

# Morning Star

## Spring 2024

Newsletter of the Vermont Astronomical Society



### \*\*\* Club Info \*\*\*

#### Announcements

Check out our Member [Forum](#) on our website ([vtastro.org](http://vtastro.org)), under Discussions.

Several [past meeting presentations and newsletter articles](#) on imaging, observing and equipment are posted on our website, check them out.

[Past newsletters](#) are posted on our website under What We Do.

**Associate Members interested in becoming full members** make your interest known to one of the board members. To become a Full Member one has to actively participate in club functions and events and be active in some other aspects of astronomy (more details are in our by-laws).

#### Moving or Changing Email?

Please send changes to Paul Walker, 53 Valley View, Middlebury, VT 05753, [paulwaav@together.net](mailto:paulwaav@together.net) ([info@vtastro.org](mailto:info@vtastro.org) will also work)

#### Hinesburg Observing Site

We have an observing site in Hinesburg, VT. (Located on town property). A locked gate (required by the town) limits access to the site.

Associate Members can request access to the gate lock. They have to be a member for 3 months. This provides access to the Warming Hut, 115v AC power, the port-a-potty and the Teaching Dome.

Full Members can request access to the gate lock, Green Mountain Observatory (18" Obsession) and the

Chmela Observatory (5" folded optics planetary scope) locks.

Board approval is required for Associates. Some training is required in all cases. There is a training checklist and an access agreement that need to be filled out.

Contact the Secretary, Paul Walker or Jack St. Louis for more information at [info@vtastro.org](mailto:info@vtastro.org)

#### Observing List for HOS

We have an email list for members interested in getting a heads-up when someone will be at the Hinesburg Observing Site (HOS).

If interested in getting on the list contact [info@vtastro.org](mailto:info@vtastro.org)

#### Observing Certificates

Several certificates (beginner to advanced) are available to members as encouragement to get out under the stars and hone their observing skills. Follow the link on our web site.

#### Outreach

#### Acknowledgment Letter

To help record our broad community involvement with public star gazing events, projects and classes, we have developed an Outreach Acknowledgment Letter with a Sample Form. It is posted on the website and can be found under **Members, VAS Club Materials for Members, Outreach Acknowledgement Letter.**

**Direct Link:** [http://vtastro.org/wp-content/uploads/2018/03/VAS\\_Outreach\\_Ack\\_Letter\\_V3.pdf](http://vtastro.org/wp-content/uploads/2018/03/VAS_Outreach_Ack_Letter_V3.pdf)

#### Dues

Are due the first of each year.

**Associate Members \$15**

**Full Members \$25**

Send dues and any address or email updates to VAS, PO Box 782, Williston, VT 05495. Or bring to any monthly meeting or Contact Paul Walker, 802-388-4220, [paulwaav@together.net](mailto:paulwaav@together.net).

#### Connect On-line

[www.vtastro.org](http://www.vtastro.org)

[Twitter@VTAstroSociety](https://twitter.com/VTAstroSociety)

[Facebook.com/Vermont-Astronomical-Society-113053818706458/](https://www.facebook.com/Vermont-Astronomical-Society-113053818706458/)

Email: [info@vtastro.org](mailto:info@vtastro.org) (Goes to the President and Secretary)

[webmaster@vtastro.org](mailto:webmaster@vtastro.org)

(Goes to Secretary and Webmaster)

#### Board Members

Jack St. Louis	Pres	857-5049
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Terri Zittritsch	Treas	598-7226
Paul Walker	Sec'y	388-4220
Bob Horton		238-7290
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(My apologies if I missed anyone)

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### Jack on the Radio

Listen to Jack's astronomy update on radio station WJOY AM (AM 1230) on Ginny McGehee's 'Breakfast Table' morning show. Airs the first Wednesday of the month at 8:40 AM.

### Gary's Astronomical Events for the Month

can be viewed via WCAX at <https://www.wcax.com/weather/astronomy>

## Stargazing and other Events

All observing events are weather permitting unless otherwise stated.

Bring extra clothes. Even a summer evening can be chilly after standing still for a couple hours in damp air. We have an email list for members interested in getting a heads-up on impromptu events at the Hinesburg Observing Site (HOS).

If interested in being on this list contact [info@vtastro.org](mailto:info@vtastro.org)

Depending on the type, some events are listed on our website ([vtastro.org](http://vtastro.org)) and Google Calendar (<https://calendar.google.com/calendar?cid=Nzc5dnQ1bnZrN2ljcDA2NG9vbXFnczI1M2NAZ3JvdXAuY2FsZW5kYXluZ29vZ2xlLmNvbQ>)

### Member & Invited Guest Star Gazing at HOS & other events

**Note:** If you would like to be a host, greeter/orienteer, would like to volunteer to help people use their telescopes or want some help operating your telescope, contact Paul Walker.

**April 5 or 6- No Moon.** Gate opens 8:00 PM. Sunset 7:20 PM. Full darkness 9:05 PM

**April 8, Solar Eclipse.** Gate opens 12:00 PM

**April 12 or 13- 5 or 6 day old Moon.** Gate opens 7:45 PM. Sunset 7:30 PM. Full darkness 9:20 PM.

**May 3 or 4- No Moon.** Gate opens 9:00 PM. Sunset 8:00. Full darkness 10 PM.

**May 10 or 11- 3 or 4 day old Moon.** Gate opens 8:00 PM. Sunset 8:05. Full darkness 10:05 PM.

**May 17 or 18- Moon between 1<sup>st</sup> quarter and Full.** Gate opens 8:00 PM. Sunset 8:00. Full darkness - N/A.

If you have trained for gate/site access are available as a backup (or primary) host for any of these events please let me know.

Thanks,  
Paul

Contact Paul Walker via:  
[info@vtastro.org](mailto:info@vtastro.org) or  
[paulwaav@together.net](mailto:paulwaav@together.net)

### Public Star Gazing at Schools, Libraries, and other groups.

If you know of a group or institution that would like to schedule a star gazing session have them contact:  
[info@vtastro.org](mailto:info@vtastro.org)

### New Members

VAS welcomes the following members who joined us since the last newsletter:

Jeff Eitreim  
George Schaefer  
William Kight  
Christopher Belanger  
Marijus Brazicka  
Grace Chiodo

### Meetings/Presentations

Meetings can be attended in-person or remotely. We are back to holding meetings in-person at Brownell Library. They can also be attended via Zoom. The Zoom link will be emailed to members with the meeting reminders. Non-members can request the link via [info@vtastro.org](mailto:info@vtastro.org).

Meetings are held the first (non-holiday) Monday of the month, at 7:30 P.M. in the Kolvoord Community Room of the **Brownell Library**, 6 Lincoln St., Essex Jct (2nd building north of Essex 5 corners on the left on Rt. 2A). Extra parking is available in the Bank North parking lot across from the library. For inclement weather call Jack St. Louis (802-658-0184) or Paul Walker (802-388-4220) to confirm.

**April 1**

**Prelude to the April 8, 2024  
Total Solar Eclipse**  
(2 parts) Viewing and Imaging

**Info about the Sun, Eclipses and  
Viewing the Eclipse**  
Presented by Jack St. Louis

This presentation includes descriptions of the Sun including bits about Solar weather and its effects on the Earth and why science is so interested in using the eclipse to study the Sun. Some basic historical knowledge is included.

We talk about the geometry of the Moon's orbit around the Earth and why eclipses are uncommon on any given part of the Earth and that repeating patterns of eclipses occur. The timing and times of the partial and total phases is discussed. A scale model demonstration of the Earth-Moon system is given to help visualize why and how solar eclipses happen.

A major part of the presentation is dedicated to Safe Solar Viewing. We include pinhole camera technics. Proper use of approved and appropriate solar filters is covered in detail and information on ISO certification number to look is provided. We inform the attendees of when it is safe to observe the eclipse without filters.

A video of the August 21, 2017, total eclipse in Tennessee made by Paul

Walker will be shown which includes scenes of the eclipse and scenes of the surrounding area including some of the lesser known effects for which one may want to keep an eye out.

A question and hopefully answer session is at the end.

**Imaging a Solar Eclipse**  
By Paul Walker

This presentation will deal primarily with imaging a solar eclipse using DSLR's (digital single lens reflex) and the similar "mirror less" digital cameras. It will also touch upon capturing images of the ambience whether with DSLR, point & shoot or cell phone cameras.

A total solar eclipse has 3 main stages, it goes from a partial eclipse, to totality and back to a partial eclipse. The partials are pretty sedate events lasting about 1 hour 10 minutes for this event. Totality a bit more hectic being only 3 min 32 sec. long at the center line to less than 1 minute if you're near the edge of the shadow. But there are 2 other stages, while technically part of the partial phases deserve special attention. They are the transition from partial to total and total back to partial. These happen very quickly, about 15 seconds and are the most challenging stages to image. This talk will cover the differences and challenges for each.

**Bio relating to Solar Eclipses:**

Paul grew up on his family's dairy farm in Cabot in the heyday of the

space program. He has been doing photography and astrophotography in one form or another since his early teenage years. He took his first images of the partially eclipsed Sun on that family farm on March 7, 1970 using his mother's Kodak Duaflex camera. He was 13 years old. It was mostly cloudy and he used a combination of the variable clouds and some over exposed b&w film to filter the Sun. NOTE: Do not use over exposed b&w film as a visual solar filter or anything other than ISO certified solar filter material. Other solar eclipses he has imaged from Vermont are an annular eclipse on May 10, 1994 and a partial eclipse on Christmas day 2001 (both through a 10" f/5.6 Newtonian telescope using an Olympus OM-1 film camera and Olympus C-2000 Zoom digital camera respectively). His only total eclipse was the 2017 eclipse where he and his wife traveled to Tennessee. In all four cases he had to contend with varying amounts of clouds. He observed but didn't image the October 14, 2023 partial eclipse (an annular eclipse in the southwest U.S.).

**May 6**

**Annual Banquet & Business Meeting  
Plans for Zooming as well  
Starts 6:00 PM**

No Presentation. Members and invited guests only. **Contact any member to get an invite. Members can invite spouses and friends.**

**Meal:** As of the time of publication the details have not been worked out.

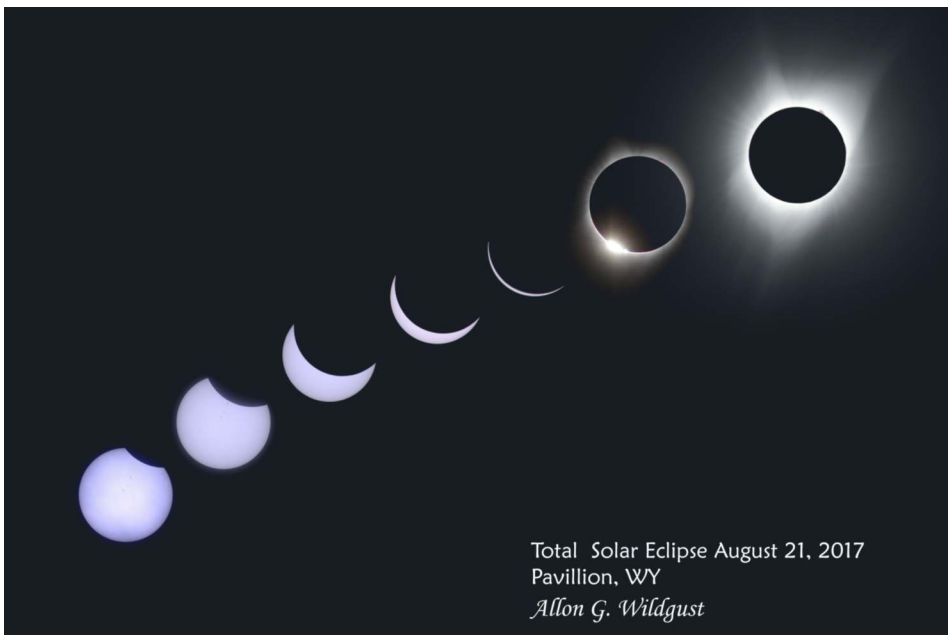
The cost of the meal has not been determined either. **An email about the meal will be sent out a couple weeks before the meeting.**

**Location:** St. John's Club, 9 Central Ave. Burlington (take Lakeside Ave. from Pine St.).

**Time:** Social Hour 6-7. Dinner 7-8 (may start earlier). Awards and Annual Business Meeting 8-9.

**Election of Officers**

Board Positions up for election/re-election this year- President, Vice President, 4 Board Members at large. Let Jack or Paul know if you are interested in any of these positions by emailing [info@vtastro.org](mailto:info@vtastro.org). **You must be a Full**



**Member** (if you are an Associate, you must request to become a Full Member early enough to give us time to consider making you a Full Member).

**June 3**

### Night Myopia and Stargazing Eyeglasses By Joshua Roth

Telescopes and binoculars come with focusing knobs, but our unmagnified views of the stars sometimes can seem forever out of focus. Can anything be done to improve our views of constellations and meteor showers? Science teacher and amateur astronomer Joshua Roth will describe the phenomenon of night myopia and some "hacks" that numerous observers have used to better see the unit-power sky.



Joshua Roth at left (dark coat).  
Tony Flanders at right (yellow).  
Photo credit: Rajani Flanders

## Articles

### Sky Lore and Stories

*Long ago, storytellers invented magical stories of the stars, the Moon, the Sun, and other mysteries of the sky. The stories helped people pay attention to our world—in the sky and right here on the Earth. Today, astronomers help us pay attention to the mysteries of the universe. By observing, measuring and predicting, they explain how things work and, like the storytellers, they help us notice and care for our world. Storytellers and astronomers are both sky tellers. Though each tells a different kind of story, both help us to open our minds and grow.*

*In this series of articles, I will be a sky-teller of the first kind, bringing you tales from*

*different cultures as we look at the stars through the eyes of historical imaginations.*

~Carrie Cruz

### Eclipse!!! A look into the legends of Solar Eclipses

Fun fact: A total solar eclipse occurs roughly every 375 years at any given region on Earth!

(No wonder everyone gets so very excited!)

Approximately 2000 years ago, the Greek astronomer, Ptolemy recorded his observations of eclipses in the *Almagest* and described a way to predict lunar and solar eclipses. He knew the details of the orbit of the Moon, including its nodal points and where the sun must be in relation to a node for an eclipse to occur. However, as Ptolemy's knowledge either came later or was not far-reaching enough, people around the globe and through time have come up with their own explanations for the sudden, and often terrifying, disappearance of the sun.

Cultures around the world have learned to depend on the steady movement of the sun and use its path as a reliable compass, clock, and calendar. Suddenly, something happens in the sky that should not and the sun disappears during the day—many took this disruption of order as a bad omen. Many, but not all.

In much of the lore, a solar eclipse happens when a demon or animal "eats" the sun. The Vikings told of a pair of sky wolves chasing the sun and when one caught it, an eclipse would occur. In Vietnam, a toad or a frog ate the sun. Korean eclipse mythology tells of fire dogs that try to steal the sun. In China, a dragon (Draco) was responsible for devouring the sun. Interestingly, the earliest word for eclipse in Chinese, *shih*, means "to eat." In India, Armenia, Tibet and Persia, the dragon was also the hungry offender. The indigenous Pomo of Northern California pictured a huge, cranky bear wandering through the heavens and biting the sun when it refused to move out of the way. In Andean mythology, a puma devours the sun. According to Choctaw legend, an ill-behaved black squirrel gnaws on the sun. Among the Apapocúva-Guaraní people of eastern Paraguay and northern Brazil, eclipses

are caused by the Eternal Bat, or in some cases the Celestial Jaguar, which gnaws the Sun or the Moon.

According to a story told in an ancient Sanskrit poem, a demon stole an immortality potion and tried to drink it, but the sun and moon reported him to the god Vishnu. Vishnu cut off the demon's head before the liquid made it down his throat, and the demon's head moves around the skies chasing the sun and moon for revenge. Occasionally it catches one or the other and eats it, but the orb always falls out of his throat.

In a Transylvanian folk tale, the sun turns away from humankind's terrible behavior during an eclipse and a poison dew falls on the Earth. (Dew does form during solar eclipses due to the drop in temperature!)

The Navajo believed that the eclipse of 1918 over the American Southwest was an omen that foreshadowed the Spanish flu pandemic. Tens of millions died in the following months, including 2,000 Navajo. One has to wonder...

Not all the lore is about something bad happening, though...

The Batammaliba people in Togo and Benin (Africa) tell a myth about the sun and the moon fighting during an eclipse. The people encourage the sun and the moon to stop fighting. They see it as a time of resolving old grudges, a story and tradition that hold to this day.

We know that the corona of the sun can be 1,000,000 degrees Fahrenheit, but there are legends that are a different kind of hot... According to stories of several Tlingit and Australian aboriginal cultures, the sun and moon were a man and woman in love, and eclipses darkened the world when they got together (so they would have a little privacy.)

In German mythology, the hot female Sun and cold male moon are married. The Sun rules the day, and the moon rules the night. Feeling the need for some "affection," the moon is drawn to his bride during the day and they come together to create a solar eclipse.

In a Tahitian myth, the Sun and moon are lovers who join up—the eclipse—but get lost in the moment and create stars to light their return to daily routine.

Mostly because people thought that nothing good was coming from an

eclipse, they came up with creative ways to try to end them. The Chippewa of North America shot flaming arrows into the sky to rekindle the sun. Ancient Mayans ate a certain type of snake. The Norse and Chinese banged pots and drums and children screamed at the sky. In Greece, human sacrifices were made to avoid harm to the king. In Aztec myth, blood sacrifices were necessary to fend off disaster.

And now? We are no longer superstitious about eclipses - except that maybe we are! Many cultures still believe that seeing an eclipse can be dangerous to a pregnant woman and her unborn child. In Italy, it is believed that flowers planted during a solar eclipse are brighter and more colorful than flowers planted any other time of the year. There is much posturing about the effect of an eclipse on the stock market and still people like to bang pots and pans and drink champagne during totality.

Whether you are the superstitious type or not, I'm certain you hoping for clear skies on April 8-so cross your fingers, get some Sun Chips and Moon Pies (maybe a Corona beer) and enjoy the company of the people you will be with!

## **Board & Committee Meetings**

### **January**

#### **Board Meeting**

Bonnie from the Dorothy Alling Memorial Library contacted Terri about doing an astronomy event. She would like us to set and man displays at a few tables, each with a different astronomy topic where visitors can ask questions.

Since it seems most libraries and schools have ordered their own solar viewers we will make ours available to members, family and friends, etc.

We are set up to make the manuals and stickers for the Library Loaner Scopes. Paul printed the manuals and stickers, Keith laminated them and bound the manuals. Keith has delivered 3 mores scopes to libraries with customized manuals.

Keith refurbished a donated 6" f/8 Edmunds telescope. He spent \$100 in parts. This was a donated scope and a

friend of Terri's had indicated an interest in it.

We currently have 32 solar eclipse presentations lined up, 2 of which have been done. Jack and Jim plan on doing most of them. Jack has made a recording of him doing the presentation and will get it to Scott so that Scott can post it to his YouTube account.

### **February Board Meeting**

The Annual Banquet and Meeting is coming up May 6. We plan to hold it at St. John's Club as usual. They no longer have the person who used to be in charge of preparing meals so Terri will look into caterers or pizza for the meal.

Terri asked whether we should have an eclipse page on our website. We agreed that we should.

Jim asked if there should be another Eclipse Committee Meeting. We agreed there should be. It was decided that we should send an email to the club members a list of events for which there will be at least one club member in attendance. Jim has ~1000 solar viewers on hand. Various board members have some as well, maybe a few hundred. We started out with ~5,250.

Terri gave the monthly financial report.

Should we be thinking about what to spend some of the club's money on, such as public outreach?

#### **ACTION ITEMS:**

Jim will schedule an Eclipse Committee Meeting for Feb. 28 or 29.

Paul will reserve space at St. John's Club.

### **March**

#### **Board Meeting**

Minutes as relayed by Jack (Paul was not present, he was doing a presentation on imaging the solar eclipse in Morrisville for a photography group).

Jack said Paul had booked St. John's Club for May 6, the downstairs room.

Jack asked Terri about the meal. (She sent an update the next day to the board, which looks good). Jack asked Terri about the Zoom account we will need after his term ends (we are currently using his personal account). She will

purchase an account for the VAS by April 1.

We don't know whether Keith will be setting up an auction for the Annual Banquet this year. Jack will ask him again.

Joe will be doing an eclipse presentation at Wake Robin, there could be up to 400 attending with residents and families. Lake Champlain Cable Access may be doing something with him in Alburg. He also talked with FOX news.

Terri has been doing eclipse presentations and will be doing more. She sent in the Astronomy League roster and will send in the dues later. VAS tax forms are due in by May 15.

Bob had a request to help during the eclipse at Severance Corners in Colchester, so he will be there on eclipse day. He built a binocular solar viewer.

Jim is busy with eclipse presentations. He will be presenting at the Pier-son Library in Shelburne Friday evening. He will be doing a phone interview with Central Vermont Radio, and is having fun with all the eclipse prep.

Scott helped at the Discover Engineering Day at UVM Davis Center, will be doing eclipse presentations and will be at the Rawson Library for the eclipse.

Had a discussion on gifts to board members for providing assistance/education. Terri explained a situation she ended up in with one of our members, and that she didn't feel comfortable accepting gifts as a board member. All agreed that any gifts provided to board members for assistance provided should be accepted on behalf of the club for the benefit of the club and that board members shouldn't benefit personally. We didn't discuss any bylaw update related to this. Terri suggested that it seemed ok to accept some reimbursement if it's a long distance drive, for travel cost, but we didn't really discuss that point further.

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#### **VAS Membership Committee**

No meetings this quarter.

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#### **Observatory Site Committee**

No meetings this quarter.

## Under the Stars & Planets

### OBSERVER'S CORNER

#### Observing Tips

If you have tips to share whether for beginners or experienced observers send them our way at [info@vtastro.org](mailto:info@vtastro.org)

► (repeat) It takes 20 minutes or more of being in the dark for your eyes to become fully sensitive to dim light (fully dark adapted).

#### Equipment Tips & Recommendations

If you have equipment tips and suggestions to share whether for beginners or experienced observers send them our way at [info@vtastro.org](mailto:info@vtastro.org)

► (repeat)  
Tips for dealing with humidity (whether dew or frost).

One common way to address humidity problems is with a dew heater and/or fans. But here are a couple more ideas. The key is to keep the lenses warmer than the air.

A common place for humidity problems is the finder scope. A dew shield there helps a lot. You can buy scope-specific shields, you can buy generic shields, or you can make your own. People have used a roll of cardboard (e.g. a toilet paper roll or paper towel roll can work nicely when blackened with paint or felt pen), sheets of foam, or very thin plywood. Some that provides more insulation like foam plastic sheets fashioned into a tub or can be wrapped around the finder to keep it warmer longer. A rule of thumb is to make the shield 1.5 times as long as your aperture is wide. Longer is better for reducing dew but but make it too long and you will reduce the effective aperture by restricting the field of view (remember finder scopes have a field of view of about 5 degrees which means there's a cone of light coming into the objective lens on the front).

If you don't have a dew shield putting the lens cap back on (and the eyepiece cap) whenever you aren't using the finder will help. No caps? Cover the finder with a cloth or small towel. Insu-

lation tubes for water pipes come in several sizes and can be used around eyepieces or cut to fit various unity finders and taped, tied or rubber banded in place.

A very effective though technically more challenging approach is to make your own dew heater with a string several electronic resistors soldered together and attaching each end of the string to a 12v power source (a standard 9v battery also works but may only last a night or two. Make one string for the objective end and a shorter string for the eyepiece (or wrap a longer one a couple times around). The resistors or at least any bare wires should be inside some heat shrink tubing to prevent shorting out the power source. The drawbacks are that you need a power source and you have wires hanging of the scope. Many observers with motorized GoTo scopes have a suitable 12vdc power source and some mounts have "pass-through" power management cables allowing accessories to be plugged into auxiliary power connectors right on the mount.

You only need about 1 to 2 watts of power to provide enough heat for eyepieces and finder scope objectives. Here's more technical info for those who may have a soldering iron but don't know how to calculate what you need to use for resistors.  $2 \text{ watts} / 12\text{v} = 0.17 \text{ amps}$ .  $12\text{v} / 0.17 \text{ amps} = 72 \text{ O}$  (ohms) (value of the total resistance needed) (1 watt of power calculates to 144 O). Any amount of resistance in about the 50 to 150 O (ohm) range will work. This resistance will be distributed between 5 or 6 resistors in series (daisy chained). So the reasonable range of values for the resistors is:  $50 / 5 = 10 \text{ O}$  each (this will produce more heat) to  $150 / 6 = 25 \text{ O}$  each (will produce less heat, a better choice when using a 9v battery).

Radio Shack has a 5 pack of 33 O (ohm), 1/2 watt resistors. Using all 5 would add up to 165 O and produce 0.87 watts, using 4 of them would give you 132 O and 1.1 watts, using 3 would give 99 O and 1.5 watts.

Note that these resistors have wattage rating of 1/2 watt. This means each resistor is rated to handle up to 1/2 watts heat. So you have to divide the total calculated watts by the number of

resistors and get a result of no more than 0.5 watts. Otherwise they will get hot enough to burn you. They get very hot when dissipating 1/2 watt.

Radio Shack has a 5 pack of 15 O, 1/2 watt resistors. 5 of these will produce 2 watts.

Radio Shack has a 5 pack of 10 O, 1/2 watt resistors (currently sold out). 5 of these will produce 2.9 watts in case you need more heat, but would get very hot and damage the resistors over time. 6 would produce 2.4 watts and handle the heat.

Amazon.com has resistors as well, only they come in large assortment packs. There is a 600 pcs. pack of 1/2 watt resistors for \$14 with resistor values in the proper range (10 O and 22 O). It has 20 pcs. of each value so you could make several dew heaters. There are other sets with 33 O and/or 47 O resistors that will work as well.

Almost forgot the heat shrink tubing. Radio Shack and Amazon carry it. Mostly in kits with short pieces but you can use multiple pieces placing one at a time over part of the string of resistors, shrinking it (you can use the soldering iron to heat the the shrink tubing, use the body not the tip). Letting it cool down some before placing the next piece overlapping the first piece a little.

Contact [info@vtastro.org](mailto:info@vtastro.org) if you need help or have questions. Paul Walker has a bunch of 9v battery clips and what seems to be a standard connector (5.5mm O.D. with 2.1mm center pins) for DC power supplies, both male and female types, if you need them.

#### On-line Resources

► From the Royal Astronomical Society of Canada. Observing tips: <https://rasc.ca/observing/tips>

► Here's a really nice, printable Star Atlas. It shows how to go about printing, laminating and binding the atlas. And, even more, with supplements! <http://www.deepskywatch.com/deep-sky-hunter-atlas.html>

► Discussion of the best star atlases- <https://astronomy.com/observing/get-to-know-the-night-sky/2014/04/choose-a-star-atlas-thats-right-for-you?page=1>

## Member's Observations

### ► **ALPO** <https://alpo-astronomy.org/>

No, not the dog food, the Association of Lunar and Planetary Observers. They are a good place to check out for those interested in learning more about the Moon, Sun, planets, asteroids, meteor showers and observing them or submitting your images or drawings of them.

The Moon is a good place to start as it is often visible, requires no specialized accessories and is close enough to see lots of different geological features.

The Lunar Section produces a monthly newsletter containing observations and images of the Moon.

It is a little tricky finding the link to the newsletter. From the link above, under Observing Section (top left side), select "Lunar Section". Look for "here" about halfway down the info for each month, that's the link to each newsletter.

### ► **The Astronomical League (AL)**

<https://www.astroleague.org/>

Whether or not you are a member of the Astronomical League, you can access their Observing Programs for lists and ideas for your personal use. Look for the "Observe" pull down near the top. It is recommended to select "Observing Program Selector Grid" to start.

At the top of the grid you will find "Difficulty", below which you will find programs aligned with your experience level. Also along the top of the grid you will find the "Equipment" (the equipment options needed or allowed), "Needs" (any special needs) and "Style" (what methods you can use, where "Manual" means with your eyes).

To find more detailed information go back to the top to the "Observe" pull down and select "Observing Programs (listed alphabetically)". Note that the listing goes left to right (I ignored the right side for a while and could find a particular program). If you are an AL member you can get an observing pin specific to each program that you finish.

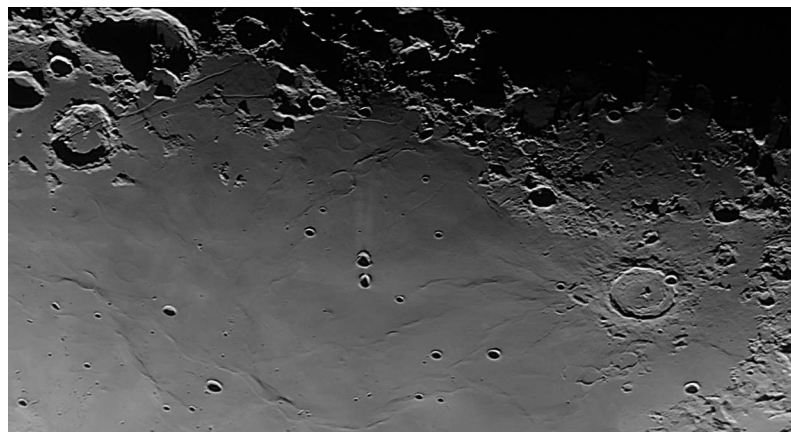
VAS is a member of the AL so going through our club your AL dues are only \$7.50/yr (compared to \$40 for a "member at large"). Contact [info@vtastro.org](mailto:info@vtastro.org) if you are interested in taking advantage of this.

### **Lunar Observations 2/14/24**

Email to Gary Nowak and Lawrence Garrett--

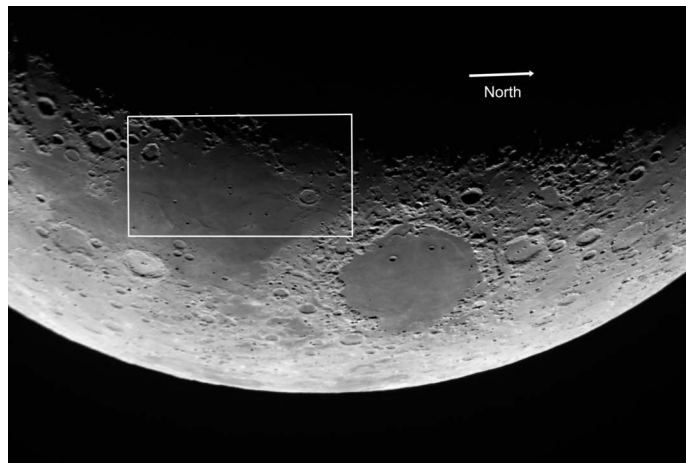
Viewed the Moon and decided the seeing was good enough for taking videos for stacking.

Here's the one I have completed processing. It features the Western part of Mare Fecunditatis with the craters Messier and Messier A. Note, West is up, North to the right. There are a few Lunar Domes (volcanic bulges) for those more familiar with this area. There are several Rimae (faults) as well. From the very obvious to the very subtle.



I sure wish we could adjust the contrast in our eyes. In the image the crater next to Messier 3 (marked on the VMA as 2 which I seem to remember is wrong) and Messier 3 itself are easy to distinguish in this image but by eye they blend together. And Messier 2 though easy here was barely detectable by eye.

Here's a context image for the image above.



Paul

Hi Paul;

You did better than I did. I got my equipment set up and a back door front of an outer band of clouds came in from the NE and completely covered the sky. So I didn't even get a chance to view at all.

Also I'm confused as to what you are calling Messier 2 and Messier 3 craters. The Main crater is Messier. Then there's Messier A, B, D, E, J, L in the area of Messier main crater... So once I know what craters you are calling Messier 2 and 3 then I can comment on the image.

One thing you should try to do is to try to increase the resolution and magnification of

Crater Messier A. If you can do that, perhaps not in this image but at another time when you are imaging the Moon... You will find that Messier A has 2 Impact

Areas which was caused by a low angle trajectory hit and ricochet hit of the meteorite or tiny asteroid.

Gary

Hi Gary,

Messier 2 and 3 are lunar domes. I think it was Larry who told me their labels shown on the Virtual Moon Atlas are swapped. Sorry, I assumed you

knew that domes are labeled with numbers and "secondary" craters with letters. I only recently learned this myself. The naming apparently depends at least somewhat on when various craters and domes were named as I see Messier D (the moderate sized crater 10:00 from Messier A) has a lunar dome

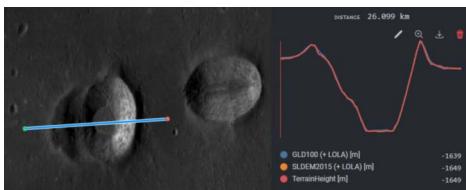
labeled Messier A 1 (not visible in the

image) nearby [rather than labeled Messier D 1].

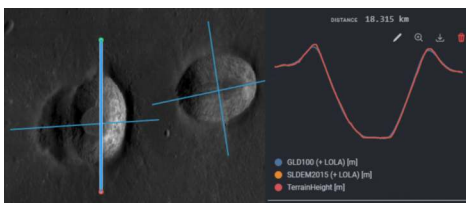
Messier 2 would be the 1st faint bump to the East of Messier (6:00 position in the image). Messier 3 is the first feature at the 7:30 position from Messier, just left of a tiny crater.

Well, this is the best image of this area I have so far. I was surprised by the detail on Messier A. One thing I can try is reprocessing the image as this was done to bring out faint contrast in low contrast features so the highlights are over processed.

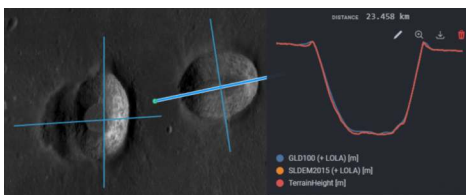
Looking at Messier and Messier A on the quickmap.lroc.asu.edu/, while Messier does look like a shallow angle strike, Messier A looks to me like a double asteroid strike. Though Messier A is slightly elongated N-S compared to Messier's E-W, the ejecta blankets appear to be different.



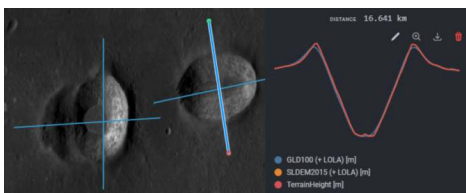
From quickmap. The E-W profile of Messier A is interesting. In the images it looks like a true double rim on west side but the profile shows it has a shallower slope the the east rim and is rougher.



Messier A, N-S profile.



Messier, E-W profile.



Messier, N-S profile.

You can see here that the Messier E-W profile is much different than its

N-S profile or either the N-S or E-W profile of Messier A.

I'm finding that the quickmap.lroc.asu.edu/ is quite useful for analyzing features.

Paul

The domes are here, from the Lunar Domes Atlas GLR group, the ALPO domes approved pages, here Messier plate (messierdomes.blogspot.com) and here Lunar Domes Atlas GLR group (lunardomeatlas.blogspot.com)

Have not been out with cold and too windy here, good work!

Larry

While the VMA is plastered with lunar domes, Raffaello Lena has stated the current Lunar Domes Atlas GLR groups LUNAR DOME ATLAS ALPO/BAA is the most complete of any dome catalog. And if you find others such as all those Messier targets (most not in that catalog), they don't make the list because they have not passed the requirements to be called a dome under current rules that you really need to be a geologist to read. They are really "historical domes", before current guidelines came into play. But as in many cases, time marches on, and new guidelines come about because of discoveries as new classes of subjects become known, requiring their addition to the catalog, or a fully new catalog of subjects if needed.

With such problems in observing and adding news features of this nature it's a slow boat to China, or a wait until a probe in orbit can gather information that those now "historical domes" and move them along into the new mainstream of improved lunar knowledge.

Later Larry

### Lunar Observations 3/16/24

Email to Gary Nowak and Paul Walker- Hope you both saw the overhead Moon in twilight and beyond last night.

Seems I am coming out of hibernation in time for eclipse and more.

While my best seeing in the 6" reflector was only good to 122x, I managed to observe old and new subjects on the moon. That DORSA SMIRNOV was the night show piece as far as I see,

and that ARAGO ALPHA just perfect on the terminator seemed much large that the 10.83" quote.

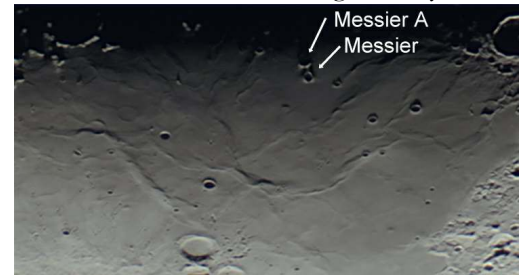
While the moon was very good, I spent most of my time searching out libration zone features, and even after years, have spotted only around 40 zone subjects, being so hard to find. DONNER T and CURIE C were little more than thin dark strips near the lunar limb, with DONNER T much more visible.

Am I the last person on earth to read about the T Coronae Borealis watch under way? Seems so.

Lawrence Garrett

Nice. I was on the phone and then family came for the weekend so I forgot to check the sky until 10 PM or so and decided it was getting too late to take a peek.

I did get out to view it on the 13th and took video of Mare Fecunditatis, with Messier and Messier A just visible and many bumps on the floor the the mare. Stacked and sharpened image, see attached. Seeing was not the best so only has craters down to about 3.5Km. It does show the wrinkle ridges nicely.



Paul

Hi Larry and Paul,

I did go out and observe on the night of 15 -16 March 2024 (UT). I was observing the 5 day old Moon in Taurus which was at 40% illumination.

As I mentioned before, these "evening moons" around the time of the 1st Quarter Moon are the 2nd highest in altitude for 18.6 years. Only next year's (2025) 1st Quarter Moons and the evening moons around them will be about 1 degree or so higher than 2024 Moons. The 2025 moons will be the highest altitude moons in 18.6 years. So any observations of these moons in their very favorable highest altitude positions should be given priority.



So I used my 60 mm (2.4") F/13 Refractor which was purchased from VAS Surplus on the Edmund light duty German Equatorial Mount which also came from VAS surplus. I had set up the scope and mount in my back yard at 23:15 UT. After a 45 minute cool down, I went to observe the Moon. 00:00 UT, at 97X and using the Baader 495 nm (yellow) filter, the Seeing was very good and the scope was revealing some fine details. Seeing was 8.0, Transparency was 3.5. I could see a few small pieces of fog slowly drifting over the Eastern horizon on the Eastern Hills of Terra Firm. I took a look at Messier / Messier A, #25 on the Lunar 100 Card. The rising Sun angle was a bit too high and the craterlets shadows which were near Messier / Messier A were almost nonexistent.

I then moved to Crater Cauchy, #48 on the Lunar 100 Card. I tried to see Lunar Domes Cauchy Tau and Cauchy Omega but failed to do so. I believe that the rising Sun angle was not that favorable. However there were some nearby craterlets which were readily visible. Cauchy D, 9 km (5.5 mi) and Cauchy B, 6 km (3.7 mi). Cauchy B was readily visible thanks to its fine distinct craterlet shadow. I could not see any other smaller craterlets.

The next stop was Crater Argo, #32 on the Lunar 100 Card. Argo was right next to the Lunar Terminator. I tired for the Lunar Domes Argo Alpha and Argo Beta but did not see them. So I moved on to Crater Posidonius, #20 on the Lunar 100 Card. The crater was well placed, for the morning sunshine was producing some fine shadows. I could very easily see craterlets Posidonius A, 11.1 Km (6.8 mi), Posidonius B, 14.1 Km (8.6 mi) and Posidonius C 6 km (3.7 mi). No sinuous rilles were seen on Posidonius floor but I could just barely make out some faint circular features just west of the craterlet Posidonius A. (Later I got a better chart of Posidonius and found out my faint circle is a small grouping of hill peaks in the crater, I was unable to determine the size of these hill peaks).

After those observations, I noticed my finder was completely dew out (objective and eyepiece). My telescope tube was all wet with moisture. At 01:00 UT, I could see large patches of thick fog slowly moving over my observing area. My eyepieces and 60 mm Objective started to fog up as well. There was very heavy dew on everything including my lunar charts which were housed in a plastic sheet. Then more fog rolled in from the West and it thicken up quite a bit. I

did a few double stars but I knew I was loosing this battle with the fog. By 01:30 UT the fog was so thick there were only three objects I could see, the Crescent Moon, Jupiter and Sirius. All three objects were exhibiting Aureole and all three Aureole had colors of blue, green, and red. The Crescent Moon's Aureole colors were most prominent while Sirius colors were quite faint.

Thus ended my observing. The Temperature was +34°F, Humidity was 99%, Wind was zero and barometer was 29.75".

The theoretical resolution of a 60 mm (2.4") telescope of the smallest craters is 3.6 km (2.2 mi). I was able to clearly resolve a craterlet of 6 Km (3.7 m) in size. Thus I was resolving a bit better than the typical 2X results of the average working limit. ( $3.6 \text{ Km} \times 2 = 7.2 \text{ Km}$ ). Thus I'm coming in under the "normal" 2X limit... I'm pleased with this result. Hopefully I'll get another chance to observe with this scope on the Moon at its very favorable position very soon. I would like to try and reach the theoretical resolution of a given aperture.

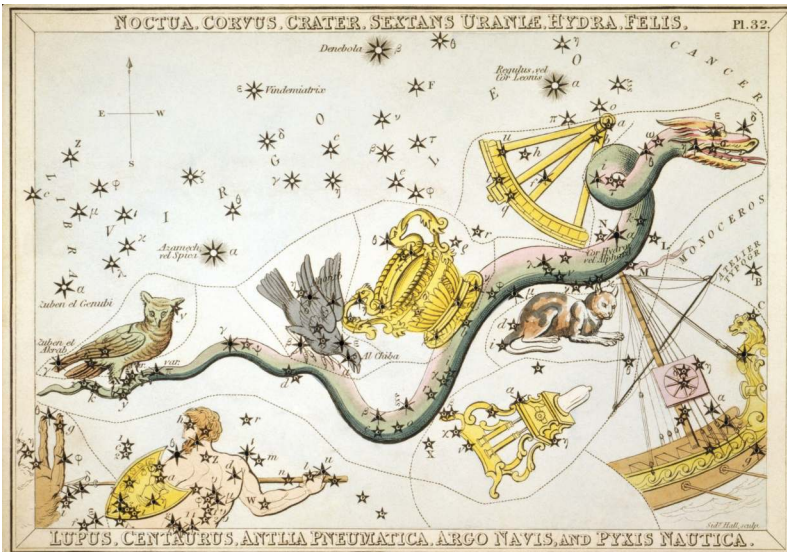
Gary

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**OBJECTS TO OBSERVE**

**The Serpent and the Sextan**

(From Terri Zittritsch's Constellation of the Month Presentations)



**Uranias Mirror plate no. 32**

**Hydra**

- Pronounced: Hy - druh
- Genitive: Hydrae
- Largest constellation in the sky at 1303 square degrees
- Bordered by Cancer, Monoceros, Puppis, Pyxis, Antlia Centaurus, Libra, Virgo, Corvus, Crater, Sextans and Leo
- Known as a southern constellation since only the head resides in the northern hemisphere
- Known as a water serpent and one of the Hercules family of constellations.

- Hydra is one of the original 48 constellations documented by Ptolemy in the Almagest
- The Hydra Myth is an adaptation of an earlier Babylonian myth where Hydra is a hybrid of a serpent, bird and lion
- Hydra – usually depicted as a 9 headed serpent had one immortal head which is depicted in the constellation
- Hydra lived near Lerna where it ravaged the lands
- Hercules was given the task, one of his labors, to kill the Hydra.
- But every time Hercules smashed one of its heads, two more would grow back.
- Eventually his charioteer, Iolaus would seal each stump after Hercules chopped off a head, the immortal head was buried under a rock!
- Hercules used the Hydra's blood on his arrow tips for future labors.

**Sextans**

- Pronounced: Sex - tens
- Genitive: Sextantis
- 47th constellation in size at 314 square degrees
- Bordered by Leo, Hydra and Crater
- Known as a southern constellation as its on the equator and its asterism is fully below the equator
- Represents a Sextant, a key navigation tool for early explorers and still used as a backup today
- Sextant wasn't defined until more than 1000 years after the initial 48 documented in Ptolemy's Almagest, and was defined by Johannes Hevelius, a polish astronomer, in 1687

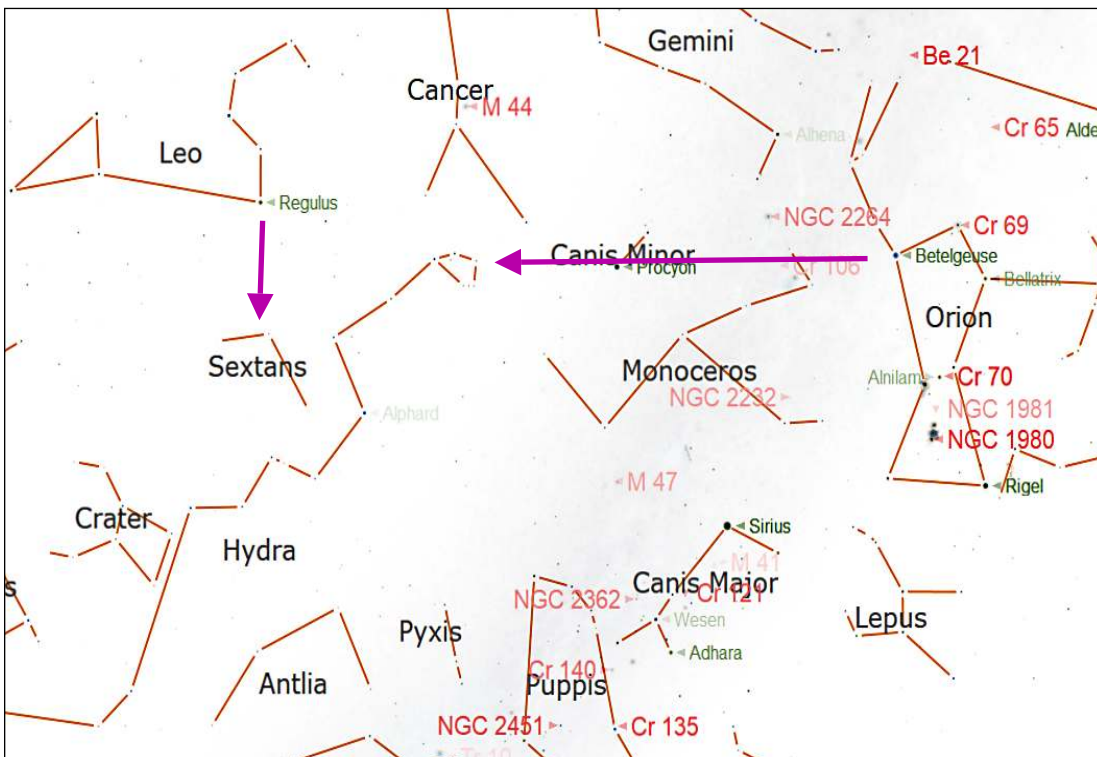
• Johannes was very partial to his Sextant and used it for most star observations instead of a telescope. He named his Sextant Sextans Uraniae

**Finding Hydra and Sextans**

Locate the winter hexagon and Procyon and the Orion Nebula and Betelgeuse

A line drawn from Betelgeuse through Procyon will point to the Hydra's head.

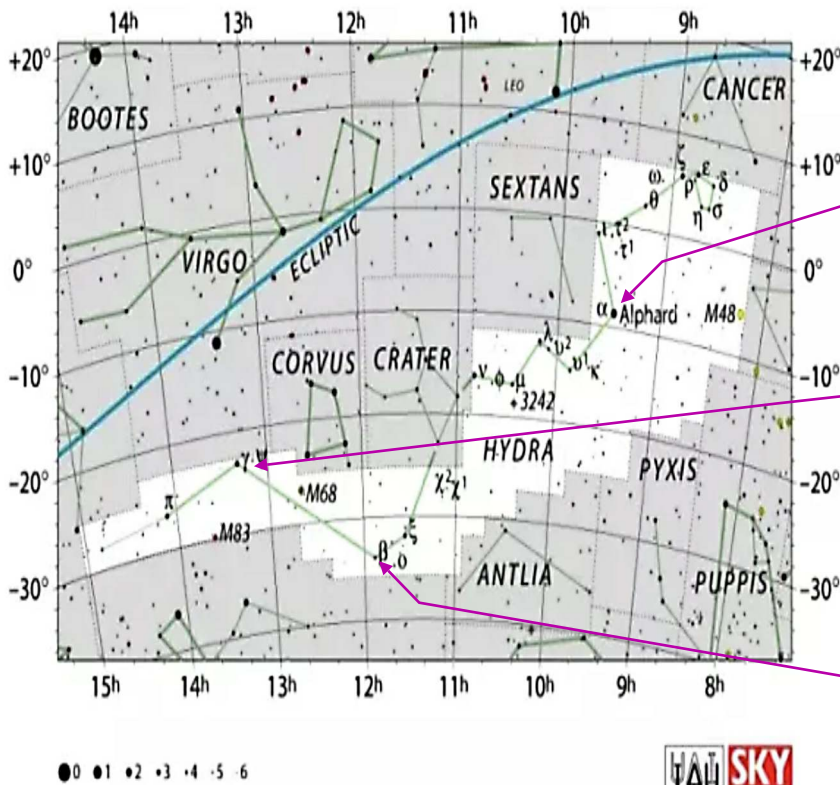
Sextans can be seen directly below the bottom of the sickle in Leo, or below Regulus.



## Observing in Hydra

### Bright stars and double stars:

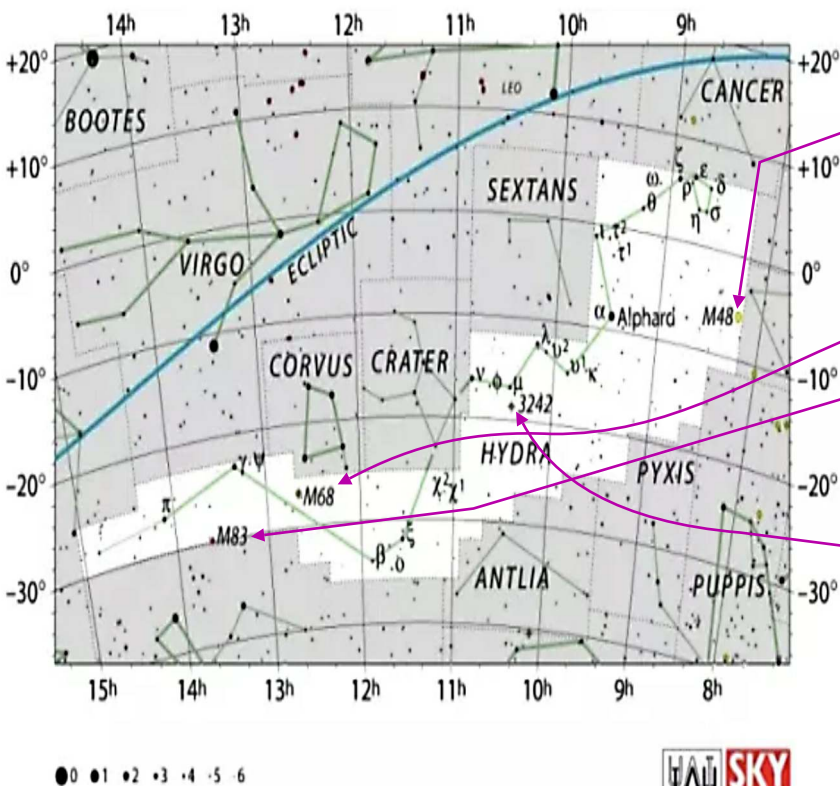
- Hydra has 8 named stars: Alphard, Ashlesha, Felis, Filetdor, Lerna, Minchir, Ukdah, and Zhang
- Alpha Hydrae (Alphard) is the brightest at mag 2.0, a bright orange giant of class K3 II-III it lies 175 ly distant with a surface temp of 4000K, 3 solar masses and 40 times larger than the Sun. It has a mag 9.7 companion at 282"
- Gamma Hydrae – (Dhanab al Shuja) Hydra's second brightest star at mag 3.0 can be found just east of a line extending from the lower 2 stars in Corvus. Gamma Hydrae is 132ly distant and classified as a G8 III giant. It's recently completed fusing all of its hydrogen and its helium core is in the process of compressing while the outer layers expand.
- Beta Hydrae – Shines at mag 4.28, is a close double with components at mags 4.67 and 5.47 and only 1.7" separation. At 365ly away Beta Hydrae A is a class B9 III giant while Beta Hydrae B is unclassified and about ½ as luminous



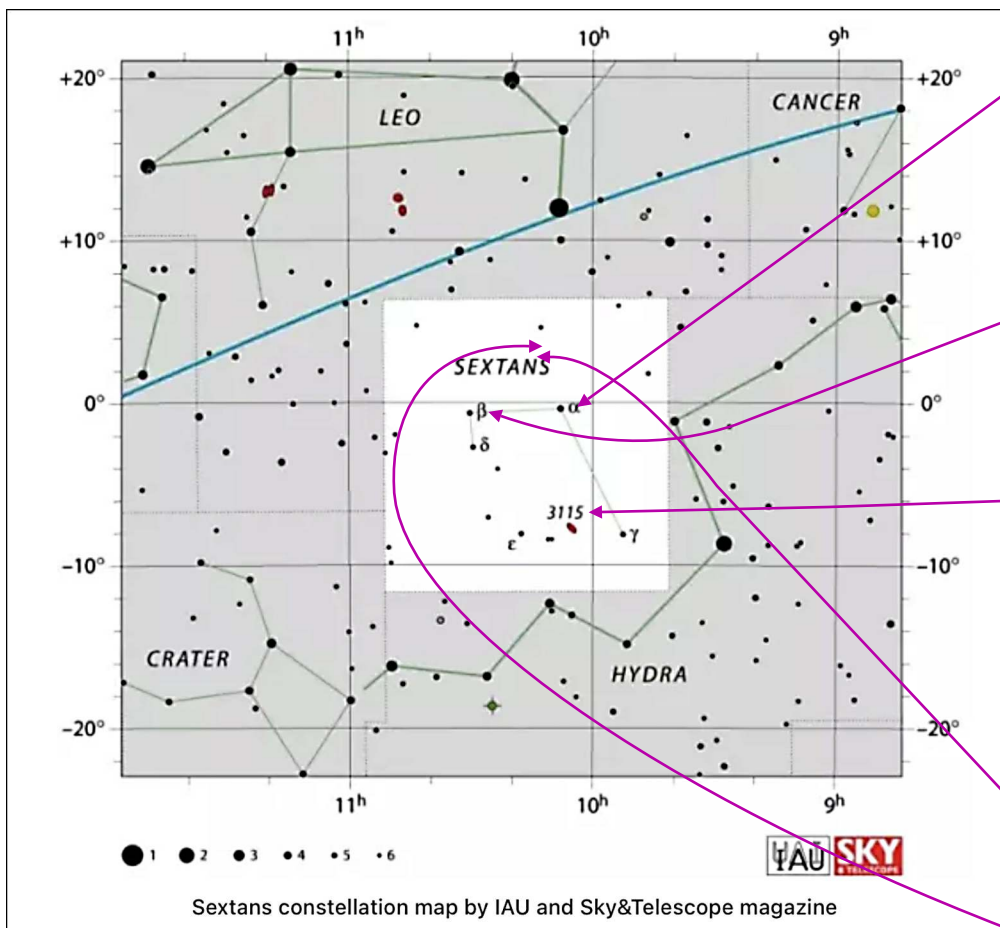
Hydra constellation map by IAU and Sky&Telescope magazine

### Deep Sky objects:

- M48 (NGC 2548) - an open cluster at mag 5.5. and ½ degree in diameter and 1500ly distant. A controversial object miss cataloged by C. Messier but matching the description of NGC 2548, later cataloged by Johann Bode and Caroline Herschel.
- M68 – A globular cluster of mag 7.8 at a distance of 33K ly and 106 ly in diameter
- M83 – AKA southern pinwheel, discovered by Nicolas De LaSaille at the cape of good hope in 1752. A mag 7.8 large face-on barred spiral galaxy. A showpiece of the southern skies but difficult for northerners.
- NGC 3242 (Ghost of Jupiter) – A mag 7.7 blue-green planetary nebula



Hydra constellation map by IAU and Sky&Telescope magazine



### Information Sources

Constellation-guide.com  
 Space.com (Pronunciations)  
 Wikipedia.com  
 Sky Safari 6.0 Pro

### Observing in Sextans

#### Bright stars and double stars:

- Alpha Sextanis - mag 4.48 star is the brightest in Sextans and directly south of Regulus. Alpha Sextanis is a class A0 III giant star at 285ly distant, a surface temp of 9,900K, and luminosity of 122 Suns nearing the end of its hydrogen burning phase.
- Beta Sextanis – A 5th magnitude blue white giant main sequence variable star of class B6V at 405 ly distant, a 13,933K surface temp and 5.2 solar masses.

#### Deep Sky objects:

- NGC 3115 (spindle galaxy) – a bright lenticular galaxy of mag 9.2 and 8.3'x3.2'. A type S0 spiral galaxy with no spiral structure where star formation has stopped. Several times larger than our Milky Way galaxy, NGC 3115 is 32M ly distant and the 4th galaxy to be identified with a super massive black hole at its center with a mass of 2 Billion suns.
- NGC 3166 – a 10th mag spiral galaxy of type S0-a and 4.5' x 2.8' in size. NGC 3166 is 84,000 ly in diameter and 64M ly distant.
- NGC 3169 – a 10th mag spiral galaxy of type Sa and 4.3' x 2.6' in size. NGC 3169 is 83,000 ly in diameter and 66M ly distant. NGC 3166 and NGC 3169 are interacting with each other and may eventually become a single galaxy.

### ASTRO-IMAGER'S CORNER

All things astrophotography, for the beginner to the expert.

#### Imaging Tips

► (repeat) Both cell phones and point & shoot cameras can be used to image the Moon and the brighter planets through a telescope. One can hold the phone or camera up to the eyepiece for the Moon. There are also adapters specifically for holding the phone and others specifically for cameras. These make taking pictures a lot easier.

If you have tips to share whether for beginners or experienced imagers send them our way at [info@vtastro.org](mailto:info@vtastro.org)

#### Software/Online Info

► **Autostakkert3! (AS!) Stacking Software** – Lucky imaging with an edge

for planet, the Moon and solar images. Works with still and video images. <https://www.autostakkert.com/>

► **PIPP** (Planetary Imaging PreProcessor) <https://pipp.software.informer.com/>  
 Can be used to convert most video formats to uncompressed AVI format for stacking in Registax or Autostakkert3!. It can take many short videos and string them together into 1 long video. Very useful when your telescope doesn't have tracking, such as a Dobsonian. (see You Tube tutorial below)

#### Astrophotography How-To

► **How to Learn Astrophotography** <https://www.allaboutastro.com/how-to-learn-astrophotography.html>

► **Autostakkert3!** How to process The Planets (Tutorial part 1):

<https://www.youtube.com/watch?v=g67DfADSWvA>

► How to image the Planets: Using **PIPP, Autostakkert, Registax and GIMP:** <https://www.youtube.com/watch?v=zQYbtzsnQ3E>

If you have imaging software or a site with imaging info to share whether for beginners or experienced imagers send them our way at [info@vtastro.org](mailto:info@vtastro.org)

#### Imaging Projects--

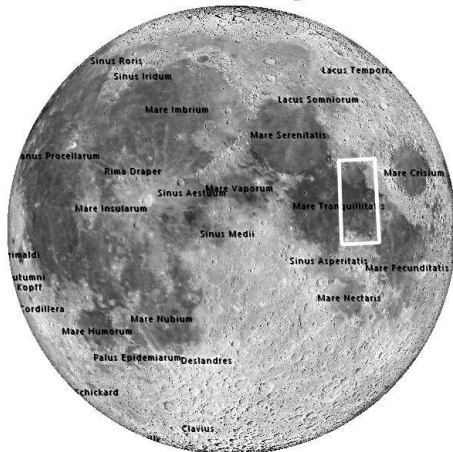
Making your own projects can add another dimension to your imaging experience. If you have an imaging project you would like to share, drop us a line at [info@vtastro.org](mailto:info@vtastro.org).

**MEMBER'S IMAGES**

**Mare Tranquillitatis (East); Lyell C 1,2&3;  
Rima Cauchy; Rupes Cauchy; Cauchy Omega,  
Tau, E2 2024-01-15, 22:44 UT  
(As submitted to ALPO)**

**By Paul Walker**

Locator Map



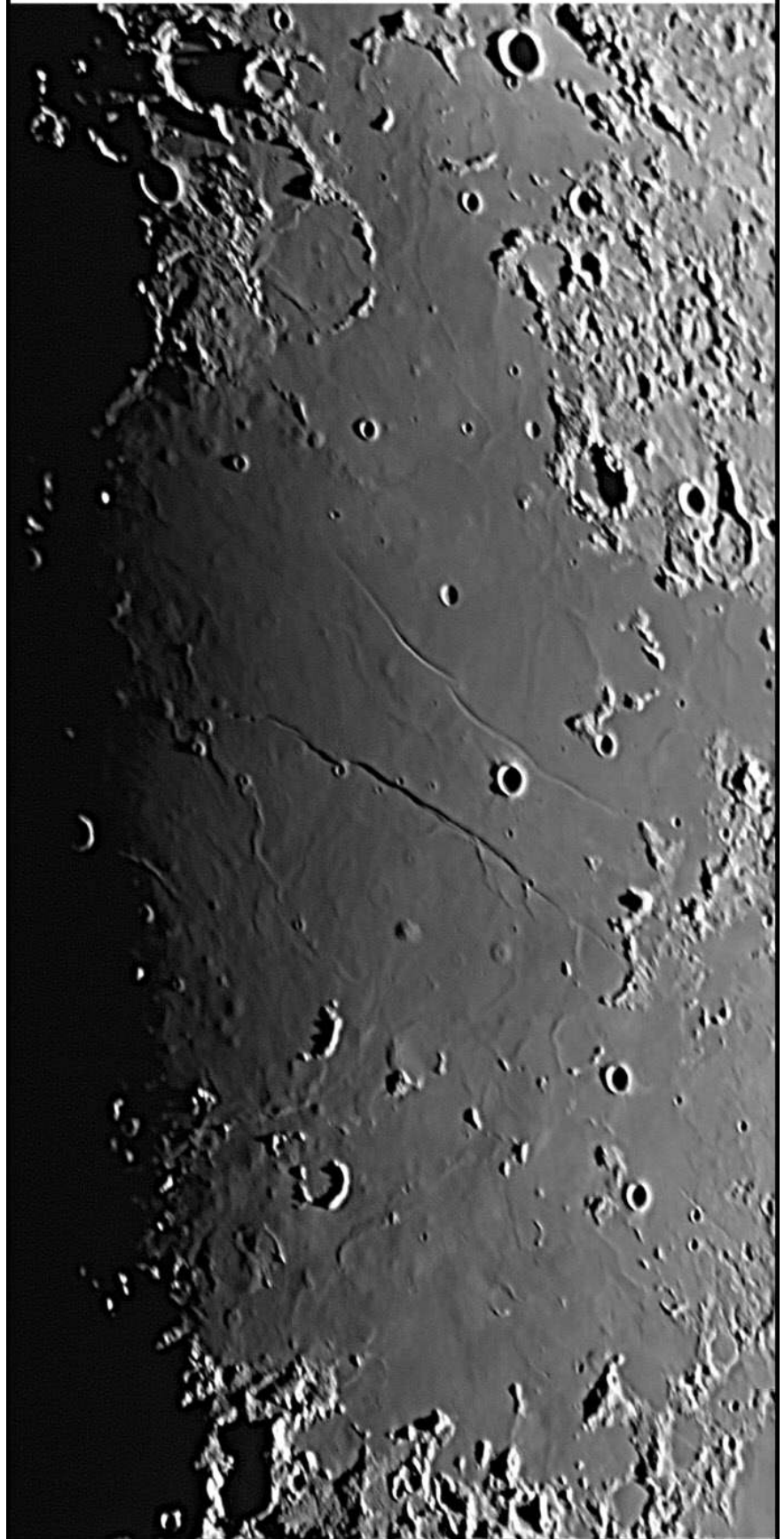
Adapted from the Virtual Moon Atlas

Oh, so many features, where to begin!  
Guess I start at the top.

First locate the prominent 20Km crater, Carmichael, at the top left of center. A little to its left, center of the image is what appears to be a ghost crater. On the left side (West) of this is Maraldi 3 (per the Virtual Moon Atlas (VMA)) an extrusive volcanism. It is difficult to positively identify some features because the identifiers on the VMA seem to be offset a little to the right from where they should be. But it appears to be the tadpole shaped feature with it's "tail" toward the north. Not to be confused with the much more prominent mountain to its Southeast that looks like a single quotation mark. To the SSE of the ghost crater appears to be another ghost with just a little of its south rim protruding above the lava plain. Moving south of the prominent "single quotation" you will come across a small crater. Just a bit below this and to the East is a small light colored spot. This is a bit of extrusive volcanism called Maraldi M 1 (per VMA).

From there, move west to the eastern intersection of the walls of Maraldi D, the large mostly filled crater, and Maraldi E the smaller mostly filled crater just above it. There, in the middle of the intersecting walls, is Maraldi D 2. It is described as extrusive volcanism like many other feature here. On the LROC QuickMap (<https://quickmap.lroc.asu.edu/>) I see what looks like a tiny 0.44Km eroded crater a little below the center the jumble of much larger undula-

Mare Tranquillitatis (East); Lyell C 1,2&3; Rima Cauchy; Rupes Cauchy;  
Cauchy Omega, Tau, E2 2024-01-15, 22:44 UT  
Lunation: 3.95 Colongitude: 321.7 deg Sub-solar Lat: -1.5 deg  
10" f/5.6 Newt @ 3946mm efl, (Meade 2", 2x Barlow) (0.19"/px org. image)  
Canon T7i, HD video @ 3x digital zoom, 1/80 sec @ ISO 6400  
Paul Walker, Middlebury, VT, USA, paulwaav@together.net



tions of this area. You can compare it to a similar sized fresher crater to the WSW near the edge of the jumble. So how much of that "jumble" is remains of the crater walls and how much is from volcanic activity? Hard to tell. I looked at some of the other overlays available on the LROC QuickMap. I found the Unified Geologic Map overlay, which could be helpful in some cases. There are a lot of colors in this overlay and it's a bit hard distinguishing between some of them. This jumbled area is colored a medium brown indicating a "Crater Unit". No part of it colored red for a "Mare Dome Unit". However, several other places in the image are colored as "Mare Dome Units". I am guessing that "Mare Dome Units" are comprised of multiple small domes and not individual domes. The named domes in the area on the LROC QuickMap and VMA would indicate this is the case.

Moving south from there into Maraldi D one can see bumps, 2 above center and one near the bottom right of center. Though they look like they could be volcanic domes they are not identified as such on the VMA. Lawrence Garrett, a fellow member of the local club and member of ALPO, pointed me to the lunardomeatlas.blogspot.com blog site. There, I see the one near the bottom right of center, labeled C42.

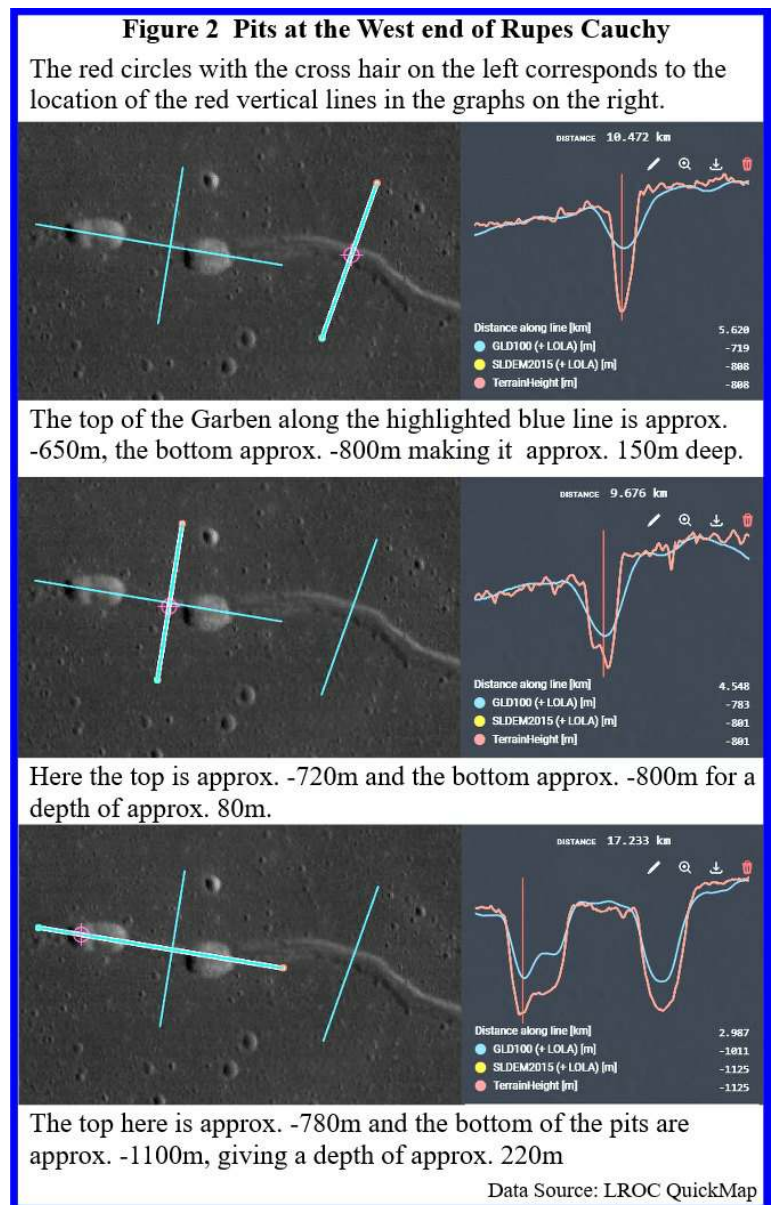
Going out of Maraldi D from its center in the 3:30 direction is small but prominent bump (about 1/2 way across the flat area). This is the lunar dome, Lyell C 3 (VMA) and as C34 on lunardomeatlas.blogspot.com. From there going left, about 2/3 the way back to the rim of Maraldi D appears to be a very low lunar dome but it is not labeled on the VMA. On lunardomeatlas.blogspot.com it is labeled as C35. I am thinking there are too many lunar domes in this image to point them all out.

So I'll move on to other features. Like the 2 fault features, Rima Cauchy and Rupes Cauchy. Rima Cauchy is type of fault called a Garben where the crust fell down between two fault lines as the crust on either side pulled apart. An interesting feature of this fault is in the middle of the portion visible in this image. That is the fault appears have a discontinuity. This seemed kind of odd. While wondering about this I realized it reminded me of how wood sometimes cracks. Wood of coarse cracks along the grain, a crack can stop along one grain line and be taken up on an adjacent line. So depending on where the crust is weakest and/or where cracks may have formed from earlier stresses, I can see how this type of discontinuity can occur.

Rupes Cauchy is for the most part a "normal fault" where there is a single fault line that angles into the crust and one side slides down as the crust pulls apart. This is like the well know "Straight Wall", Rupes Recta. While this is the case over most of length of Rupes Cauchy, its far western end appears to be a Garben. Also at the western end are 2 collapse pits (visible as 2 black dots in the image). One is about 350m deep, the other about 450m. This compares to 65-100m depth for the nearby floor of the Garben (**see Figure 2**). Makes one wonder what the difference under the surface is to cause these pits. Perhaps they are actually collapsed sections of a lava tube. The pits are 1.75 x 4.3Km and 2 x 3.4Km. The pits are difficult visual targets but within the realm of possibility.

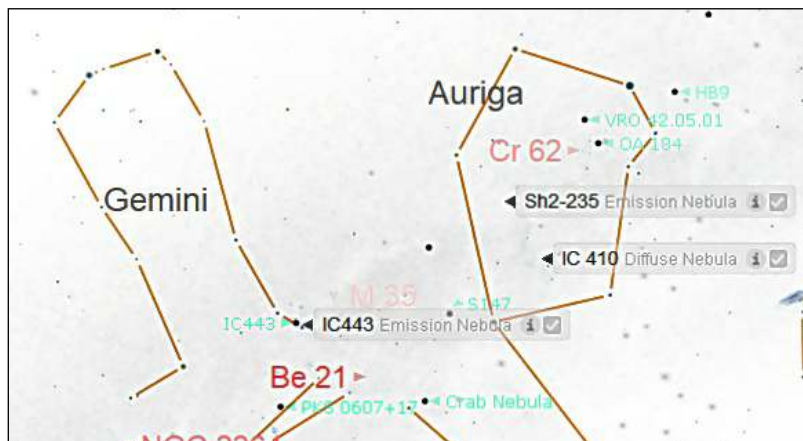
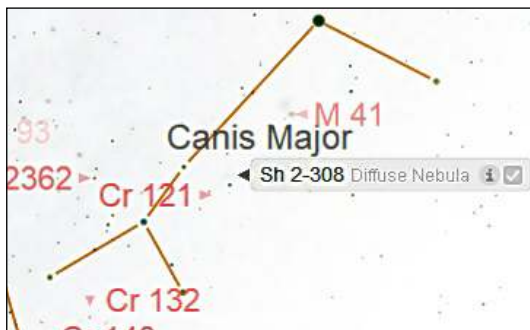
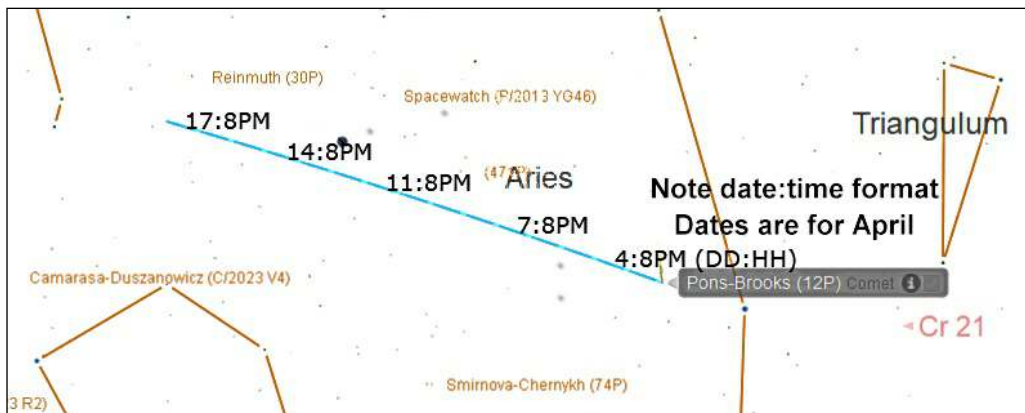
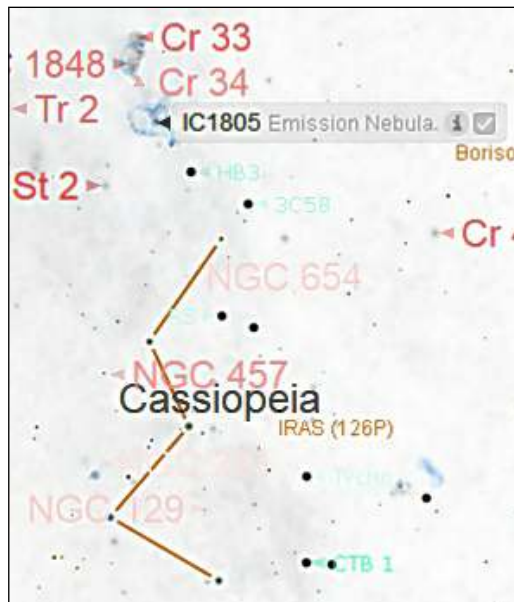
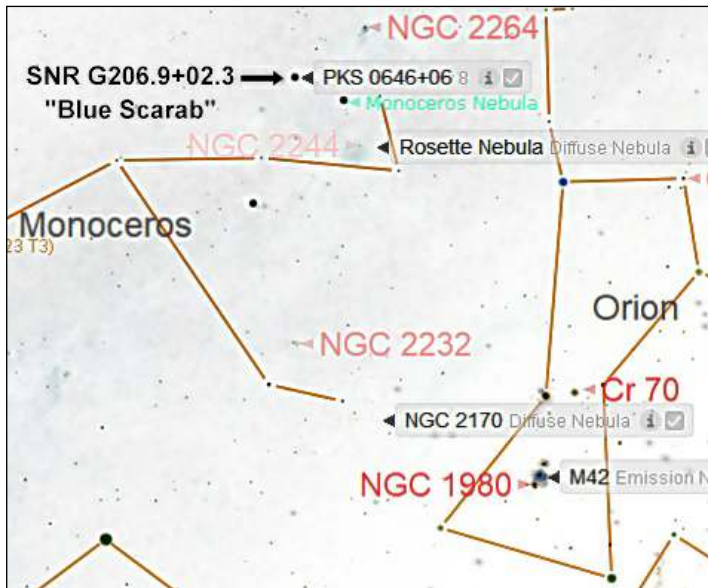
The eastern end of Rupes Cauchy (inside what looks like a ghost crater) also appears to be a Garben and has four much smaller pits. They are not obvious in the image. Three of them blend in with the fault. They are round rather than oblong like the ones at the other end. The biggest is 2.25Km (right most and visible as a small black dot in the image). This one is off-center to the Garben and looking at the profile with LROC QuickMap has a bit of a raised edge, both features indicating it may be a small crater. The others are harder to assess. Rupes Cauchy has some "discontinuities" like Rima Cauchy. It looks like a minor one in the middle of these 4 craters/pits.

OK, I'll mention 2 more lunar domes but only because you can't miss them below Rupes Cauchy. They are C2 and C3 as labeled on <https://lunardomeatlas.blogspot.com/>. They are 12.2Km and 17Km in diameter, 125m and 190m tall, respectively. C3 is below the center of Rupes Cauchy and has a textured surface. C2 is the bump to its right with a depression in the center. Both should be easy to see under good lighting.



Location Charts for the deep sky object images in this issue.

Created using Starry Night Pro 8 & Picture Window Pro 7.





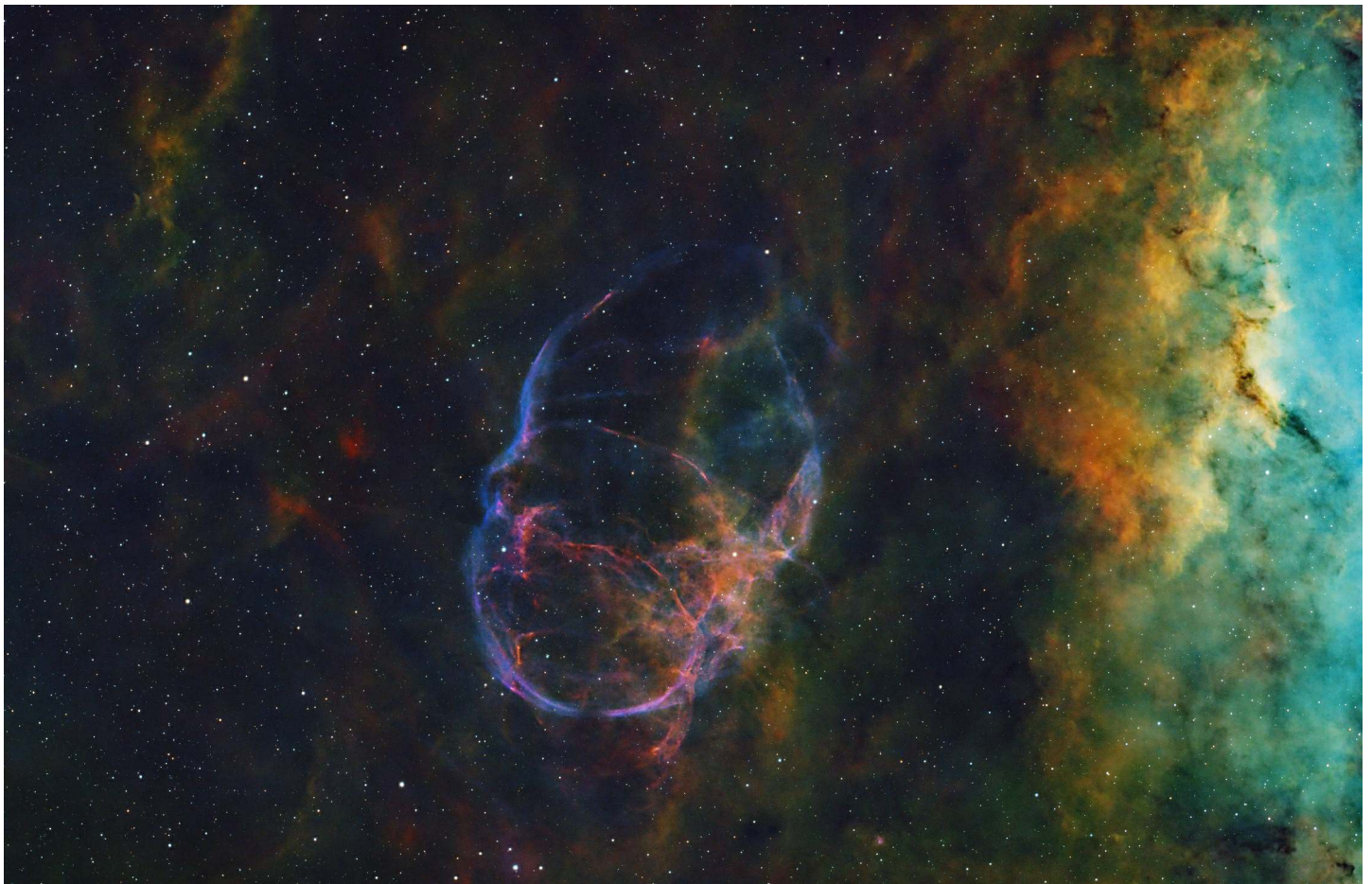
Location: 28 31'35"N 80 51'59" W  
Exposure: 30 x 120 sec  
Telescope: Askar 107PHQ  
Camera: ASI2600MC Pro  
Guide Camera: ASI290MM  
Mount: iOptron HAE43  
Tracking/capture: ASI Air Plus

**M42 (The Great Orion Nebula)**  
**By Dave Legrow**  
**Date: 31 Jan 2024**

Filter: None - it was an experiment to see if I could shoot without one, since the humidity was so low.

The glow from the neighborhood was substantially less than normal. The color is much better without a filter, and I did very little to the image. The FITS version looked better than the JPG I sent you, but it was huge.





**SNR G206.9+02.3 (I'm calling this the "Blue Scarab" since it doesn't have a name)**

**By Greg Erianne**

This extremely faint supernova remnant (SNR), currently without a name or designation (I call it the "Blue Scarab SNR") other than its galactic coordinates, is about 7,000 light-years (ly) from Earth and has a diameter of approximately 120 ly. In the image, north is up. As seen in this image, the SNR emits a very strong OIII signal with only a few strands of interlaced Ha/SII with some heavier Ha/SII emitting nebulosity at the southern tip. The SNR is located just to the west of the elbow in the Monoceros Loop Nebula (SNR), the edge of which can be seen on the right (east) side of the image. The Monoceros Loop contains the Rosette Nebula (to the east) as well as the Cone Nebula (to the north).

Capture Dates: Feb. 3-6, 2024

Antlia 3nm Narrowband H-alpha 2": 35×300s (2h 55m)  
Antlia 3nm Narrowband Oxygen III 2": 94×300s (7h 50m)  
Antlia 3nm Narrowband Sulfur II 2": 44×300s (3h 40m)  
Antlia V-Pro Blue 2": 20×60s (20m)  
Antlia V-Pro Green 2": 20×60s (20m)  
Antlia V-Pro Red 2": 24×60s (24m)

Integration: 15h 29m

Avg. Moon age:24.14 days; Avg. Moon phase:30.05%

**Equipment:**

Askar 107PHQ with 0.7x Reducer  
ZWO ASI2600MM Pro camera  
ZWO 7-position filter wheel  
ZWO AM5 Mount  
Guide Cam: SVBony SV106 60mm Guide Scope w/ ZWO ASI178MM



**M106 (NGC 4258)**  
**By Greg Erianne**

M106 is a large intermediate spiral galaxy in the constellation Canes Venatici and is about 22-25 million light-years (ly) from Earth. The dwarf galaxy, NGC 4248 can be seen at the bottom of the image. In addition, there are numerous galaxies seen surrounding M106 in this image. The edge-on spiral galaxy, NGC 4217 (not shown; 60 million ly away from Earth) is believed to be a companion galaxy to M106. One of the things that makes this galaxy very interesting is its active nucleus. Classified as a Type 2 Seyfert galaxy, it has a super massive black hole at its center surrounded by discs of material falling inward toward the black hole. As this gas heats up it emits microwave radiation that gives the galaxy two extra arms visible in light images (not shown in this image) as wisps of gas oriented perpendicularly to the main (star-forming) spiral arms. There's a beautiful image of these energetic gas arms here- <https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-messier-catalog/messier-106/>. Additionally, M106 contains two supernovae, SN 1981K and SN 2014bc.

Capture Dates: March 7-8, 2024

Celestron EdgeHD 800 (native fL of 2032mm; f/10) with Celestron OAG and ASI174mm mini guide camera  
ASIAir Plus, ASI2600MC main camera, ZWO AM5 mount, ZWO 5-position filter wheel

Antlia Triband Ultra RGB (Broadband) filter [123 x 300s = 10h 15m]  
Antlia ALP-T 5nm Dual Narrowband Ha/OIII filter [4 x 300s = 20m]  
Luminance (UV/IR cut ASI2600MC) [60 x 60s = 1h]  
Total Exposure: 11h 35m

Processed with PixInsight and Adobe Photoshop.



**12P Pons-Brooks 2023**  
**by Terri Zittritsch**

This is 12p/Pons-Brooks23 taken on 3/12. It was a beautiful night but still lots of light dome over Burlington. I shot this with an Astro-Physics Stowaway on an Astro-Physics Mach2 mount. I used an ASI2600MC OSC camera without guiding. I took 90 second exposures over almost 2 hours with the comet starting at an altitude of 21 degrees, going down to about 8 degrees. This is using most of the images except for the last few which ended up in trees. It was tricky setting up the mount to get the longest integration. The comet doesn't move that much versus the stars, but does move, so needed to process in comet format. It does have a lot of noise which is a bugger to get rid of in the tail without killing the tail. In the first version of this image I made the background very dark due to noise there. In this version I made the background a bit brighter without letting noise come though.



**The Dolphin Head SH2-308, RCW 11, LBN1052  
by Terri Zittritsch**

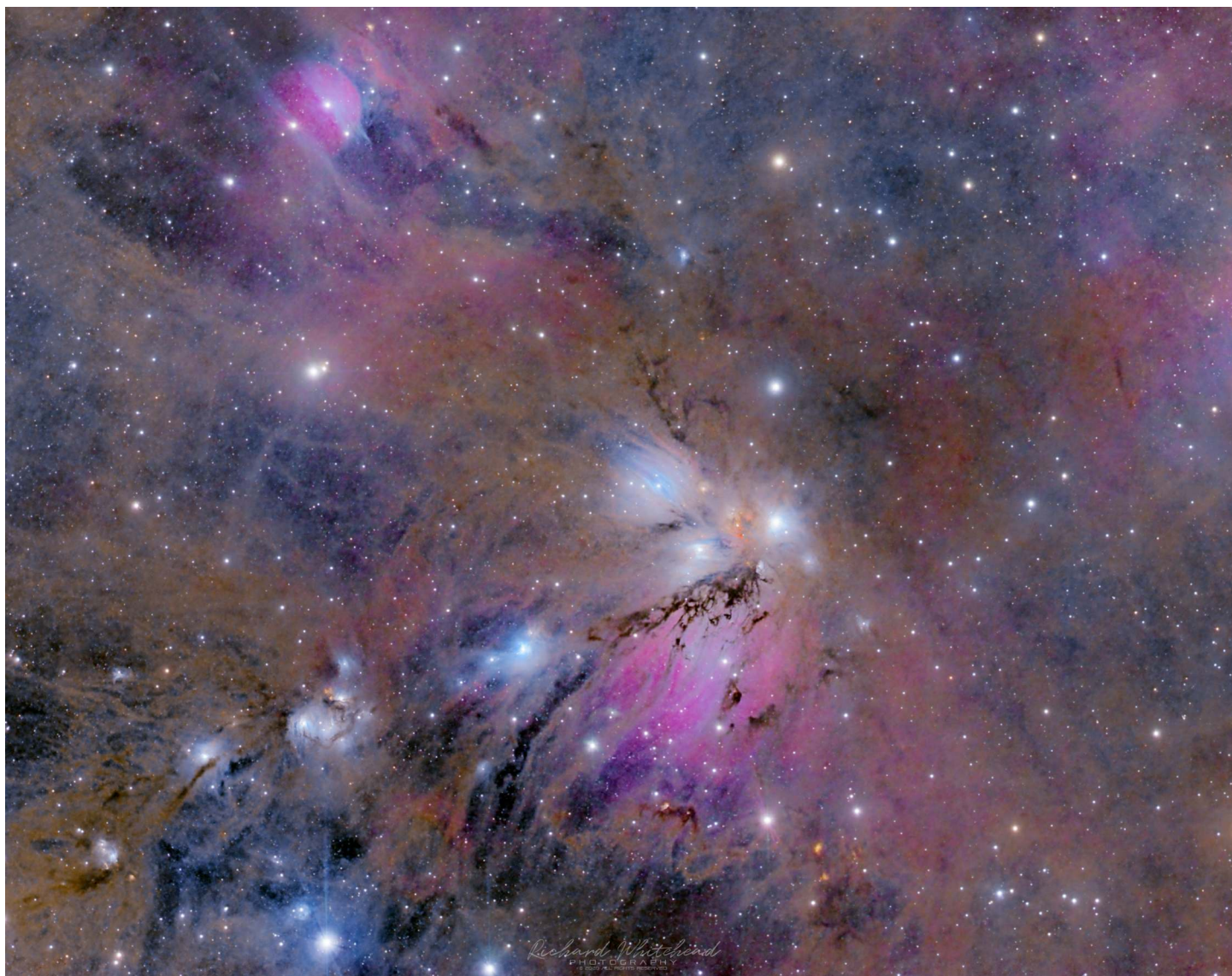
I captured this over February and a couple nights in March. It's so low, only getting up to around 21 degrees and quickly dropping back down. I'm surprised I got anything as I imaged from 21 degrees down to 13!

I shot this with a TEC140 with AP flattener at 1040mm f.l. The camera is an ASI6200 mono camera with Chroma filters. I shot the nebula in OIII and Ha and got about 200 minutes of OIII in 10 min subs 100 minutes of Ha exposure in 10 minute subs, then captured 30 minutes of R, G and B for stars in 2 minute subs.

The Dolphin head is an interesting object which shows mostly in OIII, but with a lot of Ha, I think I could get a big more red inside of the bubble. It's also a bit difficult to process given how dim it is. Most of my OIII was taken during moonshine, and this significantly hurt the contrast. I had to do a lot to get much this out of it.

The Dolphin Head nebula surrounds a Wolf-Rayette Star named EZ Canis Majoris [a little above center, if you zoom in you can see a small oblong object, that's where it is]. The Wolf-Layette star is devoid of hydrogen at its surface and someday may go super-nova and obliterate the nebula. The nebula formed around 70,000 years ago when EZ Canis Majoris threw off it's outer layers revealing inner layers of heavier elements. Fast stellar winds blowing at 1700km/s from the star create the bubble shaped nebula as they sweep up slower moving material from an earlier phase of the star's evolution. The nebula is approximately 60 ly across. They call this an HII region, but the hydrogen emissions are much less than the OIII I pick up with my filters. I assume that the oxygen is part of the heavier elements being swept up.

Besides the OIII in the Dolphin Head, there is quite a bit of OIII and Ha scattered across the image in the background, but the OIII dominates. If I get a bit more data I may try to bring out more.



**Angel Nebula in Monoceros (a deep view)**

**By Richard Whitehead**

The Angel Nebula and the dust clouds of Monoceros contain many interesting deep sky objects, principally NGC 2170 which is often interchangeable as a name. NGC 2182, NGC2167 can also be seen in this deep, wide field shot. I also wanted to include VdB70 which is the red disk seen at the top left in this image.

Tech stuff:

Telescope Takahashi FSQ 106 EDX4

Mount A-P 1100 GTO AE

QHY 600 camera and QHY Filter wheel

Chroma RGB Filters

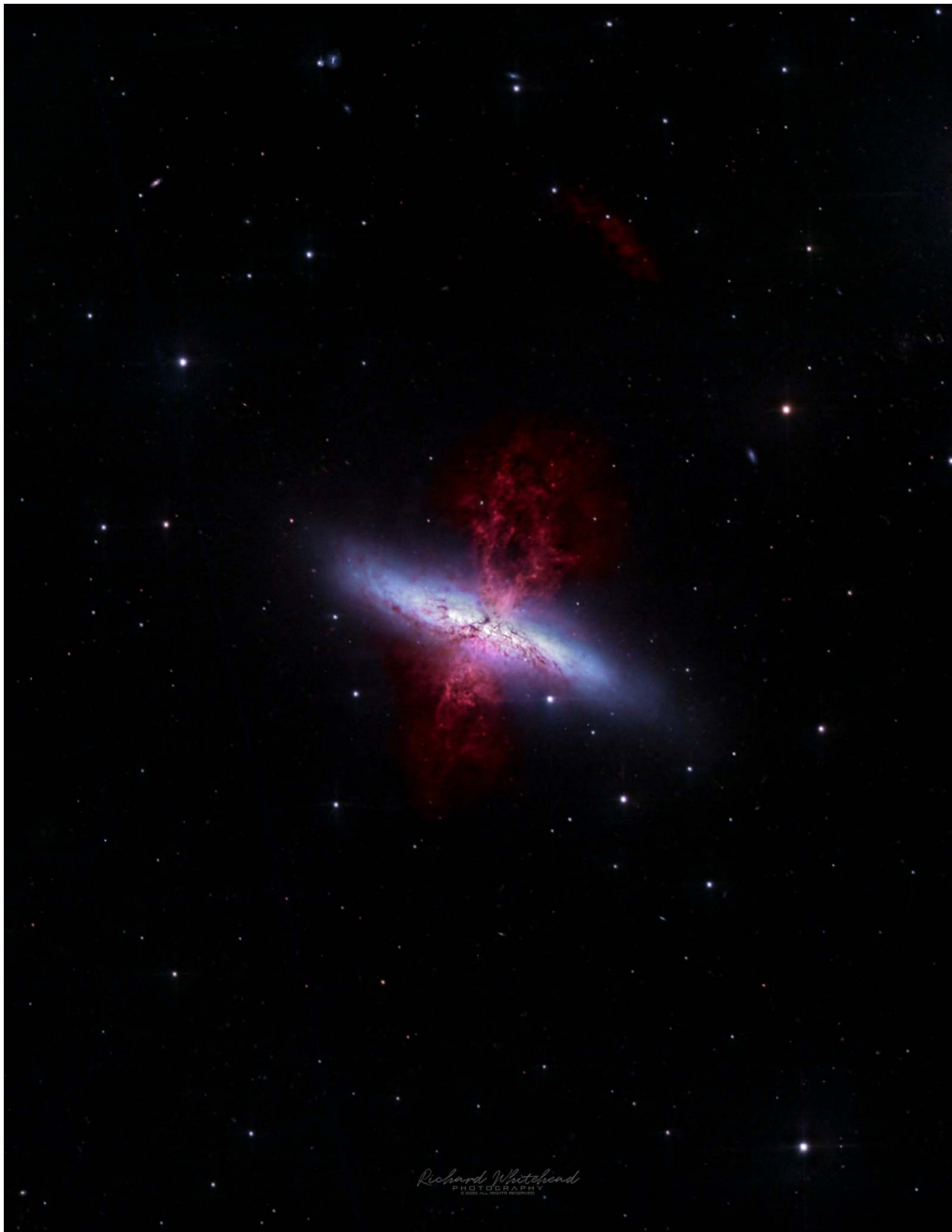
Nitecrawler Focuser

Eagle 4 Pro computer

Red 15 x15 min, Green 12 x 15 min, Blue 16 x 15 min

Location : Animas , NM, USA

Processed in Pixinsight and Photoshop



### M82 take 2 showing "The Cap"

By Richard Whitehead

I'm continuing to collect more Ha data but while I'm doing that I realized there was much more faint detail in the H2 areas, the red tendrils extending outwards from the core of this fascinating starburst galaxy. So had another process in PI and PS.

This is wider view than the previous post showing some interesting objects in the frame.

Towards the top of the image you can see a flat elongated area of Ha emission. This is called "The Cap". There is some interesting research out there what exactly this is.

The Cap is actually very distant from the Galaxy core ( about 11 Kiloparsecs)

Some possible candidates are Supernova remnant , part of the red tendrils extending continuously from the core of the galaxy but most likely is the interaction of the super wind pressure with some preexisting dust and gas cloud.

Super winds can travel at several thousand kilometers per second !

Also of interest in this image ( which is a slight crop) are many distant background galaxies , some quite obvious ,

hundreds of light years distant and top left are some members of a galaxy cluster around 3 billion LY away, more than half the age of the earth.

Tech stuff:

Planewave CDK14 f/7

L350 mount

aRGB image

R 48x 5mins

G 50x5mins

B 46x 5 mins

Ha 48x20 mins

Location : Animas , NM, USA

Processed in Pixinsight and Photoshop



**Heart Nebula**

**By Michele Hernandez-Bayliss**

This contains only part of the Heart Nebula.

Takahashi 5" 130 TOA-130NFB telescope

Astrophysics AP 1100goto mount on Sky Shed Pod Pier/Sky Shed Pod Dome

ZWO ASI2600MC Pro camera

ZWO ASI220MM guide camera with large OAG (off axis guider)

ZWO ASIAir Plus (computer)

ZWO EAF (electronic automatic focuser)



**The Tadpole Nebulae (part of IC410, a star nursery)  
By Michele Hernandez-Bayliss**

The Tadpoles are the whitish features on the right side of the blue region.

2 nights of dual narrowband imaging for approx. 7 hours total.

Takahashi 5" 130 TOA-130NFB telescope

Astrophysics AP 1100goto mount on Sky Shed Pod Pier/Sky Shed Pod Dome

ZWO ASI2600MC Pro camera

ZWO ASI220MM guide camera with large OAG (off axis guider)

ZWO ASIAir Plus (computer)

ZWO EAF (electronic automatic focuser)





**Sh2-232 (Great Pumpkin) with Sh2-235, Sh2-231, Sh2-233, and PK173+03.1**

**By Greg Erianne**

Sh2-232 (Great Pumpkin Nebula) in Auriga is a very interesting target. There 3 other nebulae in the frame (Sh2-235, Sh2-231, and Sh2-233; ordered from closest to Sh2-232 to the farthest away), as well as a planetary nebula (PK173+03.1) near the center of Sh2-232 (the orange “star” left of the brightest star in the center). There also is a miss classified planetary nebula, PK173+02.1 (a tiny faint patch of nebulosity just visible if you zoom in enough) just to the left and down slightly (~8:30 position) from Sh-235, but it now appears to be an HII region (Sh2-235A) associated with Sh2-235. Sh2-232 itself has some nice dust lanes in it as well. Processed in the ‘Pumpkin’ palette.

Capture Dates:Feb 19-20, 2024.

Askar 107PHQ w/0.7x reducer, ASI2600MM camera

Nebula Filters: Antlia 3nm (1h 25m), O (15m) narrowband filters (total 1h:40m integration).

RGB Stars Filters: Antlia V-Pro R (10m), G (10m), B (10m) (total 30m integration).

Processed in PixInsight

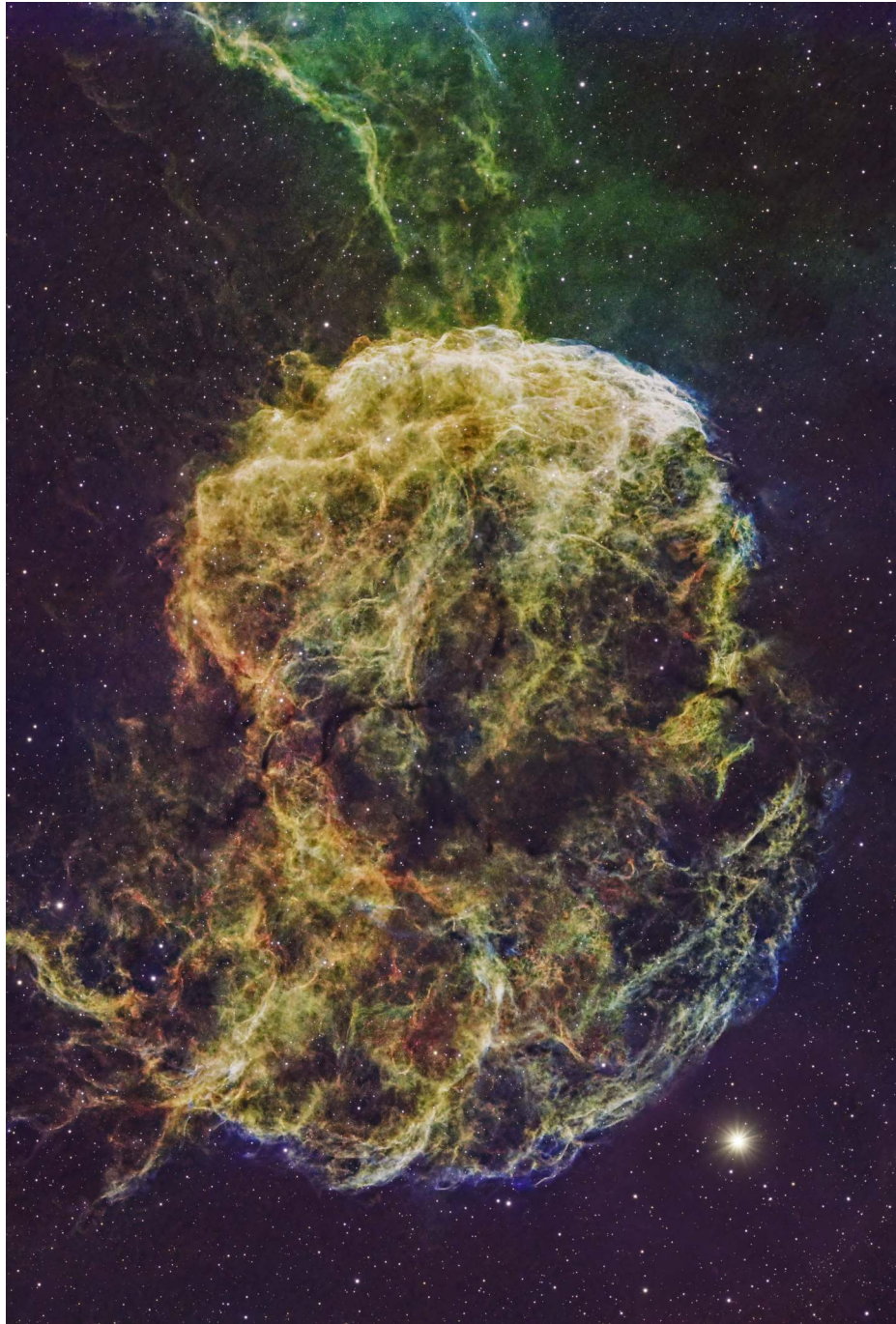


**The Tadpoles (in IC 410)**  
**By Terri Zittritsch**

Here are the tadpoles in mostly Ha. I've captured a good bit, several hours, of Ha data but my OIII data is mostly lousy due to moonlight and haze, no SII or RGB is included as the data I have is just too poor and would degrade the image. Hope to get a clear night before it goes away to finish the job. But here it is, in an HOO palette and I'm pleased quite with the Ha. Although this doesn't look the same as it does in pixinsight or even photoshop in TIF format. This is the first time I've noticed that creating a JPG really makes the stars stand out more due to the pixelation. I've muted the stars a bit in the bigger image, but even without the transformation, the stars in either XISF or TIF are much less prominent. I did small de-emphasis to try to lessen the effect, but the stars still stand out much more than in the uncompressed formats. Wondering if something has changed in photoshop causing this. Going to try some experiments on-line to see if I can figure this out.

To image IC410 I used a TEC140 with AP field flattener, ASI6200MM camera with Chroma 3nm Ha and OIII filters on an unguided Astro-Physics 1100GTO mount. Ha and OIII images were 15 minutes each.

About IC410: An area of faint nebulosity approximately 12,000 ly away and 100 light years across. IC410 and it's associated star cluster NGC1893 is a great astrophotography target for the winter months. The gas clouds have been sculpted by the stellar winds caused by radiation from the NGC1893 star cluster. The 'tadpoles' are created when some of the denser gas in the central area of the nebula is driven away by the radiation from the star cluster and creates the streamers, or tadpole tails. The tadpole tails are 10ly long so these tadpoles will make some incredibly large frogs! This nebulous area is fairly young at an estimated 4M years old.

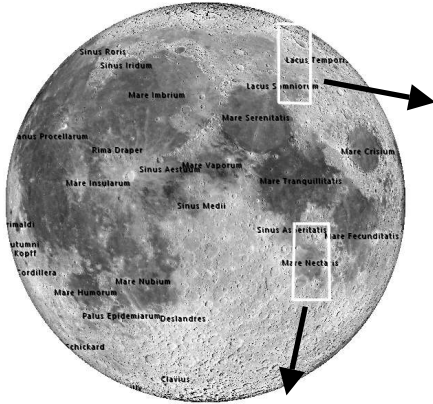


**The Jellyfish Nebula (IC 443)**  
**By Michele Hernandez-Bayliss**

This is a supernova remnant in Gemini. About 5,000 ly from Earth. The supernova is estimated to have occurred 30,000-35,000 years ago.

Takahashi 5" 130 TOA-130NFB telescope  
Astrophysics AP 1100goto mount on Sky Shed Pod Pier/Sky Shed Pod Dome  
ZWO ASI2600MC Pro camera  
ZWO ASI220MM guide camera with large OAG (off axis guider)  
ZWO ASIAir Plus (computer)  
ZWO EAF (electronic automatic focuser)

Locator Map



Adapted from the Virtual Moon Atlas

Mare Frigoris, Endymion, Lacus Temporis, Atlas, Rima G Bond 2024-01-15, 22:33 UT  
 Lunation: 3.94 Colongitude: 321.6 deg Sub-solar Lat: -1.5 deg  
 10" f/5.6 Newt @ 3946mm efl, (Meade 2", 2x Barlow) (0.19"/px org. image)  
 Canon T7I, HD video @ 3x digital zoom, 1/125 sec @ ISO 3200  
 Stack- 14% of 9038  
 Paul Walker, Middlebury, VT, USA, paulwaav@together.net



Mare Nectaris (East), Rimae Gutenberg, Gutenberg , Bohnenberger, Fracastorius  
 2024-01-15, 22:53 UT  
 Lunation: 3.96 Colongitude: 321.8 deg Sub-solar Lat: -1.5 deg  
 10" f/5.6 Newt @ 3946mm efl, (Meade 2", 2x Barlow) (0.19"/px org. image)  
 Canon T7I, HD video @ 3x digital zoom, 1/80 sec @ ISO 3200  
 Paul Walker, Middlebury, VT, USA, paulwaav@together.net



Large Sunspot Group, #3590, 2024-02-27 11:20 EST (16:20 UT)  
 10in f/5.6 Newtonian, 3.39 x prime, 3x digital zoom (4765mm efl)  
 1/1600s @ ISO 1600, 10% of 9200 video frames





## NASA News

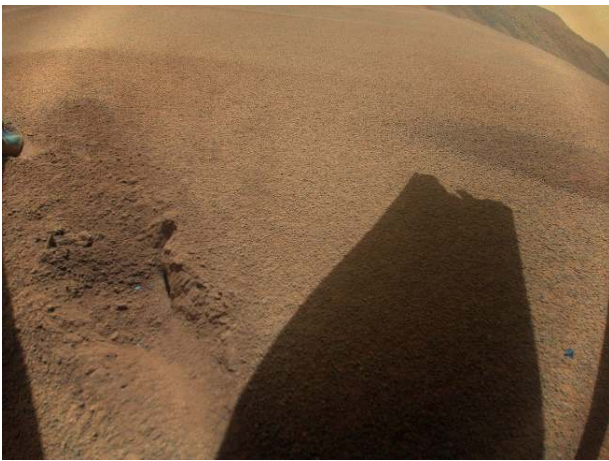
## Space Science Roundup

--by Scott Turnbull, VAS Member and Solar System Ambassador volunteering for JPL/NAS

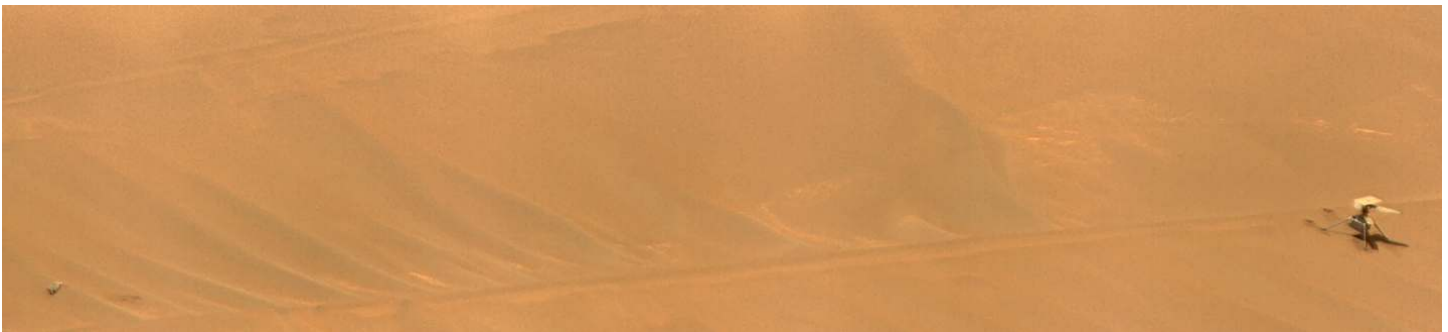
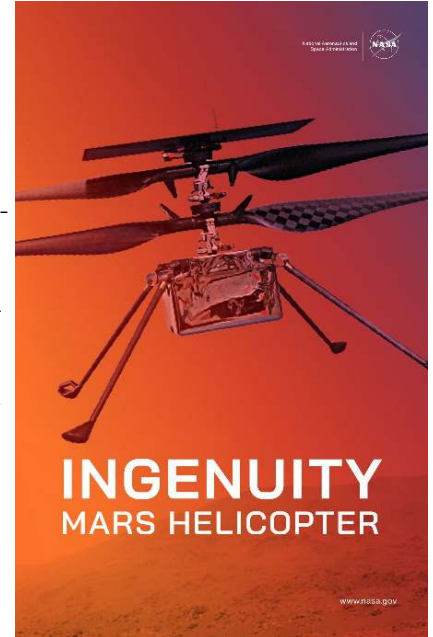
### The Last Flight of Ingenuity

After completing 72 flights covering 17km over nearly 3 years the Mars Mission 2020 Helicopter, better known as Ingenuity, has flown its last flight plan.

On Jan. 18, NASA's Ingenuity Mars Helicopter executed its 72nd flight at the Red Planet. The flight was designed as a quick pop-up vertical flight to check out the helicopter's systems, following an unplanned early landing during its previous flight. Data Ingenuity sent to the Perseverance rover during the flight indicates it successfully climbed to its assigned maximum altitude of 40 feet (12 meters). During its planned descent, communications between the helicopter and rover terminated early, prior to touchdown.



On Saturday, Jan. 20, communications were reestablished between Ingenuity and NASA's Perseverance rover. The Ingenuity team determined the helicopter was power-positive and sitting vertically on the surface. After downloading imagery from Ingenuity, it was determined that at least one rotor had been damaged, presumably by impact with the terrain. See figure at left.



Perseverance Rover captured a mosaic image showing the damaged Ingenuity Mars Helicopter and a piece of damaged rotor flung off of the aircraft

The cause for the communication dropout and subsequent rotor damage continues to be investigated, but Ingenuity has flown its last mission. The Remote Microscopic Imager (RMI) camera aboard NASA's Perseverance Mars rover took a mosaic of images that included Ingenuity. The images of Ingenuity, showing a missing rotor blade, were taken on Feb. 24, 2024, the 1,072nd Martian day, or sol, of the mission. See figure above. The mosaic shows the helicopter at right, standing at an angle near the apex of a sand ripple. About 15 meters to the west of the helicopter's location a large portion of one of the helicopter's rotor blades lies on the surface. The Ingenuity team is considering a theory that the blade detached after the rotorcraft impacted the Martian surface at the conclusion of the helicopter's 72nd and final flight.

For additional information:

<https://mars.nasa.gov/technology/helicopter/status/>

<https://mars.nasa.gov/technology/helicopter/#Helicopter-Highlights>

**Services**

**Planetarium Shows**

There's a planetarium in Williston! The Planetarium Lady's immersive Digitarium planetarium dome is a great introduction to sky viewing. This immersive experience builds familiarity with sky objects and the stories and science that surround them.

Learn more about this experience at [www.theplanetariumlady.com](http://www.theplanetariumlady.com).

**Light-duty Machining**

Need more precise drilling and shaping than hand tools can provide? Custom machining of brackets/adapters and modifications to existing hardware for astronomy purposes. Or just want the results to be aesthetically pleasing?

Nominal fee (~\$10 - \$50 depending on size and complexity).

I have a mini milling machine and a mini lathe for metal working.

Paul Walker 802-388-4220 or [paulwaav@together.net](mailto:paulwaav@together.net)

**Wanted**

**For Sale**

Copies of "Mirror Mirror" - A History of the Human Love Affair with Reflection by Mark Pendergrast of Colchester, Vt. available for \$25. Mark will split the profits with VAS.

Contact Mark at [markp508@gmail.com](mailto:markp508@gmail.com) or see Jack St. Louis at any monthly meeting.

**VAS Surplus Items**

All items stored in Bob's Hut at the Hinesburg Observing Site

**4.5" F/8 Meade 4504 Newtonian Reflector** with rings, no mount.  
**Your's for a donation of \$40.**



**6" F/8 Newtonian Reflector**, Dobsonian mount not included, tube separates into two pieces.

**Your's for a donation of \$25.**



**6" F/8 Criterion Dynascope** Newtonian Reflector, no mount  
**Your's for a donation of \$40.**



Jack St. Louis 802-857-5049 or [jack.st.louis@comcast.net](mailto:jack.st.louis@comcast.net)

**Celestron Evolution 9.25" SCT.** This is being sold with the bundle as originally purchased from Highpoint Scientific. Excellent condition. I'm helping a friend sell this that is in failing health and is unable to use it. Has been used 5 or 6 times at the most.

- 9.25" F/10 OTA
- Single arm mount with GoTo and wifi, can be controlled with the included hand controller or a phone/tablet app.
- Red dot finder
- Heavy duty tripod
- AstroZap dew shield
- Celestron Eyepiece and filter kit

**Extras:**

- Homemade heavy duty tripod dolly
- Revolution Imager 2 with the optional DVR.

**Asking \$2100.**

Also available is a heavy duty (homemade) tripod dolly – \$175.00

Pick up near Rutland, VT

Patrick Porch 802-236-2463 or [pcwizard2600@gmail.com](mailto:pcwizard2600@gmail.com)

**VAS Surplus Items**

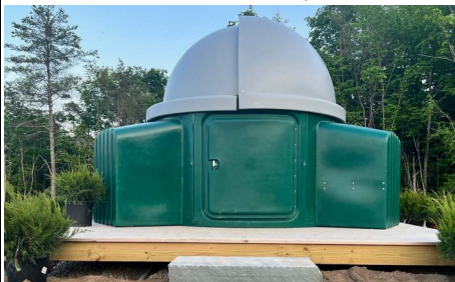
All items stored in Bob's Hut at the Hinesburg Observing Site

**TraQ Model 545 F/15 Refractor** Telescope with equatorial mount  
**Your's for a donation of \$20.**



Jack St. Louis 802-857-5049 or [jack.st.louis@comcast.net](mailto:jack.st.louis@comcast.net)

**Almost New Sky Shed Pod**  
4 bays, 2 shelves and \$500 vinyl cover. Green with Gray dome



I love my Sky Shed Pod - green with gray top. But I'm adding a second pier so I'd love to sell to someone who could pick it up in Vermont after May 1st. That way you wouldn't have to take it all apart. Would prefer someone local to Vermont/NY/NH or Canada who could pick it up and shipping is too complicated.

**Make me an offer!**

Michele Hernandez-Bayliss  
[hernandezcollegeconsulting@gmail.com](mailto:hernandezcollegeconsulting@gmail.com)

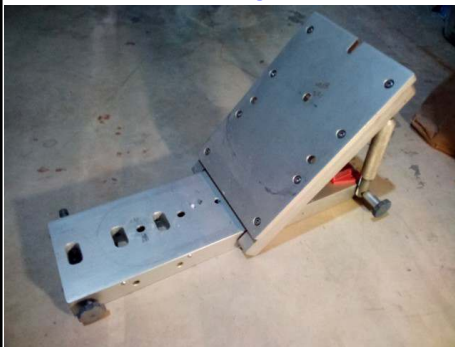
**Heavy Duty Equatorial Wedge For Schmidt-Cass Telescope**

Used with a 14" SCT.

Paid \$360 for them some years ago.

**Asking \$155 or best offer.**

Al Boudreau at  
[boudreaualbert651@gmail.com](mailto:boudreaualbert651@gmail.com)



**VAS Surplus Items**

All items stored in Bob's Hut at the Hinesburg Observing Site

**GO TO altazimuth mount - Celestron Nexstar GT**  
120 volt AC power adapter, has a printed operators manual.

**Your's for a suggested donation of \$25.00.**



**Galileo telescopes with tripods**  
**Your's for a suggested donation of \$20.00 each.**



**Meade Polaris Model 114EQ-D**, with 3 eyepieces: 25, 12 & 4 mm, 3x Barlow but all are .965" barrels. The F/8 mirror seems in great shape.  
D = 114mm, FL = 910mm.

**Yours for suggested a donation of \$50**

Jack St. Louis 802-857-5049 or  
[jack.st.louis@comcast.net](mailto:jack.st.louis@comcast.net)

**Altair 72 EDF telescope, iOptron CEM25P mount, eyepieces and accessories.**



Celestron XL Series 1.25" eyepieces:

7 mm

5mm

Barlow

Altair Altra Flat eyepieces:

10mm

Altair Lightwave 1X Field Flatteners

Altair GP-CAM, 1.25" USB camera

Celestron Power Tank

**Asking \$1700.**

Cell contact, 802 598 1886  
[senffleberfritz@yahoo.com](mailto:senffleberfritz@yahoo.com)  
Fritz Senffleber

**William Optics 15.7" Losmandy-Style Dovetail Plate**



This was a donation and is being sold to benefit the club.

**Yours for a suggested donation \$40**

Contact Terri Zittritsch at  
[theresamarie11@gmail.com](mailto:theresamarie11@gmail.com)