CACHE VALLEY ASTRONOMICAL SOCIETY
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CACHE VALLEY CLEAR SKIES

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PRESIDENT'S CORNER

by Dell Vance

Ann-Maree Vance

School is in, the nights are getting longer, and fall is not far away. It must be September. We have our annual club elections on September 8 at the USU Engineering Lab. I'd also like to encourage you to start thinking about serving in one of the leadership positions. September is the month that we select our leaders for the next year. We appreciate all the efforts that each of you are doing to support CVAS.

In August, we had three star parties. One was for the Girl Scouts at their summer camp. It was a good night for observing and the girls were very considerate. One star party was for the Newton Library. The first date was rescheduled due to weather. The second date was better, although we had some clouds come through the middle of the event. However, once they were gone, it was a beautiful night. I want to thank all those that came out to support our events. The last star party was for the Bear Lake State Park. They are

cont'd on p. 2

Dreamstime

MEETINGS, STAR PARTIES, AND STEM FAIRS, OH MY!

Upcoming Events

- September 8: Club meeting at USU's
- Engineering Lab building, room 107. (Reach out to a member of the ExecComm if you need a map or directions.) We will be electing our officers for the next year. Also, our speaker will be club member Alannah Darrington. She will be telling us "stories of the cosmos"—Greek myths about how the constellations came to be!
- September 21: STEM Fair at Birch Creek
- Elementary (Smithfield).
- September 22: Star party at Virgil Gibbons Heritage Park (Nibley).
- September 25: STEM Fair at Mountainside Elementary (Mendon).
- September 29: Star party River Heights
- Elementary.

Check your email for more info about upcoming events!

Keep up to date by visiting our website:

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

working on getting the Dark Sky Status. Tom and Bruce have been great in supporting their efforts.

September is shaping up to be a good month for activities as well. We have a couple of star parties at the end of the month: one on September 22 for the Nibley area at Virgil Gibbons Heritage Park, and another on September 29 for the River Heights Elementary School. We also have a couple of STEM Fairs planned this month: one at Birch Creek Elementary School in Smithfield on September 21, and another at Mountainside Elementary School on September 25. Be sure to check the CVAS website or the calendar on the Night Sky Network site for more information on these events.

Thanks again for all your support.

Clear Skies,
Dell Vance

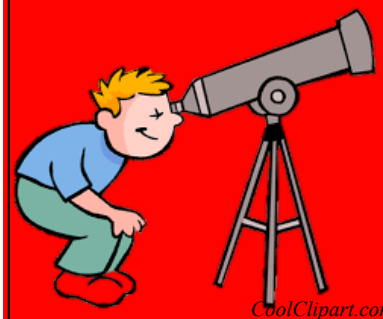
ATTENTION LIBRARY TELESCOPE COORDINATORS!

iStock and Creazilla

Star party season is here!

Please contact your library and ask if they would like CVAS to host a summer star party for them.

Your community will thank you!



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.

CACHE VALLEY
ASTRONOMICAL
SOCIETY

Our Website: CVAS-UTAHSKIES.ORG

EXECUTIVE COMMITTEE

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

SOME RECENT OBSERVATIONS IN JULY 2023

by Blaine Dickey

Figure 1

Mars made a nice naked-eye double star with Regulus on July 11, with Venus joining the pair in the western sky (figure 1).

Comet C/2023 E1 (Atlas) was around magnitude 8.5 as it passed through the constellation Draco on the evening of July 13. At that time, it was 52 million miles from Earth. The greenish color of the coma contrasts nicely with reddish star it was passing at the time I took this image (figure 2).

As the Milky Way climbs higher in the evening sky, deep-sky objects such as Messier 17 become visible both through the eyepiece and camera. This delightful diffuse nebula is also known as the Omega or Swan Nebula. It is located in the constellation Sagittarius and is bright at visual magnitude 6.0 (figure 3).

Messier 12 is a globular cluster in Ophiuchus that was discovered by Charles Messier in 1764. It is about magnitude 6.7 at 16,000 light-years distant (figure 4).

The planet Venus grew larger in apparent size in July, becoming a crescent as it moved between the Earth and sun in its orbit. The image shows is how it appeared on the evening of July 14 (figure 5).

The sun has been busy sprouting sunspots all month long as it nears solar maximum in mid-2024. This is a great time to view it with a small telescope and an appropriate solar filter (figure 6).

A colorful planetary nebula, NGC 6781 in the constellation Aquila, sports a 15th-magnitude star at its center, surrounded by a red ring.

Figure 2

Figure 3

Figure 4

cont'd on p. 4

Observations, cont'd from p. 3

Figure 5

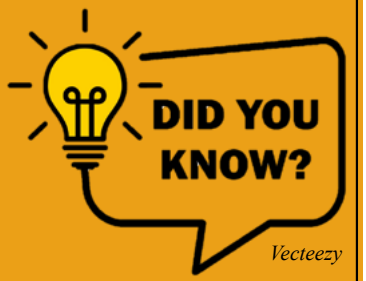
Figure 6

What Is a STEM Fair?

"STEM" stands for Science, Technology, Engineering, and Mathematics. Local elementary schools host evenings at which children can learn about STEM topics informally. This is a great chance for us to share our love of astronomy! We only need two to three people for each event.

Contact any member of the Executive Committee to volunteer. During the winter, we stay indoors, so you won't have to worry about getting cold!

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



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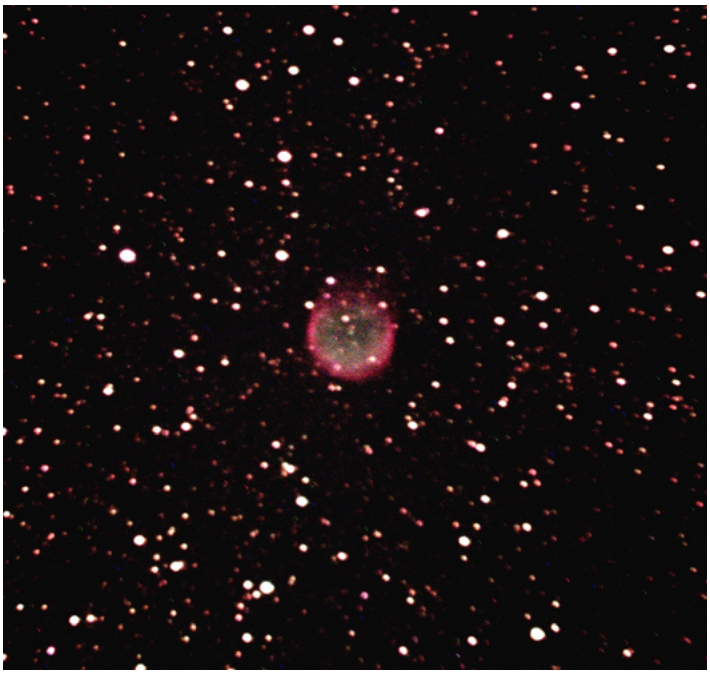

Figure 7

Images courtesy of the author.

ClipartMax

USU Observatory Public Night

September 8, 2023
9:00 – 11:00 p.m.

For details about location, targets, weather, and parking, visit the USU Physics Department website here.

FAINT GALAXY FUZZIES

by Tom Westre

Since April I have been out to my observatory ten times. My interest is in galaxies, especially galaxies that fit into four categories: (1) galaxy pairs, (2) galaxy trios, (3) galaxy clusters, and (4) billion light-year galaxies.

Another category that fits these four is based on the distance from us—the farther the better. I am drawn to photons from as far away as I can detect them with my Celestron 11. It's just amazing to realize the farther away these galaxies are, the farther back in time we are looking. I like to push my equipment to pull in these distant photons. I limit myself with a Canon T7i DSLR and short exposures from 60 to 120 seconds. Even with these self-imposed limitations, I manage to image these distant, fuzzy objects. Over the past year or so, I have imaged well over 100 of these faint fuzzies. Most come from the NGC list. I also use the following publications:

- *Atlas of Peculiar Galaxies*, by Halton Arp,
- *The Abell Catalogue of Rich Clusters*, by George O. Abell,
- *Selected Small Galaxy Groups*,
- *Galaxy Trios and Triple Systems*, and
- *Chasing Billion-Year-Old Light*, by Jimi Lowrey.

I supplement these with several other books that list galaxies, but especially find Jimi Lowrey's work invaluable. Jimi, like myself, wants to push his telescopes to the "visible limits." He, like me, "gets pleasure of seeing distant galaxies

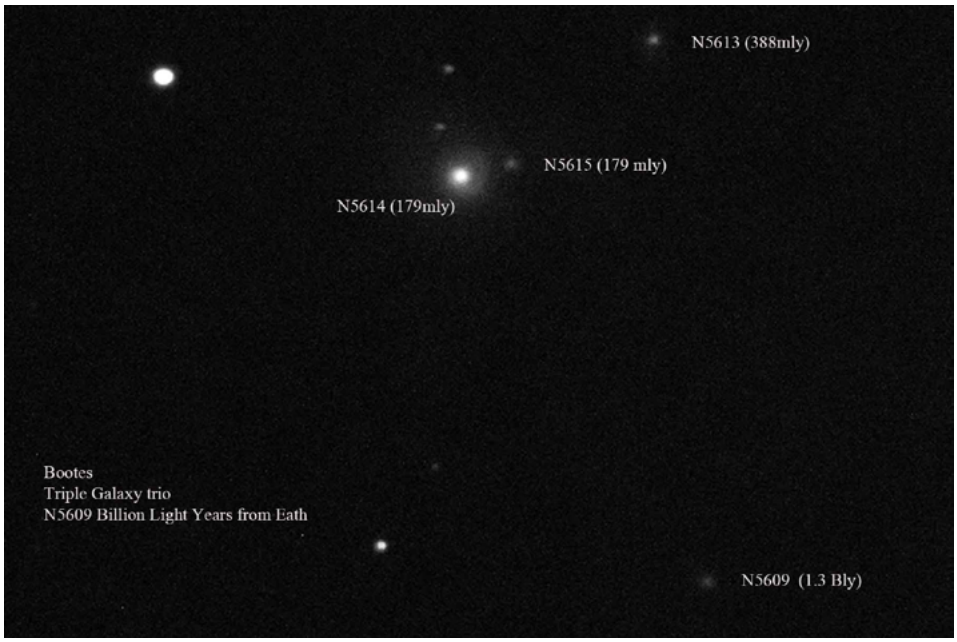

Figure 1

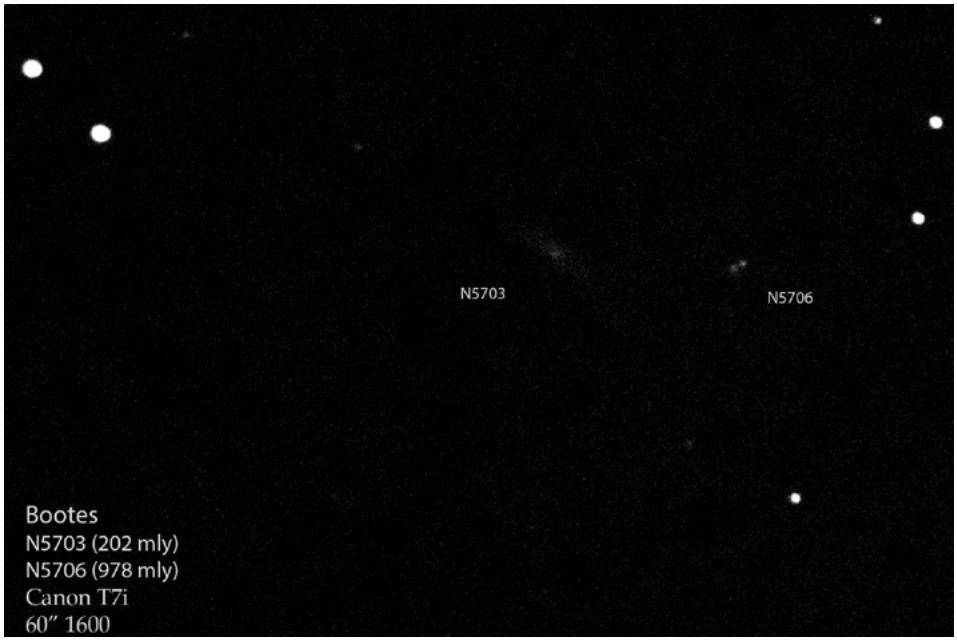

Figure 2

a billion light-years away." I am totally on board with him. But I would take any galaxy that is more than 50 million light-years or more. Preferably 100 million light-years or more.

This article includes several of my favorites. I hope you enjoy.

Figure 1 shows a billion-year-old galaxy, Bootes. It includes NGC 5614 at 179 million light-years (million light-years) and NGC 5615 at 179 million light-years. These two may be merging. NGC 5613 at 388 million light-years, and in the lower right-hand corner, NGC 5609 at 1.3 billion

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Fuzzies, cont'd from p. 5

light-years and magnitude 15.7.

Two faint galaxies can be seen in this 60-second image (figure 2). NGC 5703 is 202 light-years away, while the fainter galaxy to the right, NGC 5706, is 978 light-years. One of the websites that I used to get their distances was https://kosmoved.ru. This website lists many galaxies from several catalogs. Distances are measured in megaparsecs. NGC 5706 is 299.9 megaparsecs. Using the website UnitConverters.net, you can convert megaparsecs to light-years.

This image (figure 3) shows five galaxies in Leo. NGC 3801 is 168 million light-years; NGC 3802 is 152 million light-years; NGC 3803 is 163 million light-years; while NGC 3790 is 153 million light-years.

This galaxy cluster is known as Abell 1367 and is in Leo (figure 4). I was able to identify nine galaxies, though there may be more. They range from 260 million light-years to 339 million light-years.

These two galaxies can be found in Virgo (figure 5). They are known as Arp 271. These galaxies are interacting spiral galaxies. Both are 130 million light-years away. The Arp designation refers to the Atlas of Peculiar Galaxies by Halton Arp in 1966. They span about 130,000 light-years across.

This image (figure 6) shows the challenge of getting any detail. Three distant galaxies in Virgo are shown here. NGC 5208 is 313 million light-years; NGC 5209 is 322 million light-years; NGC 5212 is 378 million light-years; NGC 5210 is 316 million light-years.

I think the faint smudge to the lower left of NGC 5208 is a galaxy but I have not been able identify it.

My final image (figure 7) is of Arp 240 in Virgo, consisting of NGC 5258 and NGC 5257, two interacting spiral galaxies. Both are distorted by gravitational interaction, and both are connected by a tidal bridge, not seen in my image. I was able to get a two-minute

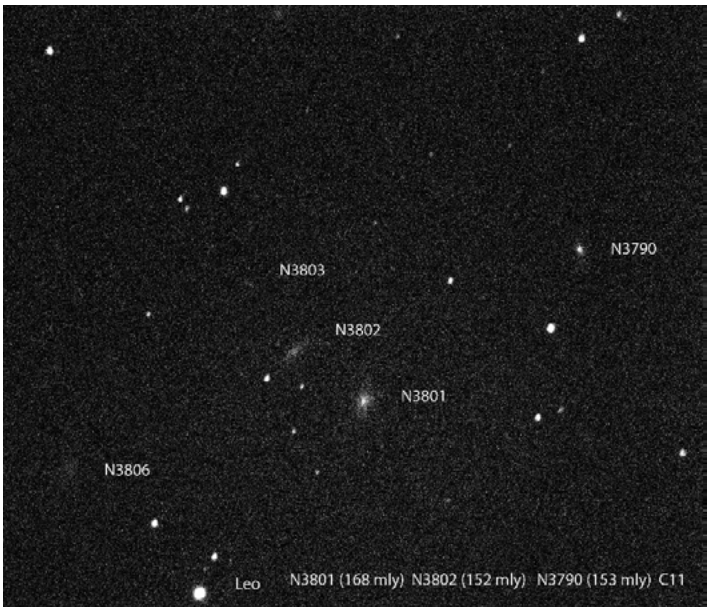


Figure 3

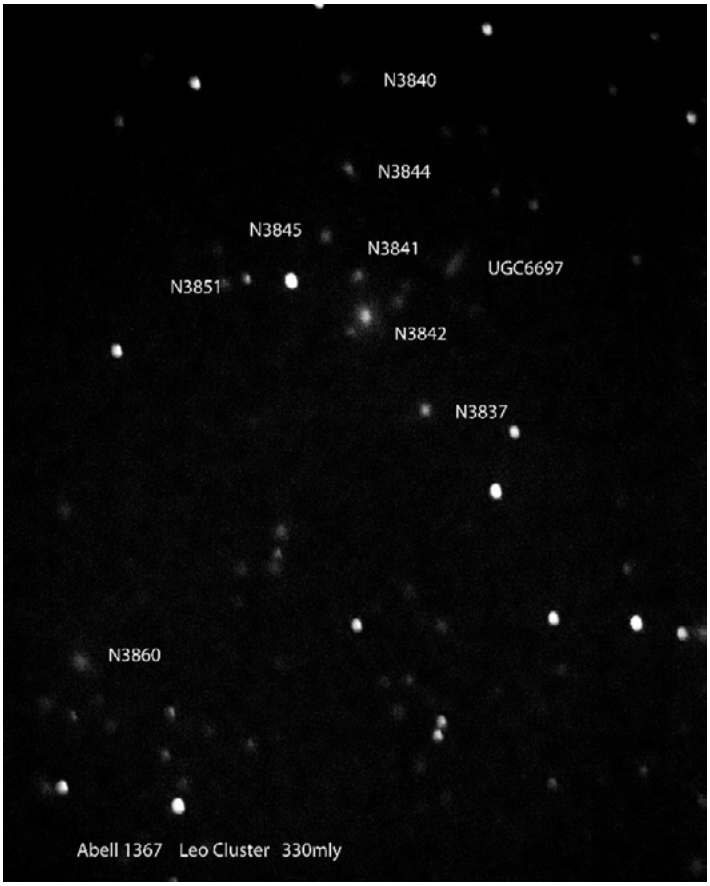


Figure 4

Figure 5

image of this pair. They are 319 million light-years from us.

This sampling gives you some idea of the many thousands of distant galaxies that lie within the range of our telescopes.

While looking at these images, it is interesting to speculate how many inhabitable Earths may orbit sunlike stars in these distant galaxies. It makes me want to hunt down more and more of them. There is not a lot of detail but the idea that our instruments can, in a matter of a minute or two, gather enough photons to create an image is a journey into our marvelous universe in our own backyard.

Images courtesy of the author.

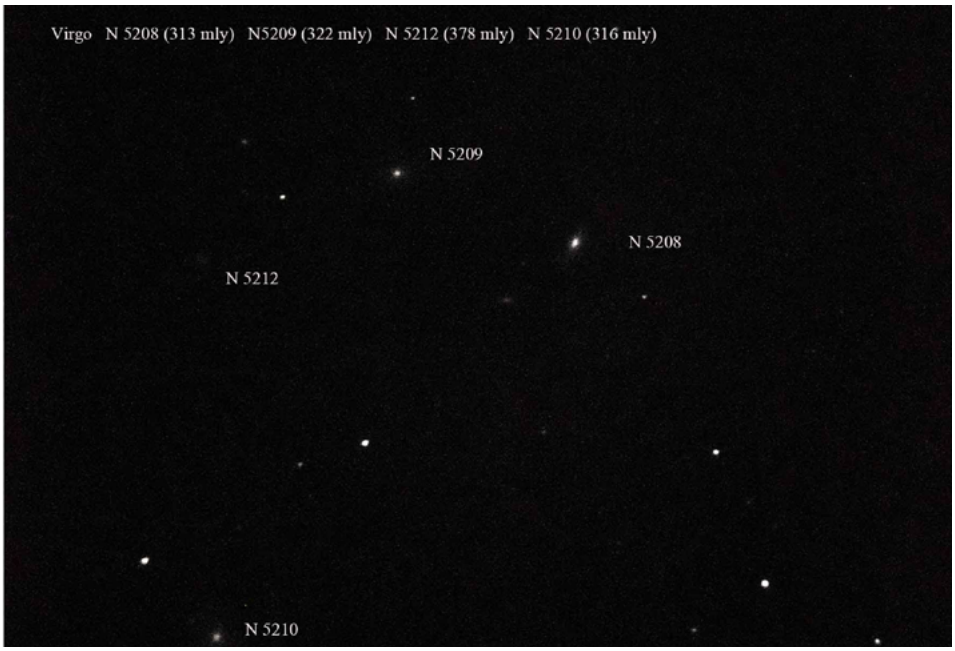


Figure 6

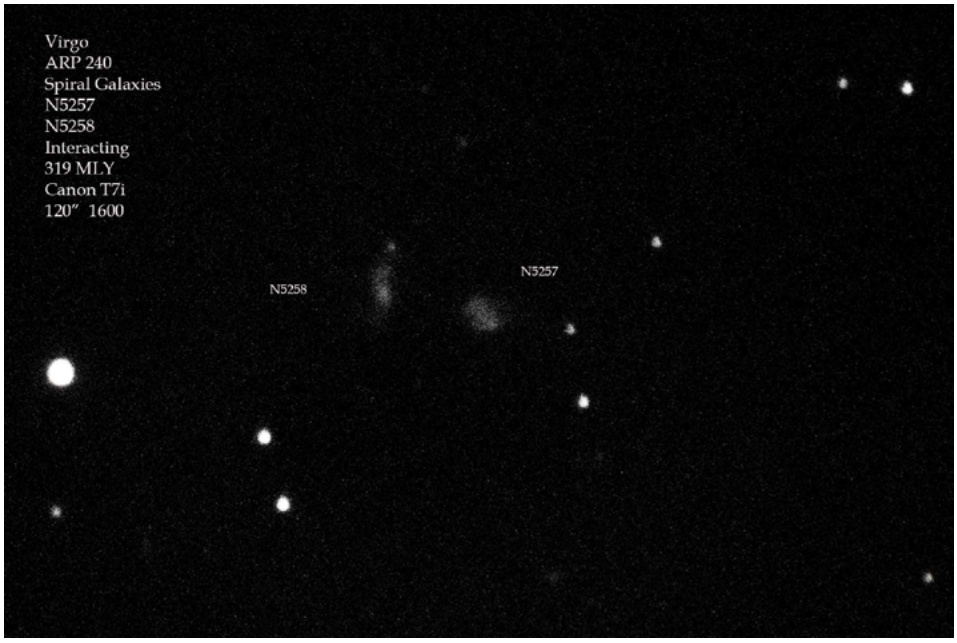


Figure 7

You can download free copies of some of the guides mentioned at Faint-Fuzzies.com.

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.

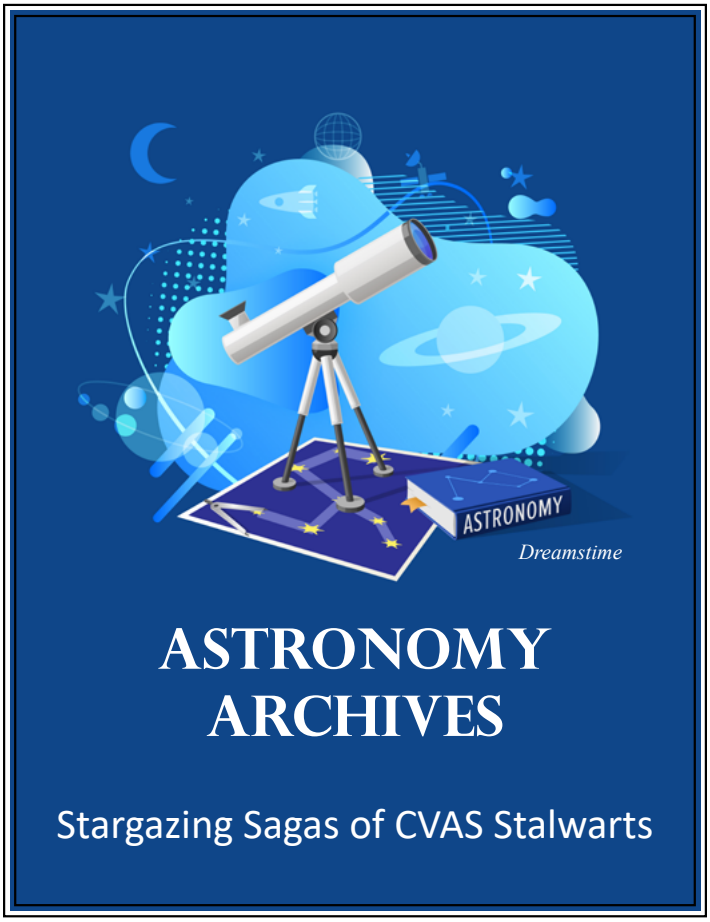
HISTORY OF THE CALVIN M. HOOPER MEMORIAL OBSERVATORY

by Dale Hooper

Bonnie often asks us for our astronomy origin stories. This isn't quite that for me, but 2023 marks the 20th anniversary of the dedication of my observatory. So, I thought that the history of my observatory—the Calvin M. Hooper Memorial Observatory—might make a reasonable substitute.

I purchased a ten-inch Meade LX-200 telescope in 1997, and soon after purchased a Milburn equatorial wedge (from Ken Milburn in Seattle) and an SBIG ST-7 CCD camera (which I later had SBIG upgrade to an ST-8XME).

After completing my radio telescope and then using the above setup for a couple years, like many amateur astronomers, I wanted to have my own backyard observatory so that I wouldn't have to take everything apart and set it all up again every time I wanted to use the telescope. Figure 1 shows my pre-observatory setup (and my lovely wife, Alice) around May 2001. I affectionately refer to this as Observatory Version 0.1. I'm now embarrassed to admit that I started work on the observatory before I had planted grass in my backyard (priorities!). I spent several months looking around the internet at various designs of observatories that other people had built and settled on a split-roof design.



Construction: July 2001–March 2003

My observatory measures 10 x 16 feet, and it is powered by electricity. So, Hyde Park required that I get a building permit for the observatory (figure 2). This also meant that I got visits from the building inspector. The inspections were a pain, but in hindsight they were also helpful. I had originally intended to have a neighbor who was a licensed contractor complete the concrete work for me. But he was also a budding commercial pilot and didn't have a lot of free time. So, after a couple months, I asked my father-in-law if he would be willing to help me. He had worked on concrete projects while he was working his way through school. Fortunately, he agreed to help me—otherwise, the project wouldn't have gotten off the ground.

I wanted to avoid ice-heaving issues, so rather than use a slab, I had to dig a foundation below the frost line. In figure 3, you can see the forms and rebar for the footings and deadman. The deadman is a cubic yard of concrete that sits below the pier. It weighs several thousand pounds, so a lot of reinforcement was needed to prevent a blowout. The form for the deadman was also staked to the ground.

Finally, in mid-July 2001, we were able to complete the first concrete pour for the footings and deadman, as shown in figure 4. The rebar that sticks out of the deadman is used to give the pier additional strength. Also, additional rebar was pushed down into the deadman. After we had the forms set for the foundation and inserted the rebar the inspector had requested, he came by and said that he wanted even more rebar in the corners! This meant we had to pull the forms off of each of the corners and add more rebar. This was excruciating work and I thought it was going to be the death of my father-

Figure 1: Observatory, version 0.1 (May 2001).

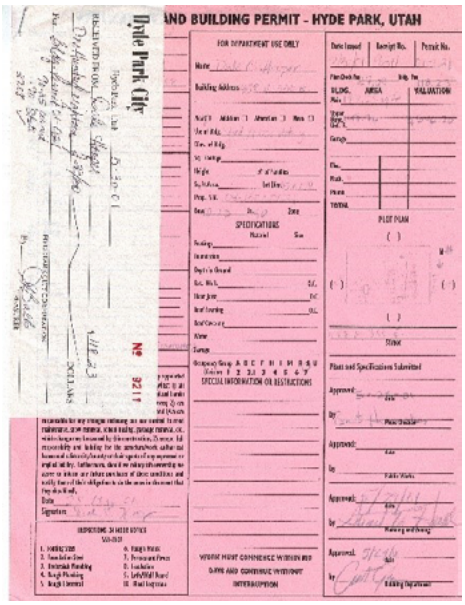


Figure 2: Building permit (May 2001).

Figure 3: Deadman and footings (July 2001).

Vecteezy

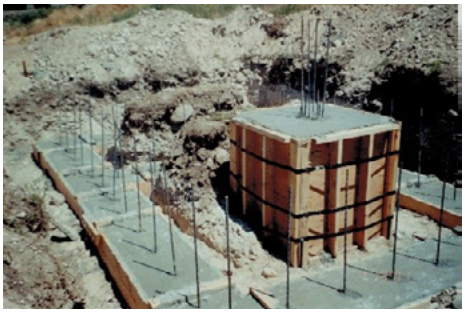


Figure 4: Footings, deadman, and rebar for pier (July 2001).

Figure 5: Foundation, control room floor, and pier (August 2001).

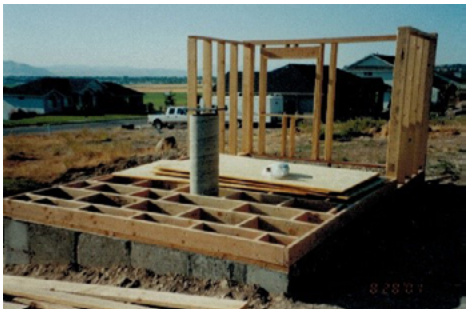


Figure 6: Framing control room and telescope room floor joists (August 2001).

Figure 7: Framing control room and roof trusses (September 2001).

Figure 8: Framing telescope room (September 2001).

Figure 9: Sheathing and drop-down south wall (September 2001).

cont'd on p. 10

Observatory, cont'd from p. 9

in-law. Later, the building inspector admitted that he was having us build this more like a house than as an unoccupied shed.

After setting the foundation forms and making the changes, we completed the second pour in early August 2001. On August 10, we had completed the third and final pour of the pier and control room floor, as seen in figure 5. Anchor bolts extend out of the foundation to secure the mudsill to the foundation. There are three protruding bars of rebar on the left side of the control room (in the foreground). This is to anchor a concrete step up to the telescope room. The deadman and pier are isolated from all the other concrete so that no vibrations can be transferred into the pier.

In August 2001, I could finally begin framing the control room and creating the telescope room floor joists as seen in figure 6. There is a foam liner between the concrete and the mudsill. The mudsill is redwood (for moisture resistance) and is located under the floor joists.

September 2001 was spent framing the control room, telescope room, and control room roof trusses. I was working on the control room roof trusses when 9/11 occurred. I remember being outside, and it was such an eerie silence because there was absolutely no air traffic for several days (figures 7 and 8).

I intentionally made the telescope room walls short (5 feet, 10 inches) to get a good horizon line. But the walls are also tall enough (for me) that that the light from a corner street lantern is blocked. However, taller visitors still get bothered by the light from the street lantern! I made the south wall so that it could fold over so that I could get right to the horizon line if needed. Admittedly I've never really used that capability (figure 9).

In September 2001, I was also able to get the tar paper in place on the control room roof so that at least something was secured against the weather. I'm not sure if this is the standard thing to use with metal roofing any more (figure 10). I had to build a scaffolding because the west side of the observatory is on a hill. I also used hinges on the south roof peak so that it can fold down when the roof is retracted. I use this feature all the time. Figure 11 shows the east section of the roof in place and the lam beams for the west side are C-clamped onto the east side.

When I first submitted my plans to Hyde Park City, I *really* didn't know what I was doing for the retractable roof. I didn't want the roof to roll off to the south because that would block part of my view. I wasn't smart enough to come up with a design (that I could build) that would allow it to roll off to the north over the control room. I originally thought I would have a foldaway roof that used hinges. This would have ultimately been extremely unwieldy. A neighbor of mine, Kim Seeholzer, did some analysis for me and he said the only way I could support a ten-foot contiguous span with the expected snow load would be to use something such as two lam beams together for each side of the roof. Ultimately, that is what I ended up doing, and it has worked extremely well!

The nearly horizontal roll-off roof supports are redwood for additional strength. A garage door track from Cantwell Brothers is secured above the roll-off roof beams to allow the roof to use gravity to open (figure 12).

When I first saw how big the gap was under each roof section, I was really discouraged and thought about changing the design and redoing it (figure 13). Fortunately, my wife talked me out of doing that. Figure 14 gives another view of the east roll-off roof section. Each side has two lam beams secured together to support the long (ten-foot) roof span. The two east lam beams are C-clamped to the west lam beams in the figure. The garage door rollers can also be seen in the background. Figure 15 shows the detail for the west roof section. An eyebolt is used to hold a cable attached to an electric winch, which makes it possible to open and close each roof section. The end plate of each roof section is a single lam beam.

I barely got the west section of the roll-off roof built and tar-papered in time for the first snowfall on November 23, 2001 (figure 16). It's good that in December 2001 I was able to work on the interior electrical and exterior door (figures 17, 18, and 19), because that month, there was one night where we got 24 inches of snow (figure 20).

In hindsight, the bathroom light bar in figure 19 was probably a mistake. It causes too much glare, so now I only use two bulbs. The center mushroom light in figure 19 is on a separate switch and is used with a red bulb to help maintain night vision. However, during most imaging sessions, I leave all the control room lights off because the monitors provide more than enough light.

Figure 10: Control room roof tar paper (September 2001).

Figure 11: East roof in place and west lam beams clamped (November 2001).

Figure 12: North side garage door track detail (November 2001).

Figure 13: Tar-papering east roof section (November 2001).

Figure 14: Roof detail with two lam beams per side (November 2001).

Figure 15: Roof detail for west side (November 2001).

Figure 16: West section tar-papered just in time for the first snow. Junior assistant, my then–six-year-old son (November 2001).

Figure 17: Worked on indoor electrical during winter (December 2001).

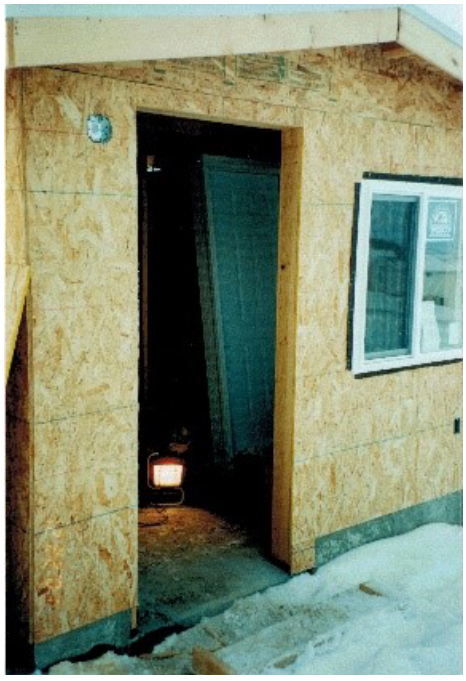


Figure 18: Exterior door (December 2001).

Figure 19: Control room lights (January 2002).

Figure 20: 24 inches of snow in one night! (December 2001).

cont'd on p. 12

Observatory, cont'd from p. 11

During that winter, I also completed an equipment case and work shelf in the telescope room (figure 21). I use the equipment case and work shelf a lot! Unfortunately, the work shelf also tends to attract my clutter.

During the winter of 2001–2002, I had a custom door made by Anderson Lumber, which goes between the control room and telescope room. It's only 5 feet, 4 inches, tall because of the lower height of the telescope room. It is essentially an exterior door. I hit my head on the top of the door casing several times while building the observatory, and I try to always warn taller people to watch out when they exit the telescope room. I rented a blow-in insulation machine in March 2002 and used that to insulate the ceiling and walls of the control room. This insulation works very well but was a real pain to install. It's essential to use eye protection and respirators when installing it (figure 22).

Finally, on April 20, 2002, I achieved first light with my (then) six-year-old junior assistant astronomer, Ammon, my son. The first thing we looked at was the moon. Back then, I had no idea that April 20 was associated with the marijuana culture, or I would have chosen a different date (figure 23).

A white roof would have been best for reducing heat retention but would have clashed too much with the color of my house, so I chose a charcoal-colored metal roofing, which I purchased from Burton Lumber in May 2002. The metal roofing does dissipate the heat a lot faster than shingles and it weighs a lot less. I built a small "cap" (attached to the east side) that goes over the top of the peak of the roof to prevent moisture from coming through where the two sides of the roof meet (figure 24).

In June 2002, I was able to complete the sheetrock in the control room, created the trenches for power and network cables, and completed the wiring into the breaker panel. My friend, Mark Migliori, helped me *a lot* with organizing the breaker panel (figures 25, 26, and 27). From July through early September 2002, I was able to complete the vinyl siding, added crossbeams to the roll-off roof supports, and completed final work in the control room. For some reason, I initially didn't think I would need crossbeams with the roll-off roof supports, but I quickly saw that every time I would open the roof, I would get a lot of vibration. As soon as I added the crossbeams, everything stiffened up just fine (figures 28, 29, and 30)!

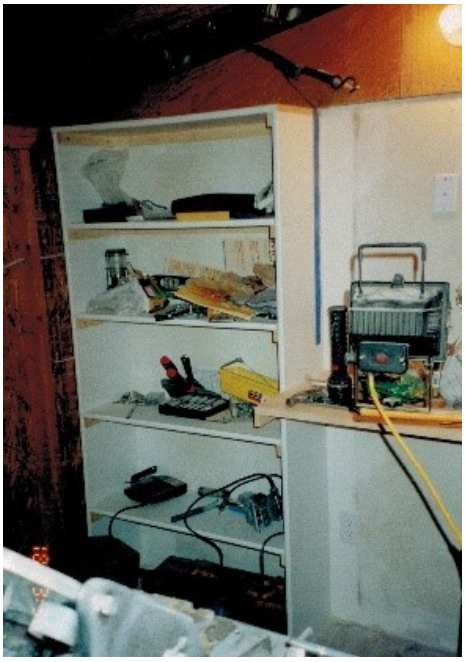


Figure 21: Telescope room equipment shelf and work shelf.

Figure 22: Blown-in control room insulation, interior door, and breaker box (March 2001).

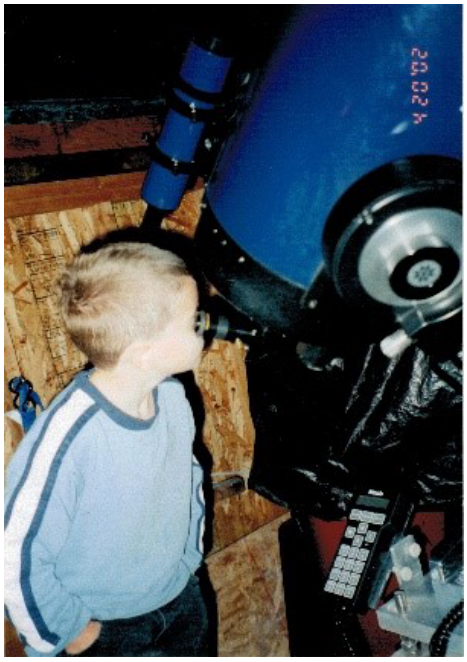


Figure 23: My son, Ammon, observes first light: April 20, 2002. My old Coulter 13-inch Dob (red) is in the background (April 20, 2002).

Figure 24: Charcoal-gray metal roofing with a small "cap" over the center of the roll-off sections (May 2002).

Figure 25: Control room sheetrock completed and prepped for painting (June 2002).

Figure 26: Trenches for power and network (June 2002).

Figure 27: Completed breaker panel (June 2002).

Figure 28: Started vinyl siding and added crossbeams (July 2002).

Figure 29: Completed vinyl siding (August 2002).

Figure 30: Completed and stained control room desk (August 2002).

Figure 31: Flap open (October 2002).

Figure 32: Flap closed (October 2002).

Figure 33 (far left): Closed "gap" panel (and winch) from outside (October 2002).

Figure 34 (middle left): In Loving Memory, The Calvin M. Hooper Memorial Observatory, Dedicated March 14, 2003, Ad Astra.

cont'd on p. 14

Observatory, cont'd from p. 13

During October 2002, I essentially finished the rest of the observatory work. I installed the conduit for the electrical, network, phone, and radio telescope, along with a horizontal copper grounding bar. I poured the Sakrete concrete mix for the front porch and step up to the telescope room, and finally came up with a tolerable solution for the gap between the telescope room walls and the roll-off roof (figures 31, 32, and 33).

Before I even started construction of my observatory, I had decided to name it after my late father, who passed away in May 1995. He was a machinist by trade, and a real gadget guy, who instilled in me a curiosity for observing things, building things, and trying to understand how things worked. I decided to wait until his birthday to dedicate the observatory. There was no better day to dedicate an observatory, because his birthday is March 14—a day he shares with Albert Einstein, and also International Pi Day! We had a small ceremony and I installed a special plaque to commemorate the occasion (figure 34).

A Few Upgrades

In 2011, I ended up working a lot of (paid) overtime because SDL needed me to work on two major projects at the same time. So, I worked on one during the day and one in the evening. I worked out a deal with my wife that 25% of the overtime money could go toward significant upgrades for the observatory. By the end of the year, she was definitely ready to have me stop with the second project, but it allowed me to purchase a 14-inch Celestron Edge HD and a Losmandy TITAN mount. I was also able to replace all of the CRT monitors with LED monitors (figures 37 and 38). In addition, since the Edge HD has a more limited back focus than a standard Schmidt-Cassegrain, I replaced my Optec TCF-S Focuser with an Optec FastFocus system, which is installed on the corrector lens and focuses by adjusting the secondary mirror (figure 39).

In late 2016, my oldest brother passed away with no beneficiaries other than myself and my siblings. My wife and I agreed to use part of this inheritance for another upgrade to the observatory. I was able to sell the Losmandy TITAN and purchase an AstroPhysics 1600GTO mount. This mount is somewhat taller than the Losmandy TITAN, so it necessitates storing the parked telescope in a horizontal configuration (figure 40). I was also able to purchase a QHY 16200a CCD camera, which is the final generation of CCD cameras and has a 16-megapixel APS-H sized sensor and supports seven two-inch filters. In addition, I purchased a Spike-A Flat Fielder box (edge-lit LED panel) for taking flats with the Edge HD (figure 41). Lastly, after hearing about it from Dell, I decided to switch from Maxim DL for astrophotography; I've fully switched to using NINA, and I'm loving it (figure 42)!

In figure 42, there is an upper left monitor (turned off) used for analog video; the upper right monitor is for environmental (i.e., weather) info. The lower left monitor is used for the Cartes du Ciel planetarium program. The lower middle monitor is used for all of the NINA displays. The lower right monitor is for the AstroPhysics mount tracking displays (overlapped), and to the right is the display for the all-sky camera that I built. (See the June 2022 edition of *Cache Valley Clear Skies*, pp. 10–17 for details on the all-sky camera.)

Figure 35: Control room (circa 2003).

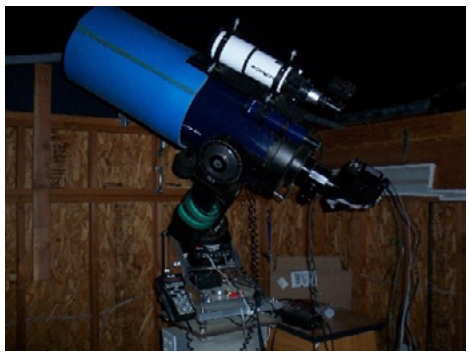


Figure 36: Typical telescope configuration (circa 2003).

Figure 37: Celestron EdgeHD 14 mounted on a Losmandy TITAN (circa 2012 to 2017).

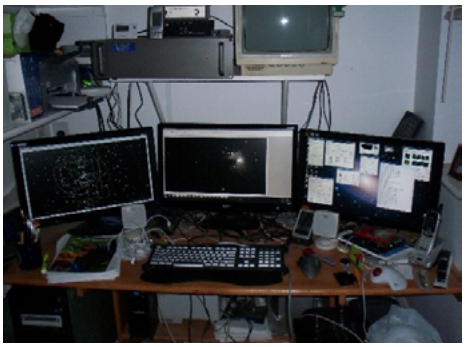


Figure 38: Control room configuration (circa 2012).

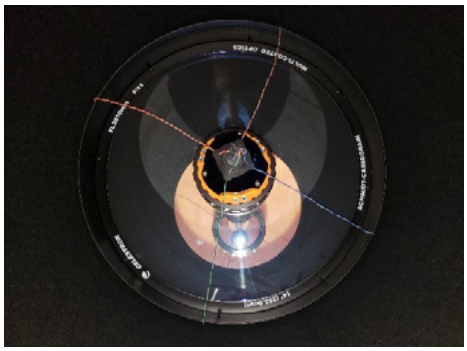


Figure 39: Optec FastFocus system attached to the EdgeHD corrector lens.

Figure 40: Celestron EdgeHD, AstroPhysics 1600 GTO mount, Pegasus Falcon Rotator, and QHY 16200a camera.

Figure 41: Taking flats using the Spike-a Flat Fielder and NINA Flats Wizard.

Figure 42: Control room in operation.

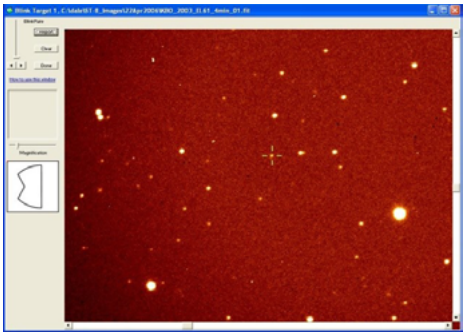


Figure 43: Asteroid astrometry.

Projects

Over the years, I have pursued a number of different projects with my observatory. I've always had an interest in observing asteroids. Early on, I hoped to discover some but, since about 2006, the large survey telescopes have scooped up nearly all of the asteroid discoveries. However, in 2006 I did receive observatory code G87 from the Minor Planet Center for my observatory for asteroid astrometry (figure 43). I plan to continue to do more asteroid astrometry (position) as well as photometry (brightness).

I've spent some time doing simple spectroscopy projects using a grating filter (figure 44). However, I have a real interest in getting into more elaborate spectroscopic projects. I've purchased an Alpy 600 spectrograph, which I hope to be using more in the future.

I also have a real interest in observing asteroid occultations (figure 45). Some of my pursuit of these has been dormant for a while but I plan to observe a lot more of these now that I am retired—because it is really fun to see stars wink out and then come back! Plus, the information is really helpful in determining the size and shape of asteroids and if they have any moonlets.

I've been involved in radio astronomy off and on since 1998. I have some upgrades to my radio telescope planned for 2024, which will hopefully help me make some additional strides in this great facet of the hobby (figure 46). I have a Linux computer in the observatory that I use for radio astronomy. I'm able to use a KVM switch so that it can share one of the monitors.

During my pursuit of amateur astronomy, I admittedly haven't spent a lot of time creating "pretty pictures." But now that I am retired, one of the areas that I plan to spend a lot of time on is using my QHY 16200a camera with PixInsight on general astrophotography and narrowband imaging. Bruce, Dell, Dean, Blaine, and several others have really inspired me toward this.

cont'd on p. 16

Observatory, cont'd from p. 15

There are, of course, several other projects I'm very interested in, such as Sol'Ex and eclipses, but they aren't specifically tied to the observatory.

Conclusion

Building an observatory truly was the fulfillment of a dream. Amateur astronomy has always been a real passion for me, and my observatory has really helped me along the way toward achieving my goals. Are there things that I would change if I were to do it over? Certainly! But I'm still very pleased with how it turned out, and my observatory has served me very well and hopefully will continue to do so for a long time.

Every member of the club should feel welcome to join me observing from my observatory. However, I admit that—because of creeping light pollution and a huge willow tree in my neighbor's backyard—for visual astronomy, I now prefer to go on the road with my Orion 14-inch GoTo Dobsonian. But for astrophotography and related projects, I will always love observing from my observatory!

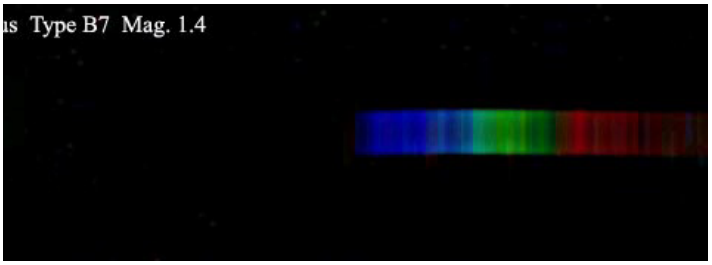


Figure 44: Spectroscopy.

Images courtesy of the author.

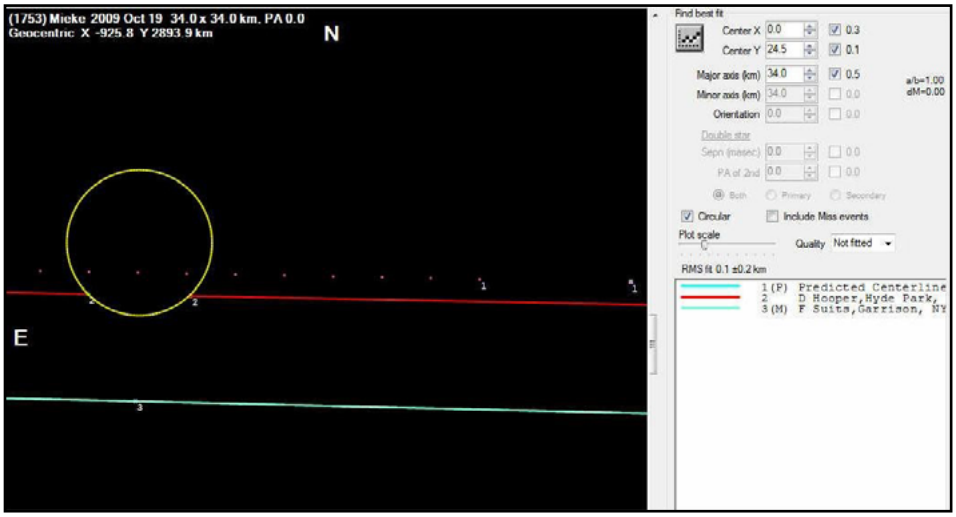


Figure 45 (left): Observing asteroid occultations.

Figure 46: Radio astronomy.

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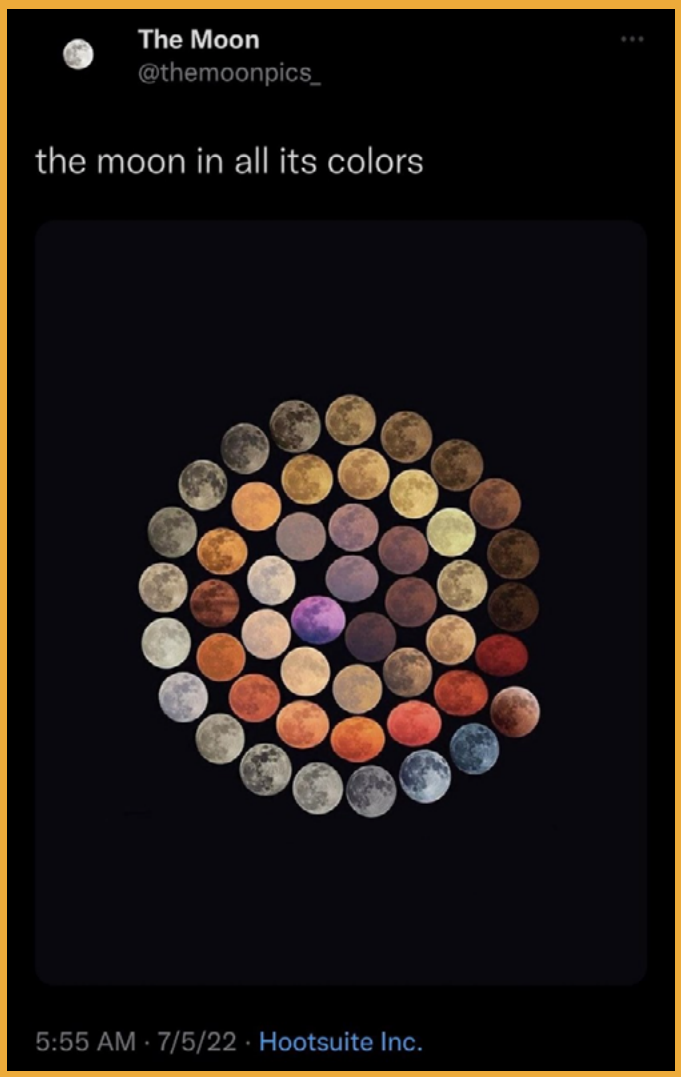

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How did you learn about CVAS?

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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.

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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.