



Cache Valley Clear Skies

The Journal of the Cache Valley Astronomical Society



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www.cvas-utahskies.org

Meeting Announcement

Our October meeting will be held **Wednesday, October 24th at 7 pm in Room 840 of the main BATC Campus.** Enter on the east side of the building located at 1301 North 600 West. Our featured speaker will be **Ms. Emma Smith.** She teaches astronomy at Ridgeline High School. Her topic will be "Contributions to Stellar Astronomy by Women". Ms. Smith has taught physics and astronomy for 21 years and is currently working on a PhD in Science Education.

Special Announcements

There are two special events in October that have websites setup:

October 4-10 – World Space Week:
worldspaceweek.org

October 20 – International “Observe the Moon Night”:
moon.nasa.gov/observe

Also:

October 15 - Dr. Shannon Rupert, the Director of the Mars Desert Research Station (MDRS) in Hanksville, Utah will be speaking on the subject “Is There Life on Mars” at the Gore Auditorium Westminster College in Salt Lake City

The President’s Corner By Dell Vance, CVAS President



President’s Corner
By Dell Vance

September was a very busy month for CVAS. We had star parties for the public and club that were very well supported. The star party for Preston Jr. High students and parents was very good. We had several telescopes and members there to show them the planets and deep sky objects. The sky was very clear this year. The moon came up just as the students were leaving (perfect timing).

We also had our club elections this month. I personally want to thank Dale Hooper and Layne Pederson for their service to the club. Dale has been the secretary and editor of the newsletter since the reorganization of the club 5 years ago. Layne was supportive in filling in for me when I was out of town and gave great ideas for the executive committee. Thanks again.

Our new executive committee is as follows:

- President – Dell Vance
- Vice-President – Bruce Horrocks (new)
- Treasurer – Brad Kropp
- Secretary – Wendell Waters (new)
- Former President – Tom Westre

We are anxious to get this new year rolling for CVAS. Be sure to congratulate Bruce and Wendell on their new positions.

After the elections, we viewed a film about the Apollo 8 Mission around the Moon. This year in December will be the 50th anniversary of this flight. I was 15 years old when this happened, and I remember it very well. However, I didn't realize how significant and risky this mission was. These three astronauts are truly heroes. It was a good movie and very informative.

As I mentioned in the newsletter last month, we have several outreach opportunities this month. We can use as many telescopes and members as we can get to cover these opportunities. October 11th is particularly challenging as we have two events to support that same night. Tom Westre will be coordinating the Brigham City effort and I will be coordinating the event here in Logan. Please let us know which event you will be able to support that night, so that we can verify we have enough telescopes and members for both events.

- 10/11 - Cache Valley South Adult Special Needs Mutual Star Party held in Logan The address for the Special Needs

Mutual Star Party on October 11th is: 94 West 600 South, Logan

- 10/11 – Brigham City USU Extension Event with Dr. Johnson (Lyle Johnson's father) speaking and a Star Party
- 10/15 – North Park Elementary School Star Party in North Logan
- 10/26 – River Heights Elementary School Presentation and Star Party



We also have a couple of observatories being built by CVAS Members. Bruce Horrocks has a great observatory he has been working on there in Wellsville. He has rolled the steel and formed the dome for his observatory. What a great achievement. I have been working on the deck and pier for my observatory here in Newton. I finished the deck on September 29th and plan to purchase a SkyShed POD to install on it sometime before next spring. Overall several of our members have observatories or had observatories in the past. If you are planning to install an observatory, be sure to ask our members about their experiences. They have a wealth of knowledge on the subject.

Be sure to get out with your family and friends to see the skies this month. The cold weather is coming and now is a great time to see the skies. Thanks again for all your support on our various activities.

Clear Skies!

The Limit of Resolution – Rayleigh Formula

By Bruce Horrocks

As all of us who have looked through the lens of a telescope know the light we see has been traveling through space for thousands if not millions of years. The objects we see are all in the past and we are seeing things as they were a long time ago. When asked how far away it is, we generally answer using the term light years. Another question I get frequently asked is can we see the old Apollo landing sites and the equipment that was left there on the moon. As you all know the answer is a definite no. Not even the Hubble Telescope can see the old lunar landing craft or rover. The reason for this is the limit of resolution of the lens or what is referred to as the angular resolution.

I recently read an article that discussed this topic of resolution and proposed the question, what if someone was out in space looking back at us? To do this, it would require a very large aperture to even view the earth, and even larger apertures to see any features on the earth. The formula to determine this is called the Rayleigh Formula as shown below:

$$\theta = 1.22 * \lambda / D$$

The left side of this equation, θ is the angle created by the size of the object divided by the distance. The right side is the number; 1.22 times the wavelength of light, divided by the diameter of the aperture. In doing the math you must use all the same type of units, i.e. meters, feet, inches. For example, if you were looking at a 6" ball from 100 yards away, then $\theta = 6'' / (100\text{yd} \times 3\text{ft}/\text{yd} \times 12''/\text{ft}) = 0.00167$ radians. And if you had a 100mm telescope looking at a yellow star with a wavelength of light of around 550 nanometers then $\theta = 1.22 \times (550 \times 10^{-6} \text{ mm} / 100\text{mm}) = 0.00000671$ radians. Converting these numbers to degrees or arc seconds make the θ for the ball almost 0.1 degrees or 360 arc seconds, and the θ for the 100mm aperture telescope = 1.38 arc seconds. So enough with the math, what does this all mean.

If you had a telescope on Alpha Centauri, our closest star other than the sun, you would be seeing the earth as it was 4.37 years ago. You would be watching the winter Olympics in Sochi and the

Ebola outbreaks in Africa. To see the earth from that far you would need a telescope with a 2.2-kilometer lens, and to see the American continent you would need a telescope that is over 6 kilometers across.

If we move farther into space and put our telescope on the Orion Nebula, 1,350 light years away, we could watch the earth as the Muslims conquer the last remnants of the Roman Empire. Your telescope would need to have a 670-kilometer lens opening to see earth, and 2,000-kilometer lens to see the America continent.

Now if we really go back to the Andromeda Galaxy which is over 2,500,000 light years from earth, you would now be looking back at earth and seeing woolly mammoths and the end of the dinosaurs. However, to do this you would need a telescope that has an aperture of 1.3 million kilometers just to see earth and if you thought of seeing a mammoth your telescope would need to be a lens that is 530 billion kilometers across. At that size it would take light almost 20 days just to cross your lens, so I have no idea of how a telescope would handle that added complexity.

While this is just all for fun and we can see complexities of even building a small telescope, you can see why finding other planets is so complexed. I hope that the next time you find yourself looking at website looking for that dream telescope and you notice a little note in the specifications called the Rayleigh Resolution, you may know a bit more of what that means.



NGC 6995 – The Eastern Veil Nebula

Taken using a 100mm SkyWatcher Refractor telescope with ZWOASI294 camera. Courtesy of Bruce Horrocks.

Kidstronomy Corner

By Bonnie Schenk-Darrington

I think I've found some good astronomy activity books this month. I can't wait to tell you about them, so without further ado . . .



Nichols, Michelle. 2016. *Astronomy Lab for Kids: 52 Family-Friendly Activities*. Beverly, MA: Quarto Publishing Group.

Ages 8 – 12

\$3.44 on Amazon.com (+ \$4.49 shipping)

https://www.amazon.com/Astronomy-Lab-Kids-Family-Friendly-Activities/dp/1631591347/ref=sr_1_3?ie=UTF8&qid=1538357256&sr=8-3&keywords=astronomy+lab+for+kids



(4 out of 5 planets)

This won't surprise you, but I do a lot of Amazon searches for children's books on astronomy. I'm always looking for something awesome and new for this column. Amazon frequently recommends books based on your searches, and this book, *Astronomy Lab for Kids*, kept coming up in my feed. At first, when I saw it, I rolled my eyes and didn't even look—how could a book that cost less than \$4.00 be any good? Right?

But it kept coming up in my feed, and so I browsed the “Look Inside!” feature about 5 different times. I finally gave in and bought it, and I'm so happy I did!

I can't remember the last time I was more pleasantly surprised by a book. This is a terrific book full of fun activities that you can do cheaply at home. The author, Michelle Nichols, has a master's degree and works at the Adler Planetarium in Chicago, Illinois, where she has been coming up with child-oriented astronomy activities like this for 20 years. She really knows her stuff! And the book is well-built; with a semi-stiff cover and spiral binding, it's sturdy and stays open to the page you want.

The photographs are taken in and around Chicago, and avoid the tropes and pitfalls of so many other science/craft book photos. The pictures, for once, did not make me feel self-conscious about my child's uncombed hair, or my mismatched furniture and crayoned walls! Clearly, these photos were taken of real children in their real homes and real neighborhoods, eschewing over-styled models on sterile sets. See, for example, p. 27 where a child poses in front of a bookshelf with the books falling over, or p. 22 where one child is wearing old boots while another is wearing a fabulously clashing outfit consisting of an orange T-shirt with a red jacket. I loved the realness of the children, homes, and neighborhoods. That said, the children all appear to be white; none of them are obviously people of color, which surprised me, given the size and population of Chicago. Also, all of them were clearly able-bodied—none of them even wore glasses or a hearing aid. My only complaint about the kids and photos is that I was hoping for a more diverse cast.

I also loved the materials lists—most of these activities you can do with stuff you probably already have around the house—a tennis ball, a pizza box, aluminum foil. When you do have to buy something, it's an inexpensive item such as drugstore reading glasses or a small prism. If you remember my frustration in July as I struggled through the badly written, badly edited *Curious Jane: Science + Design + Engineering for Girls*, you will understand why this feature of the book appealed to me. The one item in the book that I thought you might not have at home is a lightbulb basically mounted in a socket on a piece of wood, which is used in several of the activities, such as “Focus!” (p. 38), “Fuzzy Color” (p. 40), and “Make a Simple Telescope” (p. 42). The author seems to assume that pretty much any lamp without its

lampshade would work, but I can see that using a real lamp might make lining up lenses and that sort of thing a little more complicated. Still, one complicated/hard to procure item in the whole book is pretty forgivable.

Each activity also has a section called “Safety Tips and Setup Hints,” which again was lacking in the *Curious Jane* book. And sections called “Creative Enrichment” and “The Science Behind the Fun” inform adults how to explain things and what to try next.

The book is well-organized, and its units move from basic to more advanced: 1. *Observing*; 2. *Scope It Out!*; 3. *Size and Scale*; 4. *Light, Motion, Gravity*; 5. *Exploring Our Solar System*; and 6. *Seeing Stars*. All of the units contain activities that are based on physics and astronomy, though the connection might not be obvious to every kid (or adult!) all the time. For example, the activity “Supernova Bounce” (p. 138), which Alannah, Dane, and I did together—seemed a little difficult to explain to a child—“the ground under your feet represents the densest part of the center of the star. The soccer ball . . . represents the outer layers of the center of the star, and the tennis ball represents the outer layer of the rest of the star” (p. 139). I struggled to understand that the way the balls *bounced* represented the *energy* of various parts of the star, rather than the *size* of the star’s parts. Supernovas are big (unlike tennis balls) with lots of explosive energy (like tennis balls bounced together with soccer balls). Alannah had done this experiment before and explained it patiently to me about three times, plus I read the explanation in the book multiple times. I don’t think Dane absorbed the explanation at all—but he loved bouncing the balls around. And bounce your soccer and tennis ball around enough, and it might just sink in.

None of these activities are necessarily stand-alone; the author clearly meant for them to be performed in sequential order. Still, you *can* pick and choose a bit. Another one we did together was “Bend Light with Ice” (p. 36) in which you make a convex lens out of ice. You can see that if you don’t freeze it too long, your ice is nice and clear and magnifies the words and pictures in Dane’s magazine. That was pretty cool, and Dane played with it until it had melted all over the place.

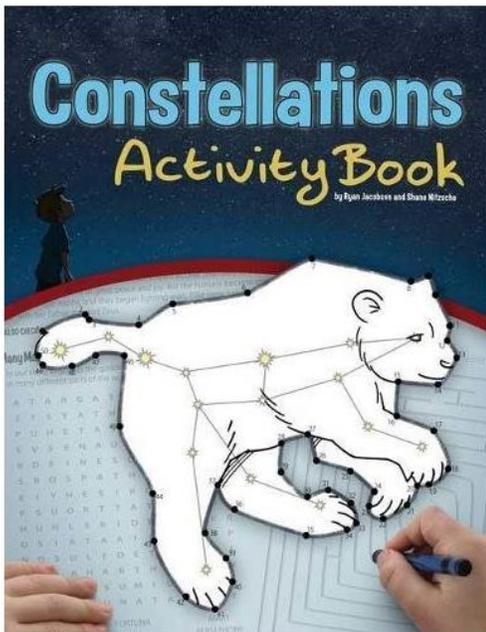


Here are some other cool activities I’d like to try: “Why Is the Sky Blue?” (p. 74); “Detecting Infrared Light” (p. 82); and “Will I Hear a Sound in Space?” (p. 104). Also, the author encourages kids to keep a lab notebook full of their observations—a great introduction to how science work is done.

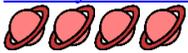
I think this book would make the most sense for teachers and homeschool parents. And I think you’d need a better understanding of rudimentary physics than I’ve got to be able to explain some of the activities skillfully to a child. And the suggested age range might be a bit too young: 12-year-olds will understand the physics behind it all better than 8-year-olds. But you can clearly have some fun with it even if you don’t completely understand it all, or don’t plan to do all the activities from start to finish.

Astronomy Lab for Kids is part of a larger series, and sister books include *Geology Lab for Kids* (which includes a unit called *Space Rocks, Too*), *Energy Lab for Kids*, and *STEAM Lab for Kids* (which has an extremely cool-looking unit on engineering). All of them appear to be sold for less than that cover price (\$24.99) on Amazon. It’s likely I’ll check out another book from this series in a later column.

So, don’t judge a book by its Amazon price! *Astronomy Lab for Kids* is a screaming deal at \$3.40 (+ \$4.49 shipping), is full of great, helpful photos and fun activities, and is written by a true expert.



Jacobsen, Ryan, and Shane Nitzsche. 2012. *Constellations Activity Book*. Cambridge, MN: Adventure Publications. Ages 5 – 10 years \$6.95 on Amazon.com https://www.amazon.com/Constellations-Activity-Book-Color-Learn/dp/1591933250/ref=sr_1_3?ie=UTF8&qid=1538357383&sr=8-3&keywords=constellations+activity+book



(4 out of 5 planets)

I was not sure I'd be able to actually get this book back in time to write a review of it. My kids liked it quite a bit. I had to send them to bed so that I could have a turn!

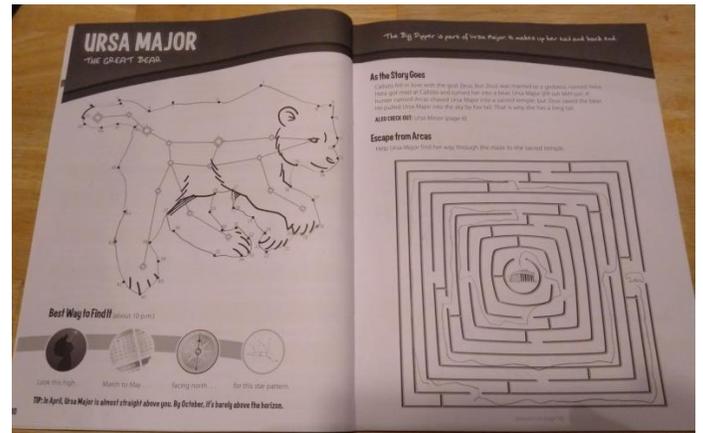
It starts with some basic information about astronomy, answering the following questions:

- What is a constellation?
- Why do constellations move?
- How do I find each constellation?
- Where did the stories come from?
- What is Greek mythology?
- Are the stories true?
- What are the zodiac constellations?
- Is every constellation in this book?

The book includes 26 of the 88 constellations—“a mix of the most famous constellations, the easiest to find and the most important to know” (p. 3). It also

includes a constellation map with information on when the best time to view that constellation is.

The main part of the book consists of two-page spreads which each highlight a constellation. For each constellation, there is a dot-to-dot picture of it, instructions on how to find it, a brief story about it from Greek mythology, and a secondary activity—in Ursa Major's case, a maze (pictured below).



Other secondary activities include things like word searches, code breaking, crossword puzzles, word scrambles, anagrams, hidden pictures, and so on. It's for this reason I think that the suggested age group is too young. Dane (my 8-year-old boy) was enjoying the dot-to-dots, but Alannah (my 17-year-old girl) was the one who was reading the stories and doing the more complicated activities, such as breaking the code to find out what Boötes invented (p. 17). It's hard to imagine a 5-year-old doing many of these activities competently.

Alannah is also a myth savant—she wants me to tell you that some of the stories are inaccurate. On the one hand, each story is a maximum of four lines long, so they have been ruthlessly edited for brevity. On the other hand, Alannah felt important details were gotten wrong; for example, the authors wrote that the mythology of Virgo was about someone named Dike, instead of Persephone, as Alannah has always read. This sent us on a trip to Wikipedia, which only muddied the waters. The truth is that mythology is complex and stories are not always recounted with the same details. Still, Alannah found herself exclaiming, “That’s not right!” as she read multiple stories.

I also want to alert you that one of the secondary activities upset me a bit. I hadn't seen it yet, but

The Invalid Package Incident **By Wendell Waters**

overheard Alannah and Dane reading it together. On p. 9, Leo's secondary activity is "What's Your Sign?" and talks about horoscopes. What I love about astronomy is the combination of science and mythology, but I don't like horoscopes and feel that they are pseudoscience. As soon as I got my hands on the book, I read this part. Overall, it's probably harmless and won't stunt your little scientist's development. It does not present horoscopes as factual, and says "Some people think your birth date tells a lot about you," and "Just for fun, find your sign below." It makes sure you know that horoscopes are not universally believed and that they are just for fun. I think you shouldn't let this one thing stop you from buying the book. It might be a good learning experience for your child; in fact, as I was eavesdropping, Alannah read Dane's horoscope aloud to him and exclaimed, "That doesn't describe *you* at all!" He laughed and they moved on to a new page. So, the horoscope page might give you a good opportunity to discuss science and pseudoscience with your child—better they get their information about this from you than from some weird, outside source. And if there's any question, turn to page 3 and show your child this quote: "Are the stories true? No, they are just stories."

While you only need just one *Astronomy Lab for Kids* book, if you have multiple kids, you will need multiple copies of *Constellations Activity Book* for your kids. It's a workbook that is meant to be filled in and colored, so if your kids don't share well, maybe you should buy one for each (as I found out the hard way!).

This would be a fun book to take on a mini-trip to work on in the car. (Antelope Island's next public star party is coming up on October 13!) Don't forget the crayons, because this book has some great pictures for coloring, as well!

Alannah gave it only 2 planets for the mythology information, but 5 planets for its "fun-ness." Dane gave it 5 unqualified planets. I'm giving it 4 because the age ability is all over the map. But it's an entertaining workbook and I fully expect my kids to get many more hours of enjoyment from it.

Some of you are aware of an issue I had with my scope at the Preston Junior High event back on the 27th. For those who are not, I experienced a technical difficulty with the hand controller (HC) on my Celestron SE8 Goto Telescope. Namely, when I powered it on the HC gave me the following message: "Bootloader Invalid Package 0080". I have owned the scope for a little over a year, I have used it several times in that period, and had never seen that message before.

After spending some time on the internet, I found the solution. It was suggested that I share what I found in the newsletter so that perhaps it might be helpful to other Celestron Goto users.

I found out that the error meant that the firmware packages on the HC had become corrupted, and thus would not load correctly. I don't know if I ever found a definitive cause for this, but some comments online suggested it might have to do with static electricity build up. The answer was not really a fix, I just needed to learn that Celestron has a way to "upgrade" or reload the firmware packages on their HCs. I don't believe I ever saw a reference to this anywhere in the manual.

So here is what you need to do to solve this problem. You need to have a USB cable that will plug into the bottom of the HC, and a computer running windows (I think pretty much any windows OS will work, but see the end of this article for more information on this). You also need to make sure that the JAVA on your computer is up to date (This may take a separate download).

You need to download a small app called the Celestron Firmware Manager. The URL for the website is software.celestron.com/updates/CFM/CFM (or you can just Google Celestron Firmware Manager and the first result should be the site that you want). Don't bother trying to find this page by going to the Celestron website, because it's nearly impossible to find.

When you open the page you will see three download links. The one you want is the second one (CFM_2.3.7111.zip). When you click on this link you will be prompted to download a zip file. It

will be easiest if you direct this file to be downloaded to your computers desktop so you will be able to find it when you need it.

Keep in mind that this is a zip file so after the download has completed, which should only take a matter of seconds, you will need to un-zip it. Do this by right clicking on the file you downloaded and selecting "extract to CFM_2.3.7111". This will create a folder on your desktop named CFM_2.3.7111. Open this folder and you will see another folder with the same name. Open this folder and you will see the programs that you need. To begin the update process, run the CFM Executable Jar File. This will launch the Celestron Firmware Manager app. When the application launches, if your computer is connected to the internet, it will automatically download of the packages. It will also attempt to find any Celestron devices connected to your computer. Then plug the HC into the computer and click the "seek devices" button. If all goes as it should, the application will find your scope. I left my HC plugged into the scope when I performed this, but you will want to turn the scope itself off. You will also notice that the HC will light up and say "initialize".

After the app finds your scope you will see it in another window called "list of devices". The message on the HC should now read "Boot Loader Serial Pass through off". Now click on the update button, the HC should now say "Bootloader Serial CFM request", and a series of 11 updates should begin to load onto the HC. This process will take a few minutes. When this is completed the app will show the message "All your devices are up to date". To finish the update process, turn on your scope and see if it is working properly. And if your HC says "press enter to begin alignment" you have successfully updated your firmware.

This is the process I used with my desktop computer running windows 10. BUT . . . This entire process may NOT have worked for you. And here's why. It has to do with Windows 10 and JAVA. You see they really don't play well together. One thing I wanted to be able to do was run this app on my windows 10 laptop (meaning I could do this "in the field" should the need arise). And it did not work. This is where my knowledge is much more limited. For some reason the app worked fine with the windows 10 on my desktop but when I tried to

run the executable file on my windows 10 laptop, nothing happed. However, with the help of my oldest son, we were able to figure out how to make it work.

So here are the additional things you need to do if the executable file did not work for you. On your computer open up the Notepad application, then type the following exactly leaving off the parentheses (java -jar CFM.jar). Next click File, then Save As. In the dialog box, change the Text Documents setting to All Files using the drop down arrow. Then in the File Name box type CFM.bat. Then click save this notepad file in the same folder as the CMF executable jar file. Then, when you run the app to update your HC, you need to open this BAT file instead of the executable jar file, and then follow the directions above.

It should be made clear that I am anything but a computer whiz, but if you have any questions beyond what is in this article I will try my best to assist. I hope this article has been helpful.

Clear Skies !!

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.



Spotlight on Microscopium, the Microscope

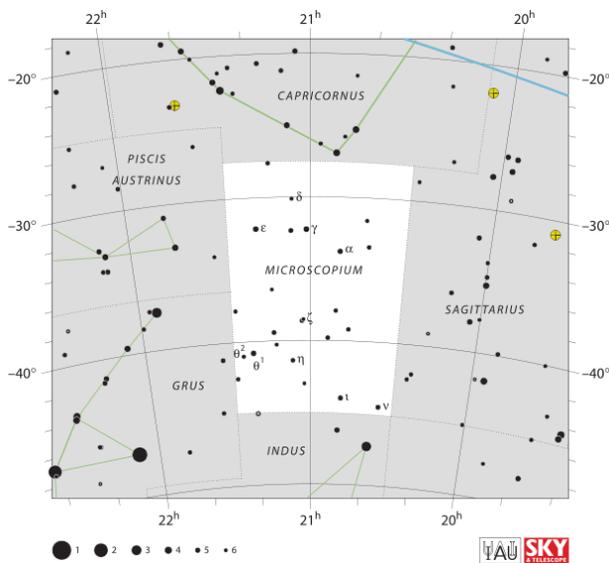
By Dale Hooper

You certainly need to make no apologies if you have never observed Microscopium. It is a smaller constellation that was created by Nicolas Louis de Lacaille during the age of enlightenment in the 1750s. It was meant to fill a void in the constellations introduced by Bayer in 1603. It is not labeled on the monthly skymap, but it can be found just south of Capricornus. It is basically where the three unlabeled stars are shown on the skymap.

Sir Patrick Moore said that there wasn't anything of interest for amateur astronomers in this constellation. However, this constellation does have a few decent double stars and a few reasonable galaxies. Even though it has no "stand out" objects, it is still worth checking out. Of course, these objects will be rather challenging at our latitude. There is a minor meteor shower, the Microscopids associated with this constellation, which occurs from June to mid-July.

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

Object	R.A.	Dec.
NGC 6925 (Galaxy, mag 11.3)	20h34.3m	-13°59'
IC 5039 (Galaxy, mag 12.6)	20h43.2m	-29°51'
IC 5041 (Galaxy, mag 12.5)	20h43.6m	-29°42'
NGC 6958 (Galaxy, mag 11.3)	20h48.6m	-38°00'
α Microscopii (Double star)	20h50.0m	-33°47'
Δ 236 (Double star)	21h02.2m	-43°00'
IC 5105 (Galaxy, mag 11.4)	21h24.4m	-40°37'
θ -2 Microscopii (Double star)	21h24.4m	-41°00'



IAU and Sky & Tel - Roger Sinnott & Rick Fienberg



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

Binocular Supports

The club still 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 Minutes – September 2018

The Cache Valley Astronomical Society Annual General Meeting was held September 26th. President Dell Vance welcomed everyone. He shared several announcements. On September 27th there will be a star party for the Preston Junior High. On October 11th the club has been asked to support two star parties. The first is a star party for the Special Needs mutual and the start time will be 6:30pm. The second star party on Oct 11th is for the Brigham City USU Extension at 989 South Hwy 89. Lyle Johnson's Dad will speak to them before the star party. The club has also been asked to support a star party on October 15th at North Park Elementary in North Logan and a star party on October 26th at River Heights Elementary. The star party on October 26th is also to include a presentation.

The topic then turned to annual elections. Dell Vance was nominated for President. Bruce Horrocks was nominated for Vice President. Wendell Waters was

nominated for Secretary and Brad Kropp was nominated for Treasurer. There were no other nominations and the above were elected by acclamation.

We then watched the video, "The Daring Adventure of Apollo 8 in 1968" (which brought back many memories to a number of us).

Dell Vance reminded everyone that it is time to pay our annual dues (\$20/year).

Door prizes were then handed out to several lucky winners.

Upcoming Star Parties

- 11 Oct Cache Valley South, Adult Special Needs Mutual Star Party – held in Logan
- 11 Oct Brigham City USU Extension Event with Dr. Johnson speaking and a star party
- 15 Oct North Park Elementary School star party in North Logan
- 26 Oct River Heights Elementary School presentation and star party

Upcoming Events

- Oct 01 – NASA 60th Birthday
- Oct 02 – Last Quarter Moon
- Oct 03 – Parker Solar Probe Venus flyby
- Oct 03 - Asteroid 13681 Monty Python Closest Approach To Earth (2.032 AU)
- Oct 04-10 - World Space Week
- Oct 05 - Neil deGrasse Tyson's 60th Birthday (1958)
- Oct 08 - Ejnar Hertzsprung's 145th Birthday (1873)
- Oct 09 – New Moon
- Oct 09 - Draconids Meteor Shower Peak
- Oct 10 - John Grunsfeld's 60th Birthday (1958)
- Oct 11 - 50th Anniversary (1968), Apollo 7 Launch (1st Manned Apollo Mission)
- Oct 12 - Asteroid 9007 James Bond Closest Approach to Earth (1.099 AU)
- Oct 14 - Mercury Passes 6.8 Degrees from Venus
- Oct 16 – First Quarter Moon
- Oct 16 - Mars Winter Solstice
- Oct 18 – Moon near Mars
- Oct 20 - International Observe the Moon Night
- Oct 21 - Orionids Meteor Shower Peak
- Oct 21 - Alfred Nobel's 185th Birthday (1833)
- Oct 23 - Uranus at Opposition
- Oct 24 – Full Moon
- Oct 26 – Moon near Pleiades
- Oct 29 - 80th Anniversary (1938), Orson Welles' Broadcast of the "War of the Worlds"
- Oct 29 - 20th Anniversary (1998), STS-9 (Space Shuttle Discovery (John Glenn's Last Flight)
- Oct 31 – Last 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:

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 Wendell Waters at wendellw57@comcast.net