

Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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No Meeting This Month – June Star Parties

There is no club meeting schedule for June. During the summer months, we instead, concentrate on getting outside for club (private) and public star parties.

Our first June event is the Library Loaner telescope presentation at noon on June 9th at the Logan Library.

To kick off the summer observing season, we begin with our annual club pot-luck dinner on Saturday, June 16th at Nibley Park beginning at 6:30pm. This will be followed by a star party. See the address in the Upcoming Star Parties section. We also have our first solar party of the year that morning (June 16th) at the Logan Library from 10:30am to noon.

We also have two public outreach star parties scheduled for June. The first will be in Aggie Village on June 18th. We can use several telescopes for this event. We also have a star party on June 22nd for the Nibley Stake cub scouts. There will be a lot of scouts in attendance, so we can use help. Be sure to watch for email and check the club website for further event details.

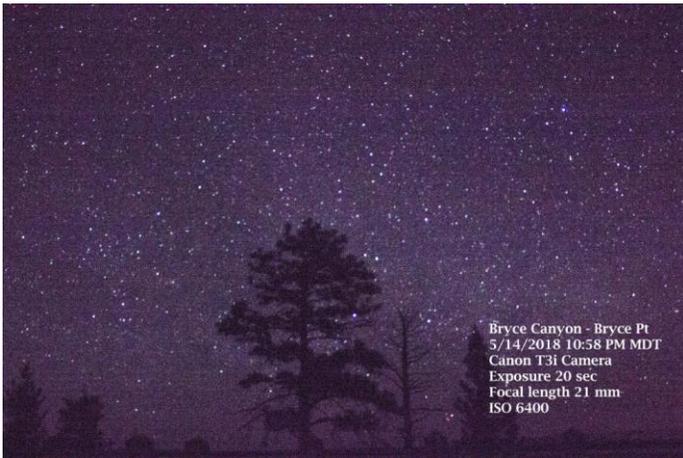
The President's Corner By Dell Vance, CVAS President



May was a good month for CVAS. We have been successful preparing the Library Loaner Telescope for the Logan Library. Gary Bradshaw did a great job making the modifications to the red dot finder scope. The tentative presentation date is June 9th. If you are available, you are certainly welcome to come participate. We are still looking for a Library Loaner Telescope Liaison for the Logan Library. This entails checking the scope each month to see if it needs minor adjustments or cleaning. Tools for the adjustments and instructions will be included in a kit for the Liaison. If you are interested, contact me and let me know.

At our monthly meeting in May Brad Kropp presented the topic, “Life on other Planets: What are the Odds?” It was very well done and pointed out that there are several key conditions for intelligent life to evolve. It is not just being in the “Goldie Locks” zone to allow life. He pointed out how special our planet is.

In May, my wife and I went down to Bryce Canyon National Park to spend a couple of nights. The skies are exceptional. I was fortunate to take several nightscape photos of the skies. Here is one that shows what the star field looks like. We even got up at 2AM to get some pictures of the Milky Way over the canyon. It was great to see it. If you get a chance, go see these National Parks in the dark sky areas. You’ll not be disappointed.



Bryce Canyon - Bryce Pt - Courtesy Dell Vance

This month we have several opportunities to have Star Parties and to help our friends and neighbors to enjoy the great skies we have here in Cache Valley. Locations and times are shown on the CVAS website. Tom Westre is teaching his astronomy course to the Summer Citizens again this year and will have a star party for them the first week in June (probably 6/8 or 6/7). We have our annual pot luck dinner for the club on Saturday, June 16th. Pack something up and come out to enjoy it with us. We will have a star party after the dinner. We are planning to have a Solar Party at the Logan Library June 16th at 10:30 to Noon. On June 22nd, we are holding a star party for the Nibley Cub Scouts and their families.

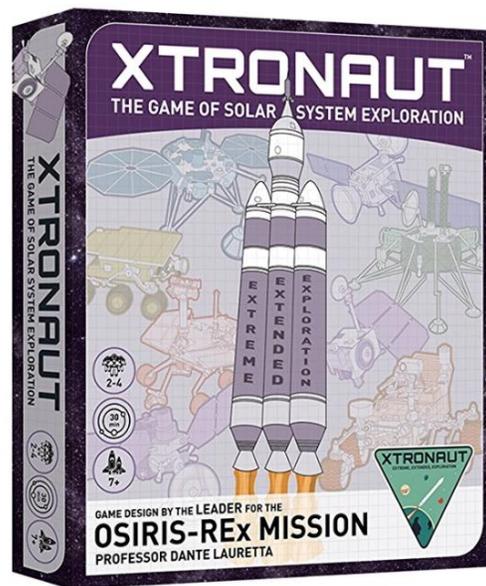
As you can see we are having a very busy month. Be sure to come out and help the club at these events.

Thanks again for your support.

Clear skies!

Kidstronomy Corner By Bonnie Schenk-Darrington

This month, I wanted to tell you about a couple of cool astronomy games that you and your kids might like to try!



Xtronaut: The Game of Solar System Exploration. 2016. Xtronaut Enterprises.

Ages 7 and up

\$35.00 on Amazon.com

https://www.amazon.com/Xtronaut-Game-Solar-System-Exploration/dp/B016VA9F30/ref=lp_14486831011_1_2?srs=14486831011&ie=UTF8&qid=1527642688&sr=8-2



(4 out of 5 planets)

Xtronaut was designed by Dante Lauretta, the leader of the OSIRIS-REx Mission—which might sound familiar to you. The OSIRIS-REx mission launched in September 2016, with the objective of landing on the asteroid Bennu, retrieving a sample, and returning it to earth. The Space Dynamics

Laboratory, a Logan aerospace company, contributed components to the suite of cameras onboard the lander. I work at the Lab and was excited when I came across this game on Amazon. It looked pretty cool, so I bought it.

And it *is* pretty cool! Your objective is to complete ten missions exploring the solar system. The actual OSIRIS-REx mission to Bennu is one of the many missions you might draw out of the pile. Other missions include:

- Landing on the surface of the moon Phobos
- Orbiting Mercury
- Lunar sample return
- Launching a geostationary earth orbiter (satellite)

You draw your mission from the mission cards and draw five playing cards. Each playing card will picture one of the following:

- Rocket components by one of four manufacturers
- Gravity assists from assorted planets
- Spacecraft (orbiters, rovers, or landers)

Action cards (such as Budget Surplus, Spare Parts, Rocket Salvage, and Mission Cancelled)

Your objective is to obtain all the cards (rocket components, spacecraft, and gravity assists) you need to launch your mission, and lay them out on your game board. The first person to reach ten completed missions wins.

I think that anyone who is at least mildly OCD can develop a massive love-hate relationship with this game. Everything is fussy and proscribed and must match exactly—not unlike space missions in real life. Instructions for your turn must be followed in a particular five-step order. All your rocket parts must be from the same manufacturer and must be put together in a certain order. In order to launch your rocket, you must reach a certain delta velocity (made by adding up the delta velocity numbers on your rocket component, spacecraft, and gravity assist cards).

You may have every component you need, except for a left fairing nose cone by your particular manufacturer. You may have two essential

components of one manufacturer, and two of another—so you have to choose one manufacturer and hope you can obtain more parts. You may spend lots of time collecting rocket parts and gravity assists, and then realize your lander is still too large to exceed delta velocity. Other players may have a gravity assist from one planet, but either they refuse to trade to you, or the planets represented are not on your mission card. You may be missing only one measly rocket component when another player socks you with a Mission Cancelled card.

The lows are extreme, but for those of us who are OCD (which includes basically everyone in the Darrington household), when all the pieces fall into place and you finally launch your mission, it is an extremely satisfying moment!

My family has had a lot of fun playing this game, and not all of us are space nuts. The non-space nuts enjoyed it quite a bit, too!

The pros of the game include the following:

- Arithmetic skills are needed to add up your delta velocity. You must develop reasoning skills to determine what “optional” parts (such as additional rocket boosters or gravity assists) you are lacking, and the persuasive skills and shrewdness to obtain them.
- The game is colorful and visually appealing. The planets and moons on the mission and gravity assist cards are particularly attractive.
- The age and skill level (age 7+) is about right. My little boy is eight years old. The first time we played, he and I were a team. The second time we played, he played by himself, with very little help from the teens or adults.
- It teaches kids about various types of spacecraft, the names of planets and moons, and the types of missions that aerospace scientists might undertake.

The game is fast-moving and dramatic. At least when my family played it, there was rarely a dull moment. Someone was always cheering, wheeling-dealing, or groaning in defeat.

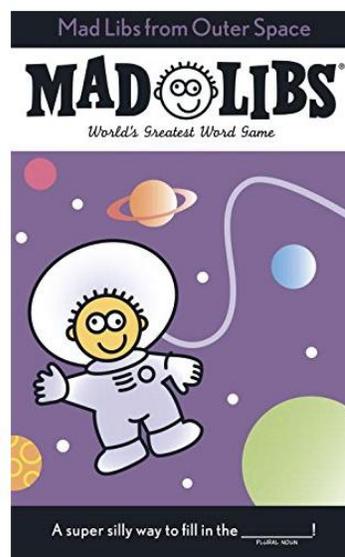
The cons of the game include the following:

- The game is complicated to learn, and therefore easy to argue about. Once you’ve got it down,

though, you've got it down, and it all makes perfect sense. And the order of tasks is right there on the game board so that you can remember what order to do them in.

- The purported length of the game is laughably unrealistic. The box says the game will take 30 – 60 minutes to play. But with four players/teams, it took my family a full hour for two people to complete one mission each. And the objective is to complete ten missions! Alannah said that during the first hour or two, the game rates five planets, but any longer than that and it sinks to just one measly planet. My advice: don't play too long.
- Only four competitors can play at a time. In my family of five, we overcome this by having two of us team up. This would be a fun game to play with a group of friends, or on a date night with several other couples.
- Kids can lose interest when it's not their turn, because of all the fussiness of the rules, rocket building, and so on. Each individual turn can take five minutes or more. This is where being part of a team can be nice, because you and your partner can discuss strategy or make small talk while the turn team searches through the discard pile for spare rocket parts. It also gives you a chance to hit the restroom or grab some munchies.
- If you are *not* OCD—if you don't like nitpicky rules and directions—this is not the game for you.
- You will know how OCD I *really* am by this comment, but I dislike the game box. Really good game boxes have compartments to store the cards and game pieces in. *Xtronaut* doesn't. Our solution has been to store the cards and wooden game pieces in two Ziploc bags, but they don't really fit in the box to my satisfaction. We never seemed to be able to get it all to fit back in the original box without the top bulging a bit.

The Darrington family verdict is that this game is a lot of fun and worth the money. *Xtronaut* scored an average of 4 out of 5 planets among the members of my family.



Mad Libs from Outer Space. 1989. Penguin Random House.

Ages 8 – 12

\$4.99 on Amazon.com

https://www.amazon.com/Libs-Outer-Space-Roger-Price/dp/0843124431/ref=pd_sim_14_5?encoding=UTF8&pd_rd_i=0843124431&pd_rd_r=XG4Q3NWDFZNFH39N32E&pd_rd_w=f9HE1&pd_rd_wg=7CHd7&psc=1&refRID=XG4Q3NWDFZNFH39N32E



(5 out of 5 planets)

Mad Libs has been a favorite game of my family for literally years. Each book is full of short stories with some of the words missing. The premise is that one person acts as scribe and asks another person/people to suggest random nouns, verbs, adjectives, and so on. Then, you read it aloud and laugh at the meaning (or lack thereof). It's a very portable game; all you need is the book, a pencil, and your imagination. It's an equally good game to play on long car trips or at parties. You can play it by yourself, or with one or more friends. I have found that even adults find it hilarious, in spite of the suggested upper age limit of twelve. Our family has many in-jokes based on funny *Mad Libs* we have done over the years.

The stories in *Mad Libs from Outer Space* vary from basic nonfictional explanatory essays (“Our Solar System”) to silly short stories (“Captain Zoom”) to letters (“Letter from a Martian”) to poetry (“Some

Outer Space Poetry”) to FAQs (“Legal Problems on Venus”). Some of the material is educational and some is silly. In my opinion, that’s what’s truly brilliant about *Mad Libs*. *Mad Libs* are fun, but they can give you a great segue into a discussion about a serious topic. When Alannah was a child, she would frequently ask me, after we had laughed at some silly *Mad Lib* story, “Mom, what’s the real word it’s supposed to say here?” The stories in *Mad Libs from Outer Space* can give you a chance to sneak in a conversation about Copernicus, the moon landing, the gravity on Pluto, the history of rockets, and the possibility of life on other planets.

One thing that can scare people away from *Mad Libs* is the fact that you need to know your parts of speech. People are sometimes nervous that they don’t know their nouns from their adverbs. Each *Mad Libs* book has a “Quick Review” page to help you with this. And guess what—if you accidentally put an adjective in a verb slot, it will just make your story a little sillier.

My family unanimously gave *Mad Libs from Outer Space* (and all *Mad Libs*) 5 planets!

Star Party Agenda

By Blaine Dickey

Having an observing plan at a star party is usually a good idea. The following plan was created referring to a list that was generated using a free program called RTGUI+S. One only needs to enter the date and time of your star party and click on the “Best of the Sky” to create a nice list of the “best objects” that can be seen that evening. From that list I selected some of the objects that were high enough in the sky to be clearly seen.

If you have a GoTo Celestron Scope for example you will notice the SAO catalog number for the double stars listed. The objects in the table below are listed in 7 columns of various types that give variety to an observing session. Some objects are listed that are often overlooked. Using RTGUI+S you may also create lists that relates to a single constellation, or type of object. You can also save the lists created and print them out. The table below for example

could be used at our final club meeting on the evening of 16 June 2018.

Star Party Agenda

Date: Saturday June 16 – Wednesday June 20, 2018

Around 10:00 pm

Moon Phases: **New Moon:** June 13 **First Quarter:** June 20

Sunset: 9:01 pm, End of Twilight: 11:15 pm

(Table is shown on next page)

Planets visible at Sunset	Globular Cluster	Open Clusters	Planetary Nebula	Galaxies	Emission Nebula	Binary or Carbon Stars
Moon	M13 Great Cluster	M4 Scorpius	M57 Ring Nebula	M51 Whirlpool		Mizar SAO 28737
Venus – West	M92 Hercules		NGC 6210 48”dia Her	M81 & 82 Bodes Group		Albireo SAO 87301
Jupiter - East	M3 Canes Venatici		NGC 6309 Box	M49 Virgo		Polaris SAO 308
	M5 Serpens		NGC 6543 Cat Eye	M63 Sunflower		5 Lyr Dbl Dbl
	M10 Ophiuchus		NGC 6826 Blinking	M64 Black Eye		Gam1 Leo SAO 81298
	M12 Ophiuchus			M66 Leo		Carbon Star Sao 44317 La Superba
	M53 Coma Berenices			M84 Virgo		32 Cam SAO 2102
				M94 Canes Venatici		Cor Caroli SAO 63256
				M104 - Sombbrero		17 Boo SAO 29046
				NGC 4490 Canes Venatici		Xi Sco SAO 159665
				NGC 4565 Needle		Bet1 Sco SAO159682
				NGC 4631 Canes Venatici		Kap Her SAO 101951
				NGC 5068 Virgo		D Sco SAO 207558
						SS Vir HD 108105 Carbon Star
						V Crb HD 141826 Carbon Star
						T Lyr Carbon Star

Star Party Agenda Generated by RTGUI+S

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



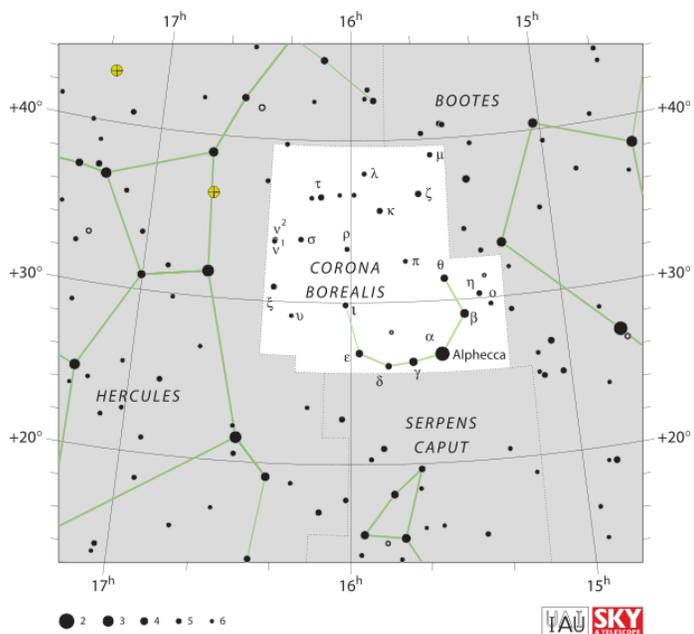
Binocular support (folded for storage) - Courtesy Ned Miller

Spotlight on Corona Borealis, the Northern Crown

By Dale Hooper

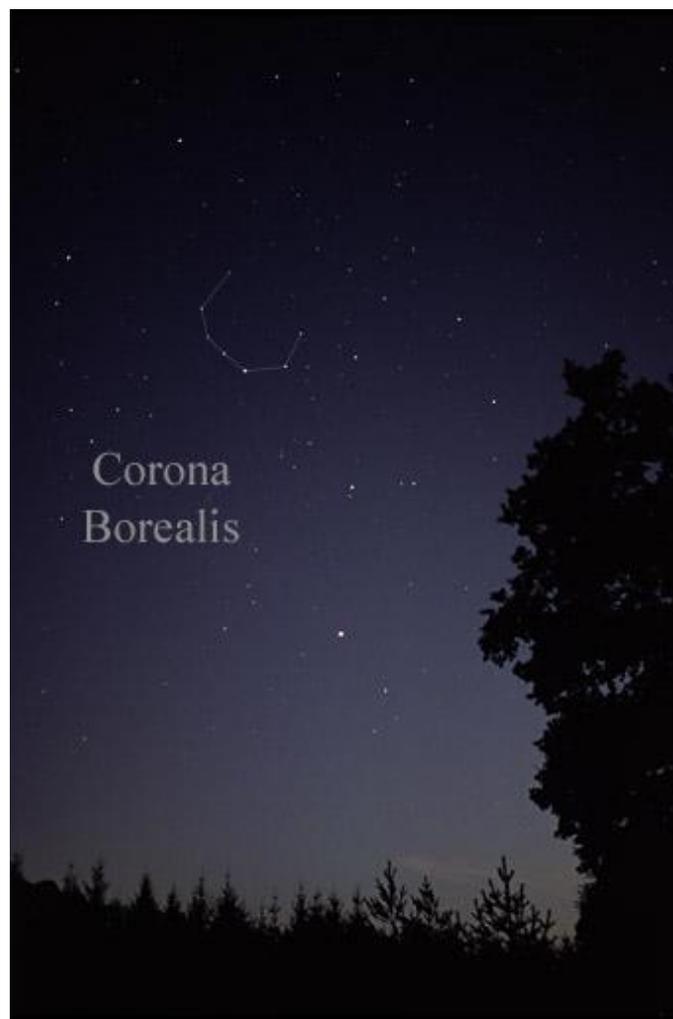
Corona Borealis is a fairly small constellation (it ranks number 73 out of 88 constellations). However, it is fairly is to find since it centered between Hercules and Bootes. Given its location of a reasonable distance away from the plane of the Milky Way, you would expect Corona Borealis to contain some galaxies. In fact it does, it is the home of the Abell 2065 galaxy cluster. Unfortunately, the galaxies in this cluster are no brighter than 16th magnitude. There is also a smattering of magnitude 13 and 14 galaxies found in the constellation. Corona Borealis is the first constellation which we have featured which contains NO deep sky objects which meet the three star criteria. In addition to a few decent double stars Corona Borealis does contain a couple variable stars which are worth observing. The first is T Coronae Borealis (the Blaze Star); this is a recurring nova and actually consists of a red giant and a white dwarf. It is usually around 10th magnitude but has reached about second magnitude when the star goes nova. The other variable star is R Coronae Borealis, also known as the “Fade Out Star”. It is usually 6th magnitude but on an irregular basis (of months to years) it will fade out to 15th magnitude!

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



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg

Object	R.A.	Dec.
Σ1932 (Double star)	15h18.3m	+26°50'
7 Coronae Borealis (Double star)	15h39.4m	+36°38'
R Coronae Borealis (Variable star magnitude 5.7 to 14.8)	15h48.6m	+34°25'
T Coronae Borealis (Recurring nova magnitude 2.5 to 10.8)	15h59.5m	+25°55'
17 Coronae Borealis (Double star)	16h14.7m	+33°52'



The constellation Corona Borealis as it can be seen with the unaided eye. © T. Credner & S. Kohle, AlltheSky.com - used with permission

CVAS Minutes – May 2018

The May CVAS meeting was held on May 23rd at BATC. There were approximately twenty-five people in attendance. It was announced that the Logan Library will be accepting the first Library Loaner Telescope on June 9th between noon and 1pm. We still need a Loaner Telescope Library Liaison who will maintain just the Logan Library Scope.

Binocular mounts are still available at \$15 for members and \$20 for non-club-members. We have our annual pot-luck dinner on Saturday, June 16th in the West Pavilion of Nibley Park. On June 22nd we will be helping with a star party for the Nibley Stake Cub Scouts. Also on June 18th we

will be helping with a star party in Aggie Village. We have been asked to help with a presentation on July 14th at Fossil Butte National Monument (near Kemmerer Wyoming).

Dale Hooper then discussed some of the things that are observable in the night sky over the next month.

The time was then turned over to our featured speaker, Brad Kropp, for his presentation on **“Life on Other Planets: What are the odds?”**

Brad referred us to the book, **Earths of Distant Suns** and stated that he highly recommends it. Brad then took a poll of how many believed there was life on other planets. Of those in attendance 21 said yes and 3 said no. He then asked a few questions to see initially, what type of life people thought might exist on other planets. (People could vote multiple times). Nine felt there was intelligent life. Eleven thought there would be fish like (i.e. water based) life. Twelve thought there would be plants. Nineteen thought there would be small microscopic life and twenty-five (there were obviously some converts) thought there would be bacteria.

Brad then detailed some of the special things about earth:

1. It is in a safe part of the galaxy
2. It is in the “goldilocks” or habitable zone
3. It has a stable, long lived star
4. It is protected by an ozone layer and by a magnetic field.
5. It has mechanisms that stabilize its environment
 - a. Tectonic plates (that recycle carbon)
 - b. Large moon dampens axial tilt
 - c. Isn’t tidally locked
 - d. Enough gravity to hold an atmosphere

He then asked if life can exist in extreme environments. He said that, yes it can and there are examples on earth called extremophiles. Some live near deep sea vents and others are salt lovers (halophiles).

Brad then discussed the possibility of life in other part of the solar system and compared each possibility to a somewhat similar location on earth.

Saturn’s moon Enceladus – has a sub-surface ocean and tidal heating. Lake Vostok on earth has been covered by ice for 15 million years. It has been buried under miles of ice. It has a high oxygen concentration and contains life.

Saturn’s moon Titan – Is cold, has a nitrogen/methane atmosphere, methane rivers and lakes. There is methane ice on earth. It is colonized by worms. Microbes help digest the methane clathrate.

Brad then detailed some of the signatures that may be found indicating life on other planets:

- Chemical signals – Oxygen, seasonal carbon dioxide variation. He indicated that life changes it’s environment
- Life is often colorful
- Look for polarized light. Life produces handedness.
- Direct communication

Brad then addresses the presentation title question, what are the odds? He indicated there are 100 to 400 billion stars in the Milky Way. Exoplanets are very common. He indicated that there are at least 200 billion galaxies in the universe.

He then referred to the Drake Equation (from 1961) which has been used to estimate the likelihood of intelligent life in the universe. He then also discussed the Brownlee/Ward equation which is known as the “Rare Earth” equation and predicts a very small number.

Lastly, Brad took a post discussion poll. Twelve now thought there would be intelligent life. Twelve thought there would be water based life. Fourteen thought there would be plants. Nineteen thought there would be small microscopic life and twenty-three thought there would be bacteria.

It was a very interesting and thought provoking presentation for everyone in attendance.

Upcoming Star Parties

- 16 Jun Solar Party, 10:30am – Noon
Logan Library
- 16 Jun Annual Pot Luck Dinner / Star Party
Nibley Park, 6:30pm (850 W. Nibley Park Ave, Nibley). Enter Nibley on 800 W and drive south until you reach Nibley Park Ave. and turn west one block before the pavilion.
- 18 Jun Public Outreach Star Party at Aggie Village
(North of the Logan Cemetery on 1200 East)
Set up scopes by 8:30pm
- 22 Jun Nibley Stake Cub Scout Star Party
- 14 Jul Presentation at Fossil Butte National Monument (near Kemmerer Wyoming).
- 14 Jul Solar Party, 10:30am – Noon
Logan Library
- 20 Jul Public Star Party – Heritage Park
2456 S. 800 W., Nibley
- 10 Aug CVAS Star Party
- 11 Aug Solar Party, 10:30am – Noon
Logan Library
- 17 Aug Public Star Party – Macey's Parking Lot,
Providence
- 19 Jun Vesta at opposition
- 20 Jun First Quarter Moon
- 21 Jun Summer Solstice
- 22 Jun Royal Greenwich Observatory founded (1675)
James Christy discovers Pluto's moon Charon (1978)
- 23 Jun Jupiter 4° south of Moon
- 25 Jun Mercury 5° south of Pollux
- 26 Jun Charles Messier born (1730)
- 27 Jun Vesta 0.3° south of Moon
Saturn at opposition
Saturn 1.8° south of Moon
- 28 Jun Full Moon
- 29 Jun George Ellery Hale born (1868)
- 30 Jun Mars 5° south of Moon
Tunguska impact (1908)
Cassini spacecraft arrives at planet Saturn (2004)

Upcoming Events

- 01 Jun Japan's Hayabusa 2 scheduled to reach asteroid Ryugu and later attempt to collect a sample for return
- 03 Jun Mars 3° south of Moon
200 inch Hale Telescope (Palomar Observatory) dedicated (1948)
Edward White, first American to walk in space (1965)
- 06 Jun Last Quarter Moon
Neptune 2° north of Moon
- 08 Jun Venus 5° south of Pollux
Giovanni Cassini born (1625)
- 09 Jun Uranus 5° north of Moon
- 13 Jun New Moon
Pioneer 10 leaves solar system (1983)
- 14 Jun Flag Day
- 16 Jun Venus 2° north of Moon
Valentina Tereshkova first woman in space (1963)
- 17 Jun Father's Day
- 18 Jun Sally Ride, first American woman in space (1983)

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:

Brad Kropp, CVAS Treasurer
1573 E 1425 N
Logan, UT 84341

For any questions contact our Treasurer at brad.kropp@usu.edu or our Secretary Dale Hooper at dchooper5@gmail.com