Morning Star

Winter 2025

Newsletter of the Vermont Astronomical Society

*** Club Info ***

Announcements

Check out our Member Forum on our website (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 (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

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**

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

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.

Connect On-line

www.vtastro.org
Twitter@VTAstroSociety
Facebook.com/Vermont-Astronomical-Society-113053818706458/
Email: info@vtastro.org (Goes to the President and Secretary)
webmaster@vtatro.org
(Goes to Secretary and Webmaster)

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October-December 1985 newsletter
(39 years ago)
Cover artwork by Russell Chmela.

39 years ago excitement for Halley's Comet's return was building. The number of telescopes grew at our Williston site with, among others, Russel Chmela's Meade DS-16 (16" f/4.5 Newtonian on an equatorial mount) installed in a modified 10'x10' metal storage shed (the property is now owned by member Carrie Cruz and the main observatory building re-purposed with a portable planetarium).

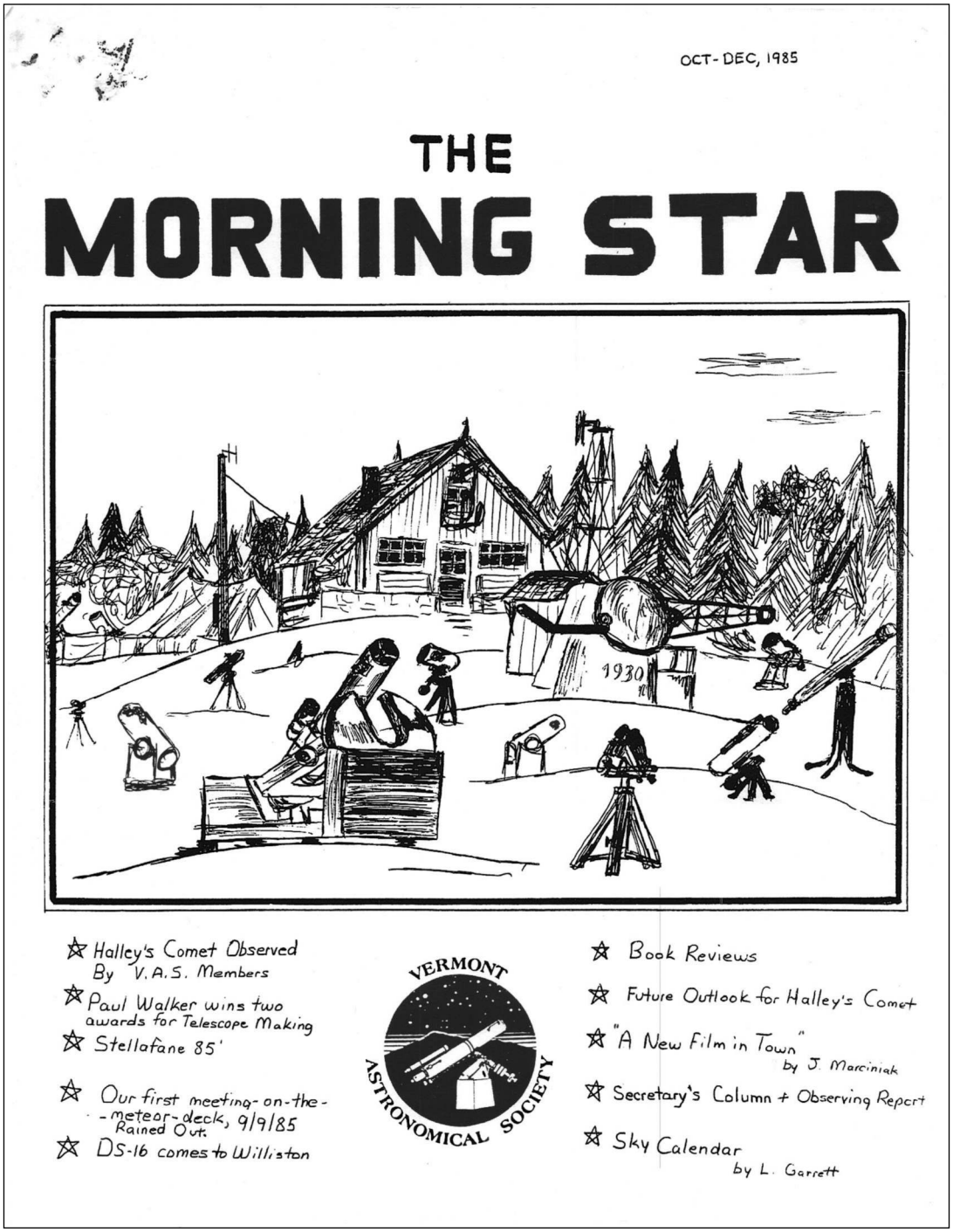
Read Gary Nowak's notes and comments from that year's Stellafane and find out who finished building telescopes that year with one entered into and winning ribbons in the Stellafane competition.

In Gary's write up on Halley's Comet find out who were the first in Vermont to observe it and who was the first member to photograph it.

Cover artwork by Russell Chmela.

To read the October-December 1985 newsletter, use this link:

https://drive.google.com/file/d/1oz21xt9QBRIPe2BtMDSesWpuyMdmR3AE/view?usp=sharing



October 17 UVM Space Club Star Gazing Event at UVM

Thank you to everyone who came out to support the October 17th Space Club Stargazing event at the UVM Redstone campus last week. We had 8 members in attendance; Jack St. Louis, James Bosek, Joseph Comeau, Peter Chapin, Chris Belanger, Sonya Rectenwald, Tanis Sheehan, and yours truly [Terri Zittritsch]. There was a huge crowd, live music and snacks and the longest lines behind telescopes that I've experienced. The highlights of the night were the Comet Tsuchinshan-ATLAS and Saturn, both beautifully presented. It was a fun time! I didn't take images of the crowds until the end of the night when it slowed down a bit, so people were wandering away by then, but still lots of people hanging around.

Contents

Scott and Jim on the Radio
Listen to Scott Turnbull's or Jim Bosek'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

Depending on the type, some events are listed on our website (vtastro.org) and Google Calendar-(https://calendar.google.com/calendar?cid=Nzc5dnQ1bnZrN2ljcDA2NG9vbXFnczI1M2NAZ3JvdXAuY2FsZW5kYXIuZ29vZ2xlLmNvbQ)

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.

Typically 2nd date is a rain date only

If you are trained for gate/site access and 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 or 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

New Members

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

David Walsh
Susan Wallis
Sonya Rectenwald

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.

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.**

January 6

2024 VAS Wrap-up
by President Terri Zittritsch

1) Eclipse
2) Aurora wide spread on multiple occasions
3) Comet 2023/A3 Tcuchinshan-Atlas
4) Solar Maximum

AND

So, You Want to be an Astronaut
By Cale Shipman

There might be many reasons to resist that thought. Captain Kirk aside, space travel is not for sissies.

Feburary 3

Unusual Things of the Cosmos
by Al Boudreu

Each day astronomers are discovering truly strange things about our universe and the objects in it. This talk looks at strange objects, including neutron stars, cannibal stars, comet and as-

teroids, methyl alcohol clouds, and the Kuiper Belt.

March 3

Exoplanet Research- History, Discoveries, Current Trends and Direction.
by Bridget Kimsley

Bridget Kimsey will be leading a talk and discussion stemming from some of her time spent on an exoplanet research team, while working on her MS degree.

Bridget is an author, researcher, and consultant- https://bridgetkimsey.com and is a current PhD student.

She is a solar system ambassador for NASA/JPL and will be including material from NASA/JPL for this talk and discussion. Please bring questions.

Articles

None

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 skyteller of the first kind, bringing you tales from different cultures as we look at the stars through the eyes of historical imaginations.

~Carrie Cruz

The Pleiades (Messier 45) star cluster can be viewed from the North Pole all the way to the southern hemisphere, past the southern tip of South America and is recognized in many ways by many cultures from north to south. The name "Pleiades" comes from the Greek word for "sail" as its appearance in the morning spring sky marked the beginning of sailing season. Meanwhile, in Greek mythology, the star cluster is known as the Seven Sisters, daughters of the Titan Atlas, turned into stars by Zeus to protect them from Orion. The Vikings call this asterism within Taurus "Freya's Hens." In Polynesia it is known as Matarii or "little eyes"—once a single star that broke into six pieces during a battle. In Finland, stargazers saw a net. (In Tolkien's The Hobbit, they were called "netted stars.") Andean cultures called them "The Storehouse" as their appearance in the morning sky (in May) coincided with harvest time. In Japan, the star group is called "Subaru," meaning "gathered together." The Subaru car company was named when 5 smaller car firms merged into a larger 6th corporation. (Have you noticed the logo?)

Galileo was the first to look at the Pleiades with a telescope. With his naked eye, Galileo, like most people, saw 6 stars in the grouping. But using his telescope, he chronicled 36 stars in the group in a sketch published in 1610. Today we know the cluster has thousands of stars.

There are many stories of the Pleiades from around the world and there are ample North American indigenous tales about the Pleiades, from the Blackfoot Lost Boys to the Inuit Great Bear, but my personal favorite comes from the Kiowa.

Before the Kiowa moved south, they were living near a stream in the far north where there were many, many bears. One day, seven little girls were playing a bit away from the village when suddenly a group of bears began to chase them. Terrified, the girls ran towards home for help. As they were running and shouting, the bears got closer and closer until they were just about to catch the girls. The children jumped on a low rock, about three feet high. One of the girls prayed to the rock, "Rock take pity on us; rock save us!" The rock heard them and began to grow upwards, pushing the girls higher and higher. When the bears jumped to reach the girls, they scratched the rock, broke their claws, and fell on the ground. The rock rose higher and higher, and the bears kept jumping and scrabbling to get to the girls. The rock rose and rose and rose until it was pushed up into the sky, with the girls on top. And this is where they are to this day; seven little stars in a group, high up in the sky. When the people came to look for the girls, they found the great big rock that had grown like a tree with the bears' claw marks, and broken bear claws all around the base, turned to stone. In the middle of winter nights, the seven stars are right over this high rock. Today, we call this rock Devil's Tower.

The Kiowa call this rock "Tso-aa", a tree rock, because it grew tall like a tree.

Board & Committee Meetings

October
Board Meeting

AGENDA:

1) Review and accept minutes
2) Outstanding action items:
   - 2a Club swag
   - 2b. Open positions
   - 2c. CD for funds
   - 2d. Using GMAIL for officers emails and securing NP Google space for storage and getting outlook account.
   - 2e. Web site enhancements - images from outreach events, club bylaws posted
   - 2f. Installing 150mm scope and training on teaching dome.
   - 2g. Accepting electronic funds.
3) Quick discussion on Astroscan scope in recycled optics program. Whether to use it in our recycled optics program or allow it to be donated to a southern Vermont library in Rons Lewis's honor?
4) Continued discussion on education sessions, how we might bring newer members up to speed on the basics of astronomy so they can better appreciate the monthly meetings and not feel intimidated

5) Continued discussion on membership and whether we should eliminate 2 tiered membership and what needs to be touched in the bylaws, other implications such as level of dues, etc.

NOTES

1) Reviewed Sept. Board Minutes. Scott moved that we accept the minutes as-is. 2nd by Joe. Passed

2a) Jim's wife would prefer to work with local vendors for creating swag. We are interested in getting patches and T-shirts. It was noted that baseball caps are not as popular with amateur astronomers as the visors interfere with looking into the eyepiece.

2b) Sonya Rectenwald has started as our Outreach Coordinator. To help get her started, Terri suggested that we have her reach out proactively to entities we have worked with before using the on-line records of events. When we do events for libraries with Library Loaner Scopes we should highlight those scopes during the events.

2c) Terri transferred $12,000 to a 7 month CD. Also had a 2nd meeting with a bank rep about electronic banking for collecting dues and donations. She found it would cost ~$200/year + 3% per transaction and an additional fee of $36/month if we did not meet the required minimum monthly transactions. Assuming we would not meet the monthly minimum and not counting the 3% fee the cost would be $632. The 3% fee, assuming all dues and donations were electronic would add ~$50.

2d) We use Gmail for officer emails. Gmail accounts can have up to 5 email addresses, which will cover all the officers. This will also decouple officer email accounts from the Spam related issues with the VAS emails connected to our domain name. We still need to look into subscribing to MS Office for the club's laptop.

2e) Scott has updated the main page on our website, adding pictures from recent events. He will put the bylaws on the website.

2f) Terri and Keith will install the APO scope in the dome. Need to change the access code. Paul will produce instructions for using the dome, mount and scope.

3) Keith recommended we trade the donated Astroscan for some eyepieces from Ron Lewis's collection. The other board members agreed.

4) Keith offered to head up a group to work out a details for a series of training for members looking to learn more about the basics of astronomy.

5) Combining Associate and Full membership has been discussed at a number of meetings. It was suggested we are probably ready make the decision. All agreed to move ahead with the 1 membership and start the process of changing the by-laws to accommodate this.

Round Robin:

Bob- Contacted one vendor that carries encoders for the 18" Obsession but they have been slow to respond. He will soon contact Obsession Telescope directly.

Keith - The Library Loaner Scope group, associated with the Astronomical League, is working on a new source for the telescopes. The cost of the scope will probably be less than $400.

Joe- He is having an ad hoc stargazing event on Isle La Motte on November 7th. He's happy to have help. He's been taking wide field constellation images to use in a presentation at the event. It will be very informal. The location is at the town offices.

Jim- He may be picking up a donation of a telescope from the Montpelier area. Jim has a 6" Dob with a whole bunch of accessories that was given to him. He knows someone who may be interested in it.

Paul- There are Member and Invited Guest observing events scheduled for November 1st or 2nd and for November 22nd or 23rd. He will also schedule at least a couple work parties for cutting the brush at the Hinesburg Observing Site.

Scott- He found out that the Library Loaner Scope at the Essex Town Library was not working right. Someone had taken the eyepiece out and disassembled it apart and contaminated internal lens surfaces.

November
Board Meeting

AGENDA:

1) Review and accept minutes
2) Outstanding action items (Quick report from AI owners)
   a) Secure training logs from Jack (Terri)
   b) Purchase of digital setting circles (Bob)
   c) Purchase of Swag update (Jim)
   d) Schedule additional outreach events (Terri to report)
   e) Gmail and outlook suite for club officers (Terri)
   f) Update CD authorized administration to include J. Comeau
   g) Get Sonya going on new outreach events (Terri)
3) Telescope donation update - Meade ETX 125EC (Terri)
4) Winterizing the observing site (Scott) - Scopes, Batteries, Mower, Last work party- mower gas
5) Around the room (if board members have new topics not sent by the weekend prior)
6) Continued discussion on education sessions, how we might bring newer members up to speed on the basics of astronomy so they can better appreciate the monthly meetings and not feel intimidated (Keith to lead)
7) On-going discussion on how to amend bylaws to support a single tiered membership (all)

NOTES

1) Scott moved that we accept the October board meeting minutes. Seconded by Paul. All approved

2a) Done

2b) Done. Bob will read through the instructions for installing the digital setting circles.

2c) Bob did some research of local embroidering. He found some places only do silk screening or printing. A few do embroidering. We would like to get minimum order information and pricing. Also the cost of single color, 2 color and multi-color.

2d) We have one outreach event scheduled at South Burlington elementary school.

2e) Terri has a request in for us as a not-for-profit with Google for free storage space.

2f) Joe's name has been added to the CD we have at the bank (Terri opened the CD but they require a person to sign in-person to be listed on the CD so they only allowed her name on it at the time).

3) We received a donation of a telescope. A Meade ETX125. Terri picked it up and checked it out. The electronics partly works. The mount is a bit loose so not that good.

4) Terri will get a trickle charger for the 12vdc gel cell batteries at the Hinesburg Observing Site and will take the batteries home for the winter. Scott will take the 6" refractor out of the Dome for safe keeping for the winter.

5) Around the room:

Jim sold a 6" Dobsonian that was donated to him for $100. He will donate the money to the club. He will keep most of the accessories that came with the scope.

Joe is thinking of having a "photo" event at Wake Robin using an imaging device on a telescope from which images can be shared on multiple smart phones.

Keith fixed an issue with the Charlotte Library Loaner Scope.

Terri picked up a donation of a 4 ¼" f/10 Edmunds telescope from the Seeger family (long time member Jeremy Seeger passed away). The scope is in poor shape.

6) Keith will head up the efforts to produce materials and presentations, etc. to help members learn some of the basic concepts in astronomy.

7) Terri has marked up and highlighted proposed changes to the by-laws related to combining the Associate and Full memberships into a single membership.

Terri gave the Treasurer's report

ACTION ITEMS
none
MOTIONS:
See item 1.

December Board Meeting
No meeting

VAS Membership Committee
No meetings this quarter.

Observatory Site Committee
No meetings this quarter.

Under the Stars & Planets

OBSERVER'S CORNER

Observing Tips

When "star hopping" to your subject use your lowest power eyepiece in your telescope. As you gain experience with your telescope and finding your favorite objects, you will find this is not always necessary.

If you have tips to share whether for beginners or experienced observers send them our way at info@vtastro.org

The Royal Astronomical Society of Canada - observing tips- suggest by Lou Vicchario:
https://rasc.ca/observing/tips
It has basic as well as more advanced information some of which is found by following links.

Equipment Tips & Recommendations

Electric Heating pad for your scope.

If you are one of those observers who braves the winter temperatures and use a goto mount, this tip is for you, or rather your mount. Because most lubricants become stiff at cold temperatures some mounts will "freeze up", especially when slewing to objects or trying to star align the mount. Most annoying!

Once I used a hair dryer to warm my mount when that happened, but it took several minutes. A couple of times I literally took a blow torch to warm it up. It was faster but required a lot of care to avoid damaging wires, other plastic parts and avoid burning the paint. Another technique I have used is covering the equatorial head with a vest to slow down the rate of cooling. But on really cold nights that is not enough.

I then had an aha moment. I could use an electric heating pad to keep it warm (my wife uses one to keep her feet warm while using her computer). With the heating pad set to high and the air temperature at 13 degrees F, the mount was a relatively warm 40 degrees. I could have used a lower setting with no problem. This pad uses 55 watts at max heat so you can use the pad with a small inverter running off car battery or large lithium-ion battery for at least a few hours.

Note, you should try running it with the inverter you plan to use as most inverters produce a very "dirty" line voltage and the heater has electronics for control, it may not work. FYI- the inverter at the Hinesburg Observing Site is a "true RMS"(has a clean sinusoidal line voltage) and 600W output so any pad will work on it. Any modern heater pad will likely have a safety feature that shuts it off after 10-15 minutes, so keep an eye on the power light and turn it back on.

Telescope Making Class? Maybe.

Ken Brack, who recently joined the club has made several telescope mirrors, some years ago and some recently. For the recent ones he purchased kits from "Firsthand Discovery" at firsthanddiscovery.com.

They offer a 6 inch mirror making kit including glass blank, grits, polish and pitch for $110. One will also need to buy a 2nd blank or dental plaster and a sheet of small ceramic tiles as the "tool" for grinding and polishing the mirror. They also have 3 sizes of secondary mirrors.

They have 4.25", 6", 8", 10" and 12.5" mirror kits and blanks. The glass is Schott borosilicate glass.

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

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

► **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 if you are interested in taking advantage of this.

Member's Observations

(Some editing for clarity)

Comet Tsuchinshan-ATLAS from Middlebury

10/12/2024

I set up 20x90 binoculars, 10x50 binoculars and an 8" f/6 Newtonian on a Dobsonian mount set up in the parking lot of a condo complex near my home. I had several people there observing the comet.

I started trying to spot the comet in the binos about 7 PM. I had checked and saw that it would be about 25 degrees to the right of Venus but it was further to the right and I was unable to spot it (maybe the measurement using my hand was off). At any rate we saw in the 20x90 binos first, well before we could see it with the naked eye but as it got darker we could readily see the both the comet's head and it's tail.

In the 20x90's I could follow the tail for about 6 degrees, about to the 5.9 magnitude star HIP70894.

Paul Walker

10/12/24

I went out to a special spot of mine, some ledges in back of my house, on the Hinesburg Thrust Fault. I have a clear view to the Adirondacks from there, along with a sweeping view of the Hinesburg Valley. Knowing the weather is going to be lousy for the next four days, I figured this to be my only chance to see A3 this well. A beautiful sunset, and then waiting, as the dark got deeper. Venus led the way to early spotting, first picked it up at 7:08 PM EST.

Trust me, it's there! About 2/3 of the way between the red tower lights and the single white streetlight to its right, at about the same elevation as Venus, which is way over near the left edge. **(images on page 14)**

The view just kept getting better as twilight faded, and many photos were taken.

The comet was quite visible, naked-eye, even after the head had set, and at that point I noticed that even an ion tail was visible, off to the left of the dust tail! Do you see it? **(image on page 15)**

A wonderful walk back home through moonlit woods, with such fine memories, and maybe even photos!

Peter Gillette

The Moon, Jupiter and Mars

12/13/2024

I was up late last night doing some stuff related to the camera I use for asteroid occultations. But I also took time to view the Moon, Jupiter and Mars between midnight and about 1:30 AM

The seeing was above average. I used my "big" 10 in with binoviewers at 150, 180, 230 and 260x. I started out on Jupiter studying the details visible in its bands and zones. I then watched Europa slowly approach the start to pass in front of Jupiter. Europa was a very obvious white speck against Jupiter at 150 and 180x.

The Moon beckoned me and I obliged. It is in its waxing gibbous phase so features on its western side were well placed. Viewing at 180x I spent most of my time on Schroter's Valley area, with Schroter's Valley and the banded sides of Aristarchus crater being the highlights, and Mons Rumker where the lighting and seeing were just right where I could see the relatively flat area on the interior of this large volcanic dome. By the way, Schroter's Valley area is an even larger volcanic dome.

Though not yet at its highest I swung over toward the East to Mars. At 13 sec of arc in apparent size it is almost as large as it will appear on this go around. At its closest in mid-January, it will appear 14.6" in size. However, it passes high overhead where the seeing is better lower to the horizon. I started at 180x but soon went up to 230x then 260x. A bit of a toss up as to whether 230 or 260x was better at bringing out the details. I had a pleasant view of the currently large north polar cap (it will shrink as Martian spring progresses). The dark ring around the cap was quite obvious as were a few other dark markings but without looking at a map I could tell which they were. I could make out some morning clouds on the western limb (toward our East). Yellow and orange filters enhanced the view. The orange filter made the dark marking more prominent and it dimmed the glare of clouds on the limb making details there easier to see. There seemed to be a particularly bright spot on the western limb but it was hard to separate it from the brightness of the limb clouds. The orange filter made it stand out enough to verify its existence. I don't know

whether it was a brighter surface feature, a dust storm or a particularly bright cloud. Orange suppresses but doesn't eliminate the clouds, the polar cap was still very visible.

So I encourage all to brave the cold weather and give them a look. They are all bright, so coming inside to warm up as needed is not a problem for your dark adaptation.

Paul Walker

12/15/24

Anyone else get a chance to check them out last night [Moon, Jupiter and Mars]? Yes, it was cold but I was well dressed and stayed warm.

I started with Jupiter. Last night the Moon was on the east side of Jupiter where as the night before it was on the west side.

This time the Great Red Spot was presenting itself very nicely on Jupiter's meridian. I viewed with my "big" 10" and binoviewers at 260x. The fine scale seeing was a little worse than the night before but didn't seem to bother much. The Galilean Moons didn't quite show as disks at any time where as the night before they did a good part of the time. The "Red Spot Hollow", light colored cloud tops between the Red Spot and the South Equatorial Belt was easy to see flanking the northeast quadrant of the Red Spot. There was a dark streak from the west side (toward our east) going diagonally from the dusky South Temperate Belt northeast up through the South Tropical Zone to the west end of the Red Spot. It was widest to the west and tapered down toward the Red Spot. FYI- belts are dark and the zones are light colored (I had to look that up). The Equatorial Belt was visible as a thin band in the middle of the wide Equatorial Zone. A white, very elongated oval was at the top of the Equatorial Zone, nestled up against the dark North Equatorial Belt. It was not easy to see as it was only a little brighter than the zone. There were also some faint details visible within the North Equatorial Belt. Initially I used the Baader yellow and orange planetary filters but I swapped out the yellow for the Baader green (the binoviewers can hold 2 filters at a time). The green darkened the red features, like the Great Red Spot, as well as the brownish belts. Brown is actually dark orange so that makes sense. The increase in contrast is not great and you may not notice it at first, but like planet viewing in general, it takes some amount of concentration and practice. The green filter did make the subtle details that I wasn't quite sure I was actually seeing, into features I was sure I could see. The green made the features I was sure I could see a little bit better.

The Moon was full and one would think there would be no shadows to speak of to show any relief of features. However, you would be mistaken. I first noticed in high resolution images I have taken that there are always shadows on the southern limb. This appears to be due to the cratered and hilly terrain there. I am starting to recognize many of the features there. You don't see this on the northern rim, at least not to this extent. The really cool thing about these shadows? It gives a very distinct 3-D effect. Much more pronounced than I noticed anywhere else on the Moon. I love perusing this area. You don't have to wait for Full Moon either, within a day or two after first quarter some of this terrain becomes visible. You do however need good seeing and moderately high magnification to fully appreciate the effect.

Mars was cool too. The green filter helped here as well. Even though Mars was only about 35 degrees high in the East when I viewed it last night (about 10:15-10:45), I was pleasantly surprised by how much I could see. From north to south I could see; the north polar cap (of course), the dark rim around the cap, Syrtis Major and Hellas Basin. I am now sure I saw Syrtis Major Friday night and maybe Hellas Basin, only they were farther east, toward the western limb with limb clouds and foreshortening interfering with viewing Hellas. Last night they were almost dead center on the meridian. Syrtis Major very much reminded me of a shark's tooth, like what you can buy in some museum gift shops. I read this description recently in the January 2025 Sky & Telescope magazine. If I hadn't known that Hellas Basin is due south of the Syrtis Major and that the northern hemisphere is tilted toward us, I could have easily have mistaken it for the south polar cap. Something I did not see this time were clouds on the western (sunrise) limb. Not even a hint of clouds.

Paul

12/25/24

Hi Terri and Gary and Paul

You all get you get first dibs on the Jupiter storm, I have posted about it in the info here. If we have success it should be posted to the club.

Tonight the SEB [South Equatorial Belt] CM I [Central Meridian System I] values will be favorable from 2-4 hours UT [9 to 11 PM EST], with the feature about centered at 3 hours UT. This is if its position has not moved too much.

2h UT CM I 61 degrees -feature is before the center of Jupiter's disk.

3h UT CM I 97 degrees (very close to the center of the disk), about where the long storm was in a low res image from a few days ago.

4h UT CM I 131 degrees, with feature now past the disk center.

I suggest you try both visual as well as imaging.

Low resolution image here CM I 103°

Latest image showing the storms real extent, doing what was predicted by the head of The BAA , disrupting the SEB.

Good luck! Your images could add a 5th rare sight to this year and next month's talk. Should you search for Jupiter's shadow, do what I did. I placed Jupiter just above a blocking row of trees to make sure very little light fell on the snow in front of me, to ruin dark adaptation, or give a reflection shadow rather than direct shadow. Will try again tonight, with a tripod held white sheet. I've already tried out on spotting the Moon this morning, pinhole finder works very well. I should have posted that holding your hand on the far end and then moving it quickly towards you works too. Will make Venus my first stop tonight with this below.

This morning's white paper, cardboard and tape are tonight's planetary shadow capture devise.

Maybe even better results tonight?

Lawrence Garrett

12/26/24

Cold enough observing? I did indeed spot the disturbance in the SEB at the of the storm feature location, shortly after 3hr UT.

With seeing as it was early, my 12.5" telescope showed the color of Jupiter's bands much better that the 6" did, but the image fell far below the 6" for sharpness, in which I made the observations. Even so seeing was limited to just 113x for the best view, even 144x fell very short of sharp. While I used GUIDE 9.0 for CM I values, the Arkansas Sky Observatory - 2001 (https://arksky.org/JupCMCalc.html) has values a few degrees different.

Following this feature (online posts) since December 2 has really helped a lot. Really want another look, Friday night, 28th 4hr UT holds this feature again.

Oh that tripod shadow setup really works well, far better than holding by hand, both seen again.

Will post that to the group.

Clear Skies

Lawrence Garrett

Arkansas Sky Observatory - 2001, In addition, other factors are accounted for to compensate for "light time", synodic period, speed of orbit variations during and between perihelion and aphelion, arksky.org

12/26/24

Hi Larry, saw it as well (I think). Got some images for you. At least I think this is what it is as it's a big disturbance in the SEB.

We were looking at Jupiter and Saturn with my 11" SCT which was performing beautifully last night. Also earlier in the night we had company and I took the opportunity to show everyone the planets and we looked at Venus, Saturn and Juipter. Mars had not yet risen. Seeing was very good and we were looking at all of the planets at 350X without trouble.

Lots of ooohs and ahhhs. After company left I proceeded to do imaging of Saturn and Jupiter and then finally Mars later in the night. Let me know if I captured the storms correctly. These are just quick processing, I may play with it to get a bit better and also to align the moon which had no alignment marks. I believe that's Io, so images are mirrored.

Terri Zittritsch

(see Terri's Jupiter and Mars images on page 13 under "Members Images")

OBJECTS TO OBSERVE

ARIES – THE RAM

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

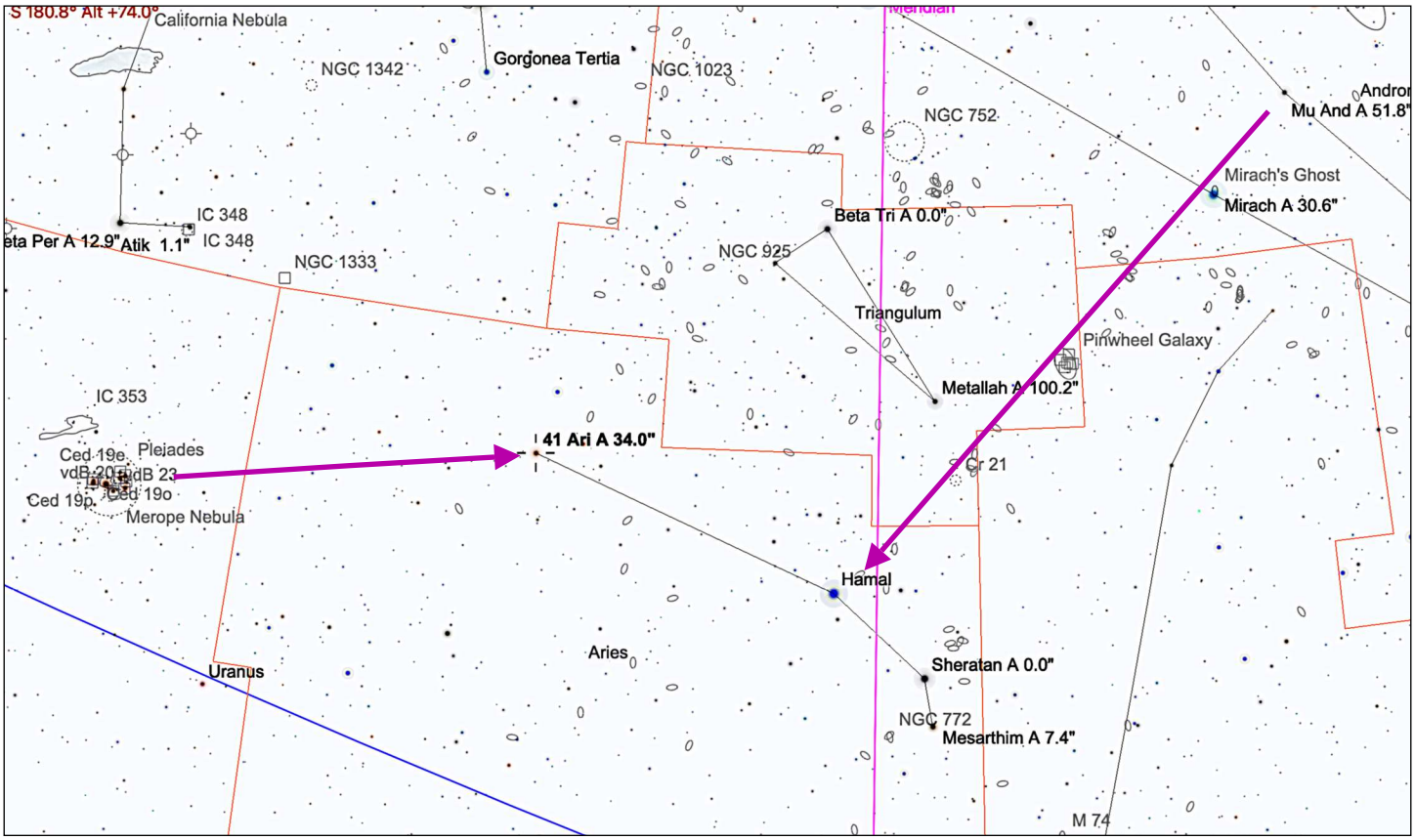
Plate No. 16 from Uranias Mirror

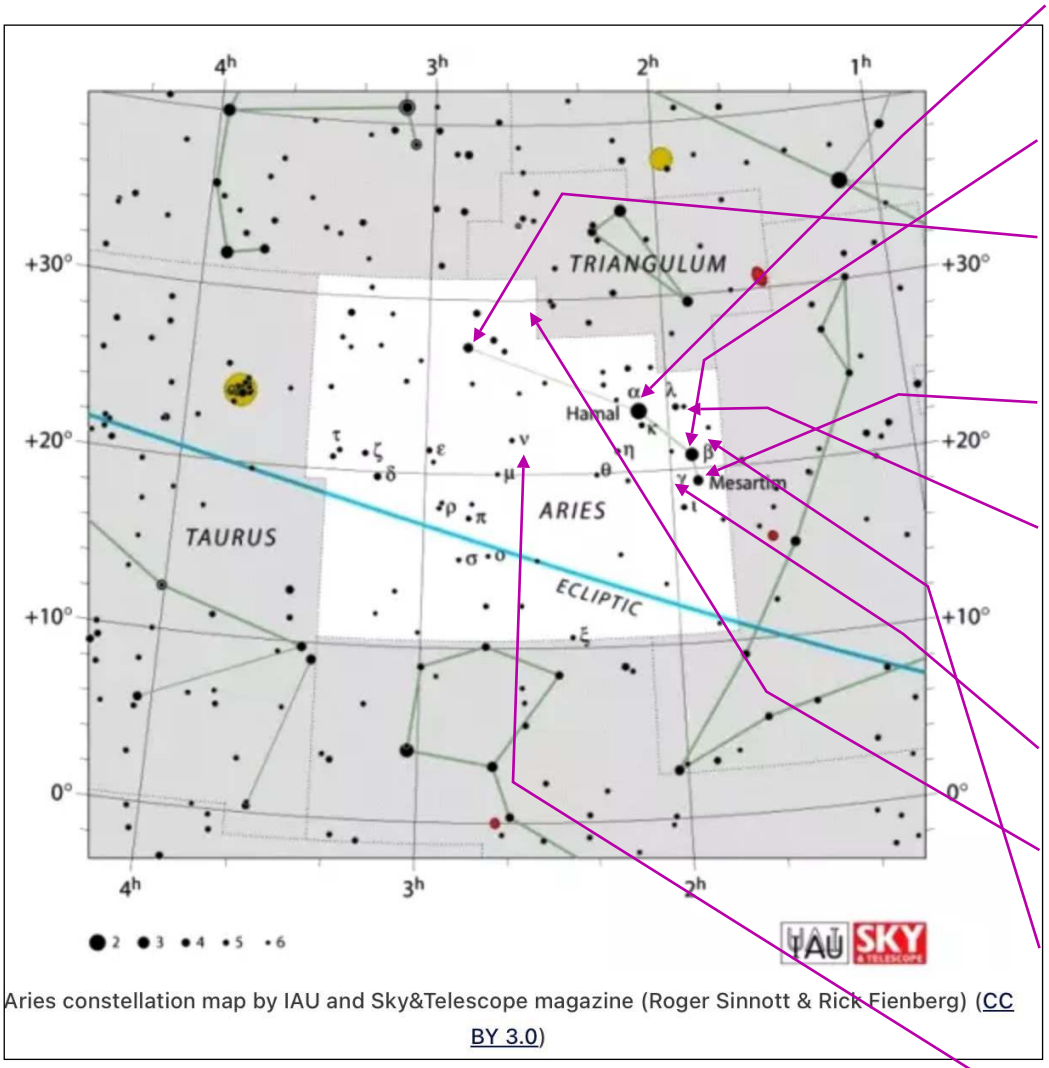
Aries

- Pronounced – Air – ease
- Genitive form is Arietis ah-rie-eh-tis.
- The 39th largest constellation at 441 square degrees.
- One of the constellations on the ecliptic, so one of the Zodiac family of constellations.
- An important constellation in ancient times when classical mythology was created 1000BCE – 420CE. At that time it marked the Spring Equinox.
- Was documented by Ptolemy in the 2nd century in his Almagest but defined long before.
- Many myths are associated with this constellation.
- The Babylonians called it MuLahunga, or hired hand or agrarian worker and associated it with the first station of the ecliptic.
- It's association with a Ram may have come from it being tied to an ancient Mesopotamian deity known as Dumuzid the shepherd and consort to the goddess Ishtar.
- In early Bedouin lore the Pleiades cluster was the tail of the ram.
- In Egyptian lore Aries was associated with the god Amon Ra.
- And in Greek mythology the Ram has been associated with the Jason and the Argonauts quest for the golden fleece.

Finding Aries

1. In September through February in the southern sky on the Ecliptic.
2. Highest, crosses the meridian, middle to late November at 10 PM.
3. Just West of the Pleiades, find Alpha Arietis which is bright yellow mag 2.
4. Try to make out the small crooked line of stars including Mesarthim, Sheratan, Hamal and 41 Arietis.
5. Can also use Beta Andromedae and Mu And, the stars used to point to M31, in the opposite direction point to Hamal.





Aries constellation map by IAU and Sky&Telescope magazine (Roger Sinnott & Rick Fienberg) (CC BY 3.0)

Observing in Aries

Bright stars and double stars

- Alpha Arietis (Hamal) is the brightest star in Aries at mag 2. Its name in Arabic means 'The Lamb'. A variable orange giant star of class K2.
- Beta Arietis (Sheratan) is the second brightest star in Aries at mag 2.6. A white class A5 main sequence star.
- 41 Arietis (Bharani), A white dwarf double star of blue-white color and class B8 is the third brightest star in Aries and shines at mag 3.6. Its companion, a mag 11 star, is 34" distant.
- Gamma Arietis (Mesarthim) the fourth brightest star in Aries at mag 3.9 is a variable double star with a mag 4.6 companion 7.5" away.
- Lambda Arietis, Mag 4.8 with component mags 4.9, 7.4(yellowand pale blue) separated by 37".

No Messier objects but numerous NGC objects

- NGC772 – Beautiful unbarred mag 10.3 Sb spiral galaxy 4.6'x2.4' in diameter also called the Fiddlehead galaxy.
- NGC972 – Another unbarred spiral mag 11 Sab sprial galaxy of 1.6' x 3.3' in diameter.
- A cluster of galaxies centered on NGC680 just west of Sharatan and Hamal – contains 5 NGC objects and two IC objects on the border of Aries and Pisces.
- A cluster of galaxies centered around NGC935 just west of 26 Arietis comprised of 6 NGC objects.

ASTRO-IMAGER'S CORNER

All things astrophotography, for the beginner to the expert.

Imaging Tips

► Electric Heating pad for your scope.

If you are one of those observers who braves the winter temperatures and use a goto mount, this tip is for you, or rather your mount. Because most lubricants become stiff at cold temperatures some mounts will freeze up, especially when slewing to objects or trying to star align the mount. Most annoying!

I have used a hair dryer to warm my mount when that happened, but it took several minutes. A couple of times I literally took a blow torch to warm it up. It was faster but required a lot of care to avoid damaging wires, plastic parts and avoid burning the paint. Another technique I have used is covering the equatorial head with a vest to slow down the rate of cooling. But on really cold nights that is not enough.

I realized I could use an electric heating pad to keep it warm (my wife uses one to keep her feet warm while using her computer). With the heating pad set to high and the air temperature at 13 degrees F, the mount was a relatively warm 40 degrees. I could have used a lower setting with no problem. This pad uses 55 watts at max heat so you can use the pad with a small inverter running off car battery or large lithium-ion battery for at least a few hours.

Note, you should try running it with the inverter you plan to use as most inverters produce a very "dirty" line voltage and the heater's electronics may not work. FYI- the inverter at the Hinesburg Observing Site is a "true RMS"(has a sinusoidal line voltage) and 600W output so any pad will work on it. Any modern heater pad will likely have a safety feature that shuts it off after 10-15 minutes, so keep an eye on the power light and turn it back on.

In most cases you can probably just drape the pad over the housing of the equatorial head without it falling off as the scope moves. You don't want to tie it down in a way that will interfere with the movements of the mount.

If you have tips to share whether for beginners or experienced imagers send them our way at 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

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

Imaging Projects--

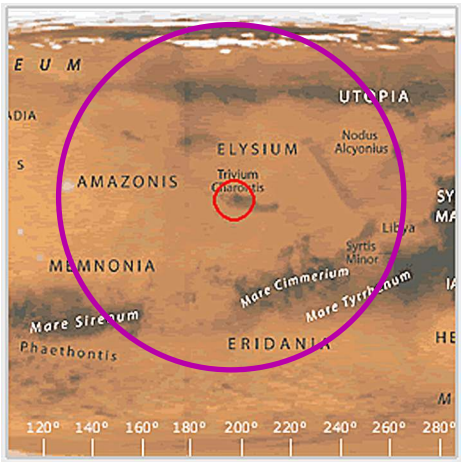
Making your own projects can add another dimension to your imaging experience. If you have an imaging project you would like to share, drop us a line at info@vtastro.org .

MEMBER'S IMAGES

Jupiter by Terri Zittritsch
2024-12-26 at 02:52 UT (9:52 PM EST) Stack of several frames. South is down, rotation left to right. The storm mentioned on page 10 is the light colored disturbance in the SEB (lower dark band), left of center.

Jupiter by Terri Zittritsch
2024-12-26 at 03:49 UT (10:49 PM EST)
Stack of several frames. The original images of Jupiter were mirror reversed (taken though a "star diagonal"). These have been flipped right-left for "correct" view. Comparing the 2 images, the storm moved from left of center (the meridian) to right of center. This demonstrates Jupiter's fast rotate period of ~10 hours. The storm can be identified by a small bright spot with "arms" that stretch to the left and right. Most of the light colored clouds to the left of the spot are part of, and/or caused by, the storm.

Mars by Terri Zittritsch
2024-12-26 at 04:29 UT (11:29 PM EST).
Stack of several frames. The north pole is tilted toward us. Mars is only 14" in diameter but rides high in the sky, 69 deg high, when it reaches the meridian. The map below shows which part of Mars was facing us at the time of Terri's image. The small circle indicates the center of the image. The large circle is approximately the area visible in the image. Note that because Mars is a sphere the areas near the limb are highly foreshortened .
You can generate your own map at: https://skyandtelescope.org/observing/interactive-sky-watching-tools/mars-which-side-is-visible/#

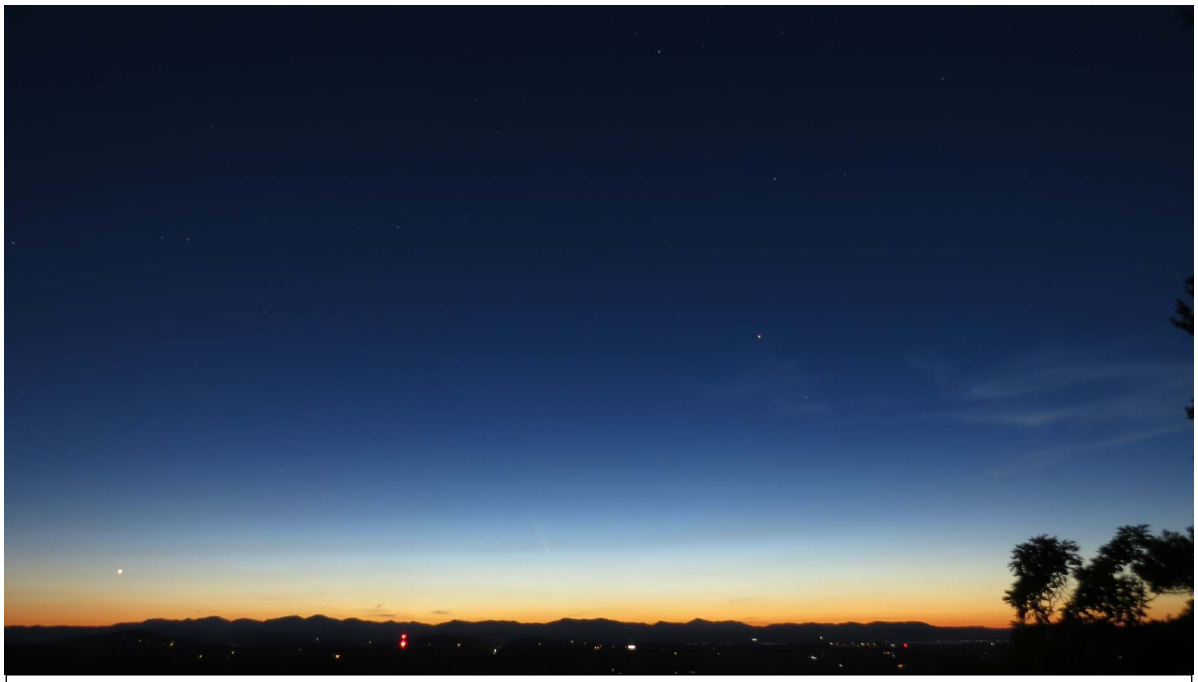


Comet Tsuchinshan-ATLAS

A highlight this Fall was a new fresh comet visiting the inner solar system. After rounding the Sun it was only visible from the southern hemisphere but soon worked its way north. Though not a Hale-Bopp or Hyakutake (both graced the northern skies in 1996) it was none the less a bright and impressive comet and the first bright comet for many people.

We opened the Hinesburg Observing site, home of the Green Mountain Observatory. The weather cooperated on 4 of 7 scheduled nights, October the 17th, 18th, 19th and 20th with Paul Walker hosting 3 and Maura Kelley host 1 night. Several people attended each night (the login sheets are still at the site and have not been tallied). Moonlight and twilight were factors interfering with seeing and imaging the comet for a while. Once the Moon moved into the late night sky it was easier to see but the comet was also moving farther from the Sun and therefore fading. Still, all in all a great sight.

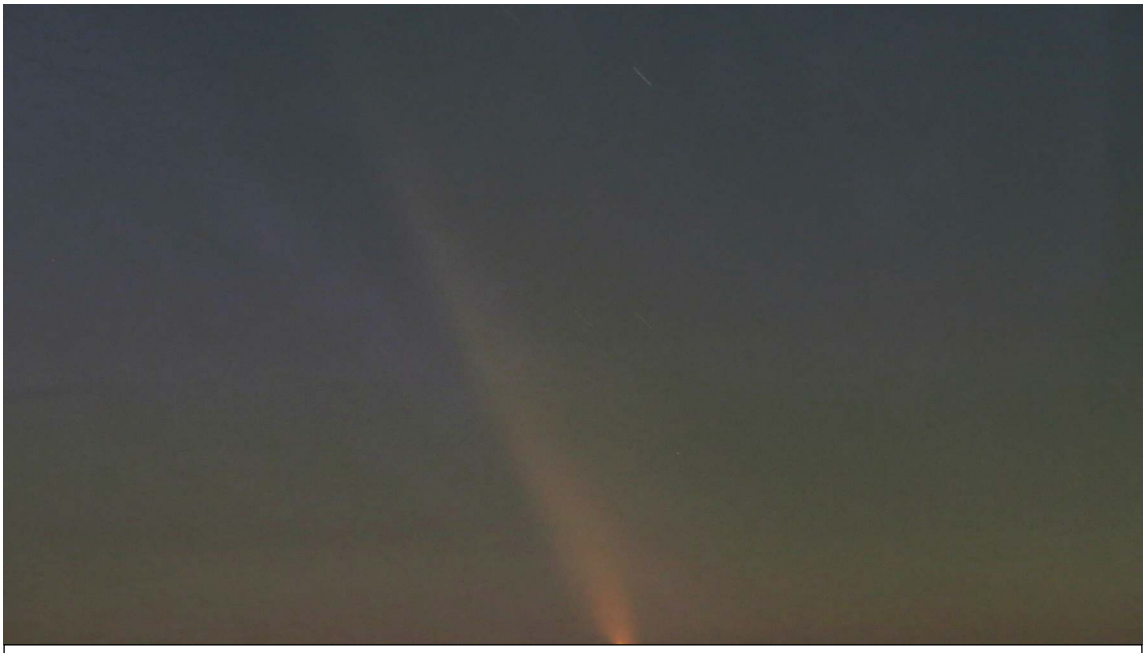
Several members observed and imaged the comet on October 12th shortly after it arrived in the northern evening sky.



By Peter Gillette
2024/10/12

About 2/3 of the way between the red tower lights and the single white streetlight to its right, at about the same elevation as Venus, which is way over near the left edge.

By Peter Gillette
2024/10/12



By Peter Gillette
2024/10/12

The comet was quite visible, naked-eye, even after the head had set, and at that point I noticed that even an ion tail was visible, off to the left of the dust tail! Do you see it?

By Allon Wildgust
2024-10-12

Last night I went looking for Comet C/2023A3 and after 45 minutes (6:30-7:15 PM EDT) I could not find it. Frustrated that I missed it, I decided to shift my position to look further north and WOW! there it was much higher than I thought. It was visible with the naked eye, including the tail. So my first pictures were at 7:15 and the last (the above photo) was at 7:25 before it set.

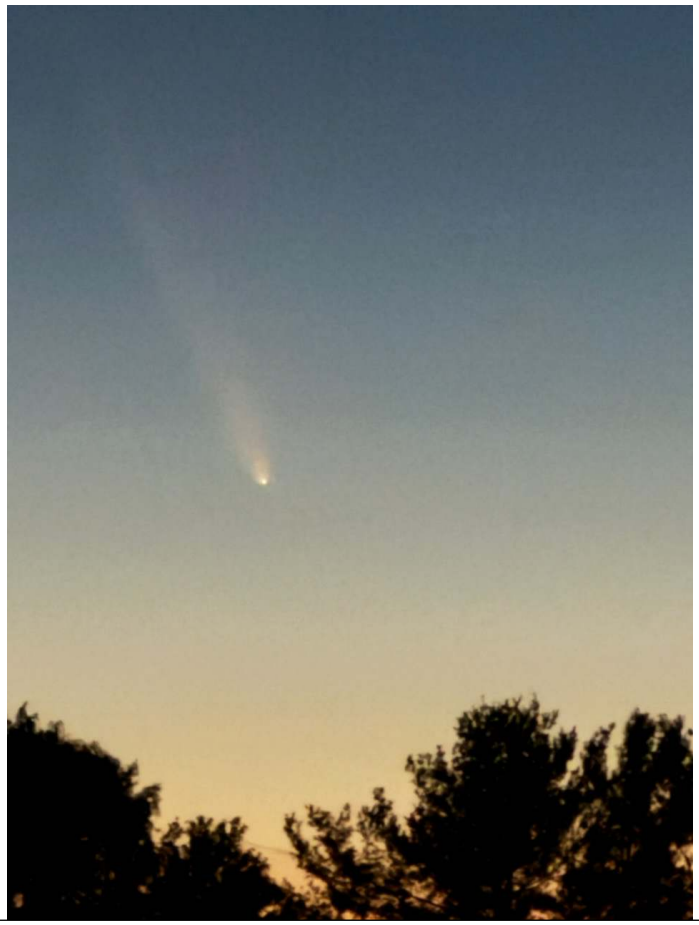
Nice comet! Number 58 for me.

Photo details: Canon R6 at 200mm, tripod mounted, Raw file;.8 sec F/5, ISO 4000.

By Paul Walker

Paul invited some local club members and other local folks to a parking lot in a condo complex near his house that has a good view to the West overlooking Middlebury, VT. This is the 6th image he took of the comet from his first series of images. It was taken at 7:15 PM EDT.

Canon Rebel T7i, 50mm (80mm eff 35mm camera f.l.) @ f/2, 3 sec, ISO 200, 22 x 25 deg. field of view.



By Yvette Feig

It was also taken at 7:15 PM EDT with an iPhone 15.

Using digital zoom for a 35mm camera eff focal length of 341mm (according to the meta data in the file, comparing to the image above, it's about 150mm efl), f/2.9, 1 sec, ISO 640

By Eben Gay
10/16/2024 at 7 PM EDT

Eben took these pictures of comet Tsuchinshan-Atlas from Brown's Head on Vinalhaven island in Penobscot Bay, Maine. **Note that the anti-tail is very faintly visible.** An anti-tail is made up of larger dust particles not easily pushed by the sunlight and therefore trail behind the comet in its obit. The dust tail is made of small dust particles that are easily pushed by the sun's light (radiation pressure).

He used an Olympus OM-D E-M1 Mark II micro four-thirds camera, Micro 4/3 300mm lens (600mm equivalent) at f/4, 2 sec, ISO-5000.

By Paul Walker
10/19/2024 at 7:35 PM EDT

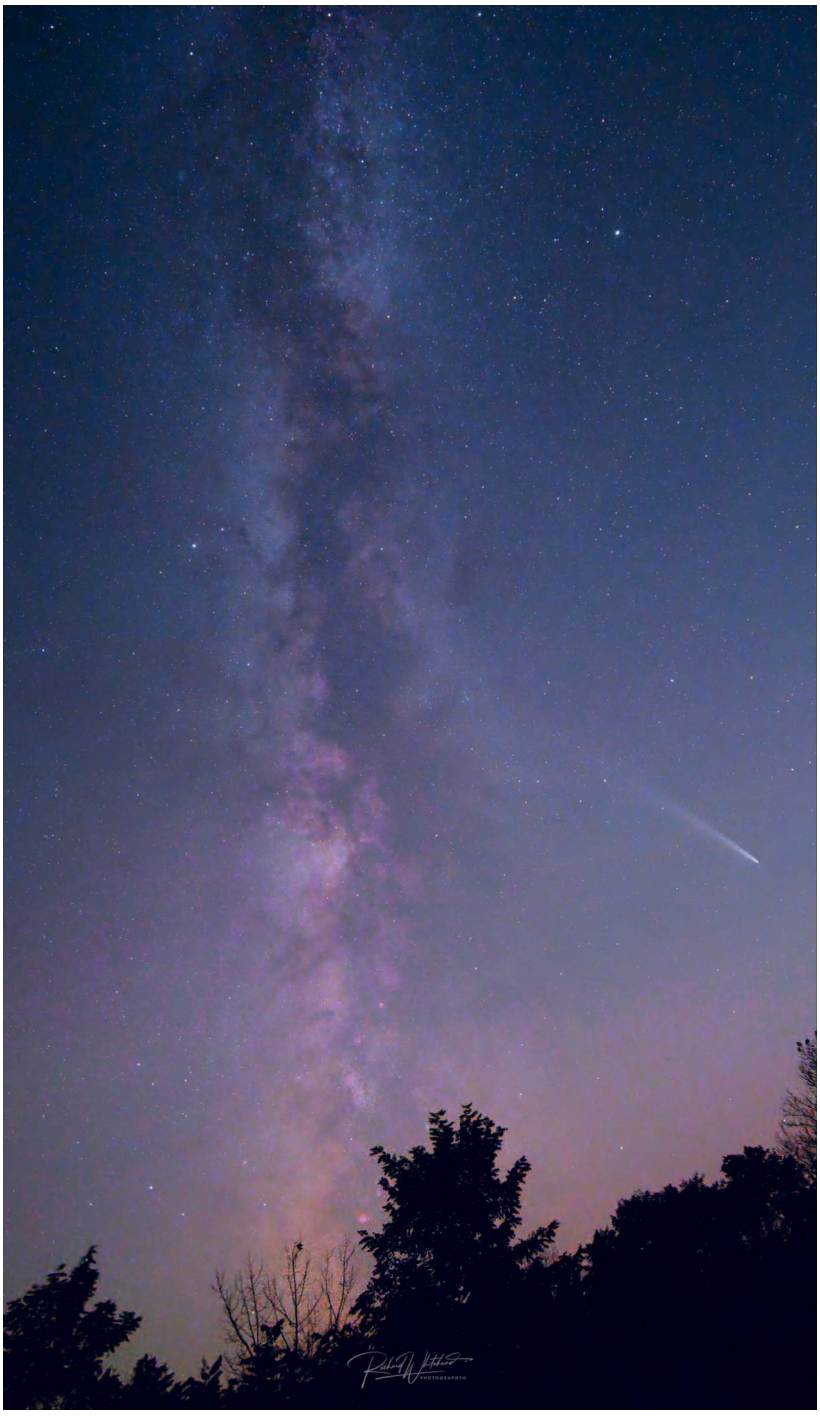
Very faint anti-tail in this image and a little bit of structure behind the coma. A close up of Comet Tsuchinshan-ATLAS over Middlebury, Vt on October 19.

Taken through a 10" f/4 Newt. (1000 mm f.l.), Canon T7i (astro modified), 30 sec, ISO 800, tracking but not autoguided. Field of view (FOV) is 1.2 x 0.8 degrees.

By Paul Walker
2024-10-20 7:52 PM EDT
Taken at the Hinesburg Observing Site

There are a few satellite streaks in this image and what I thought to be a meteor. However, if you look closely at the meteor-like streak, a little to the right of the head, you will see a break in the trail. Looking at the trail going across the comet's tail, it has a kink in the middle caused by my bumping the tripod during the exposure. So I'm pretty sure the gap in the "meteor" means it's a satellite.

Canon T7i, 50mm @ f/1.4, 20sec, ISO 400, tracked (but as 1/2 speed to split the difference between blurring the tree and trailing the stars, hence the stars are slightly trailed and the trees slightly blurred). 22 x 25 deg. field of view.



By Richard Whitehead
2024/10/22

I went up to HOS tonight and it was the clearest evening yet.
Shot some wide angle stuff seeing as the Milky Way is pretty close to comet now.
Sky wasn't brown tonight!

By Terri Zittritsch

I've imaged Tsuchinshan-Atlas from my home observatory as it's finally risen above my trees. I took this on 10/22/2024 when the comet was between 30 and 25 degrees altitude. I only have about 15 minutes per channel. I used a mono camera with 30 second exposures and R,G and B filters. The field of view is fairly narrow having used a scope with 700mm of focal length, a TEC 140 with 0.7X focal reducer. The sub frames were all unguided. Comet processing is a bit tedious!

By Terri Zittritsch

Here is Comet A3/2023 Tsuchinshan-Atlas one more time. I shot this quite a while ago with one shot color camera remote from my house, using an AM5N mount with my astro-physics stowaway and ASI2600MC color one shot camera. I also had the use of an ASI AIR a friend in the club loaned me to try it out. This all makes a very portable and light weight system for imaging remotely. These strain wave mounts are very cool. The most important thing is to stabilize the tripod with some weight, and it comes with a tripod sling to throw in a brick or big rocks that you find around your imaging location.

This is probably 40 minutes or so. Just a simple image and much easier to process these OSC comet images versus the mono. I still have a couple of mono images that one day I'll get to, but they take a lot of work.

By Richard Whitehead
2024/10/25

Here's a close up of the comet for the newsletter. I tried the multi-stage process of stacking on stars then on the comet nucleus and combining them to get sharp comet and stars.
The anti-tail is still visible as broad very faint batch angling slightly off to the lower left.
4x2 mins R, G, and B mono.
Takahashi FSQ106 EDX4 (530mm) QHY600 mono camera.

Comet aimed at Champ?!
by Maura Kelley

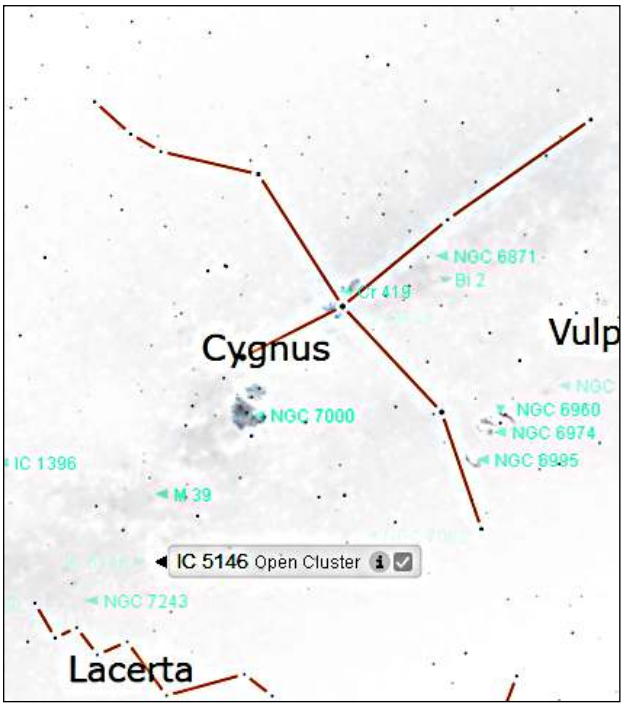
Comet is above and left of center.

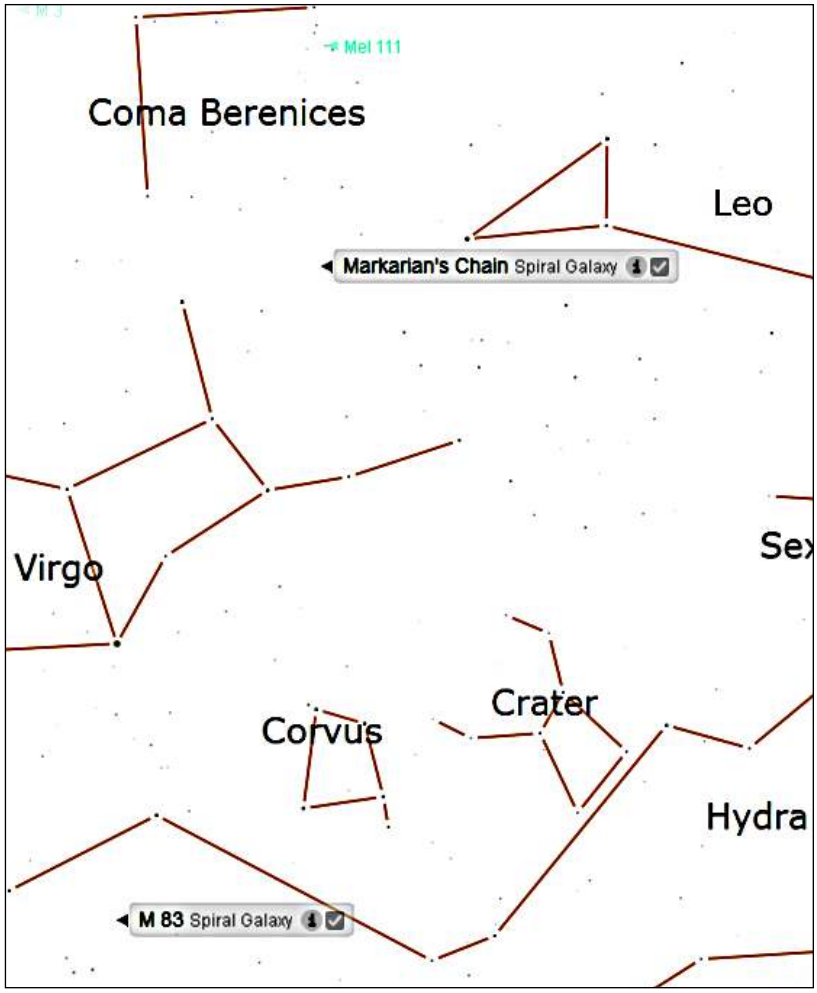
After having imaged the comet at our club's observatory site (our HOS events!) with some great other folks on 10/16 - a very short window with the Moon coming up as a spotlight & then again on 10/18, I thought it might be interesting to hike up Mount Philo in Charlotte for a more 'open' opportunity, but of course the comet was 'fading' as the nights went on.

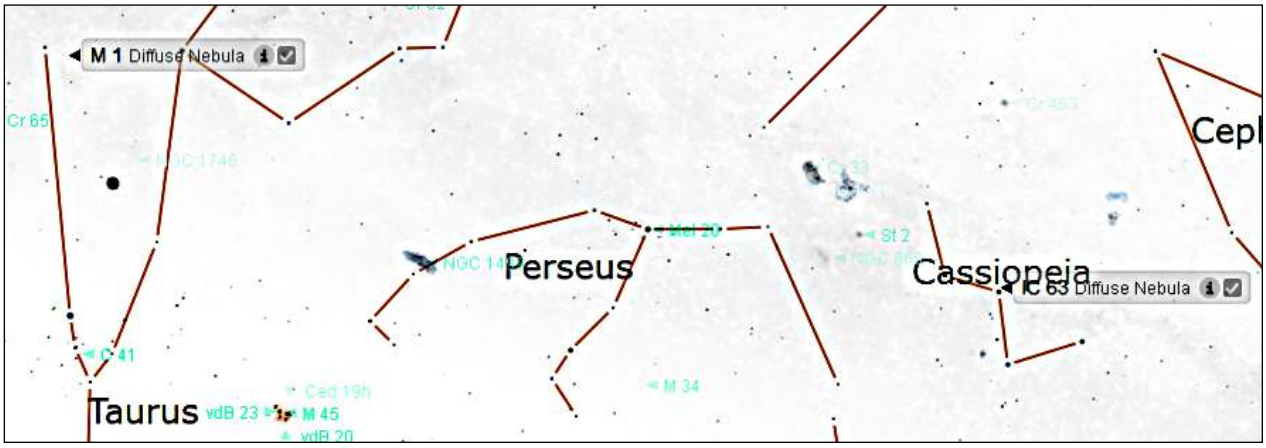
So I hiked up with just my camera in my day pack, carrying my tripod. It was exciting to see it (the comet) with the view over the towns of Charlotte & Shelburne, busy Route 7, and Lake Champlain with the Adirondack Mountains of NY in the distance. And it was VERY cool hiking down after, in the dark with my Petzl headlamp, alone. The following night, I went back again and realized that that "cloud" was the Milky Way!

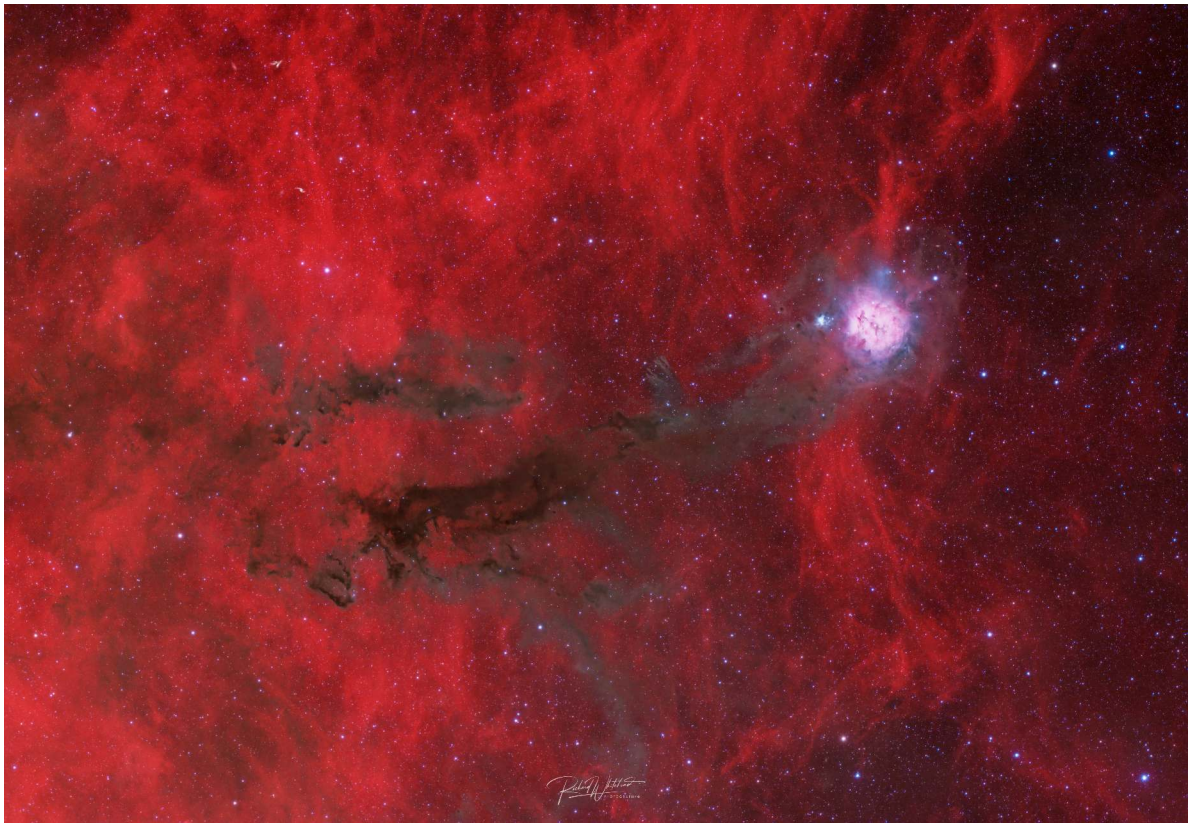
I took a video, you can see here: https://drive.google.com/file/d/1-vNSndCTxo5nTz1Yhdh47cgQ4jWbHQyf/view?usp=sharing"

Location Charts for the deep sky object images in this issue.
Created using Starry Night Pro 8 & Picture Window Pro 7.









Cocoon Nebula and Hydrogen Clouds
By Richard Whitehead

The Cocoon Nebula or IC 5146 -(HaLRGB image), is a star forming region about 4000 light years from earth. It's an interesting object with a cluster of stars within the nebula and it's also a reflection /emission nebula. You can see the pink ionized Hydrogen in the emission part and various bluish reflection nebulae.

Extending in a long ragged tail is the dark nebula, Barnard 168. usually this can be seen as a negative signal dark area partially obscuring stars lying behind it. In this image I have taken a large number of deep exposures (Total integration ~43 hours) to show the dust lanes and their structure, and also Ha narrowband data (17 hours) to show the interesting structure in the hydrogen clouds that lie beyond. It's a very star rich area, so I've dialed back the stars a little to not obscure the nebulae. I also shot short exposure subs for the stars and used these instead of the stars in the original RGB image.

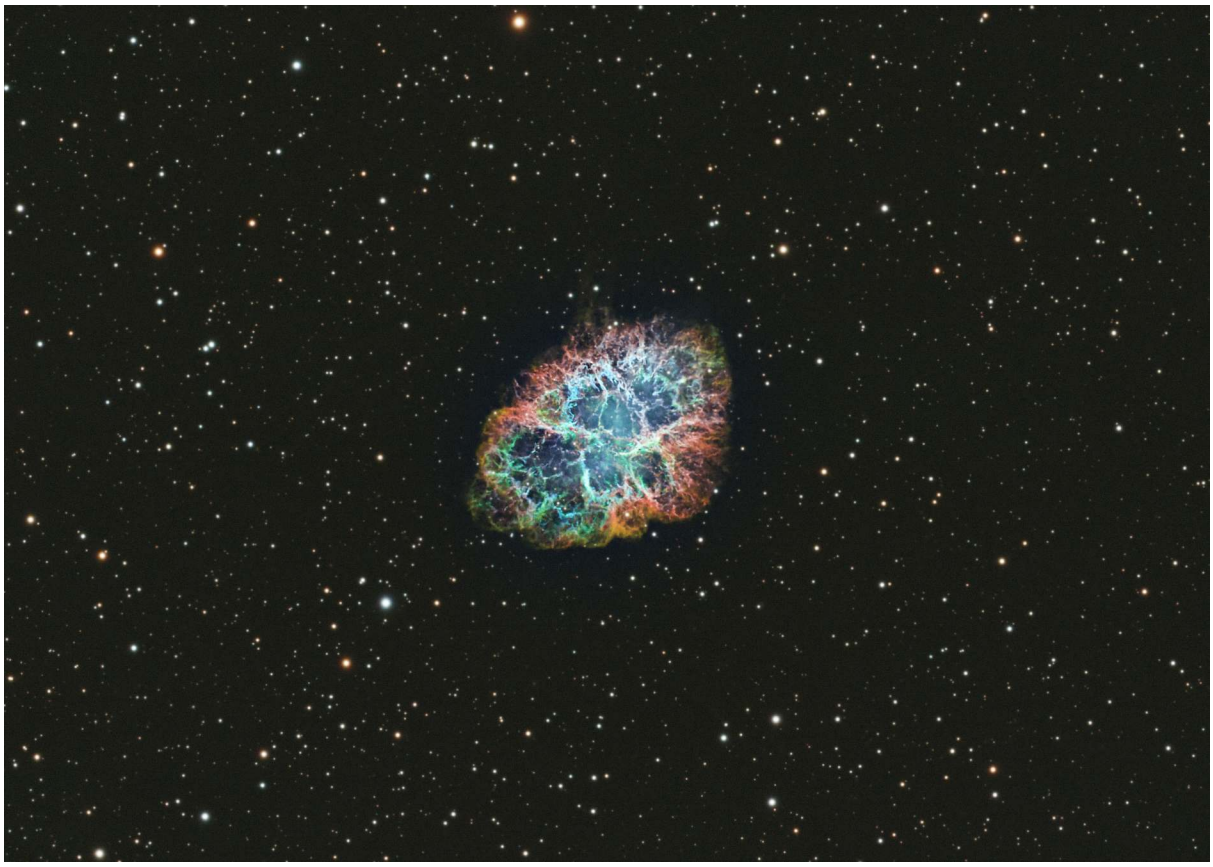
Also of note are several very distant galaxies.

Tech Stuff
Telescope Takahashi FSQ106 EDX4
Mount Astro-Physics 1600 GTO AE
Camera QHY 600
Ha 3nm Chroma 52 x 1200sec
L 61 x 5 min
R 28 x 600
G 26 x 600
B 26 x 600
(also shot 30 x 60 secs, RGB for stars)

The Ghosts of Cassiopeia
By Michele Hernandez-Bayliss

This was a tough target -RGB so no moon and you need at least 15 or so hours - and then the 3 temperatures and different gains made it a calibration nightmare - but it had a happy ending!

IC 63 is in the center, IC 59 to the lower left. The bright star is Gamma Cassiopeiae.



M1 (Crab Nebula, NGC 1952, Sh2-244)
By Greg Erainne

The Crab Nebula is a supernova remnant (SNR) in the constellation Taurus and is about 6,500 light years (ly) from Earth. At the center of the Nebula is the highly energetic Crab Pulsar (a neutron star) spinning at about 30 times per second and emitting radiation spanning wavelengths from gamma rays to radio waves.

The supernova explosion that gave rise to the Crab Nebula was first observed by Chinese astronomers in 1054 who called it a "guest star", so bright that it was visible during the day.

M1 is called the Crab Nebula because early drawings of the object viewed through large telescopes resembled a crab with its jutting appendages.

The colors in this image are an attempt to reproduce the coloration of the image captured in a 24-panel mosaic taken by Hubble in December of 2005 with its Wide Field Planetary Camera 2 (WFPC2). (See https://esahubble.org/images/heic0515a/ for details.) As described at the ESA Hubble site, the colors in the image represent the gases expelled during the supernova explosion, with blue representing neutral oxygen, green representing singly ionized sulfur (SII), and red representing doubly ionized oxygen (OIII).

Capture Dates: 11/9, 11/12, 11/13/24

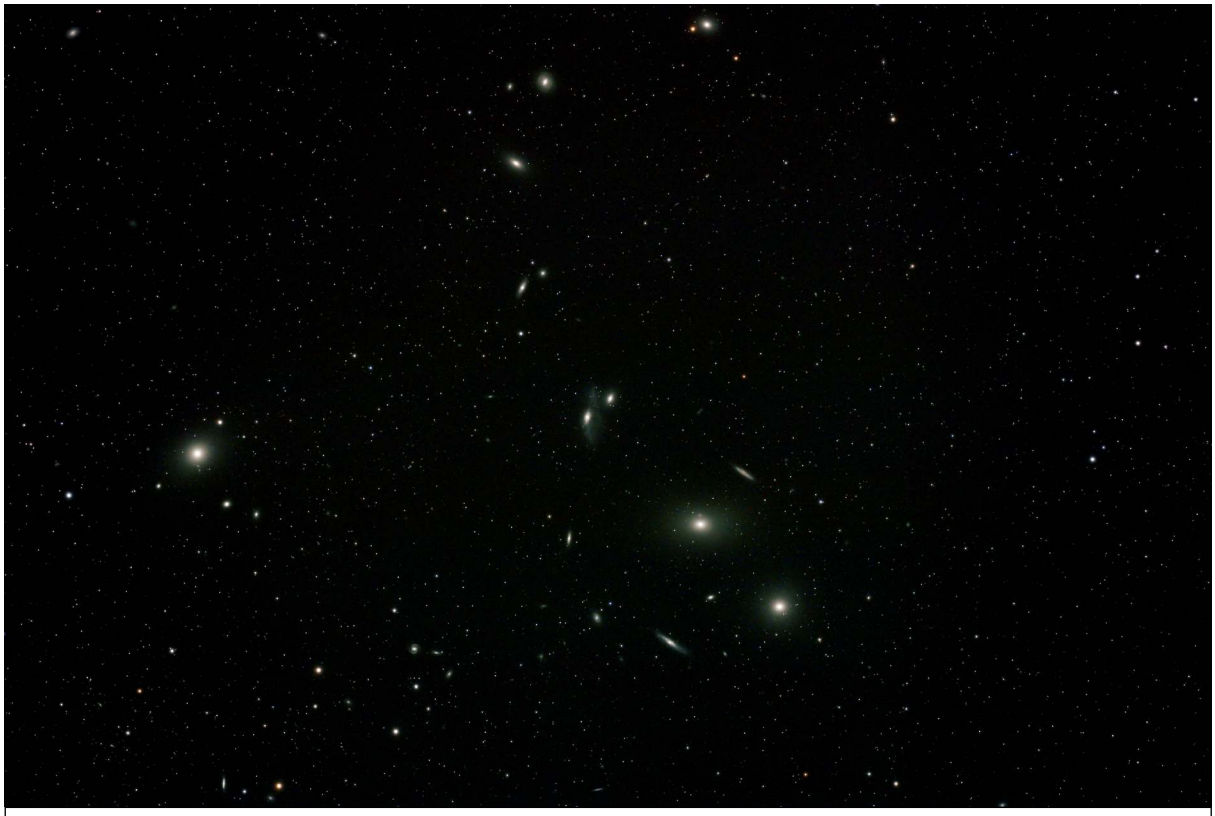
Equipment
EdgeHD 800 with 0.7x focal reducer @ 1422mm fL
Guidescope/Cam: Celestron OAG and ASI174mm mini
ASIAir Plus, imaging camera ASI2600MM , ZWO AM5 mount, ZWO 7-position filter wheel

Filters:
Antlia 3nm Narrowband H-alpha 2": 54×300" (4:30)
Antlia 3nm Narrowband Oxygen III 2": 54×300" (4:30)
Antlia 3nm Narrowband Sulfur II 2": 54×300" (4:30)
Antlia Pro-V RGB Filters: 141x60" (2:21)

Total Integration Time: 15:51

Processed with PixInsight and Adobe Photoshop.

M83 (The Southern Pinwheel Galaxy, NGC 5236)
By Steve Grimsley
AP155 refractor at f/7, Canon Ra camera, ISO 800, 1 hour total



Markarian's Chain
By Steve Grimsley
1 hour 8 minutes, AP92 refractor at f/5, Canon Ra camera, ISO 800, 1 hour 8 minutes total.

Space Science Roundup

NASA News

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

Europa Clipper – On its way towards a Mars Gravity Boost

Headed to Jupiter's moon Europa, the Europa Clipper is operating without a hitch and will reach Mars in just three months for a gravity assist.

The spacecraft launched Oct. 14 on a journey to Jupiter's moon Europa. It has already traveled 13 million miles (20 million kilometers) from Earth.

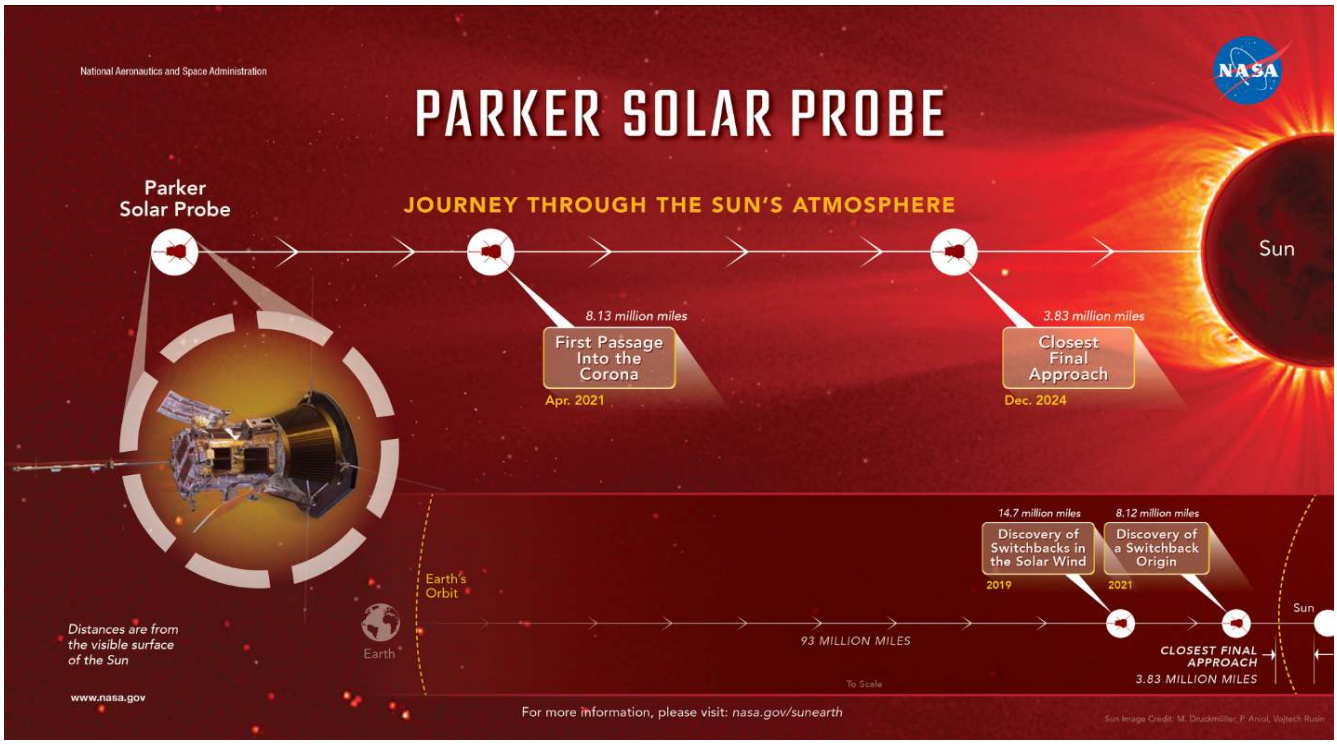
Shortly after launch, the spacecraft deployed its solar arrays, which extend the length of a basketball court. Next was the magnetometer's boom, which uncoiled from a canister mounted on the spacecraft body, extending a full 28 feet (8.5 meters).

To confirm that all went well with the boom deployment, the team monitored the magnetometer's three sensors. Once the spacecraft is at Jupiter, these sensors will measure the magnetic field around Europa, both confirming the presence of the ocean thought to be under the moon's icy crust and telling scientists about its depth and salinity.

Europa Clipper will come to within 300 to 600 miles (500 to 1,000 kilometers) of the surface of Mars on March 1, 2025. This enables the spacecraft to use the planet's gravity to help it accelerate towards Jupiter. While sling-shotting around Mars the team will take the opportunity to turn on the spacecraft's thermal imager to capture multicolored images of Mars as a test operation. They also plan to collect data with the radar instrument so engineers can be sure it's operating as expected.

In December of 2026 Europa Clipper comes home (briefly) for its second gravity assist, swinging about 2,000 miles (3,200 kilometers) from Earth. This flyby, along with the earlier Mars flyby, gives the spacecraft enough energy to reach Jupiter in 2030.

Parker Solar Probe – Dipping into the Sun



Operations teams have confirmed NASA's mission to "touch" the Sun survived its record-breaking closest approach to the solar surface on Dec. 24, 2024.

Breaking its previous record by flying just 3.8 million miles above the surface of the Sun, NASA's Parker Solar Probe hurtled through the solar atmosphere at a blazing 430,000 miles per hour — faster than any human-made object has ever moved. A beacon tone received late on Dec. 26 confirmed the spacecraft had made it through the encounter safely and is operating normally.

This pass, the first of more to come at this distance, allows the spacecraft to conduct unrivaled scientific measurements with the potential to change our understanding of the Sun.

Parker Solar Probe has spent the last six years navigating towards this moment. Launched in 2018, the spacecraft used seven flybys of Venus to gravitationally direct it ever closer to the Sun. With its last Venus flyby on Nov. 6, 2024, the spacecraft reached its optimal orbit. This oval-shaped orbit brings the spacecraft an ideal distance from the Sun every three months — close enough to study our Sun's mysterious processes but not too close to become overwhelmed by the Sun's heat and damaging radiation. The spacecraft will remain in this orbit for the remainder of its primary mission.

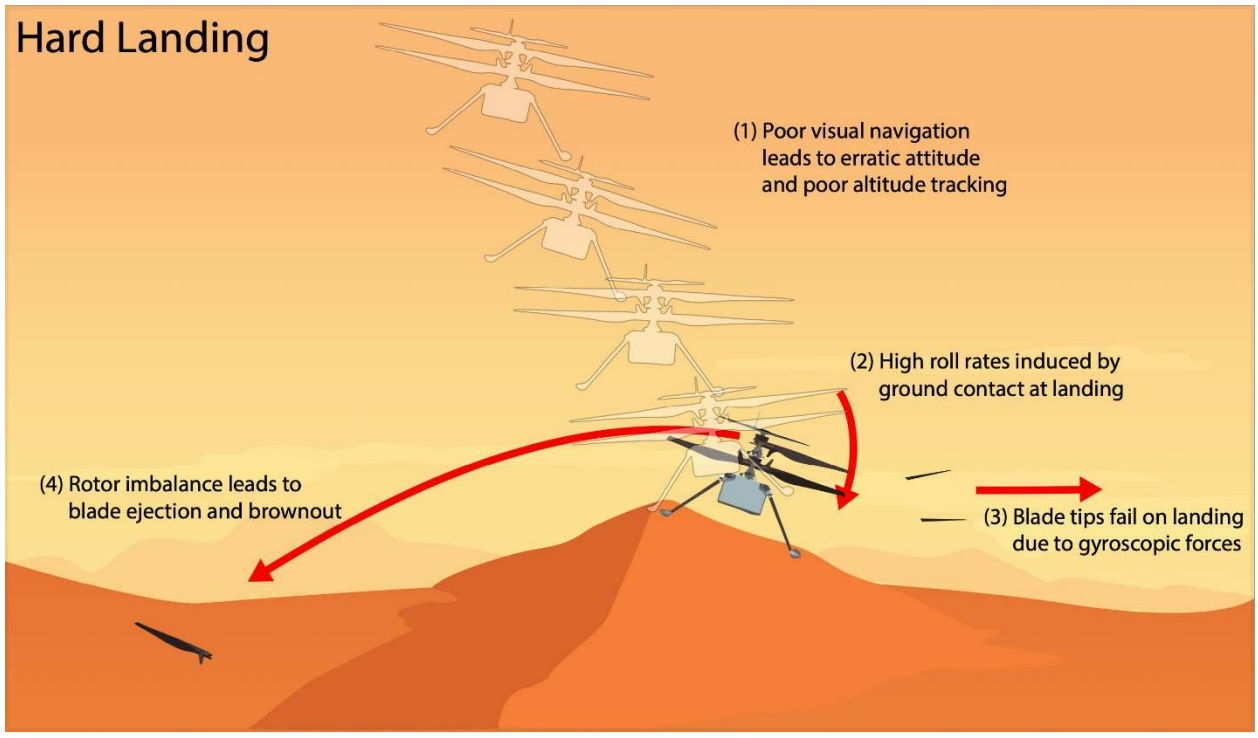
Ingenuity – First Aircraft Accident Investigation Undertaken on Another World

Engineers from NASA's Jet Propulsion and AeroVironment are completing a detailed assessment of the Ingenuity Mars Helicopter's final flight on Jan. 18, 2024.

The investigation concludes that the inability of Ingenuity's navigation system to provide accurate data during the final flight likely caused a chain of events that ended the mission. The report's findings are expected to benefit future Mars helicopters, as well as other aircraft destined to operate on other worlds.

The helicopter's vision navigation system was designed to track visual surface features using a downward-looking camera over well-textured (pebbly) flat terrain. This limited tracking capability was sufficient for carrying out Ingenuity's first five flights, but by Flight 72 the helicopter was in a region of Jezero Crater filled with steep, relatively featureless sand ripples. Data sent down during Flight 72 shows that, around 20 seconds after takeoff, the navigation system couldn't find enough surface features to track.

Photographs taken after the flight indicate Ingenuity had high horizontal velocities at touchdown. In the most likely scenario, the impact on the sand ripple's slope caused Ingenuity to pitch and roll. The rapid attitude change resulted in loads on the fast-rotating rotor blades beyond their design limits, snapping all four of them off at their weakest point — about a third of the way from the tip. The damaged blades caused excessive vibration in the rotor system, ripping the remainder of one blade from the hub.



Although Flight 72 permanently grounded Ingenuity, the helicopter still beams weather and avionics test data to the Perseverance rover about once a week. The weather information could benefit future explorers of the Red Planet. Soon Perseverance will maneuver out of radio range of Ingenuity and the grounded helicopter will continue collecting data with no way to send it home.

For additional information:
https://science.nasa.gov/mission/europa-clipper/
https://europa.nasa.gov/mission/about/
https://europa.nasa.gov/mission/faq/
https://science.nasa.gov/science-research/heliophysics/nasas-parker-solar-probe-makes-history-with-closest-pass-to-sun/
https://www.jpl.nasa.gov/news/nasa-performs-first-aircraft-accident-investigation-on-another-world/

List of Items Available for a Donation to the Club.

Some are already listed in our Ads section. Some are usable as-is some will require some work. Note: the Suggested Donatoin Amounts are suggestions only, don't be afraid to make an offer. Also note some of these items will are past due to be sent to the dump (see Termination Date).

Contact Keith Lawrence 802-453-5496 or sleepingbearwoodworking@yahoo.com

Item Description	Planned Termination Date	Suggested Donation Amount	Comments
6" F/8 Edmunds Scientific Newtonian reflector telescope		$40	no accessories, new mount by Keith Lawrence
4.5" F/8 Meade 4504 Newtonian reflector telescope	Oct-23	$20	no mount or accessories
Traq 60mm f/15 545 refractor telescope w/ built-in finder	Oct-23	$25	with equatorial mount
Tower 40mm F/15 refractor telescope	Oct-23	$10	15x - 45x Varipower focus tube
10" F/8 Newtonian reflector telescope	Oct-23	$35	tube only, no mount or accessories
5" F/13.8 Zeiss Refractor	May-25	$1000	alt-az mount, 3-EP turret
Galileo Scope with tripod	Feb-24	$15	1 of 2
Galileo Scope with tripod	Feb-24	$15	2 of 2
Meade Polaris 4.5" F/8 Newtonian reflector telescope	Dec-24	$50	Equatorial mount, 0.965" eyepieces - 25mm, 12mm, 4mm, 3x Barlow
8" Coulter Odyssey 8 Newtonian telescope	Apr-24	$100	Dob mount, 2 Eps
2 sets of 30mm/18mm eyepieces to go with these telescopes	Nov-27	$50/set	Traded an AstroScan for 4 eyepieces from Ron Lewis' estate
Edmunds Scientific, 4.25"? & equatorial base	Nov-25	$30	Kind of rough shape but probably salvagable
Meade ETX-125EC Telescope with case, tripod and electronics	Nov-25	$150	Optics seem good. The motor drive works except for the GoTo function which does not.
Edmunds Scientific, 4.25" f/10	Nov-25	$50	In very poor shape
Orion 8" Dobsonian	Dec-25	$150	Was GoTo but gearing broke, now a push to. It worked, but not well. With accessories and eyepieces that came with it?
3" f/10 Edmunds Scientific Newtonian	Dec-25	$25	Complete with a wood tripod in very good condition, a lens and a finder scope.
4" f/10 Celestron Refractor with equatorial mount and tripod	Dec-25	$100	condition not accessed
Spoting scope	Dec-25	$25	condition not accessed

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.

Light-duty Machining

Need more precise drilling and shaping then 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 have mini milling machine and a mini lathe for metal working.

Paul Walker 802-388-4220 or paulwaav@together.net

Wanted

For Sale

Various remaining optics for sale from an estate in Morrisville. Most of the items have sold. We want to get rid of the remaining ones so we've dropped the prices. Items can be shipped or I can meet you within an hour east or south of Burlington, VT, eliminating the shipping cost.

- 3 polished 6" Pyrex mirror blanks, no apparent curve, 2 with Beral coating, **$25 apiece + shipping**.
- 10" x ¾" raw mirror blank. Some edge chipping and blemishes on one side – other side looks fine. **$80 + shipping.**

If interested or for more information, contact Neil Perlin at lcvtsg@gmail.com

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.

Keith Lawrence 802-453-5496 or sleepingbearwoodworking@yahoo.com

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:

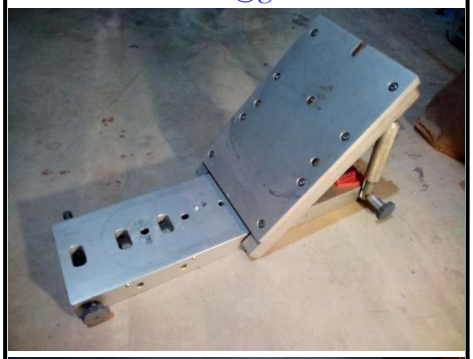
- Homemade heavy duty tripod dolly
- Revolution Imager 2 with the optional DVR.

Asking $1800 (new price).

Pick up near Rutland, VT

Patrick Porch 802-236-2463 or pcwizard2600@gmail.com

Heavy Duty Equatorial Wedge For Shmidt-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



Various optics for sale. Three raw mirror blanks, two projection lenses whose optics might be useful, and 4" and 6" mirrors of unknown focal length (with one exception), and whose finish is in various states of disrepair but that may be good for ATM or experiments. . Items can be shipped or I can meet you within an hour east or south of Burlington, VT.

Various optics for sale from an estate in Morrisville.
(Prices do not include shipping, if necessary)

- 1 raw 10" thin mirror blank, **$100**
- 3 polished 6" Pyrex mirror blanks, no apparent curve, 2 with Beral coating, **$20 apiece**
- 2 Kodak Ektar 4" F1.5 projection lenses, rear lens on one is cracked – **best offer**

(Prices do not include shipping, if necessary)

Items can be shipped or I can meet you within an hour east or south of Burlington, VT.

If interested or for more information, contact Neil Perlin at lcvtsg@gmail.com

Celestron AstroMaster 130 EQ-MD #31051

It has been used maybe 6 times since 2009.

For sale $225. cash preferably

Contact Mike Thompson at mikehtvt@yahoo.com I live in Milton. May be able to deliver also.

VAS Surplus Items
All items stored 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

Keith Lawrence 802-453-5496 or sleepingbearwoodworking@yahoo.com

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

Celestron XL Series 1.25" eyepieces:
7 mm
5mm
Barlow
Altair Altra Flat eypieces:
10mm
Altair Lightwave 1X Field Flattener
Altair GP-CAM, 1.25" USB camera
Celestron Power Tank
Asking $1700.

Cell contact, 802 598 1886
senftleberfritz@yahoo.com
Fritz Senftleber

VAS Surplus Items
All items stored at the Hinesburg Observing Site

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

Keith Lawrence 802-453-5496 or sleepingbearwoodworking@yahoo.com

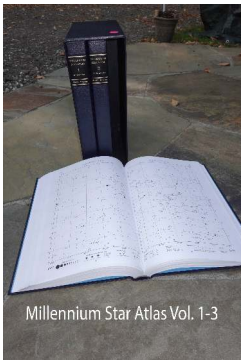
The following items are the property of the late Ron Lewis of Brandon, VT.

Top of the line **18" f/4.2 Obsession Telescope...$6,600**
This scope was built for Ron Lewis (longtime VAS member) with every accessory that could be added to this dream telescope.
-18" f/4.2 Mirror made by Optical Mechanics Inc. in 2016.
-Argo Navis Hand Controller System
-ServoCAT Go To System (motorized)
-Feather Touch dual focuser
-Finder Scope, Telrad Finder, Shroud, Power Base, Stalk for controllers, padded box for upper assembly and poles, the list goes on! This scope is absolutely loaded.
Current new retail value is probably around $14,000. This is like new.
Pick up only (Brandon, Vermont).

Lunt 152mm Solar Scope...$6,600.
This Hydrogen Alpha scope was owned by Ron Lewis.
Comes with:
Single Stack H Alpha filter
Night time visual back to allow the scope to be used as a 152mm duplex.
Calcium K back for astrophotography of the Sun in that wavelength of light.
Padded carrying case.
Lunt Zoom eyepiece.
Weight of scope is about 30 pounds depending on the configuration.
Mount is not included.

Six TeleVue Ethos Eyepieces. Sold as a set-in case. Excellent condition. If bought new $4,281 plus tax. This set is priced at **$3,780**, a $500+ savings. 3.7mm, 6mm, 10mm, 13mm, 17mm, & 21mm

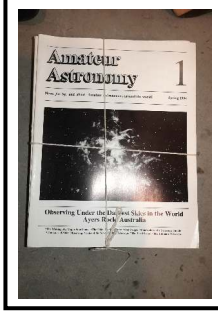
TeleVue 31mm Nagler type 5; $598.00

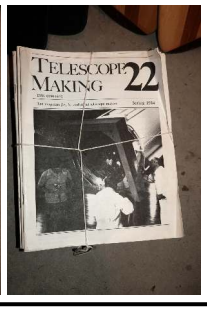


Millennium Star Atlas, $599.00, three volume set in excellent condition or best offer.

Sky Atlas 2000.0 Deluxe ED. 1981; W. Trion, 26-star charts **$50.00**

Magazines:





Amateur Astronomy 1-67 Set of 55; **$80.00**
Telescope Making 1-46 (missing # 7 & # 8) Rare materials. **$ 175.00**
ATM Journal/ Amateur Tel. Making, (1-16) **$80.00**

Contact Allon Wildgust 802-247-3119 or allon.wildgust@gmail.com

8" Apertura Dobsonian f/5.9

Helping a friend sell this.

2 years old, very little use as owner lost interest.

Options as purchased from Highpoint
- Primary mirror cooling fan
- 8x50 RACI finder
- 2" dual speed focuser
- 9mm and 30 mm eyepieces (plus one I gave him somewhere in between the two, don't remember the size)
- 1.25" moon filter
- I believe this comes with a laser collimator too.

Asking $ 500.00

Patrick Porch 802-236-2463 or pcwizard2600@gmail.com

2022 Celestron Nexstar 8SE

This is being sold with the bundle as originally purchased from Celestron. Excellent condition.

- 8" F/10
- Single arm mount with GoTo can be controlled with the included hand controller
- Red dot finder
- Heavy duty tripod
- Celestron Eyepiece and filter kit: https://www.celestron.com/products/eyepiece-and-filter-kit-125in
- Astrotech Premium Flat Field 15.5mm 65-degree field eyepiece
- Telrad finder scope (not mounted)

Link to current 8SE: https://www.celestron.com/products/nexstar-8se-computerized-telescope
Asking $950.00 (Current over a $1500.00 retail value)

Pick up in Stowe, VT or can arrange drop off within a reasonable distance

Jay H. Kaknes 603-490-2207 call or text jkaknes@gmail.com