



Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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www.cvas-utahskies.org



August 21, 2017 Total Solar Eclipse Image courtesy Aubrey Gemignani/NASA

Annual General Meeting This Month

Our annual general meeting will be held on **Wednesday, September 27, 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.

Elections for Officers in September

At the September annual meeting we will again have the opportunity to elect club officers. Every currently serving officer has indicated that they are willing to step aside if someone else is willing to serve.

The following is the list of those who currently have accepted nominations:



WE WANT YOU!

President – Dell Vance
Other nominations accepted at the meeting

Vice President – Layne Pedersen
Other nominations accepted at the meeting

Treasurer – Open, nominations will be accepted at the meeting

Secretary – Dale Hooper
Other nominations accepted at the meeting

Ned Miller has decided to step away from the Treasurer position after serving for four years. We really appreciate his service. With Ned stepping aside, the position is wide open for other members.

The September meeting is also the time to pay our annual dues of \$20. Members may pay with cash or a check.

The President's Corner By Dell Vance, CVAS President



August was the Super Bowl of Astronomy, with the Great American Eclipse. I had the opportunity to go up to Lewisville, Idaho to the Richards' residence to witness the total eclipse. What an experience! My daughter went with me so it was a pleasureable experience both coming and going.

I used my telescope to watch the eclipse and took some photos through the telescope. We even had sun spots to entertain us during the prelude. During the Total Eclipse I used my camera mounted on top of my telescope in video mode (an idea that I got from Dale Hooper).



Partial eclipse image - courtesy Dell Vance

This allowed my friends to still see the sun through the telescope. From the video I got some good shots as well, including the diamond ring. On another shot I was able to pick out Regulus below the corona. It

was a great day. Even the 5 hour drive home wasn't too bad.



Totality! (with Regulus to the left of the Sun) - courtesy Dell Vance



Diamond Ring at the end of totality - courtesy Dell Vance

Monday, August 28th, I got up early (2:30 AM) to get some pictures of Uranus and Venus. It was a challenge that I have wanted to do for some time. With a Celestron NexStar 6SE telescope it is difficult to identify Uranus, but I was pretty sure that I had it in the eyepiece. I switched over to the NexImage 5 camera and was able to get some photos of it. I was also able to get some shots of Venus.



Uranus, 28 Aug 2017 - courtesy Dell Vance

What a great month. We are now moving into September and the fun continues to roll. We have an opportunity to provide a star party at the American West Heritage Center's Harvest Festival, September 22nd. All Members with a CVAS membership card can get in free with your telescope. Others will be charged \$6 to get in, so be sure to bring your card along. (Contact Ned Miller if you can't find your card.) They are setting a spot aside where we will be out of the lights. I hope to see most of you there. It should be a lot of fun and lots of people there to share our hobby with.

We will also have our annual CVAS meeting on September 27, 2017 at BATC. It is your chance to elect new club officers or even better, to run for one of the positions. If you would like to serve in one of the offices, please let any member of the Executive Committee know and we will get you on the ballot. Also, if you have interest in one of the non-elected positions let us know as well. We have lots of things that you can help with.

Be sure to come out to our events and to check the website for updates on times and locations. Thanks for all your support.
Clear Skies!

CVAS Loaner Telescope



CVAS provides a 10 inch Dobsonian telescope to club members. Contact Brad Kropp to make arrangements to use this telescope. Brad can be contacted by email at brad.kropp@usu.edu.

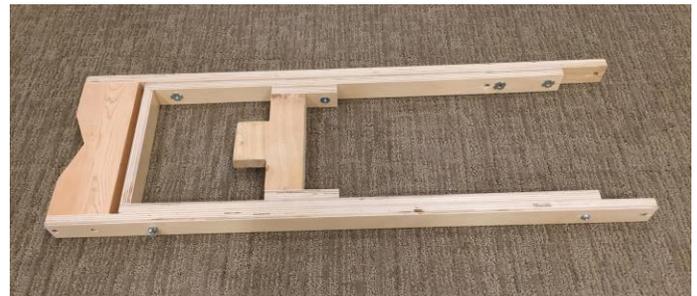
Binocular Supports

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 binos attached) -
Courtesy Ned Miller**



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

CVAS Eclipse Lecture at Logan Library

By Tom Westre

CVAS members Tom Westre and Dell Vance gave a public lecture on the Solar Eclipse at the Logan Library on August 14th. Nearly 100 people attended with standing room only. Librarian Joseph Anderson was in charge of organizing and promoting the event. Dell and I spent an hour covering all

aspects of a solar eclipse. We wanted the public to know what to expect and how to safely watch the event and protect their eyes.



At the end of our presentation we handed out over 40 solar glasses to those in attendance that planned to travel to see the eclipse. The library handed out over 700 glasses on the day of the eclipse. During the summer CVAS has a number of star and solar parties for the public. Beginning in September we begin our regular monthly meetings and lectures and BATC.

CVAS Post Eclipse Solar Party

By Tom Westre

The Great Solar Eclipse was an awesome experience for many members of CVAS. On August 26th several members of CVAS set up their telescopes at the Logan Public Library Saturday morning for a few hours to show the public the Sun. Over 50 people took advantage of the opportunity to view the Sun in several telescopes including a solar telescope and other scopes with mylar filters.



During the Summer and early Fall CVAS schedules evening star parties and solar parties for the general public to introduce them to the exciting hobby of astronomy. Club members enjoy these activities where they can share their hobby with the public.

Cache Valley Astronomical Society Members Experience the Great American Eclipse of August 21, 2017

By CVAS Members

Many members of CVAS were able to experience the Great American Eclipse of 2017. Some watched the deep partial eclipse from Cache Valley and others were able to experience the wonder of a total solar eclipse Idaho and Wyoming (and possibly other locations). The following is a compilation of members' experiences (with some minor editing). They are listed in alphabetical order. If you had an experience that wasn't included in this issue of the newsletter, please submit it to me and it will be included next month.

– Dale Hooper

Alannah Darrington -

For the eclipse of 2017, I observed the behaviors of my two cats and our 7-foot-tall sunflowers. I viewed the eclipse from Nibley, Utah, where we were able to see 95 percent totality.



I took pictures of the sunflowers before and during the eclipse. The sunflowers didn't do much during the eclipse. They just closed their petals a little and wilted slightly, and then opened again after the eclipse.



My cats, on the other hand, were doing just fine before the eclipse: playing, lying down, snoozing, and eating. But during the eclipse, they freaked out and hid in a massive rose bush near my house. As I took pictures of them in the bush, they kept staring at me wondering what was happening. After the eclipse, they went back to eating and snoozing, for they looked a little more tired than before the eclipse.



These are the observations I made before, during, and after the eclipse.

Bonnie Darrington –

I was able to take some pictures through my solar glasses with my phone.



11:07 am



11:09 am



11:29 am



11:36 am



12:01 pm

I took the first two pictures from the east side of the SDL Administration building and the last three were from the west side. So the perspective is a little different.

Blaine Dickey –

We had been watching the weather reports for Idaho Falls for a few weeks prior to the eclipse day and they were not always encouraging. When I looked outside on eclipse morning I noticed high thin clouds overhead and thicker clouds to the south. But after about 9:00 am the sky miraculously cleared off to what was to become perfect weather to watch the upcoming eclipse.

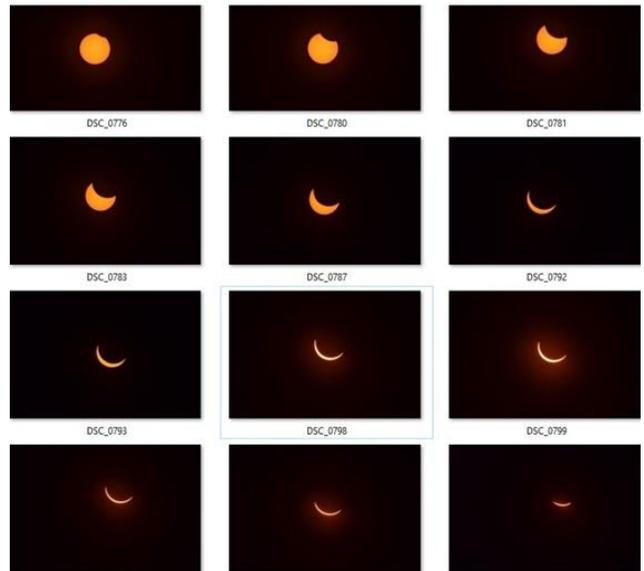
What an event it was! We passed out solar glasses around 10:15 am and watched as the moon began to take a bite out of the sun. As the eclipse progressed toward totality we watched the crescent shadows that fell on a sheet underneath one of the trees in their yards. Then a noticeable dimming of the sky and cooling temperatures began to take place about 10 minutes before totality.

As the eclipse neared during the last minute it became noticeably much darker and cooler just before totality. We noticed the planet Venus to the west of the sun high overhead. At about 10 seconds before totality we removed our solar glasses and watched the beautiful diamond ring on one side of the sun.

Then suddenly the sun was gone, replaced by an exceptional black moon surrounded by an astonishing corona. No language or picture can describe the beauty of the moon and surrounding corona as we witnessed it that day. It was the most

awe inspiring sight I have ever seen in all my years of observing celestial events and objects. Everyone was transfixed; including the children, as the event progressed and was over much too soon as the sun again appeared after one minute and 45 seconds and the event was essentially over.

The diamond ring reappeared and we put on our glasses again and watched as the eclipse progressed in reverse, the sunshine returned, the stars and planets disappeared, the temperature rose and the moons bite into the sun became less and less until it was gone. Then all was normal as if nothing had ever happened. Nothing except that it left an indelible memory burned into my consciousness and a humbling realization of the small place we humans find ourselves compared to the mighty cosmos surrounding us.



Just after C1 to nearly C2



Diamond Ring – just before C2



Totality!

Sharell Eames –

Our eclipse experience was certainly no different than anyone else's. I knew what to expect, but it was still the most wonderfully emotional event I've ever seen. Sharing the experience with others was significantly important. Our group of about 100 loudly cheered right at the moment of totality. No one signaled it was time. No one shouted, "Now!" No one even counted down. It just happened.

I've seen videos from all over the nation, and all of them include cheering. Our two teen-age grandchildren and their dad were with us. To share that experience with them was worth the \$840 we paid for an apartment overnight and the 9 hour trip home from Rexburg. Our grandson said as we neared home, "We've been in the car 9 hours and laughed 8 of them."

Dale Hooper -

My eclipse experience included AstroCon 2017 the week before the eclipse in Casper, Wyoming. There were many great speakers and it was a fantastic lead-in to the eclipse. One of the most memorable talks for me was given by Dr. Kate Russo. She is a psychologist and addicted eclipse chaser. She has written several books about the eclipse experience. One book contains interviews of several people before and after their first total eclipse. The word

she used to capture their reactions is ineffable; which means too great, powerful and beautiful to be described or expressed in words.

Another speaker many of you will recognize. Dr. Shane Larson founded our club. He is now at Northwestern University and is affiliated with the Adler Planetarium where his wife Michelle (also from CVAS) is the planetarium director. Shane spoke about the Gravitational Universe with emphasis on the LIGO project.



Dr. Shane Larson speaks to AstroCon 2017 about the Gravitational Universe

The keynote speaker was none other than Mr. Eclipse himself, Fred Espenak. He has now observed 26 total solar eclipses. He gave a lot of great information concerning photographing the eclipse. He surprised me with the fact that he removes his solar filters more than a minute before totality!

I'll have to wait to use most of his advice since this was my first total solar eclipse and I listened to most of the experts which advised against attempting photography with your first total (I did run a camcorder – mostly to record the audio of our experience).



"Mr. Eclipse" - Fred Espenak - speaks to AstroCon 2017 about How to Photograph a Total Solar Eclipse

We observed the eclipse from Mike Sedar Park in Casper, Wyoming which was within 50 yards of the centerline. We went there so that my family (who didn't attend AstroCon) could observe with me. I used my h-Alpha scope and white light filtered scope (as well as solar glasses and solar binos) to observe the partial phases. I was able to do a lot of public outreach with members of the public who had also come to the park.

Just before C1 I could see the moon beginning to take out a loop prominence. We observed crescent shadows through a straw hat – which greatly impressed the public onlookers. We weren't able to see any shadow bands – mainly because we were looking up at the Sun. I could see Sirius more than a minute before totality began. I didn't notice Venus until after totality began, because it was in some high clouds which began creeping closer to the Sun as the eclipse progressed.

I have an app on my smartphone (eclipsedroid) which I was going to use to keep track of the eclipse timing, but it shut off just as totality began. I wasn't going to spend any time restarting it, so I had to wing-it concerning the timing. I was like a kid in a candy store during totality! What a beautiful sight, as I mentioned before, ineffable is the best I can do to really express the “totality” of the event: the beautiful eerie darkness, the fifteen degree temperature drop, the 360 degree sunset, the “gossamer wings” of the corona, and the piercing dark hole where the Sun was moments before along with all the accompanying feelings.

I was surprised how well a NASA affiliated group had done in their prediction of the shape of the corona. You can see the information about their prediction at:

<http://www.predsci.com/corona/aug2017eclipse/home.php>

As I mentioned before, I had to wing it concerning timing – which almost bit me! I decided to use my 8x binos to get a closer view of the corona. A few seconds after I started looking I noticed the bright red chromosphere, which is the lower atmosphere of the Sun. I thought, “oh man I've got to put these binos down”. About two seconds after I dropped

down the binos totality ended and I saw the gorgeous diamond ring!

I simply have to see more of these!

Garrett Smith –

Our eclipse viewing was in a farmer's field in Archer, ID. Getting from Logan to Archer was an adventure. We traveled in an old class C motor home, built in 1986, and the last time we took it on a long haul road trip the radiator burst causing a six hour delay. So, crossing our fingers we headed out. I had tried to prep my family, and myself, for what we were about to see but as I am sure everyone is now aware words alone cannot prepare anyone for totality.



A group photo of us watching the start of the eclipse

We had an enjoyable morning chatting with friends and playing games. Watching the moon slowly pass in front of the sun was much like a roll being consumed at dinner, a bite at a time. As the temperatures dropped and the sky began to grow dim, many reached for jackets. One thing that was unexpected was the crisp shadows that were cast about while at the same time the light was dimming, very different from a sunset.



A panorama from on top of my camper during totality



My little boy trying on his eclipse glasses

When totality hit, cheers of "Wow!" and "Amazing!" slipped out as involuntary as breathing. We all later agreed that we couldn't find the words of how it felt and looked. The experience is so unique and unfamiliar we struggled to categorize how we thought about it. A friend related that it was if "we stepped into another realm, transported into confusion, wonder and possibly another planet".



A photo of the eclipse at totality captured from my iPhone

Even though the eclipse only lasted a little over two minutes, the joy and wonder carried us through the rest of the day. Playing games the rest of the afternoon as traffic cleared, drinking delicious chocolate milk from Reed's Dairy in Idaho Falls, and hitting traffic worse than Manhattan in Blackfoot are all footnotes and will soon be forgotten. But those

two minutes will be carried with myself and everyone that was there for the rest of our lives.

Jared Smith –

(Note – some of Jared's images are copyrighted. Please check with Jared before making any copies)

You can also find his work at:

<http://smithplanet.com/archives/the-great-american-eclipse>

- Editor)

I've had the total eclipse on my calendar for almost a decade. I've planned and anticipated this for A LONG TIME! Fortunately the weather was perfect and everything came together for an experience that is indescribable. The brief moments of totality are nothing short of breathtaking. I was happy to share such a great experience with my family.

Below are photos of the eclipse. My setup was an 8" Newtonian telescope (essentially a HUGE f5 1000mm lens) with a Canon T2i DSLR at prime focus and a Canon T5 with a 250mm IS telephoto lens. Both were on a Celestron equatorial mount to track the sun and moon as they moved across the sky. The photos were entirely automated using Solar Eclipse Maestro software.



Montage - Just after C1 to nearly C4



Bailey's Beads are formed due to terrain on the moon blocking the sun unevenly. Prominences are seen at the right and bottom



Jared's group anticipates totality



Each sunspot is larger than the earth



During an eclipse, shadows take on the shape of the eclipsed sun. Here my son is surrounded by thousands of mini-eclipse shadows

Ross Trowbridge –

I was part of a group that left Trenton, Utah at 4:30 AM to travel to the Ricks' farm in Rexburg, Idaho. Traffic on the way up was surprising light and we were able to make great time. It took approximately 3 hours to reach our destination. My plan was to photograph the eclipse through its entire progression, as well as view the eclipse through welding goggles with appropriate glass.

I planned to take a photo every two minutes or so using my Panasonic Lumix FZ1000 equipped with a solar filter. I also had a WeatherHawk handheld weather station to observe the current air temperature.

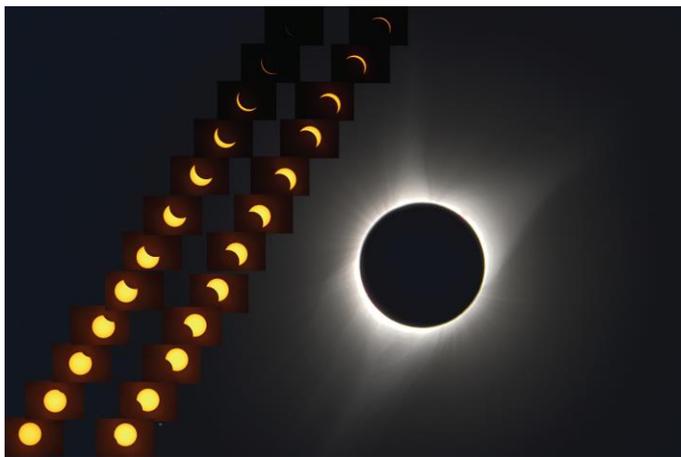
At 10:21, I took my first photo showing the beginning of the eclipse, first contact. The temperature was 85°. To my great delight, there were two sets of sunspots visible on the surface of the sun. My camera was set to take seven photos each time I took a photo. I was bracketing my exposure +/- 3 Fstops. I planned on stacking each group of seven



The solar corona is an aura of plasma that extends millions of miles into space. Earthshine - reflection of sunlight off of the Earth and back to the moon - causes the features of the moon to be visible.

photos in PhotoShop later on to obtain final photos with a higher dynamic range.

The moon continued to move across the face of the sun. The air temperature began to slowly go down. I continued taking photos while catching glimpses of the eclipse through my goggles. At 11:36 AM, the eclipse reached totality. I quickly removed my solar filter to photograph the sun's corona. The sight was incredible! There were three strong bands in the corona with multiple smaller bands and flaring around the circumference. There were hints of red in a couple places.



Eclipse Progress

I continued to take photos while watching the eclipse. My weather station was showing a temperature of 56° at this point. People were looking for blankets and jackets to stay warm. I took a moment to glance around me, seeing the 360° sunset all around me. The view around me, and above me, was absolutely incredible.

For 2 minutes and 15 seconds, I enjoyed the beauty of the sun's corona above me. But then the light began to flare on one side totality came to an end. But my camera caught a final view as the 'diamond' formed.

Totality was over, and I continued to take my photos. The light quickly brightened up, and the temperature began to climb again. Eventually, the eclipse came to an end. It's an experience I will never forget. My last photo showing the eclipse was taken at 1:01 PM.

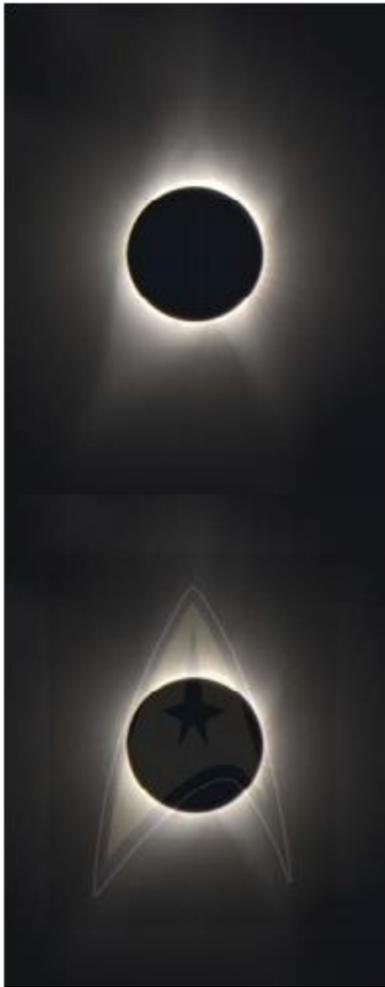


The drive home was completely different than the drive up. I think ½ of Utah was in South East Idaho and they all wanted to go home at the same time. The drive from Idaho Falls to Pocatello normally takes about 45 minutes. On this day, it took 6 ½ hours.

Traffic finally started to move around Inkom. It took us 8 hours on the road to get home. But the traffic was worth it. We had seen a total eclipse. I may never see another one, but I will never forget this one. I

took over 700 photos.

As I was taking a closer look at the eclipse during totality, I noticed the corona was forming a familiar shape. I rotated the image, and sure enough, I could see the Star Trek Delta symbol in the shape of the corona. I thought that was a fitting finale to one of nature's most incredible shows.



Tom Westre –

We observed the Solar Eclipse from just a few miles south of Rexburg, Idaho in the middle of the path of totality so we got 2 min 19 seconds of totality. Even though we knew what to expect actually seeing the event was overpowering.

Our group had about 25 members. I set up my 8 inch SCT with solar filter with a DSLR and 300 mm telephoto piggybacked on top. I was not going to image the event though I managed a few images.

Before first contact we noted a number of sunspots on the Sun. We also observed Venus three different times, once before first contact with binocs and with the 8 inch, the second time after first contact and the third time during totality. We noted the arrival of the moons shadow from the west. The landscape around was grew eerily dark and just before totality it seemed a greenish-gray. The sky near the moon/Sun grew very dark blue but the horizon was somewhat bright all around. We noted the drop in temperature as the moon crossed over the sun, the drop was at least 15 degrees.

At one point we brought out a spaghetti colander with many holes and noted the many images of the partial eclipse. About 3 seconds before totality the diamond ring and Bailey's Beads shown forth, then totality hit.

The delicate corona took your breath away. The Suns corona brightened and Venus and a few stars shown. I kept thinking it would be great if this experience could last longer so the impact could continue to affect our senses. During totality I looked at Venus and tried to find Jupiter, I quickly looked at the horizon, and the darkened landscape, but failed, but my eyes were drawn back to the corona.



Sunspots in an 8 inch SCT before first contact (C1)



Diamond Ring, corona and prominences as eclipse ends. DSLR with 300 mm telephoto lens

Then as fast as it began the 2 minutes and 19 seconds was over. The Diamond Ring signaled the end as the Sun began to reappear on the opposite side of the moon. As the cheering of the past 2 minutes died down we were speechless and sad to see this all come to an end, but the event was so perfect that we relived the experience over and over. Over the next hour we talked about this event among ourselves reliving the experience again. We all agreed how lucky we were to be part of one of nature's most awesome spectacles. It's definitely worth the hassle of the drive from Logan to Rexburg and back again.

The drive back was horrible. The Interstate was gridlocked. Everywhere we went it seemed that millions of cars were blocking our path forward. Yes, that was very frustrating. But, would we do it over again? YES, YES, YES. Even for a measly 2 minutes. We are already planning to attend the next event April 8, 2024. The event was "other-worldly", of course.

We amateurs normally get connected to the universe every time we observe, but this was very special. It seemed a much deeper connection, almost spiritual. What really made this special was to share it with a group of other eclipse watchers. Hearing their responses when totality hit was an added bonus as we all partook of this unique experience together. For my part, my role as an amateur astronomer was to help the people in my group appreciate and prepare for the event, to answer questions and be sure they were safe. Witnessing the total solar eclipse will never leave you, to experience the power of nature in this singular event is life changing.

Greg Young –

We were located at Stoddart Farms in Mud Lake, Idaho for the eclipse and took some pictures. We had a telescope set up, so most of these pictures were taken with my phone through the viewfinder of the telescope. There's also a few that I took with my DSLR during totality



Greg's cousins and other people at the farm



After C1 through nearly C4



The ethereal corona and Regulus at lower left



The final moments of totality

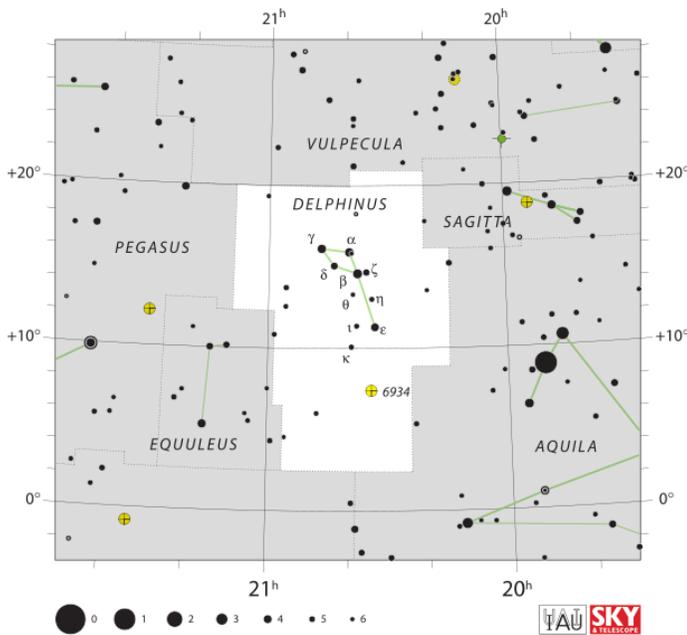


The iconic diamond ring adjacent to the chromosphere

Spotlight on Delphinus, the Dolphin

By Dale Hooper

Delphinus is a fairly diminutive constellation but it is fairly easy to trace its shape. Delphinus was included as a constellation clear back to the 48 constellations defined by Ptolemy in the 2nd century.



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg

Delphinus is sandwiched between the major constellations of Pegasus, Aquila and Cygnus. But it is also bordered by other small constellations Equuleus, Sagitta and Vulpecula.

Even though it is very small Delphinus still contains several noteworthy objects. This includes two very

nice planetary nebulae; one of which is the blue flash nebula (NGC 6905).

Objects which rank at least three stars in *The Night Sky Observer's Guide* (Delphinus is in Volume 2) have been included. As usual, the table is organized according to increasing Right Ascension values.

Object	R.A.	Dec.
NGC 6891 (Planetary Nebula)	20h15.2m	+12°42'
NGC 6905 (Planetary Nebula)	20h22.4m	+20°05'
NGC 6934 (Globular Cluster)	20h34.2m	+07°24'
12 Delphini (Double Star)	20h46.7m	+16°07'
NGC 7006 (Globular Cluster)	21h01.5m	+16°11'

CVAS Minutes – August 2017

There was no meeting in June.

Upcoming Star Parties

- 15 Sep Greenville Elementary School star party
- 22 Sep Public Star Party – American West Heritage Center
- 29 Sep Public Star Party – Macey's in Providence
- Oct Club Star Party at Gary Bracken's home – Petersboro

Upcoming Events

- 01 Sep Karl Harding discovers asteroid Juno (1804)
Pioneer 11, first Saturn flyby (1979)
- 03 Sep Viking 2 lands on Mars (1976)
- 04 Sep Labor Day
- 05 Sep Neptune at opposition
- 06 Sep Full Moon
Neptune 0.8° north of Moon
- 09 Sep E.E. Barnard discovers Jupiter's moon Amalthea (1892)
- 10 Sep Mercury 0.6° south of Regulus
- 11 Sep Patriot Day
ICE probe flies past Comet Giacobini-Zinner (1985)
- 12 Sep Mercury at greatest western elongation (18°)

13 Sep	Aldebaran 0.4° south of Moon Last Quarter Moon Luna 2, first craft to impact Moon (1959)
15 Sep	Cassini mission will end when Cassini dives into Saturn's atmosphere. It will burn up and disintegrate. Cassini was launched Oct 15, 1997.
16 Sep	Mercury 0.06° north of Mars
17 Sep	Venus 0.5° north of Moon
18 Sep	Regulus 0.09° south of Moon Mars 0.1° south of Moon Mercury 0.03° north of Moon
19 Sep	Venus 0.5° north of Regulus William Bond discovers Saturn's moon Hyperion (1848)
20 Sep	New Moon
22 Sep	Autumnal equinox
23 Sep	Neptune discovered (credited to John Couch Adams and Urbain Le Verrier) (1846)
26 Sep	Saturn 3° south of Moon
27 Sep	First Quarter Moon

CACHE VALLEY ASTRONOMICAL SOCIETY MEMBERSHIP APPLICATION FORM

Member # _____

NAME: _____
 First Middle Initial Last

Address: _____
 Street City State Zip Code

Home Phone: _____ Cell Phone: _____

Work Phone : _____ Occupation : _____

Email Address: _____

How did you learn about CVAS?

_____ Website _____ Star Party _____ CVAS Member _____ Other _____

Membership: \$20 a year

Tell us about yourself: Do you have a special interest in astronomy? Do you have special skills? Are you willing to volunteer on CVAS projects or attend public outreach star parties? Astro equipment owned.

By signing this application, I acknowledge I have access to the CVAS website, cvas-utahskies.org, and the CVAS Constitution. I agree to abide by the constitution.

Signature: _____ Date: _____

Bring this form to the meeting or Mail Application to:

Ned Miller, CVAS Treasurer
480 N 400 E
Providence, Utah 84332

For any questions contact our Treasurer at nedmiller2008@gmail.com or our Secretary Dale Hooper at dchooper5@gmail.com