific value of continual wide-field surveys of the sky, coupled with intensive follow-up observations, to find things we wouldn't otherwise know are there."

Since this is the first object of its type ever discovered, rules for naming this type of object will need to be established by the International Astronomical Union.

"We have been waiting for this day for decades," said CNEOS Manager Paul Chodas. "It's long been theorized that such objects exist -- asteroids or comets moving around between the stars and occasionally passing through our solar system -- but this is the first such detection. So far, everything indicates this is likely an interstellar object, but more data would help to confirm it."

The Panoramic Survey Telescope and Rapid Response System (Pan-STARRS) is a wide-field survey observatory operated by the University of Hawaii Institute for Astronomy. 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 (<http://www.minorplanetcenter.net/>). JPL hosts the Center for Near-Earth Object Studies (CNEOS). 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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