Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society

CVAS Executive Committee

Pres – Tom Westre - (435) 787-6380
twestre45@aol.com

Vice Pres- Dell Vance – (435) 938-8328
avteam.dell@gmail.com

Public Relations – Lyle Johnson
lyledj@aol.com

Treasurer- Ned Miller - (435) 757-9035
nedmiller2008@gmail.com

Secretary – Dale Hooper - (435) 563-0608
dchooper5@gmail.com

Librarian – Open
Loaner Scope Coordinator – Lyle Johnson
Webmaster – Tom Westre

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No Meeting This Month

There will be no CVAS meeting in August. Instead we will be having several star parties and a solar party. We have a club star party scheduled for August 14th at Dell Vance's house. The GPS coordinates for his house are: **41°52′4″ N 111°59′25″ W**. There will also be a public star party at Mt Logan Park on August 21st. In addition we will have a solar party at the Logan Library on August 22nd from 11am to 1pm.

Elections for Officers in September

WE WANT YOU!

At the September annual meeting we will have the opportunity to elect officers. Please consider running for one of the officer positions.

The President's Corner
By Tom Westre, CVAS President

We are now is August. The summer is going fast. We hope you have found time to get out under the stars and do some observing or photography. I would like to hear from some of you about your observing…the targets you choose or any projects you may be doing with the telescope.

Dale and I set up our solar telescopes at the Logan Public Library last Saturday and had a great turnout. We had over 50 people stop by and look at the Sun. There was a nice prominence that impressed folks. This is a great opportunity to reach out to the Logan community and introduce them to astronomy.

Saturday evening we had a club star party at Mt. Logan. Not many from the community showed up

but we had eight telescopes brought by club members. It was a fun time to get together and view the sky. A number of members brought their telescopes for the first time. We had everything from a six inch to Gary's large Meade 14". Thanks to those members that helped the beginners get their scopes up and running. That's the value of being part of a great organization where we help others progress in the great hobby.

Our August parties will include a club star party at Dell Vance's place at 240 N 100 W, in Newton on August 14. He has some great skies. That's a New Moon so we should have some dark skies and we should be able to find many faint fuzzies. We will set up at 8:30 pm. It would be nice if you could let Dell know if you plan to be there. His phone is 435-938-8328.

We have scheduled a public star part at Mt. Logan on August 21. We will be advertising that event so we hope to have a good turn-out of telescopes.

The Perseid Meteor Shower peaks the morning of August 12-13 with up to 60 to 80 per hour. This shower is also known for its fireballs that streak across the sky at over 100,000 mph. We will be looking for them at our Club star party at Dell's place on August 14. This is a great opportunity to invite family and friends to view the event and get kids interested in astronomy and stargazing.

We hope you had the chance to watch the Venus – Jupiter conjunction this spring. Later this year we will be treated with another in the early morning skies. Mars-Jupiter on October 17, Venus-Jupiter on October 26, and Venus-Mars on November 3.

Messier 13 is one of the main summer targets in Hercules. This is the Great Globular Cluster in Hercules, one of the best in the northern hemisphere. Halley first mentions it in 1715 and Messier found it in 1764. It's located in the "Keystone" of Hercules, about one third of the way between Eta and Zeta. The cluster contains well over 500,000 and probably at least 1 million stars. It lies about 25,000 light years away. Its total diameter is about 160 light years. Most of the stars are concentrated in the central core less than 100 light years in diameter. Photographs give the impression that they are so compact that they are in contact. This is an illusion. According to Robert Burnham in his Celestial Handbook, "The central region covers a region of 100 light years or about a million cubic light years in volume. Assuming that a million stars populate this region it is evident that the density is no greater than about one star per cubic light year. In the actual center of the cluster the star density may be several times greater, but in no case would it approach actual crowding." So it appears to be still mostly empty space.

Messier 13 in Hercules by Tom Westre

Robert Burnham then describes what the sky would be like from a planet orbiting within the cluster. "The appearance of the heavens from a point within the Hercules Cluster would be a spectacle of incomparable splendor; the heavens would be filled with uncountable numbers of stars which would dwarf our own Sirius and Canopus… Many thousands of stars ranging in brilliance from between Venus and the full moon would be continually visible, so that there would be no real night at all on that planet, and the civilization would know nothing of other clusters, the Milky Way Galaxy and other galaxies, as their view would be completely blocked by the brilliance of their own skies.
To them, the Hercules Cluster would be "the Universe." The Milky Way has about 100 globular clusters orbiting it on all sides.

See you at our August star parties… Clear Skies

Messier 22 in Sagittarius by Tom Westre

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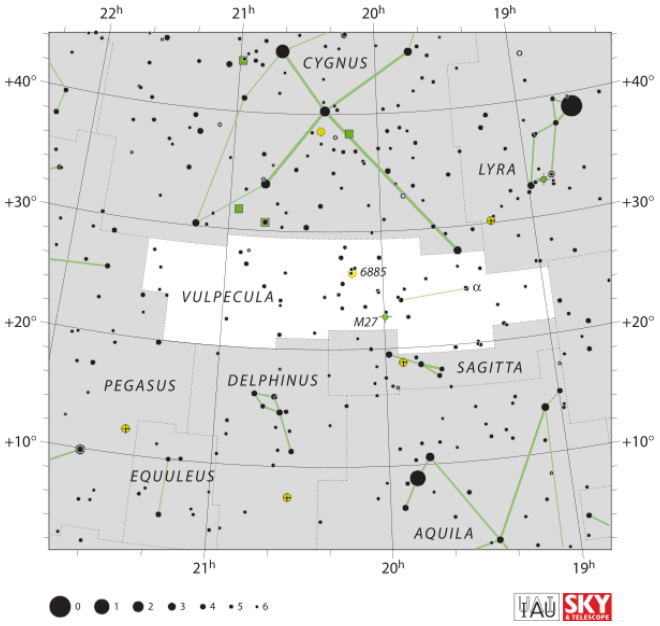
Spotlight on Vulpecula, the Little Fox

- Submitted by Dale Hooper

Admittedly, I picked this constellation because one of my favorite objects is the Dumbbell Nebula, M27. Vulpecula doesn't have any really bright stars and isn't shown on the skymaps.com star chart, but it falls between Cygnus, Delphinus and Aquila. This is shown in the IAU/Sky and Telescope chart below.



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg

Vulpecula is also home to some fine double and multiple stars and many open clusters including the Coathanger (Collinder 399).

Most of the best deep sky objects in Vulpecula only rate three stars in *The Night Sky Observer's Guide* (Vulpecula is in Volume 2), so that is the cutoff point this month. All of the double and multiple stars rate four stars. As usual, the table is organized according to increasing Right Ascension values.

Object	R.A.	Dec.
Σ2445 (Triple star)	19h04.6m	+23°20'
Σ2455 (Triple star)	19h06.9m	+22°10'
Σ2457 (Double star)	19h07.1m	+22°35'
NGC 6793 (Open cluster)	19h23.2m	+22°11'
Collinder 399 (Open cluster)	19h25.4m	+20°11'
NGC 6800 (Open cluster)	19h27.2m	+25°08'
NGC 6802 (Open cluster)	19h30.6m	+20°16'
Σ2540 (Triple star)	19h33.3m	+20°25'
Stock 1 (Open cluster)	19h35.8m	+25°13'
NGC 6830 (Open cluster)	19h50.0m	+23°04'
NGC 6834 (Open cluster)	19h52.2m	+29°25'
Messier 27 (Planetary Neb)	19h59.6m	+22°43'
NGC 6885 (Open cluster)	20h12.0m	+26°29'
Σ2653 (Double star)	20h13.7m	+24°14'
Burnham 441 (Double star)	20h17.5m	+29°09'
NGC 6940 (Open cluster)	20h34.6m	+28°18'

NGC 891 (Andromeda) - SLOOH Canary Islands Obs – submitted by Dale Hooper

Astronomy Update - Tom Westre

Closest super-earth HD 219134 (HR 8832b) A magnitude 5 star 21 light years away in the w shaped constellation Cassiopeia is the home of a 3 super earth planets and one giant planet. The 3 super earth's orbit their star in 3 days, 6.8 days and 46.8 days, while the giant planet orbits in three years. The first super earth was discovered as it transited in front of its star, the other three by their tugs on their sun, it's about 4-5 times the mass of the earth and 1.6 times the size of earth. None of the planets are habitable. Its coordinates are 23h 13m 17", +57deg 10 m

Figure 1 Star HD 219134 inside the circle in the constellation Cassiopeia. NASA/JPL-Caltech/DSS

New Horizon's Pluto discoveries.

After nine years of traveling, NASA's New Horizons reached Pluto. A new close-up image of an equatorial region near the base of Pluto's bright heart-shaped feature shows a mountain range with peaks jutting as high as 11,000 feet (3,500 meters) above the surface of the icy body. The mountains on Pluto likely formed no more than 100 million years ago. This suggests the close-up region, which covers about one percent of Pluto's surface, may still be geologically active today. This is one of the youngest surfaces ever seen in the solar system. Unlike the icy moons of giant planets, Pluto cannot be heated by gravitational interactions with a much larger planetary body. Some other process must be generating the mountainous landscape. The new images show fascinating details within the Texas-sized plain, informally named Sputnik Planum, which lies within the western half of Pluto's heart-shaped feature, known as Tombaugh Regio. There, a sheet of ice clearly appears to have flowed -- and may still be flowing -- in a manner similar to glaciers on Earth. Additionally, new compositional data from New Horizons' Ralph instrument indicate the center of Sputnik Planum is rich in nitrogen, carbon monoxide, and methane ices. At Pluto's temperatures of minus-390 degrees Fahrenheit, these ices can flow like a glacier,

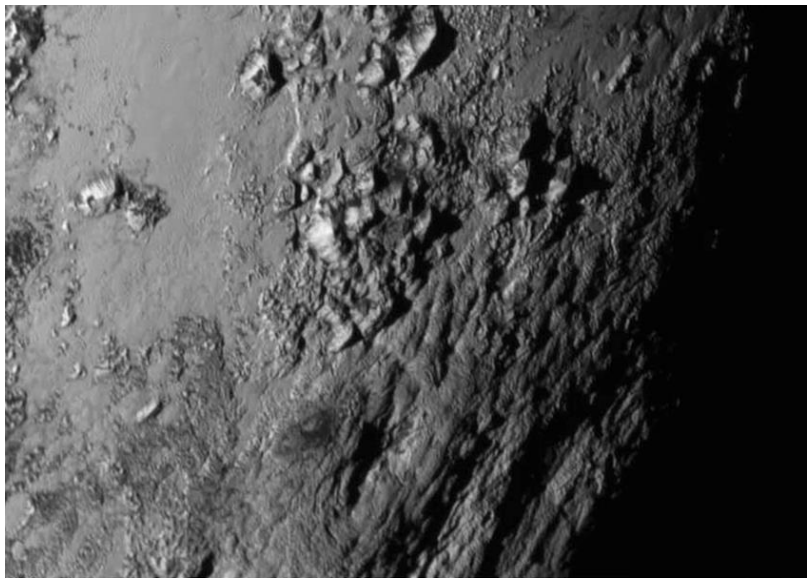


Figure 2 New close-up images of a region near Pluto's equator reveal a giant surprise -- a range of youthful mountains rising as high as 11,000 feet (3,500 meters) above the surface of the icy body. Credits: NASA/JHU APL/SwRI

Figure 3 Pluto and Charon are shown in a composite of natural-color images from New Horizons. Portray Pluto and Charon as an observer riding on the spacecraft would see them. Image Credit: NASA/JUAPL/SwRI

The new view of Charon reveals a youthful and varied terrain. Scientists are surprised by the apparent lack of craters. A swath of cliffs and troughs stretching about 600 miles (1,000 kilometers) suggests widespread fracturing of Charon's crust, likely the result of internal geological processes. The image also shows a canyon estimated to be 4 to 6 miles (7 to 9 kilometers) deep. In Charon's north polar region, the dark surface markings have a diffuse boundary, suggesting a thin deposit

Figure 4 Backlit by the sun, Pluto's atmosphere rings its silhouette like a luminous halo in this image taken by NASA's New Horizons spacecraft around midnight EDT on July 15. This global portrait of the atmosphere was captured when the spacecraft was

or stain on the surface. New Horizons also observed the smaller members of the Pluto system, which includes four other moons: Nix, Hydra, Styx and Kerberos. A new sneak-peek image of Hydra is the first to reveal its apparent irregular shape and its size, estimated to be about 27 by 20 miles (43 by 33 kilometers).

The observations also indicate Hydra's surface is probably coated with water ice. Future images will reveal more clues about the formation of this and the other moon billions of years ago. Spectroscopic data from New Horizons' Ralph instruments reveal an abundance of methane ice, but with striking differences among regions across the frozen surface of Pluto.

The New Horizons mission will continue to send data stored in its onboard recorders back to Earth through late 2016. The spacecraft currently is 7.6 million miles (12.2 million kilometers) beyond Pluto, healthy and flying deeper into the Kuiper Belt.

New Names for Ceres

On March 6, 2015, NASA's Dawn spacecraft made history as the first mission to reach a dwarf planet, and the first to orbit two distinct extraterrestrial targets. It conducted extensive observations of Vesta in 2011-2012.

Colorful new maps of Ceres, based on data from NASA's Dawn spacecraft, showcase a diverse topography, with height differences between crater bottoms and mountain peaks as great as 9 miles (15 kilometers).

Some of these craters and other features now have official names, inspired by spirits and deities relating

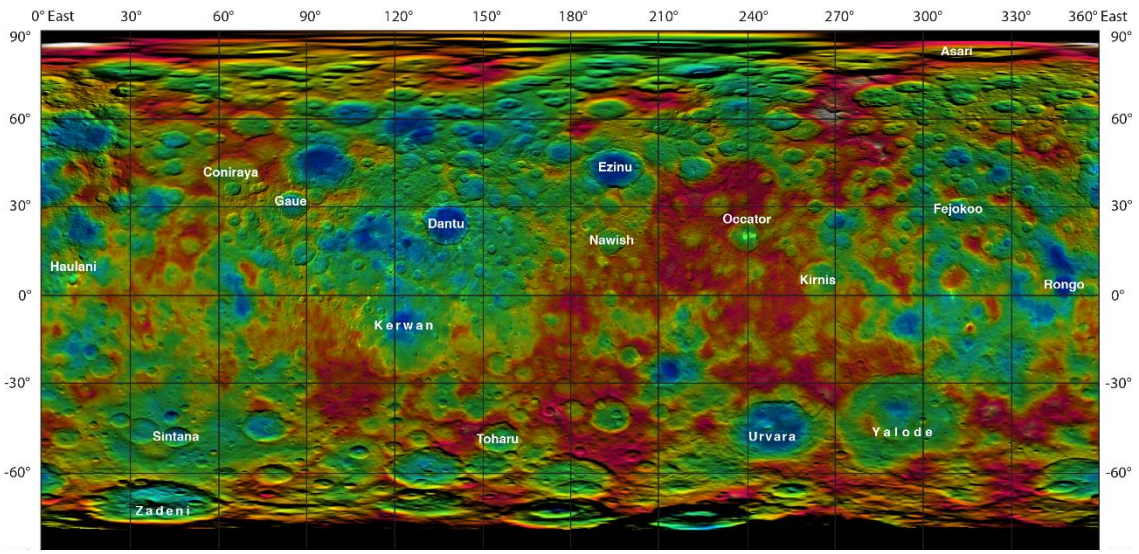


Figure 5 This color-coded map from NASA's Dawn mission shows the highs and lows of topography on the surface of dwarf planet Ceres. Credits: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

to agriculture from a variety of cultures. The International Astronomical Union recently approved a batch of names for features on Ceres.

The newly labeled features include Occator, the mysterious crater containing Ceres' brightest spots, which has a diameter of about 60 miles (90 kilometers) and a depth of about 2 miles (4 kilometers). Occator is the name of the Roman agriculture deity of harrowing, a method of leveling soil.

A smaller crater with bright material, previously labeled "Spot 1," is now identified as Haulani, after the Hawaiian plant goddess. Haulani has a diameter of about 20 miles (30 kilometers). Temperature data from Dawn's visible and infrared mapping spectrometer show that this crater seems to be colder than most of the territory around it.

Dantu crater, named after the Ghanaian god associated with the planting of corn, is about 75 miles (120 kilometers) across and 3 miles (5 kilometers) deep. A crater called Ezinu, after the Sumerian goddess of grain, is about the same size. Both are less than half the size of Kerwan, named after the Hopi spirit of sprouting maize, and Yalode, a crater named after the African Dahomey goddess worshipped by women at harvest rites.

Dawn is currently spiraling toward its third science orbit, 900 miles (less than 1,500 kilometers) above the surface, or three times closer to Ceres than its previous orbit. The spacecraft will reach this orbit in mid-August and begin taking images and other data again.

Ceres, with a diameter of 584 miles (940 kilometers), is the largest object in the main asteroid belt, located between Mars and Jupiter. This makes Ceres about 40 percent the size of Pluto, another dwarf planet, which NASA's New Horizons mission flew by earlier this month.

CVAS Minutes – July 2015

There was no meeting July.

Upcoming Star Parties

14 Aug	Club Star Party, Dell Vance's house (8:30pm), 240 N 100 W, Newton
21 Aug	Public Star Party, Mt Logan Park, (8:30pm)
22 Aug	Solar Party, Logan Library (11am to 1pm)

Upcoming Events

6 Aug	Last Quarter Moon Curiosity rover lands on Mars (2012)
10 Aug	Magellan radar mapper arrives at Venus (1990)
11 Aug	Asaph Hall discovers Deimos, moon of Mars (1877)
13 Aug	Peak of Perseid meteor shower
14 Aug	New Moon
17 Aug	Asaph Hall discovers Phobos, moon of Mars (1877)
22 Aug	First Quarter Moon
24 Aug	Voyager 2 flies past Neptune (1989)
25 Aug	Voyager 2 flies past Saturn (1981)
28 Aug	William Herschel discovers Enceladus, moon of Saturn, (1789)
29 Aug	Full Moon
31 Aug	Neptune is at opposition