



Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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www.cvas-utahskies.org

**Total Solar Eclipse Countdown:
180 days (as of February 22nd)**



Total Solar Eclipse Image courtesy NASA

Meeting Announcement

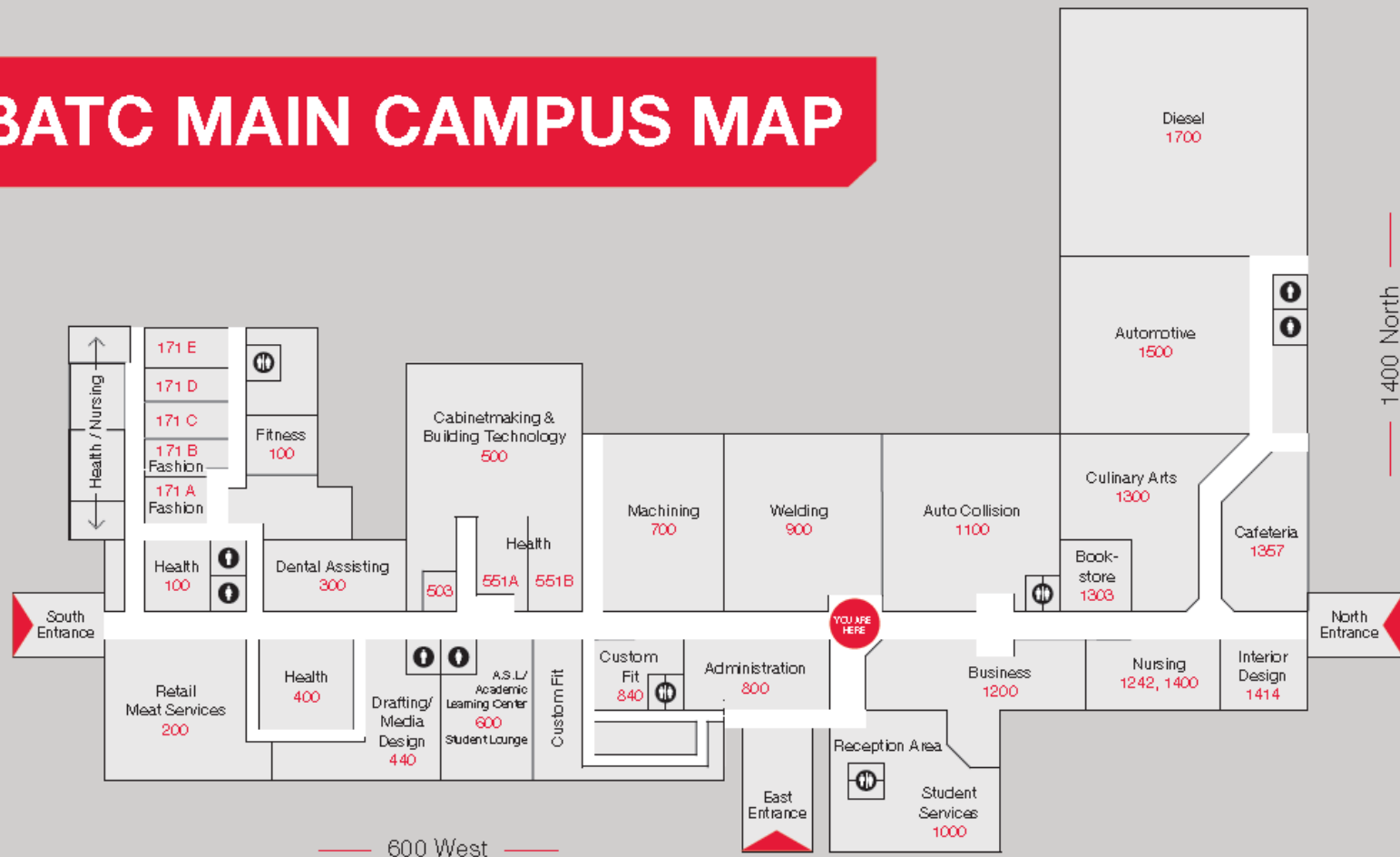


We are moving! We have enjoyed holding our meetings at the Logan Library. However, it has been rather difficult to get a large meeting room on a consistent basis. As a result, our club President, Dell Vance spent a lot of time searching for a new location.

Dell was able to schedule rooms in the 840 (Custom Fit) and 800 (Admin) area of the main BATC campus. We will be able to meet on the fourth Wednesday of every month during the remainder of the year. A map of the main BATC campus is shown on the next page. **This month we will be meeting on Wednesday, February 22nd at 7pm in room 840 of the main BATC campus.** Enter on the east side of the building located at 600 W 1400 N.

This month we will have a discussion and presentation about the August 21st Total Solar Eclipse, which will be led by Dale Hooper. This will be an opportunity to hear about what to expect, where to observe and what to avoid as you prepare to observe the eclipse. It will also be an opportunity to ask questions about the eclipse and draw on the experience of all the club members.

BATC MAIN CAMPUS MAP



| | | | | | | | |
|-------------------------------|------|-----------------------|------|-----------------------------|---------------|---------------------------|------|
| Academic Learning Center..... | 600 | Business..... | 1200 | Drafting/Media Design..... | 440 | Fitness..... | 100 |
| Administration..... | 800 | Cabinetmaking..... | 500 | Fashion Merchandising..... | 171 | Real Estate..... | 1349 |
| A.S.L..... | 600 | Cafeteria..... | 1357 | Health Sciences..... | 100,400,500 | Retail Meat Services..... | 200 |
| Auto Collision..... | 1100 | Culinary Arts..... | 1300 | Interior Design..... | 1414 | Student Services..... | 1000 |
| Automotive..... | 1500 | Custom Fit..... | 840 | Library/Student Lounge..... | 600 | Welding..... | 900 |
| Bookstore..... | 1303 | Dental Assisting..... | 300 | Machining..... | 700 | | |
| Building Technology..... | 500 | Diesel..... | 1700 | Nursing..... | 100,1242,1400 | | |

The President's Corner **By Dell Vance, CVAS President**



January was a month of heavy snow and bitter cold. I saw temperatures of -38°F in the flats between Newton and Smithfield. I have seen snow on my yard over 2 feet deep and mounds of snow over 8 feet where I have been pushing it off my driveway. I remember only seeing the stars briefly two nights the whole month. Even with all this we are still actively involved as a club with binocular support frame workshops, hosted by Ned Miller, and our annual Show and Tell meeting.

The workshops were great for all of us that came out on two snowy nights. We made components for 19 support frames. Those that participated completed their frames and took them home. We had about 8 to 10 people involved in the workshop. The remaining support frames are available for purchase. Contact Ned Miller if you are interested.

The Annual Show and Tell meeting was good as usual. It is always fun to see what the members are doing with their equipment and interests in different parts of our hobby. We had about 10 to 15 people in attendance.

With the month of February, we are also moving our monthly meetings from the Logan Library to Bridgerland Applied Technology College (BATC) Main Campus. (See information here in the Newsletter for Map and times.) We have been able

to reserve space for all our meetings through December. This allows us to have a consistent location and planned meetings for the 4th Wednesday of every month, September through May. The only exceptions will be November and December, where we will adjust the dates for the holidays. During the summer months, we will be holding our usual Star Parties rather than monthly meetings.

With the improving weather, we will have more opportunities to get out and see the skies. Be sure to look up and enjoy the view. We live in a great valley for stargazing. I hope to see you and your friends at the next meeting on February 22nd at the BATC. The topic is very appropriate for this year as we get ready for the Total Solar Eclipse in August. Dale Hooper will provide us with great ideas and tips on how to best enjoy this rare event. Get the word out and bring your friends.

Clear Skies!

Gravitational Lens Observing?

By Dale Hooper

Gravitational lensing is a phenomenon that was predicted by General Relativity. In a nutshell, a gravitational lens occurs when the light from a very distant object is bent as it passes by or through some closer, very massive object or set of objects. This causes brightening and magnification of the more distant object, just like what occurs when light passes through a telescope lens. It may also generate multiple or distorted images of the more distant object because the closer object doesn't form an "ideal" lens.

Gravitational lenses have become very useful in observations of extremely distant objects that existed just a few hundred million years after the big bang. For example, proto-galaxies might be observable after their light is gravitationally lensed through a massive (nearer galaxy cluster).

I recently became curious concerning whether or not there were any gravitationally lensed objects that we could observe as amateur astronomers through our smaller telescopes. While investigating this I came

upon a conversation thread on Cloudy Nights that was discussing this very topic. Here is a link to the thread:

<http://www.cloudynights.com/topic/492969-is-gravitational-lensing-visible-through-amateur-scopes/>

It turns out that there are a number of gravitationally lensed quasars that can be observed visually with rather large amateur telescopes. Most would require a telescope with at least a 25 inch mirror.

At the very end of the thread is a post by Alvin Huey and he refers readers to one of his free downloadable deep sky atlases, specifically his *Galaxy Trios and Triple Systems* atlas. This atlas can be found at:

<http://faintfuzzies.com/Files/GalaxyTrios-v6.pdf>

This contains a smaller atlas which lists several “brighter” gravitationally lensed quasars which range from magnitude 14.4 to 21.5. Several of these objects could be photographed by amateurs with moderate sized scopes and CCD cameras. I have photographed 18th magnitude asteroids using four minute CCD exposures.

The following table lists these gravitationally lensed quasars, but if you are interested, you should also refer to Alvin’s atlas because it contains additional information about these objects including images.

| Object | R.A | Dec | Const | Mag. |
|-------------------|------------|------------|-------|------------------------|
| Einstein’s Cross | 22h40m30.2 | +03°21’30” | Peg | 17.4, 17.4, 14.4, 18.7 |
| Double Quasar | 10h01m21.1 | +55°53’52” | UMa | 17.3, 17.4 |
| Leo Double Quasar | 11h23m20.8 | +01°34’46” | Leo | 15.7, 20.1 |
| Cloverleaf Quasar | 14h15m46.3 | +11°29’43” | Boo | 17 (all four) |
| Twin Quasar | 12h18m41.1 | +50°15’34” | CVn | 17.2, 19.0 |
| Triple Quasar | 11h18m17.1 | +07°46’01” | Leo | 15.8 |
| HE 1104-1805 | 11h06m33.6 | -18°21’25” | Crt | 16.2 |
| OM-076 | 11m47h51.6 | -07°24’41” | Crt | 18.7, 21.5 |

Gravitational Lensed Quasars - from Galaxy Trios Atlas

So these are some great challenge objects if you really want to push your scope and your imaging to their limits.

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 (shown folded for storage) - Courtesy Ned Miller

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.



Spotlight on Orion, the Hunter

By Dale Hooper

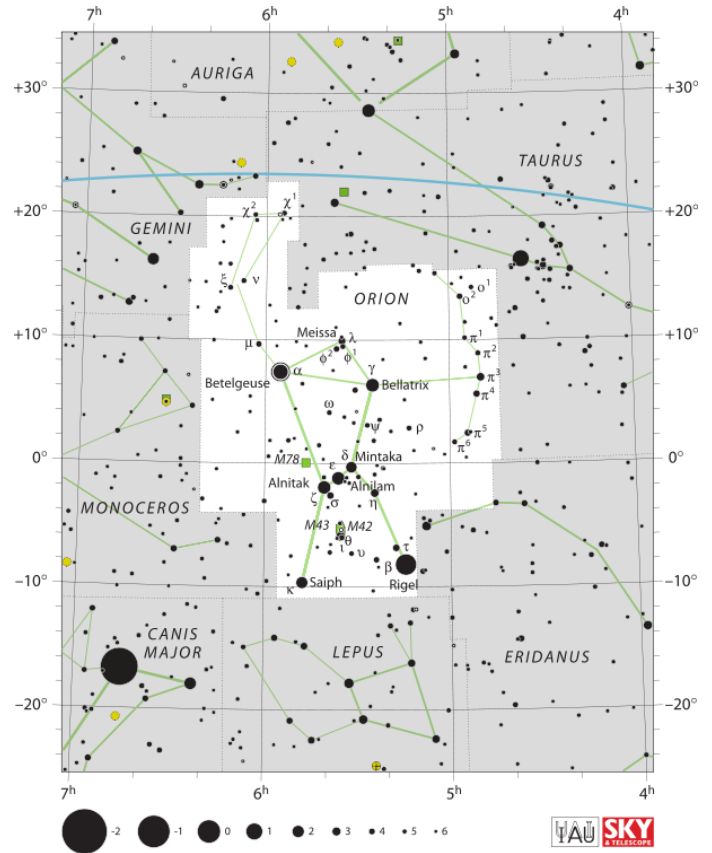
Orion is arguably one of the finest constellations in the entire sky. Orion is located along the celestial equator so it is observable by nearly everyone on the planet. Orion is highest in the sky around this time of year. It contains many of the brightest stars in the sky and the entire region is filled with nebulae.

The star forming region in the Orion nebula is one of the grandest and closest in our galaxy. If you have a 10 inch or larger scope, you may be able to see a slight tint of green (visually) in the Orion nebula (M42). M42 is absolutely stunning in even short exposures using a DSLR or Mallincam. Views of the Orion nebula *do* make it worth venturing out in the cold to observe.

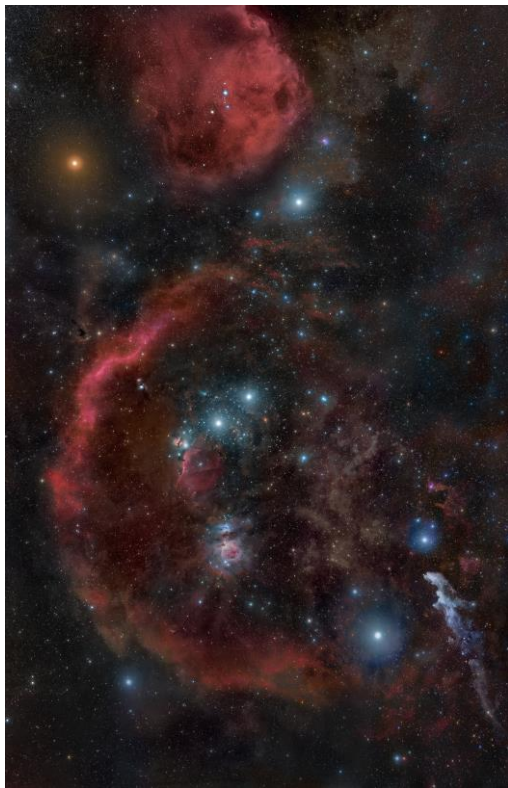
Betelgeuse, in the left shoulder of Orion is a supergiant star and it is also a variable star. Betelgeuse is likely to go supernova sometime between now and the next ten thousand years. I occasionally wonder what the Hunter is going to look like without a left shoulder.

Objects which rank at least three stars in *The Night Sky Observer's Guide* (Orion is in Volume 1) have been included. I am also including the Horsehead Nebula (B33) even though it doesn't rank three stars.

As usual, the table is organized according to increasing Right Ascension values.



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg



Orion Region - Public Domain Image

| | | |
|-----------------------------|----------|---------|
| 50 Orionis (Triple star) | 05h40.8m | -01°57' |
| IC 432 (Reflection Nebula) | 05h40.9m | -01°29' |
| B33 (Horsehead Nebula) | 05h40.9m | -01°29' |
| NGC 2023 (Emis & Ref Neb) | 05h41.6m | -02°16' |
| NGC 2022 (Planetary Neb) | 05h42.1m | +09°05' |
| M78 (Emis & Refl Nebula) | 05h46.7m | +00°03' |
| Betelgeuse (Var 0.4 to 1.3) | 05h55.2m | +07°24' |
| Basel 11B (Open cluster) | 05h58.2m | +21°58' |
| NGC 2143 (Open cluster) | 06h03.0m | +05°43' |
| NGC 2169 (Open cluster) | 06h08.4m | +13°57' |
| NGC 2180 (Open cluster) | 06h09.6m | +04°43' |
| NGC 2175 (Open cluster) | 06h09.8m | +20°19' |
| NGC 2186 (Open cluster) | 06h12.2m | +05°27' |
| NGC 2194 (Open cluster) | 06h13.8m | +12°48' |
| NGC 2202 (Open cluster) | 06h19.9m | +05°59' |

CVAS Minutes – January 2017

It was announced that next month we will begin meeting on the fourth Wednesday in the Main Campus building of BATC. This is so that we can consistently meet on the fourth Wednesday.

Dale Hooper discussed current sky events.

The time was then turned over to club members to explain what they had brought for our annual Show and Tell meeting.



Byron Ray shows his 90 mm Meade ETX

Lyle Johnson showed a number of items which are useful for general observing. This included a nice Dobsonian mounted telescope, a binocular support, and a green laser. Lyle also mentioned that KSL.com is a good source for locating used astronomical items.

| Object | R.A. | Dec. |
|---|----------|---------|
| NGC 1662 (Open cluster) | 04h48.5m | +10°56' |
| NGC 1663 (Open cluster) | 04h48.6m | +13°10' |
| NGC 1788 (Reflection Neb) | 05h06.9m | -03°21' |
| 19 Orionis (Double star) | 05h14.5m | -08°12' |
| Dolidze 17 (Open cluster) | 05h22.4m | +07°07' |
| Dolidze 19 (Open cluster) | 05h23.7m | +08°11' |
| 28 Orionis (Triple star) | 05h24.5m | -02°24' |
| 34 Orionis (Double star) | 05h32.0m | -00°18' |
| Collinder 70 (Open cluster) | 05h35.1m | -01° |
| NGC 1973-75-77 (Nebulae) | 05h35.1m | -04°44' |
| 39 Orionis (Quadruple star) | 05h35.1m | +09°56' |
| NGC 1981 (Open cluster) | 05h35.2m | -04°26' |
| 41 Orionis (Multiple star) | 05h35.3m | -05°23' |
| Messier 42 (Orion Nebula) | 05h35.4m | -05°27' |
| NGC 1980 (Emission Neb) | 05h35.4m | -05°54' |
| 44 Orionis (Triple star) | 05h35.4m | -05°55' |
| M43 (Emission & Refl. Neb) | 05h35.6m | -05°16' |
| NGC 1990 (Emission & Reflection Nebula) | 05h36.2m | -01°12' |
| NGC 1999 (Emis & Ref Neb) | 05h36.5m | -06°42' |
| IC 426 (Reflection Nebula) | 05h36.8m | -01°15' |
| 48 Orionis (Multiple star) | 05h38.7m | -02°36' |
| NGC 2024 (Emission Nebula) | 05h40.7m | +02°27' |

Byron Ray then displayed a unique binocular support which uses a curved PVC pipe, which the user places over their head. This support is shown at lower center in the above image. Byron also showed his Meade 90 mm ETX telescope.

Tom Westre showed a number of observing aids. He brought several observing books including a list of binocular double stars and an observing handbook and catalog of Deep Sky object. He also explained his f/10 to f/6.3 focal reducer. Lastly he showed his Revolution Imager and monitor which is a complete kit for video astronomy.

Dale Hooper showed an Astro-Tech coma corrector which is helpful for reducing coma on fast Dobsonian telescopes. He also showed a Watec low light camera useful for asteroid occultations. Lastly he displayed a pair of mini 6x30 binoculars which contain a solar filter and are usable for observing the sun.

Blaine Dickey then explained the items which he had brought. He showed solar eclipse glasses and a 3 1/2 inch solar filter. He then showed a book that he had purchased about Totality (i.e. Total Solar Eclipses). Blaine then showed two different planispheres, first a mini one and then an Orion Planisphere which also lists 100 deep sky objects. He then showed two types of star atlases, the Orion Deep Map 600 and the Jumbo Pocket Sky Atlas from Sky and Telescope. Lastly he showed us the AAVSO DSLR observing manual.

Dell Vance then showed us his Schmidt Cassegrain telescope and improved wedge which he uses for astrophotography. He also showed his OIII (or nebula) filter and he also showed and explained Photoshop Elements 14 which he now uses for stacking images.

Upcoming Star Parties

There are currently no CVAS star parties planned for February 2017.

Upcoming Events

| | |
|--------|---|
| 01 Feb | Space shuttle Columbia disintegrates during re-entry (2003) |
| 02 Feb | Groundhog Day Ceres 1.0° south of Moon |
| 03 Feb | First Quarter Moon Luna 9, First craft to make a soft landing on the Moon (1966) |
| 04 Feb | Clyde Tombaugh born (1906) |
| 05 Feb | Aldebaran 0.2° south of Moon |
| 07 Feb | Bruce McCandless makes first untethered spacewalk (1984) |
| 10 Feb | Full Moon Penumbral Lunar Eclipse |
| 11 Feb | Regulus 0.8° north of Moon |
| 15 Feb | Galileo born (1564) |
| 16 Feb | Gerard Kuiper Miranda (a moon of Uranus) (1948) |
| 17 Feb | Venus at magnitude -4.8 |
| 18 Feb | Last quarter Moon Clyde Tombaugh discovers Pluto (1930) |
| 19 Feb | Nicolas Copernicus born (1473) |
| 20 Feb | President's Day John Glenn, first American in orbit (1962) |
| 22 Feb | CVAS Meeting at room 840 in the Main Campus BATC building (7pm) |
| 23 Feb | Supernova 1987A explodes in the Large Magellanic Cloud (1987) |
| 24 Feb | Discovery of first Pulsar announced (1968) |
| 26 Feb | New Moon Annular Solar Eclipse |
| 27 Feb | Mars 0.2° north of Uranus |

Classifieds

For Sale – Losmandy Titan Equatorial Mount (by Dale Hooper dchooper5@gmail.com)

I recently received a small inheritance after my oldest brother passed away, so I have decided to go in a slightly different direction with my telescope mount.

As a result, I am selling my Losmandy Titan computerized mount. This is a very sturdy mount with an instrument weight capacity of 100 pounds (excluding the counterweights). It has excellent tracking of +/- 5 arc-seconds (without PEC enabled).

The Gemini 2 controller has a database of 41,000 objects and includes its own web server, so you can connect to it via a browser. There is also an ASCOM driver for the mount. Autoguiding is supported via pulse guiding (commanded) or through an RJ11 (ST4) interface. It supports an internal mount model to improve GOTO performance. The graphic hand controller has a touch screen GUI as well as physical direction buttons.

The Titan equatorial head is 75 pounds and breaks down into the R.A axis (37.5 pounds) and Dec axis (37.5 pounds). This mount uses the Losmandy High Torque R.A. and Dec motors.



More info about the mount specs can be found at the Losmandy website: <http://www.losmandy.com/hgm-titan.html>

What is included –

- Losmandy Titan equatorial head (R.A. Axis, Dec Axis, counterweight bar, high torque R.A. and Dec motors)
- Gemini 2 controller (with up to date firmware)
- Graphical (touch screen) hand controller
- 95 pounds of counterweights (4 x 21 pounds, 1 x 11 pounds)
- Original boxes for R.A. Axis, Dec Axis and Gemini 2 controller and one (21 pound) counterweight box
- Losmandy MAL (used to attach the mount to a pier or tripod)

Not included –

- The telescope
- Pier

Asking \$4,600. If you are interested – let's talk.

Clear skies,
Dale (dchooper@gmail.com).

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 .