

PRESIDENT'S CORNER

by Dell Vance



Ann-Maree Vance

December and January have been tough months for observing objects. It has been either cloudy, stormy or *toooooo cold*. I have a limit on the temperature that I will operate my mount/telescope. If it is below 20 degrees Fahrenheit at the start of the session, I probably won't go out to set up the observatory. This month, I even changed my limit to below 16 degrees and still didn't get any real observing in. I had two nights that I got about 45 minutes in before the clouds moved in. You might say I'm getting cabin fever. I'm not too worried about the telescope or the electronics, but I cringe when I hear my mount's gears grinding away. I guess I had too many years working for an oil company and have some experience with lubricants and cold temperatures.

It's a good thing we had our club meeting in January. I enjoyed hearing what other people are doing and the things that they are working on. Some of the tech-

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Clker and ClipartMax

UPCOMING EVENTS

Club Meeting

- Friday, February 10, at the Nibley City Offices (455 West 3200 South, Nibley)
- Topic: Guest speaker Zach Casper will tell us about his adventures as a booster rocket engineer on the Artemis moon mission team!

STEM Events

Events last from 6:00 to 8:00 p.m. Please plan to arrive at 5:30.

- February 2: Birch Creek Elementary
- February 9: White Pine Elementary
- February 16: Sunrise Elementary
- March 9: Cedar Ridge Elementary
- March 13: Greenville Elementary
- March 23: Providence Elementary

Keep up to date by visiting our website:



President's Corner, cont'd from p. 1

nology that we have available as amateurs is amazing. I'm also very impressed with the diversity of the club members. The meeting was our first on our new day of the month (second Friday of the month). We had a couple of members there that we don't get to see very often. The attendance was better than our last meeting in November, but we would like to see even more of you come out to our meetings.

February, we have a very interesting guest speaker. Zach Casper will be sharing information about the current rocket motors. With the projects that are focusing on travel to the moon and eventually Mars, his topic is very timely. The meeting will be on February 10 at 7:00 p.m. The location is at the Nibley City Hall. Be sure to bring your friends.

We also have several STEM Fairs lined up over the next few months. If you are available to help, please let Tom Westre know; he is the coordinator with the schools. These are good opportunities to encourage students to have an interest in astronomy. It is not very complicated, and a very rewarding activity.

Thanks again for your great support for the club.

Clear Skies,
Dell Vance



ClipartMax

USU Observatory Update

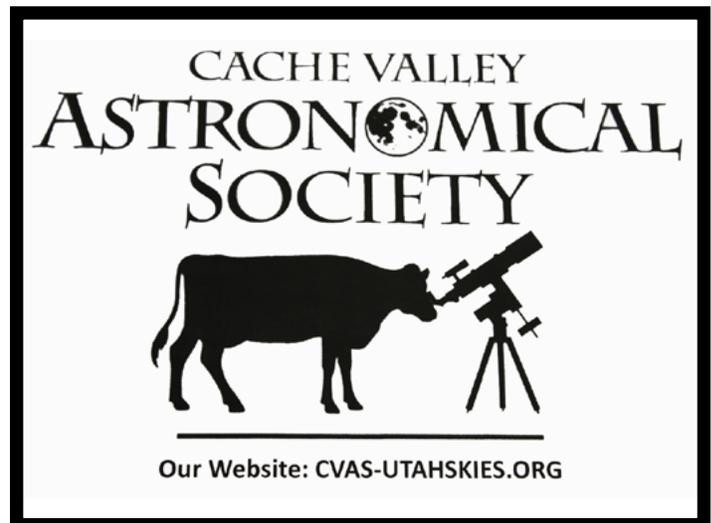
The December public night was cancelled due to copious snow and freezing weather. The observatory is currently closed and will reopen in the spring. For details about location, targets, weather, and parking, visit the USU Physics Department website [here](#).



PNGtree

Challenge from Our President

Bring a friend to our February meeting!



EXECUTIVE COMMITTEE

- President: Dell Vance; avteam.dell@gmail.com
- Vice President: Dale Hooper; dchooper5@gmail.com
- Secretary-Treasurer: Bonnie Schenk-Darrington; bschenkdarr@gmail.com
- Night Sky Network Coordinator: Dell Vance; avteam.dell@gmail.com
- Public Relations: Bruce Horrocks; bruceh@gem-buildings.com
- Webmaster-Librarian: Tom Westre; twestre45@aol.com

COLORFUL DOUBLE STARS

by Blaine Dickey

You put your eye to the eyepiece and are greeted with two dazzling stars, one a warm orange and the other an intense blue. That describes the appearance of Albireo, one of the grandest double stars in the sky. This spectacle in a telescope is a favorite at star parties both for the presenter who shows it, and the public who are privileged to observe it. Many other similar doubles, visible to the naked eye, binoculars, or a telescope, lie scattered across the sky, waiting for us to discover them.



For example Delta Boötis is a wide double consisting of a bright yellowish giant star that is 2.5 times the sun's mass and 11 times brighter, appearing at magnitude +3.7. The +8-magnitude companion, similar to our own sun, lies at a distance of 3800 AU from the brighter star. It is estimated that they orbit each other slowly over 120,000 years.



Eta Boötis, as shown in the accompanying image, is a binary star, but not to the +9.7-magnitude star on the left side. The dimmer star is 166 light-years distant, while the brighter star of Eta Boötis lies much closer at 37.2 light-years. Eta Boötis is, however, a spectroscopic binary that is too close together to separate each star using a backyard telescope.



Iota Boötis has a nice separation of 39 arc seconds and is delightful to view in a small telescope or binoculars. The primary is white at magnitude +4.8, and the secondary is yellowish at magnitude +7.3

Finally, Kappa Boötis is nice pair of white and yellowish stars with magnitudes of +4.5 and +6.5 and a separation of 14.6 arc seconds. This pair requires a

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Double Stars, cont'd from p. 3

little larger telescope to separate the two. We can only imagine what it would be like to be on a planet that orbits these types of star systems.

Each double star that you observe will have different orientations, separation from each other, magnitudes, and colors. Once you find them, they are like old friends that you want to visit again and again.

Images courtesy of the author.

Kappa Bootis



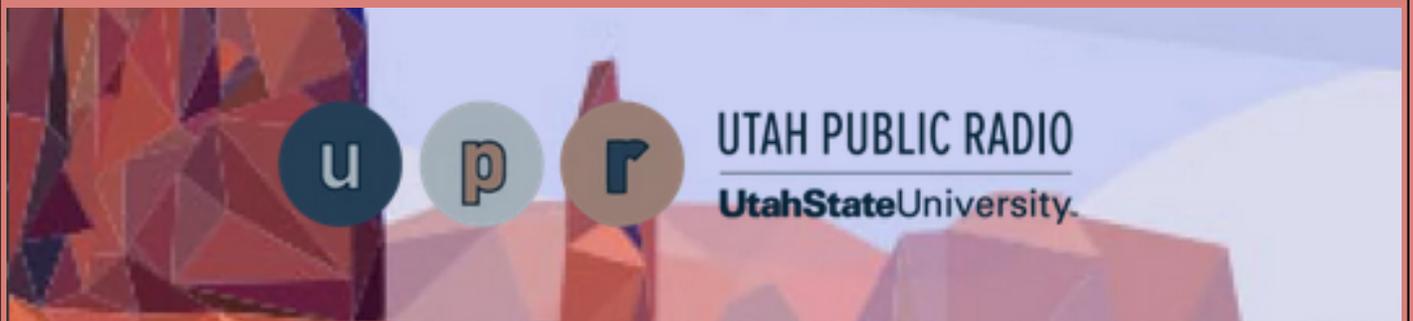
Clipart.World and Cliparts Zone

Need a quick astronomy fix?
Tune in to CVAS's astronomy show on Utah Public Radio!

UTAH SKIES

Every Tuesday at 4:48 p.m.
91.5 KUSU-FM (west Cache Valley)
89.5 KUSR (east Cache Valley)

You can also download the UPR app or listen to the livestream [here](#).
Check out our past radio shows [here](#).



OPINION: THE ARTEMIS I MISSION HARDWARE IS THE RIGHT WAY RETURN TO THE MOON

by Dale Hooper

I really enjoyed reading Bruce Horrocks's article in the January newsletter titled, "Opinion: The *Artemis I* Mission Hardware is Outdated Technology," and what I hope to articulate is a counterpoint rather than a rebuttal.

Like Bruce, I remember the heady days of the Apollo missions. I received my first telescope, a three-inch reflector from Edmund Scientific Company, the Christmas when *Apollo 8* first orbited the moon (1968). However, I believe there are a few really good reasons for why NASA is approaching the Artemis missions the way they are; none of these reasons are technological.

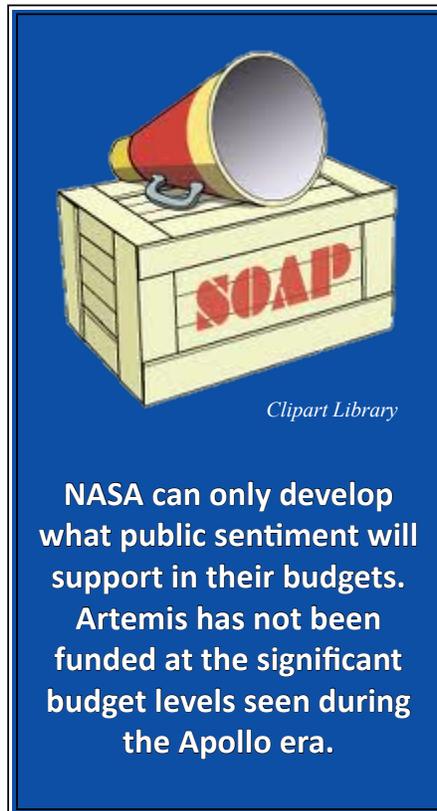
I believe the first reason it makes sense for Artemis to be built this way is because NASA is subject to the congressional budget process. Beginning in 1966, NASA began what was known as the Apollo Applications Program. This included plans for an initial lunar base called Apollo Extension Series (AES) Lunar Base, which would ultimately be followed by a permanent lunar base called the Lunar Exploration System for Apollo (LESA) Lunar Base, which would be powered by a nuclear reactor. It also included plans for a manned Venus flyby. However, after the race to the moon was "won" with *Apollo 11*, public attention to the Apollo missions began to wane quickly. Congress and President Nixon decided to stop funding the Apollo missions at the significant previous level.

As a result, *Apollo 18* and *Apollo 19* were cancelled and the Apollo Applications Program was scaled back to *Skylab* and *Apollo-Soyuz*. So, NASA can only develop what public sentiment will support in their budgets. Artemis has not been funded at the significant budget levels seen during the Apollo era. This means

they have been wise to save money by reusing proven technology.

But NASA did learn one very significant budget lesson from what happened with the proposed Superconducting Super Collider in the 1980s and early 1990s. When it was originally proposed, it had very wide and deep congressional support. However, when it was ultimately decided that it would be built in Texas, congressional support from other state delegations quickly evaporated. Members of Congress always want to be able to show the "bacon" that is being brought back to their individual districts. So, NASA has learned to spread development out across many states to help maintain budgetary support.

There is another reason why it really makes sense for NASA to follow the path they are on with Artemis: Risk. For example, in 2005 and 2006 at the Space Dynamics Lab (SDL), I was working on the flight software for the Solar Occultation For Ice Experiment (SOFIE) instrument, which was part of the NASA Aeronomy of Ice in the Mesosphere (AIM) satellite, an unmanned satellite. I used to comment to coworkers that if we had as many people actually working on the software as we had following us around verifying our work, it would have been much easier. The documentation that SDL had to provide would have easily reached to the ceiling. NASA is a very risk-averse organization. (Note that AIM is still working to this very



day.)

I think a lot of this risk aversion reaches back to two major events. I'll never forget the events of January 28, 1986. I had recently started my job at San Diego Gas & Electric as a programmer in their power

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Artemis, cont'd from p. 5

distribution and generation control center. On the drive to work that morning, I remember that the radio DJs were joking about how there was yet another launch delay with the space shuttle. NASA was facing a lot of pressure to launch because the shuttle program had been problematic, and they really wanted the great PR of sending schoolteacher Christa McAuliffe to space. At work that morning, I went into the terminal room to work on a FORTRAN program that I was debugging. All of a sudden, one of the hardware guys came running into the room, ashen faced, and yelled out that the space shuttle had exploded! All of us were shocked. Because of the public pressure, NASA and Thiokol managers had overridden engineers who said it was too cold to launch—and 73 seconds after liftoff, the shuttle *Challenger* exploded, killing all seven crew members. Some people said the space program should be cancelled but NASA still enjoyed wide public support. President Reagan and Congress decided to build another space shuttle.

Concerning the second major event, I'll also never forget February 1, 2003. The space shuttle *Columbia* was going to follow a different trajectory for reentry than usual, so it would be observable from St. George, Utah. So, along with several other members of the Ogden Astronomical Society and a group from the Salt Lake Astronomical Society (SLAS), I traveled to St. George so that we could observe part of reentry. It was early in the morning and the sky was completely clear. We were extremely excited because we could easily see the shuttle during its initial reentry. We were very surprised because, looking at it through binoculars, we could see what looked like sparks coming off of the shuttle. We were really happy because of this amazing event. However, about five minutes later, one of the SLAS members came over to our group, and to our horror, he said that he heard on the radio that *Columbia* had exploded over Texas!

NASA had changed the insulation that was being used on the external fuel tank. During launch of

Columbia, a section of the insulation broke off and struck and damaged the delicate heat shield tiles on the shuttle. During reentry, the damage to the heat shield allowed hot atmospheric gas to destroy the wing structure of the shuttle, which caused it to break apart.

The destruction of *Columbia* initially caused the NASA director to want to scrub the last servicing mission to the Hubble Space Telescope and ultimately led to the early retirement of the shuttle. The shuttle had no way for the crew to escape during launch and always had the heat shield exposed.

So for Artemis, NASA wished to return to the ability to use an escape tower and have a protected heat shield. In addition, they wanted to be able to use technology that was already proven to work wherever possible.

But Bruce and the rest of us that want to see major advancements can take solace in the fact that NASA is no longer working alone. Private companies like SpaceX are very innovative and have created things like reusable boosters, including cameras that allow you to watch the booster

land back on Earth! Elon Musk has a great desire to see people (including himself) land on Mars. SpaceX has really returned the *cool* factor to space travel. I do believe that the SpaceX boosters like *Starship* will ultimately replace the current NASA heavy-lift boosters. But they weren't available when Artemis was first being developed.

I think the synergy of these public-private initiatives will be the factor that really gets people excited about space travel again. This is what will help cause the innovation that we all really want. This will be possible because the decisions that NASA is now making will finally get us out of low Earth orbit and will work toward long-term advancement and sustainability of the space program.

Hopefully, in a few years we will see really cool images from the south pole of the moon, and the upcoming lunar gateway will make it so that we can keep going back. This will eventually also provide the gateway to Mars!



ASTROPHOTOGRAPHY GALLERY

Recent Images by Club Members



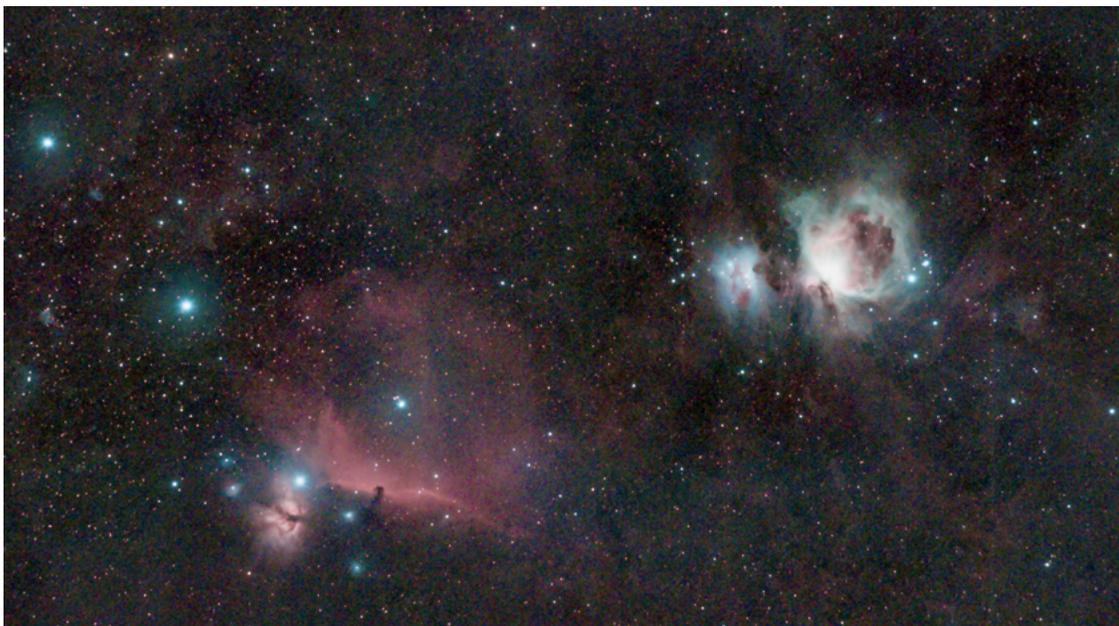
Core of the Orion Nebula in Infrared (left)
and
Close-Up of the Orion Nebula in LRGB (below)

Dean L.



Wide Field of the Orion and Horse Head
Nebulae (below)

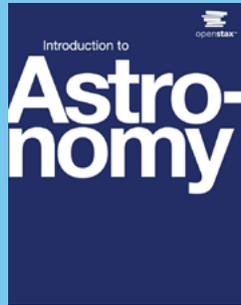
Dean L.



PNGEgg

**Your Image Could Be
Here Next Month!**

We all learn when you share
your astrophotography with
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bschenkdarr@gmail.com for
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Amazon Kindle

Free Astronomy 101 Textbook Now Available!

In an effort to democratize knowledge, the [OpenStax](https://openstax.org/) project produces free digital and inexpensive hard-copy college-level textbooks written by professionals in many fields. You do not have to be a college student to request a copy. You can read more about the new astronomy textbook [here](#). And you can download or order a copy [here](#).



Classroom Clipart

You can see CVAS events on the NASA Night Sky Network calendar at <https://nightsky.jpl.nasa.gov/clubs-and-events.cfm>. If you don't yet have access to the NSN website, please let a member of the Executive Committee know! We can add you to the roster and help you create a login and password.

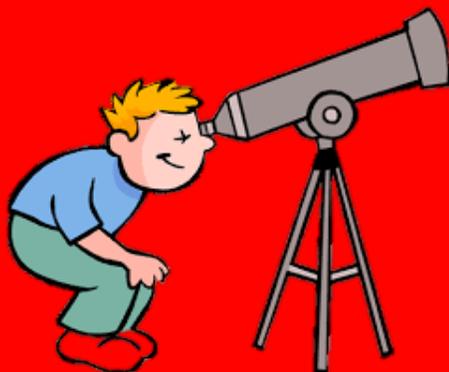


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Hey, Astronomy Hero! What's Your Origin Story?

CVAS members are astronomy superheroes who share their love of astronomy with the galaxy! (Or, at least with the people of Earth!)

What piqued your interest in astronomy? Please tell us! Send your article to Bonnie at bschenkdarr@gmail.com!



CoolClipart.com

Stumped? Befuddled?? Bamboozled???

Telescope Help Is Available!

When even your CVAS friends can't answer your obscure telescope questions, you might find it helpful to call Tom Sevcik

at the Clark Planetarium in Salt Lake City!

His number is (385) 468-1264. You can read his bio on the [Clark Planetarium website](#).

UPCOMING ASTRONOMY EVENTS AND ANNIVERSARIES

by Bonnie Schenk-Darrington



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- All month: Great Comet of 1556 first observed in Europe.
- Feb. 1: [Comet C/2022 E3 \(ZTF\)](#) reaches its perigee and is at its brightest. This comet appears green when viewed through a camera due to the carbon in its coma.
- Feb. 3: The Soviet Union landed the first unmanned spacecraft, *Luna 9*, on the moon in 1966.
- Feb. 4: [Beth A. Brown](#) was born in 1969. She was the first African American woman to earn a PhD in astronomy and became an astrophysicist for NASA. Feb. 5: *Mariner 10* became the first spacecraft to use a gravity assist in 1974, when it flew by Venus in order to reach Mercury.
- Feb. 5: Full moon. This moon is often called the [Snow Moon](#); it feels like an especially appropriate name this year!
- Feb. 7: [Harvey Washington Banks](#) was born in 1923. He was the first African American person to receive a PhD in astronomy. He taught at Georgetown, Delaware State, and Howard Universities. Feb. 8: Peak of α -Centaurid meteor shower.
- Feb. 10: In 2002, the European Space Agency's [Solar Orbiter](#) was launched to measure the inner heliosphere and observe the sun's polar regions, among other tasks.
- Feb. 11: [International Day of Women and Girls in](#)



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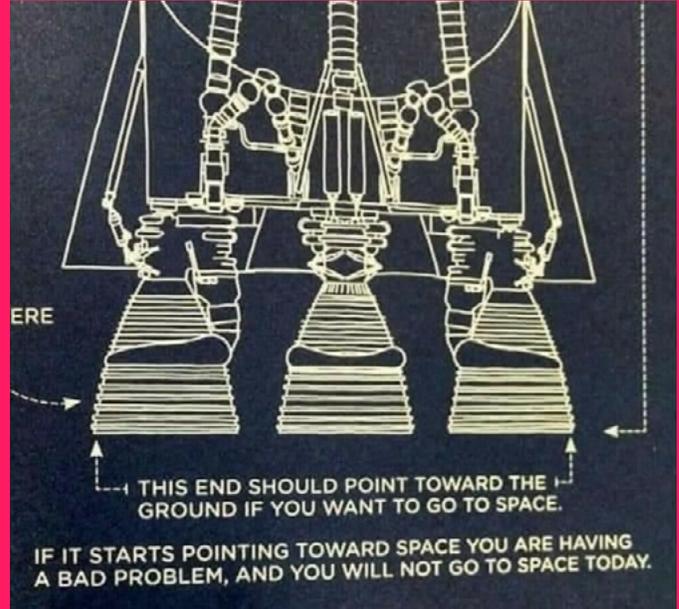
[Science.](#)

- Feb. 15: Astronomer and physicist Galileo Galilei was born in 1564.
- Feb. 15: In 1845, the [Leviathan of Parsonstown](#) saw first light. It was the world's largest telescope from 1845 to 1917. It had a 72-inch aperture. It was built by William Parsons, 3rd Earl of Rosse, at Birr Castle in Ireland.
- Feb. 16: Saturn at solar conjunction. It will be unobservable for a few weeks and will appear lost in the sun's glare.
- Feb. 18: Mars rover *Perseverance* landed in 2021. (You can check out the NASA *Perseverance* blog [here](#).)
- Feb. 18: Astronomer Clyde Tombaugh discovered Pluto in 1930. It was the first discovery of an object in the Kuiper Belt; originally considered a planet, Pluto is now considered a dwarf planet.
 - Feb. 20: New moon.
 - Feb. 22: The moon occults Jupiter.
 - Feb. 25: *Mariner 6* mission launched to study the atmosphere and surface of Mars in 1969.
 - Feb. 26: Niccolo Cabeo was born in 1586. He was a monk, philosopher, and engineer, who performed experiments with falling objects, pendulums, and electrically charged objects.



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RATHER A LOT OF ASTRONOMY HUMOR



This carrot wants to be an astronaut so badly



he needs those parts for his space ship he's going to otter space



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 lifetime membership

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 contact **Bonnie Schenk-Darrington, Secretary/Treasurer** at bschenkdarr@gmail.com.