

Morning Star

Summer 2023

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@vtastro.org

(Goes to Secretary and Webmaster)

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(My apologies if I missed anyone)

The Morning Star newsletter from Yesteryear

1985-April-May-June Morning Star:

This is the first page of an 8 page newsletter. The complete newsletter is on Paul's Google Drive, the link is here: <https://drive.google.com/drive/folders/12zBSjZqEwKOd9a14LHdqMMH1NaaWNq?usp=sharing> and look for the file "1985-April-May-June.pdf".

Gary Nowak was president and Lawrence (Larry) Garret VP of the club at this time.

In it you will find an astro calendar by Larry, the president's report on the activities of club members, a pre-return Halley's Comet article by Gary, a letter

writing effort by Gary to try to include a planetarium in what we know as ECHO, Leahy Center for Lake Champlain.

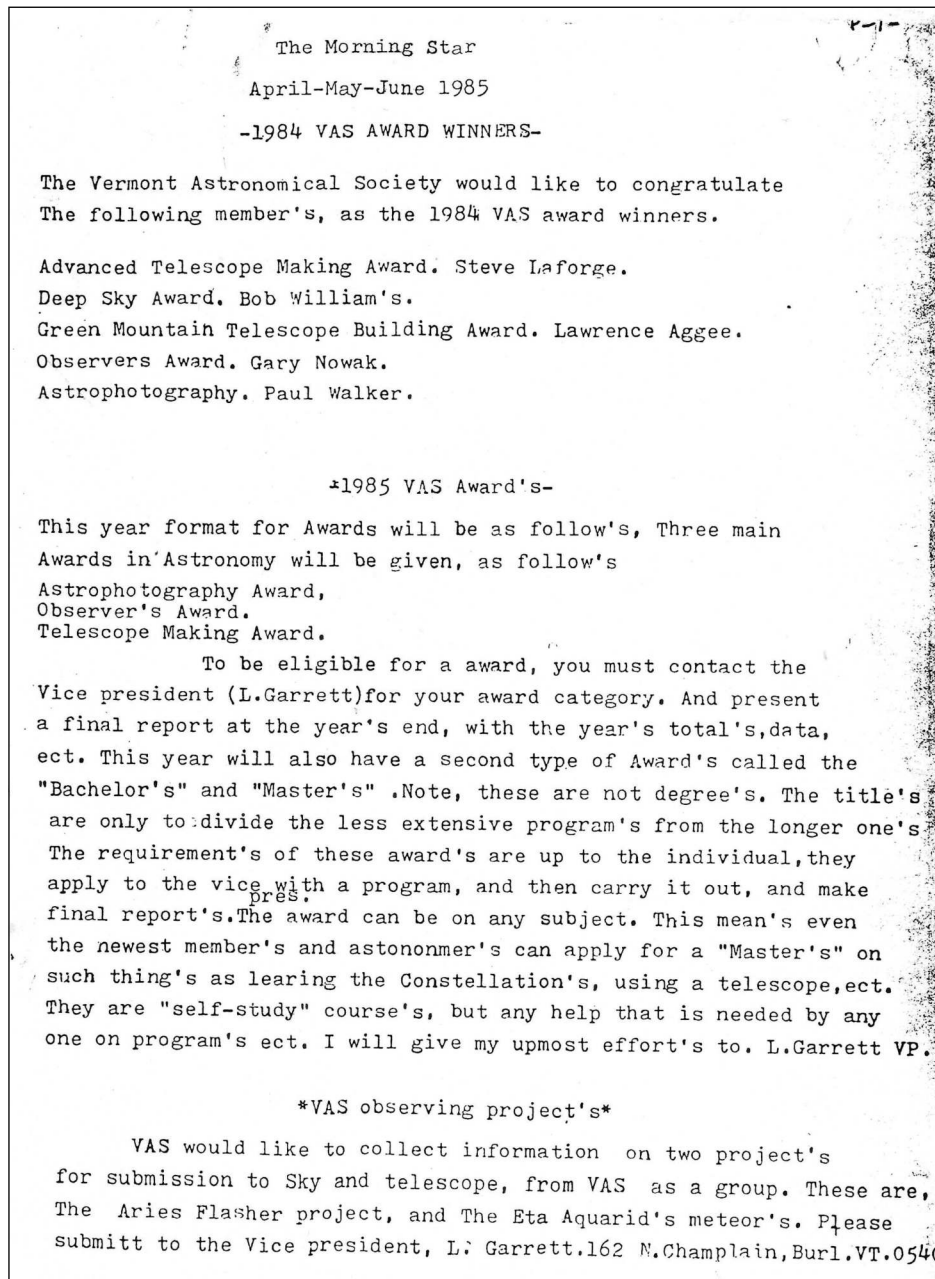
How many of you remember the excitement of the "Aries Flasher"? No not that kind of flasher, a flash of light observed in the constellation Aries. There is an article by Paul about his experimenting with exposure time to see how bright it would have to be to imaging it with a 35 mm camera. Here's a link to a New Yorker article that July - <https://www.nytimes.com/1985/07/23/science/science-watch-flashing-star-is-sighted-in-aries.html> . And a NASA

paper on the Aries Flasher- <https://ntrs.nasa.gov/citations/19870062993> .

I don't plan to do the 10, 25, 40 year type of thing. Nor necessarily do them sequentially. I don't have copies of all the back issues nor was the production necessarily consistent in the early 80's.

Most are multi-page publications so I won't be including the whole newsletter here each time but will provide a link to a PDF file of it.

We will get to see examples of the cover artwork that Russell Chmela produced starting in the Fall of 1985.



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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

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

Member & Invited Guest Star Gazing at HOS & other events

There plans to scheduled events starting in September.

Keep watch for emails announcing scheduled or impromptu observing at the Hinesburg site.

Note: If you would like to be a host, greeter/orienteer or want some training on operating the scopes, let Paul Walker know.

Contact: info@vtastro.org

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

Deborah Rawsen Memorial Library, Jericho, VT:

July 26, 7:30-10:30 PM with the 27th and 28th as rain dates. .

Rokeby Museum, Ferrisburgh, VT:

Sept. 16, 8:30 - 10:30 PM. with a raindate of the 23rd.

"Spontaneous Night Under the Stars" Late August or early September

Joe Comeau will once again hold public observing at his observatory, Orchard Hill Observatory at 70 Poor Farm Rd. Alburgh VT. The plan is to make a list of interested people and contact folks up to a few days in advance based on the weather forecast. This event will likely occur in July but it may not happen until August.

Activities will begin at dusk. This will be a no-cost event for people of all ages. Families with children are welcome.

VAS members are invited to bring their telescopes to show participants around the summer sky. There will be a slide show of pictures taken by Astronomical Society members. Invite your friends for an exciting evening.

Contact Joe at 802-238-1664 or jkcomeau@hotmail.com

New Members

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

Chelsea Marcus
Christopher Keller
Brad Vietje

Green Mountain Astronomers (GMA)

There are plans to schedule some events in the Fall.

Stay tuned for email notices.

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@vtastor.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.

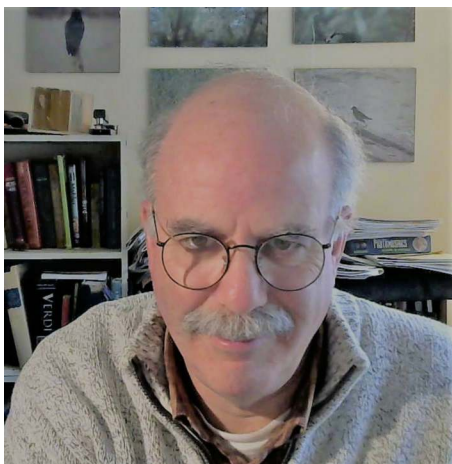
July 10

Animal Astronomers & Astronauts

By Dr. John Sichel

It's not just we humans who have an interest in astronomy. This talk will focus on the ways that the lives of our fellow animals—from turtles and terns to dragonflies and dung beetles—depend on astronomy to negotiate their lives. Additionally, those non-human animals who have actually traveled into space will be discussed.

Dr. John Sichel is a Professor of Music and Co-chair, Arts & Design at Raritan Valley Community College, North Branch, NJ



Dr. John Sichel

August 7

Building of a 14.5" Telescope Plus an Observatory to House It

By George Viscome

In this talk, George Viscome of Lake Placid, NY will describe the construction of a sizable telescope and observatory he built back in the mid-80's, which has been in continuous use ever since. The design of both is somewhat unconventional but quite functional. Over the years it has been used to take thousands of astrophotos, to make thousands of asteroid position measurements, to discover several dozen asteroids, and is used in other research-grade projects.



George Viscome's 14.5" and observatory.

Sept 11

Mastering Observing with the Astronomical League's Observing Programs

By Peggy Walker

This will be a walk through of the nearly 80 observing programs and how they are arranged for progression. On the League's website, there is a grid that is a great capsulation of the criteria of each program such as, level of expertise, equipment, etc. Another list is the alphabetical one that will show how inclusive of almost all types of celestial objects or phenomena that one can observe. Not all on the list is about observing, some were developed for outreach and others for special events.

All the programs list the respective Program Director along with an overview of how the program was generated, the possible nuances and points of particular interest in that particular pro-

gram. All programs also have a list of objects, some with specific log sheets or sketching pages, along with any additional information one may need to proceed. These include catalogues of objects that have been used for decades, and even some databases from specific organizations at one's disposal.

Because of the large selection of programs, one would be best to approach this like a student going to college. To get the Mater level, a basic groundwork needs to be developed first and each program will build upon the former with increase of skill set, equipment, maybe filters, or even sketching or imaging included. There are lots of resources at the ready and some manuals are a separate purchase while others are a simple download and print.

Peggy Walker will review the Observing Programs by subject matter and give a broad overview of what is available to the beginner, novice and expert amateur astronomer as well as student and family participants.

Articles

Zero Gravity Bino-Chair Fully functional, easy to use

By David Selinger

Acknowledging the fantastic pioneering designs of fellow CN'ers. Their references are listed below. Could not have started this chair without their ideas. To further help develop this prototype, it would be great to hear any suggestions, mechanical or otherwise. Like other zero gravity bino-chairs, this one is comfortable and stable, easily sweeping any part of the sky. It is adjustable for each user and binocular size. It has two additional features not seen on other chairs: first, a binocular cradle which, among other benefits, helps maintain the difficult-to-control all-important eye-to-optics distance when one is changing viewing altitude. Second, it has an easy to use hand-controlled drive wheel for panning.

Usage:

Before viewing session:

Slide the backrest blocks up or down for user height. Choose holes on



the backrest blocks, for the teeter-see-saw pivoting, to later minimize head re-positioning when tilt changes. The natural pivoting axis of the neck is in front of the backrest, near the earlobes. Can pick holes further out from the backrest, for example, when padding has been added to the chair. Counterweights behind the chair, and at the foot of the chair, can be adjusted for bino weight. Slide the cradle holder on the metal tubes, out a couple of inches to help get in behind the binos. Can move the binos up out of the way by tilting the teeter and the cradle up.

Eye-to-optics adjustment:

When seated, slide in the cradle holder on the metal tubes to bring the binos closer, then tighten the thumb-screws. In previous designs, as the chair and the teeter are tilted, the eye-to-optics distance would significantly change. This design greatly minimizes this eye-to-optics adjustment: first, the teeter fulcrum has previously been chosen to match the neck's tilting pivot point; second, the cradle can be tilted slightly forward or back to easily adjust eye-to-optics on the fly. Example: if the cradle has been tilted up slightly, the teeter can be tilted down slightly, to keep viewing the same point. The cradle also helps in quickly shifting the binos away, in order to look at a chart for example.

Main tilt adjustment:

One can tilt the chair, the teeter and the cradle. At higher alt viewing, the neck will also slightly tilt up. There are rubber friction washers, for stability

when letting go. Adjustment of eye-to-optics can easily be done as the tilt changes; see above.

Drive wheel for panning:

Operated with a light push or pull of the left hand. It is mounted to a connection between the two left legs of the chair. There is a little pressure of the wheel's rubber edging on the rubber track of the ground board. Due to a small amount of wheel friction, the chair does not have to be completely level. Dowels are attached to the outside of the wheel for easier handling.

Construction:

Teeter:

Consists of hardwood frame and backrest blocks, metal tubes, and counterweight. There are a few pivot hole choices, as described above. Each axle is a 1/4" bolt/lock-washer/wing-nut, but I am instead planning on using a bolt/castle-nut/R-clip-in-bolt-hole, which would allow tightening by inserting washers. It uses a rubber fender washer for adjustable teeter friction. The tubes are 3/8" aluminum for easy sliding of the cradle-holder, with thumb-screws, and stoppers on the ends of the tubes.

Sliding hardwood cradle holders and 3/8" hardwood plywood shelf for the binos, which is light, strong, and stable. The best stability is if it pivots at the cen-

ter of gravity of the cradle and bino combination. Again, rubber washers on the tightened axles provide fluid friction. Can add other pivot holes on the cradle for different binos or piggybacked binos. The cradle axles are the same as the teeter axles, and friction can be adjusted in the same way.

Wheel:

Made of pine boards laminated edge-on, routed to ~22" diameter, with hardwood hubs. The wheel's grooved edge holds a timing belt, ribbed side out, for traction, not for timing. The hardwood wheel mount is attached to the left legs of the chair. The axle is positioned on the wheel mount such that the wheel runs tangentially to the ground board track. The wheel axle is now a 1/4" bolt/jam-nut, with a silicone greased metal fender washer, but planning on using a 3/8" hex bolt, castle nut, and R-clip.

Rotating base:

The ground board has a recessed track for the wheel, lined with yoga-mat rubber. The Lazy Susan bearing is on the center of the ground board (12",

1000 lb rating). The mid board is small and attached to the top of the bearing. It adds more separation between the chair and ground boards. The chair board, attached to the mid board, holds the chair. The four feet of the chair just sit on cavities in the chair board. The center of the lazy susan bearing is about twice as far from the front, as from the back of the chair board. The loaded and tilted bino-chair's center of gravity is directly over the center of the bearing. When the chair is not tilted back, the center of gravity is slightly in front of the bearing's center.

Counterweight at foot of chair:

A wood stair tread, routed to fit over the chair frame, balances the loaded and tilted chair.

Transporting:

Two sections: the rotating base, and the chair with its mounts. Typically rolled out with a dolly that has a large plywood base added.

Indispensable bino-chair design implementations:

www.cloudynights.com/topic/591591-my-new-bino-chair/?p=8101379
(Bob4BVM)

www.cloudynights.com/topic/855766-novel-design-bino-chair-for-100mm-binoculars/?p=12366360
(paulhinyorkshire)

[www.astroleague.org/files/reflector/Reflector June 2021 final pages.pdf](http://www.astroleague.org/files/reflector/Reflector%20June%202021%20final%20pages.pdf)
(drwickholm)

Quotes from Cloudy Nights and Sky & Telescope:

“just the chair and the binocs and the experience was transforming”
www.cloudynights.com/topic/500733-still-having-a-ball-with-my-new-binocs-and-zero-gravity-chair/?p=11161639

“forget the mount and grab yourself a zero-gravity reclining chair”
www.cloudynights.com/topic/758803-mount-for-binoculars/?p=10925531

“get a zero gravity type chair first and work from there”

www.cloudynights.com/topic/758803-mount-for-binoculars/?p=10925777

“Lying down makes one feel smaller and more vulnerable, a perspective further enhanced by the vastness of the cosmic dome above. This is a good sensation, one many observers consider one of the best reasons to be involved in astronomy.....Looking straight up, we see through the least amount of air.....objects are brightest when viewed overhead.”

www.skyandtelescope.org/astronomy-news/lie-back-look-up-and-find-your-zenith-stars

Fight to save historic Big Bang radio telescope

By Lou Varricchio

The historic radio telescope that 1978 Nobel Prize-winning physicists Arno Penzias and Robert Wilson used in 1964, to first detect the cosmic microwave background (CMB) radiation of the Big Bang, is in danger of being demolished.

The 18-ton, 15-meter Horn Antenna is located on Crawford Hill in Holmdel, New Jersey.

This writer visited the site in April but was warned off by a new, high steel fence and no-trespassing signs around the radio telescope.

The fate of the former Bell Labs instrument has rallied local amateur astronomers and residents to help save it. (Nokia purchased Bell Labs but no longer controls the radio telescope.)

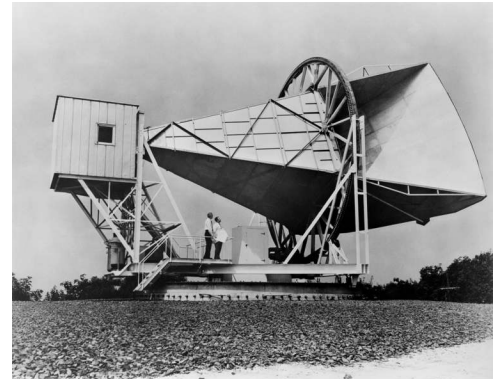
The individual developer, yet to be identified but who owns shadowy Crawford Hill Holding Co., apparently wants to build upscale townhouses at the site.

In April, Holmdel town officials filed a lawsuit to, first, identify the holding company owner and, then, acquire the property, by eminent domain, in order to save it.

Holmdel Mayor D.J. Luccarelli said in various news reports that he is seeking every legal means necessary to save the radio telescope.

After helping Penzias and Wilson to serendipitously detect the Big Bang's CMB signature, the antenna became the prime receiver of signals from the historic Telstar comsat.

If you want to learn more about how to help save the CMB Horn Antenna, visit www.Holmdel-CILU.org.



Wilson and Penzias at the historic radio telescope located in Holmdel, New Jersey, in 1962. (NASA public domain image)

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

You've Got to Love Cygnus

By Carrie Cruz

Looking towards the southeastern night sky in summer, one can find the Northern Cross, officially known as the constellation Cygnus the Swan, appearing to fly through the Milky Way. The entire cross pattern (or swan) fits inside the easy-to-recognize Summer Triangle asterism, created by three bright

stars: Vega (in Lyra), Deneb (in Cygnus) and Altair (in Aquila).

Many and varied are the myths relating the constellation Cygnus...

One of several Greek myths relating to Cygnus is that it was once the pet bird of Cassiopeia. Another story is that it was named after Cionus, who was changed into a swan and brought to the heavens by his father, Neptune, in order to protect him from being smothered by Achilles.

A better-known myth about this constellation is the story of Leda and the Swan. Leda was the very beautiful wife of King Tyndareus of Sparta. Zeus, known for his affairs with mortal women, fell in love with Leda and changed himself into a swan in order to seduce her. After lying with both Zeus and her husband in a single night, Leda gave birth to twins: Castor, the mortal son of her husband, and Pollux, the immortal son of Zeus. Castor and Pollux are in the constellation of Gemini the Twins.

Then there is the story of the boy Cygnus, who tried to save his friend Phaeton, when he was struck by one of Zeus's thunderbolts and fell into the River Eridanus. Phaeton was the son of Clymene, whose husband was the Egyptian King Merops. Eventually, Clymene told Phaeton that his father was not the king, but was really the Sun god Apollo. After learning this, Phaeton bragged to his friends how his real father was a powerful god. Phaeton's friends teased him and said he was lying. Hurt by this, Phaeton went to his mother, who told him to go to Apollo and ask him the truth. (Perhaps this was the first time a mother said, "Go ask your father!")

Apollo was so happy to see his son that he promised him anything that he asked for in order to prove to his friends who his father truly was. Much to Apollo's dismay, Phaeton insisted on driving the Sun-chariot across the sky. Apollo tried to talk Phaeton out this, telling him that driving the chariot was too dangerous for mortals or even demi-gods. However, unable to convince his son otherwise, Apollo kept his promise and off Phaeton went on the chariot, with the Sun in tow. Phaeton soon lost control of the chariot as the horses realized that someone new and inexperienced

was holding the reins. The horses took their own lead, racing across the sky.

The uncontrolled trail left a scorch mark across the sky that became the Milky Way. The Earth became cold as the Sun-chariot rode too high and ice caps formed. As the horses continued their uncontrolled trek, they raced down too close to the Earth, burning the land across Africa and creating a great desert.

To keep the Earth and sky from even more destruction, Zeus, King of the Gods, called for Aquila, his eagle, to bring him his thunderbolts. Zeus threw a thunderbolt, striking Phaeton, knocking him out of the chariot and into the river Eridanus. The horses returned to their stables and back to Apollo.

Phaeton's friend, Cygnus, had witnessed the entire thing and was so worried that he went down to the river where he plunged into the raging waters, over and over again, looking for Phaeton, with no luck. Zeus took pity on Cygnus and was touched by his act of true friendship and caring so he turned Cygnus into a swan to dive more effectively. Cygnus managed to save Phaeton and Zeus decided to place him up into the heavens as the Cygnus constellation to honor him.

The Chinese know the constellation of Cygnus as Que Qiao, the "magpie bridge." In this story, the lovers, Niu Lang (a mortal Shepherd) and Zhi Nu (a fairy Weaver) secretly married, going against the rule that fairies and mortals were not to be together. When the Goddess of Heaven learned that the two were married, she took the fairy Weaver with her up into the heavens and created a river, represented by the Milky Way, in the sky to keep the two separated.

The two lovers cried so many love-sick tears that the Goddess took a softer line and allowed that once a year, on the seventh day of the seventh lunar month the two could be reunited. Once a year, all the magpies in the world come together to form a bridge over the Milky Way river and help the two lovers reunite to see each other. In the story, the star Deneb either marks the start of the bridge or represents a fairy who chaperones the two lovers when they meet.

The Qixi Festival, also known as the Magpie Festival, celebrates the joyful

reunion of the Shepherd and the Weaver. It is a holiday held on the 7th day of the 7th lunar month in China. It is also celebrated and observed in Japan as Tanabata and in Korea as Chilseok. The Magpie Festival is a holiday comparable to our celebration of Valentine's Day.

You've got to love Cygnus!

Board & Committee Meetings

April Board Meeting

Checked our readiness for the Annual Banquet and Business Meeting - the meal is set, officers were reminded to have reports ready. Paul has emailed the ballot for officers and Board at Large members out to the Full Members.

Wake Robin Retirement Community would like to have a stargazing event at their facilities.

Essex Town Library is interested in purchasing Library Loaner Scope. We only one, the demo unit. We will sell it to them for 1/2 the normal price.

Terri met the Astronomical League's Mid-west Coordinator, Peggy Walker, at the Winter Star Party. Peggy offered to do a presentation at one of our monthly meetings.

May Annual Meeting

Jack opened the meeting.

Jack presented a VAS Messier Observation Certificate to Barry Connolly for observing all 110 Messier Objects.

VAS's 59th anniversary is May 6th.

Jack gave the President's Report.

Joe gave the VP's Report

Paul gave the Secretary's Report, an observing site report and newsletter report.

Keith reported that no Library Loaner Scopes were placed in 2023. He will be placing one soon and has a request for one.

Jim gave a Solar Eclipse Committee Report. The club has purchased 5,000 hand held solar viewers. The committee now needs to decide how to distribute them. They are also asking members to scope out areas near them and consider hosting an eclipse viewing event.

May Board Meeting

We agreed to change the lock code on the storage shed so those who have volunteered to mow the grass at the site don't need to receive the normal training for site access.

We discussed getting new patches to celebrate our 60th anniversary (coming up next year).

Keith has placed a Library Loaner Scope with Essex Town library and working on placing one with the library in Sharon, VT. Cornerstone Science is no longer supporting the Library Loaner Scope programs. They used to obtain the scope a below retail value as well as provide an instruction booklet and other items for the scopes. So even when the Orion telescope is available again, many of the periphery items will not be.

Jim approached the Essex Jct. Park Agency about using the Cascade Park for the 2024 solar eclipse.

Deborah Rawson Memorial Library is interested in having another star gazing party.

We went over some proposed changes to the by-laws.

June Board Meeting

Aegis Renewable Energy plans to start installing the solar farm on the Hinesburg landfill soon and take 3-4 months (late Fall) to complete it. They have offered to donate \$100 to the club for each month they are there to compensate for the disruption to our activities at the site (we don't expect much in the way of disruptions. At this point they have placed a storage unit on the north side of the parking area.

Joe will hold his "Spontaneous Night Under the Stars" at the end of the Summer, probably early September.

Terri is working with Rokeby Museum in Ferrisburgh who would like to have a star gazing event this summer. She will be doing a constellation presentation at Greg Brown Lodge in St. Albans.

Keith received a request for a Library Loaner Scope from St. Albans Library. We do not have any scopes in the que. The board approved his purchasing two Orion Starblast 4.5" f/4 scopes

at higher price than the discounted price from Cornerstone of Science of Brunswick, ME (from which they are no longer available).

With Peggy Walker from the Astronomical League (AL) giving a presentation at the September meeting, it was suggested we order some of the AL's observing manuals to have available at that meeting. Keith will get back us on the cost.

Scott has been working with the Deborah Rawson Memorial Library in Jericho, VT to set up a summer star gazing event. The event is scheduled for July 26 with the 27th and 28th as rain dates.

We spent some time going over some proposed changes to the by-laws.

----- VAS Membership Committee

----- 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

► Tip (repeat) 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.

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

► (repeat) Before you start each observing session check that your finder scope, red-dot finder (or other "unity" finder) is aligned to your telescope. This can be done before it gets dark if there is a fair-

ly distant terrestrial object you can use as target, which, unlike a star or the Moon won't move on you. After dark, try using Polaris, as it doesn't move much. Put your lowest power eyepiece in the focuser and center the target. You may want to fine tune the alignment by switching to a higher power eyepiece. This can save a lot of time searching for objects.

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.

Member's Observations (mostly from the vtastro@list)

Supernova in M101 (in the Big Dipper)

(May 22) In case you haven't heard, there a supernova (SN 2023ixf) in M101

(the Pinwheel galaxy) off the handle of the Big Dipper.

I have seen observational reports where it was about magnitude 12 about 18 hours ago. It will likely be about mag. 11 tonight, bright enough to find it in a 6 inch scope or smaller (if you have some experience).

I'll be viewing it with my 12.5" f/4.8 in my backyard tonight as well as imaging with a 6" f/4 scope.

Paul Walker

(May 23) It seemed quite bright. Much brighter than any of the other nearby stars. I would have guessed it was brighter than mag. 11.

Mark Moyer

(May 23) I agree, Mark!

Quite bright, easy to spot. I coulda/shoulda done more imaging, but the astro-video camera I use was giving such a sweet live-view that I forgot to do anything else! I'm sure others will offer much better pix, but this was my raw, real-time shot with my cell phone of what I was seeing on my monitor. Well, sorta. The real viewing was better than what the cell phone presents... Oh, and this was through an 80mm f/5 refractor!!!!!!!!!!!!!! In case you don't know, the SN is the bright spot at 10:00 from the core.



-P- (Peter Gillette)

(May 23) Looks so much like the AAVSO star chart right on your phone for telescope work. Great!

Lawrence Garrett

(May 23) You're right Mark it was brighter than 11th mag., at least if my estimate is right. From info I found online it appeared that it would be about 11 mag. last evening. After helping Lou find it in my 12.5" Dob. and getting my imaging of it going, I went back to the 12.5". For some reason I had a hard

time getting sufficiently oriented between a printout from Starry Night Pro planetarium software that included the star magnitudes and the view through the scope to identify the appropriate field stars on the chart. Once I got oriented I estimated it at 10.9 mag.

Hi Peter, nothing like a pleasant distraction. Your image appears to be mirror reversed?

So here's one of those better images you mentioned :) Not a great image, but I'm happy with it. I have my 6" f/4 on the Atlas mount right now so that's the scope I used. The image is a stack of 15, 4 minutes exposures, with darks and flats applied. Background is a little splotchy, with linear streaks. But I darkened it enough so it's not particularly noticeable. I took JPG images rather than RAW, so that doesn't help. And only 1 hour of time.

The original Field of view is 2 x 1.3 deg. M101 is offset because that's where the goto put it and I said good enough. Turns out that was a bonus with the galaxy top left, NGC 5474, which is labeled as a spiral though it looks "irregular". But I do see what look like star clouds in spiral arms. There's actually at least 7 other galaxies [in the original image] including the one on the far left that doesn't show on Starry Night Pro.



Cropped- field of view 0.74 x 1.07 deg

Paul Walker

Venus Naked Eye

(May 22) Just spotted Venus naked eye. About four finger widths East of the Moon.

Brian S. Johnson

(May 22) Oh yea, the Moon and Venus are close enough together that if you can find the Moon you have a chance of seeing Venus in full daylight. Nice catch.

We have a thin veil of smoke down here in Middlebury right now. So even the crescent Moon was not easy to spot. Had to look at my planetarium software to get the direction and separation between them (~6 deg to the upper left at a ~45 degree angle. Caught Venus a few times briefly before finally being able to hold it steady. Down here Venus was just barely visible. All those tiny sparks of light flashing in and out of existence like virtual quantum particles were very distracting!

Paul Walker

(May 22) Mid-afternoon tomorrow will be even closer.

Got my 6SE out to do some solar observing. Sun looks good.

Switching to the Moon reveals pretty bad seeing. Not much detail on what is visible. Venus bounces around a LOT!

Brian S. Johnson

(May 22) Sun was good here as well today, glad to hear you got some viewing in. Many moments of very good seeing, for daytime viewing!

Paul Walker

Talking About Viewing the Sun-Naked Eye Sunspot

(May 22) This sunspot is big enough to see with the naked eye (with proper filtering like #14 welders glass or a pair of solar glasses)

Paul

(May 22) Nice post Paul, just spotted that at work and will try to get people outside a well.

Thanks

Lawrence Garrett

(May 22) Paul, Thank you so much for the (literal) heads-up!

I out and set up my APM 100/90 binos our deck with 18mm/~30X eye-

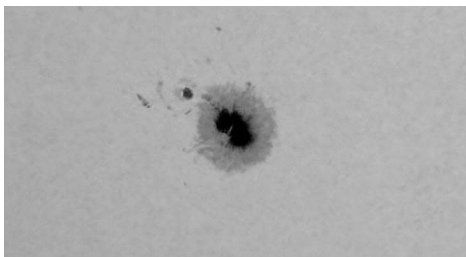
pieces. With the Baader solar filter material caps I assembled a couple of months ago in anticipation of next year's eclipse, I aimed them at Sol: Voila, (!! my first view of sunspots on-the-hoof!

What fun!
Thanks again,
Russ Lavigne

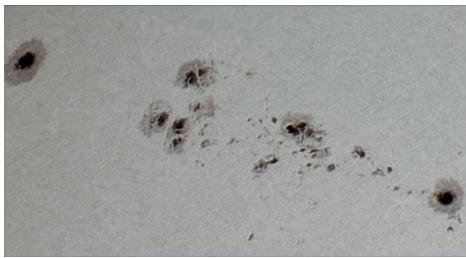
(May 22) As you saw there's also a long string of smaller very complex sunspots in the northern hemisphere of the Sun as well.

Paul Walker

(May 22) Paul, Yes. Indeed I did!
R.L.



2023-05-22, naked eye sunspot (#3310) 10" @ f/14.8 (3730mm efl), plus 3 x digital zoom in HD video mode. Stack of 3% of 9208 frames.



2023-05-22, long string of sunspots, #3313, 3311 and 3314, 10" @ f/14.8 (3730mm efl), plus 3 x digital zoom in HD video mode. Stack of 1% of 9689 frames. These 2 images are the same scale.

Another Naked Eye Sunspot

(June 30) Yup, definitely visible with solar filter only. Seeing good detail in my 8" Dob with solar filter.

Took 5 minute video with my "big" 10" as well for stacking into an image.
Paul Walker

(June 30) Thanks for the heads up Paul. I'm curious, do you use a full aperture filter on the big scopes or do you have it sized down?

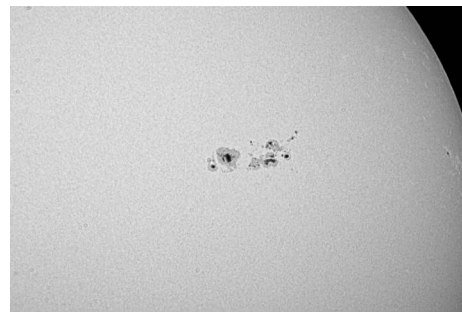
Pat Porch

(June 30) Full sized on the 8" Dob and slightly down sized on the 10". On the 10" I use an 8" filter because I originally got a 2nd 8" filter for an 8" Schmidt-Newtonian scope I have (the filter for the 8" Dob is a little too small for the 8" Schmidt-Newt.). So rather than getting a 10" filter for the 10" I opted to make an adapter plate for the front of the 10". Even 8" of aperture is overkill for the typical daytime seeing most of the time. But it's what I have. 4-6" is probably a better max aperture for solar viewing but 8" gives you a brighter image just as it does at night which can be helpful seeing subtle details on the Sun at higher magnifications.

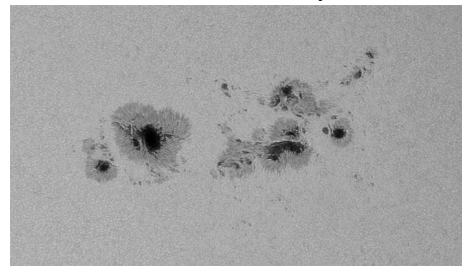
I have gotten really sharp views at 150x during the better moments of seeing with resolution down in the 1-2 arc second range where 100x is not enough magnification to show the smallest details visible.

Based on discussions with Gary Nowak, it seems the daytime seeing in my backyard is better than one would expect.

Paul Walker



2023-06-30, Sunspot #3354, 10" f/5.6, 2.65 x prime focus, Canon T7i camera single image. The group was visible with a solar filter only but the single large spot on the left probably would not be visible by itself.



2023-06-30, Sunspot #3354, 10" f/5.6, 2.65 x prime focus plus 3 x digital zoom in HD video mode. Stack of 3% of 9235 frames. This is at the same scale as the 2 right hand images.

Always happy to include your observations. Send them to info@vtastro.org.

Observing Article

My Lunar Observations: Domes and Smallest Craterlets: 8 April 2023 By Gary T. Nowak

29 March 2023 UT, 00:00 UT, Seeing 7.0, Transparency 4.2, Moon 52% illuminated, 7-Day Old Moon, 1st Quarter Moon, Moon is in Taurus. 4.7" (120 mm) F/7.5 APO Refractor, 180X. The 200X eyepiece was just a bit more magnification than the Seeing could handle.

I observed the Crater Argo Region, #32 on the Lunar 100 Card. Also observed the Crater Lamont Area "The Ghost Crater." #53 on the Lunar 100 Card. I first concentrated on the Lamont Area. The Lamont area is known for its network of low wrinkled ridges (Dorsa). The network of low wrinkled ridges seems to run by the Crater Lamont. The somewhat lower sun angle helped to show these wrinkles. At 180X, the Baader 610 nm (Red) and the W (Wratten) 23a (Red) did not work at all to show the Dorsa. The Baader 570 nm (Orange) and W21 (Orange) filters just helped to see the Dorsa just a very tiny bit. The best filter for viewing the Dorsa was the Baader 495 nm (Yellow) filter. The Baader 500 nm (Green) and the Baader 470 nm (Bright Blue) did nothing for the Dorsa or the Ghost Crater.

I switched back to the Baader 495 nm (Yellow) and I noticed that filter helped to sharpen the view of Crater Argo a tiny bit. I also noticed that Argo's shadow seems a tiny bit darker in the 495 nm filter. After looking at Argo, I swept North and West of Argo looking for its Lunar Domes. North of Argo, I swept up a faint small "Kidney Bean" shaped shadow. I studied the spot to see if I could determine the source of the shadow. It was the top of the knob of Argo Alpha. The 495 nm (Yellow) filter helped me see the dome Argo Alpha. Turning West, I could see another faint small "Kidney Bean" shaped shadow. This was the faint shadow of Argo Beta. Both Argo Alpha and Argo Beta Domes were observed at 180X. I finally got to see my first lunar domes. These domes are hard to see. I could make out the swell or rise in the lunar floor from the domes but it was not much of a rise.

The faint shadow was the key to locating them. To me Argo Alpha was a tiny bit easier to see than Argo Beta. I wonder if the Sun Angle was lower; would this still hold true? A much lower Sun Angle such as a 5 day old Moon should help some in seeing the Domes and the Crater Lamont. I need to do some more observations of this area with a much lower Sun Angle.

Being so close to the Statio Tranquillitatis area, I moved the scope to observe that area. Just North of Statio Tranquillitatis I picked up a small crescent shaped dark shadow from a small craterlet. The small craterlet was Armstrong, 4.6 km (2.8 mi), and I could see the whole craterlet rim. Try as I might, I could not detect Aldrin, 3.4 km (2.4 mi), or Collins, 2.4 km (1.4 mi). These 3 craterlets are #90 on the Lunar 100 Card. The reason why I could see Armstrong was that crater is large and deep enough to cast a visible shadow with this Sun Angle. It would be interesting to view this region with a lower Sun Angle which should be more favorable for all three of those craterlets to cast shadows. The use of shadows from lunar features is a great way to locate such features. I also believe that the 495nm (Yellow) filter helped a tad too. In case you have not noticed the Baader 495 nm (Yellow) filter is my favorite lunar observation filter. The meteorological conditions for the observing session were, Temperature +25°F, Humidity 96%, Wind 0 mph and Barometer 29.63”.

Two days later, the sky cleared again. It was good to get a few clear nights since we had such a long cloudy and stormy stretch from Mid-February to the end of March 2023. 31 March 2023 UT, Seeing 8.0, Transparency 3.5. Moon Waxing Gibbous, 70% Illuminated, 9 day old Moon, Moon in Gemini; I set up my 4.7” (120mm) F/7.5 APO Refractor in my back yard and let it cool down for a while. I decided to look at Venus before it went into the trees. At 00:00 UT, I observed Venus at 90X. The planet was low and just above the tree line. I tried the Baader 610 nm (Red) Filter but it gave a too dark image. The W25a (Light Red) worked better giving a brighter image which also sharpen Venus up a bit and helped steady the image a tad. I could see the Gibbous Phase but no

cloud features. Venus was at magnitude -4.0, size 14.0”. As I was finishing up my Venus observations, I could hear the Geese honking in the Western Sky. So, I hope this is a sign of Spring and the start of better observing weather.

I then turned my 4.7” (120 mm) F/7.5 APO Refractor to the Moon at 00:30 UT. I knew the Moon was in Gemini and therefore in an excellent high observing position. I ran through my eyepieces starting from the lowest magnifications up to the highest magnifications. I was surprised that I could use my 200X eyepiece and that the clarity and sharpness of the lunar features was extremely good. I do not like to use that 200X eyepiece due to its acute light cone but I will still use it tonight. I knew that the Moon had transited at 00:30 UT and would be in its highest position for the night. At transit, the Moon would be about 65° above the horizon. So, I pointed my Scope at Rupes Recta and Rima Birt #66 on the Lunar 100 Card. I have observed this area many times and was wondering what the very good Seeing and the 200X eyepiece with the Baader 495 nm Filter (Yellow) would show. Looking West of Rupes Recta and the Crater Birt, 17 km (10.5 mi) across, I could clearly see the whole grayish black line of Rima Birt. I could easily see the elongated craterlet Birt E, 5 km (3.1 mi), and the faint shading and swell of the small dome which the crater sits on. That dome rise was seen more as a darkish shading then an actual rise of a hill. I could trace Rima Birt line down to its end at Craterlet Birt F, 3 km (1.8 mi), which is just West of Crater Birt. West of Rima Birt, I could see Birt D, 3 km (1.8 mi), and Birt B, 5 km (3.1 mi). So, I saw the complete Rima Birt, 50 x 1.5 km (30 x 1 mi), and its terminus craterlets. Immediately recognizing that this is the smallest craterlets I have ever seen,

I then moved to Crater Plato #83 on the Lunar 100 Card. My goal was to look for the Plato floor craterlets to see what I could resolve. The Plato floor was a disappointment to me. I was able to resolve a floor craterlet 3.2 km (1.9 mi) across at 200X with the Baader 495 nm Filter (Yellow). I tried for the floor craterlet of 2.7 km (1.6 mi) size but failed to see it. Then I tried to view any other floor craterlets but failed to see

any any others. I wondered if I had a better quality 200X eyepiece would I have seen more of the floor craterlets. I also wondered if the Sun Angle was lower would that add more shadows to the craterlets and make them more easily visible? After that I moved my telescope back to the Rupes Recta area.

Arriving at Rupes Recta, I moved SE to Crater Lippershey, 7 km (4.3 mi). This crater was easy to see due to its shadow. Then I went after some of the craterlets in that area. At first, I thought these craterlets were part of the Birt satellite craterlets but they are not. They belong to the Lippershey Region. I was able to resolve craterlets Lippershey T, 5 km (3.1 mi), Lippershey R, 4 km (2.4 mi), Lippershey L, 3 km (1.8 mi) and Lippershey N, 3 km (1.8 mi).

While I was observing, I could hear 2 Raccoons fighting in the woods, West of me. Usually, Raccoons fight each other for food. This observing event showed me that if seeing is extremely good (Seeing 8.0+) and the Moon is in a very high favorable position; my 4.7” (120mm) F/7.5 APO Refractor can deliver very good resolution of small lunar craterlets. Meteorological conditions were Temperature +24°F, Humidity 76%, Wind 0 mph and Barometer 29.76”.

So now the question is how well did I do with my 4.7” (120mm) F/7.5 APO Refractor on smallest size craterlet resolution? Theoretically, if the seeing was 10.0 (Perfect), My 4.7” (120 mm) Refractor working at 235X (50X per inch) should split the minimum double star separation of 1.0”. The smallest lunar craterlet visible should be 1.9 km (1.1 mi) which is often rounded off to 2.0 km (1.2 mi). In my article “How Small of a Lunar Craterlet can be seen Through a Telescope” (13 May 2022). The smallest craterlet diameter was a 3.7 km (2.2 mi) craterlet at 180X with the Baader 495nm Filter (Yellow) using my said refractor, Seeing was 8.0 and Transparency 4.3. This result was only achieved once from backyard in 7 years. My recent best resolution was at 3 km (1.8 mi). This was done using the same equipment. The 9-Day old Moon was just past the most favorable 1st Quarter Moon (7 Day) position in the sky for the year. This high-altitude position Moon

Hair and the Herdsman

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



Plate No. 10 in Urania's Mirror

Berenices Locks

Pronounced – 'CO-ma bare-uh-NYE-sees'

First documented by Ptolemy as an asterism in 2nd Century "A tuft at the end of Leo's tail"

Aphrodite placed Berenices hair into the sky after Queen Berenices II of Egypt offered up her hair to Aphrodite to bring her husband, also a Ptolemy, back from battle safely

Not promoted to a constellation until the 16th century by Tycho Brahe

- Tycho star catalog
- Tycho Crater on the moon
- Tycho Crater on Mars
- Minor planet Tycho

By Area Coma Berenices is the 42nd in size

Boötes – The Herdsman

Pronounced – 'Bow –Oh-Tease' – means driver or plowman or herdsman.

First documented by Ptolemy in 2nd Century

Traditionally depicted as a herdsman with a sickle and leashed to two dogs in his left hand and a spear in his right. The two dogs are another constellation Canes Venatici 'KAN-es veh-NAT-ih-see.

- The Romans saw the Herdsman as an Ox driver, and saw Ursa Major as two mythical oxen, called Triones, and a plow
- The Greeks saw the herdsman as driving or chasing the bears, Ursa Major and Minor.

In mythology The herdsman is associated with Arcas, a son of Zeus and Callisto (a concubine).

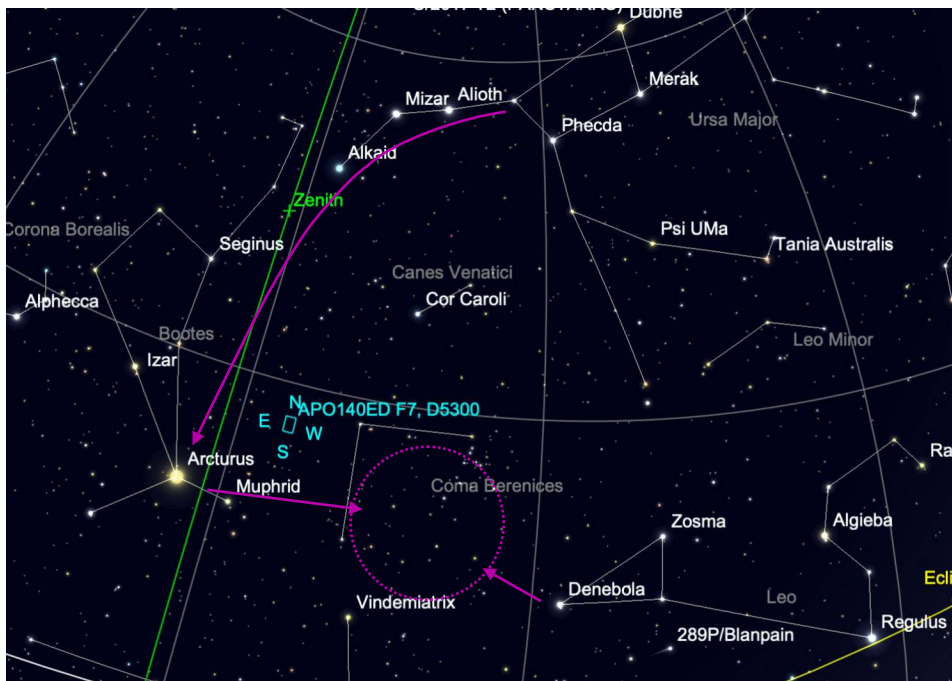
By area Boötes is the 13th largest constellation.

helped to contribute to the great seeing I experienced. The Moon on that date 31 Mar 2023 was at Apogee. If the Moon had been at or near Perigee, I could have gained a slight bit more resolution since a closer to Earth Moon would have been a bit bigger in size. A Quarter Moon phase which aligns with a Perigee position is not that common.

Another way I could improve my situation is to get a better-quality eyepiece with a bit more magnification. My current 200X eyepiece is sharp but I have trouble with its 76° Apparent Field Light Cone. This causes me not to like that eyepiece. This "trouble" is due to my 67-year-old senior eyes... I have now ordered a higher quality eyepiece which will give me a bit more magnification at 225X and a narrower 60° Apparent Field Light Cone. I believe the narrower light cone and the 225X magnification which is much closer to the telescopes maximum magnification of 235X (50X per inch) should in theory give me an observing result much closer to the theoretical minimum resolution of 2.0 km (1.2 mi).

I also know that Sky Conditions play a very important and major role in seeing fine details on the Moon. If I look at the time period of my observations from my backyard; 20 June 2015 – 31 March 2023, I have observed on 206 different nights. Yet out of these 206 nights only 2 (so far) have given me Seeing 8.0. A little math will reveal that I have a 0.0097% chance of having excellent Seeing (8.0) from my back yard observing site. I hope this will change for the better now that a new spring season has arrived.

I looked at the RASC Observers Handbook 2023 to pick out the best favorable Quarter Moon position for the rest of the year. There are 2 Last Quarter Moon positions that are in a very favorable position (high altitude). The Last Quarter Moon around 8 September and 5 October 2023 are very favorably placed for our viewing area. I hope that I can get in a few more very favorable lunar observation nights to see how close can I come to the theoretical resolution limit of a lunar craterlet for my given aperture size.

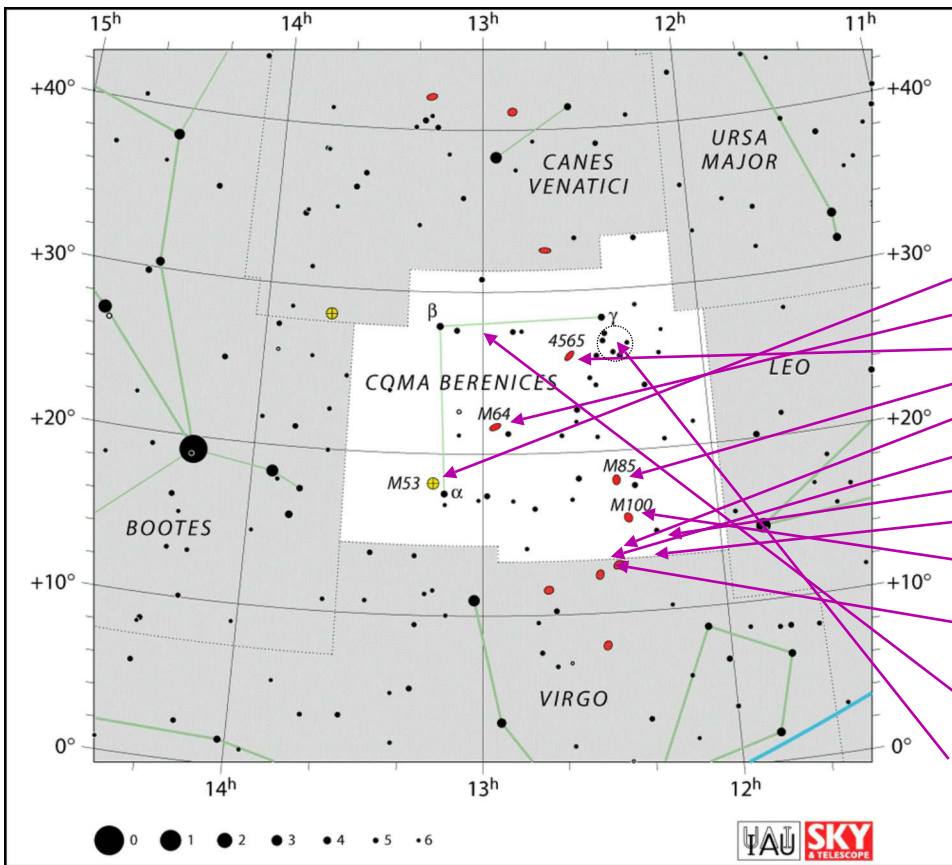


Finding Coma Berenices and Boötes

Spring to mid Summer

Follow the handle of the dipper in Ursa Major and arc to Arcturus, the brightest star in Boötes and Boötes is to the north.

Locate Coma Berenices directly West of Arcturus or between Arcturus and Denebola (the end of the tail of the asterism in Leo).



Observing in Berenices

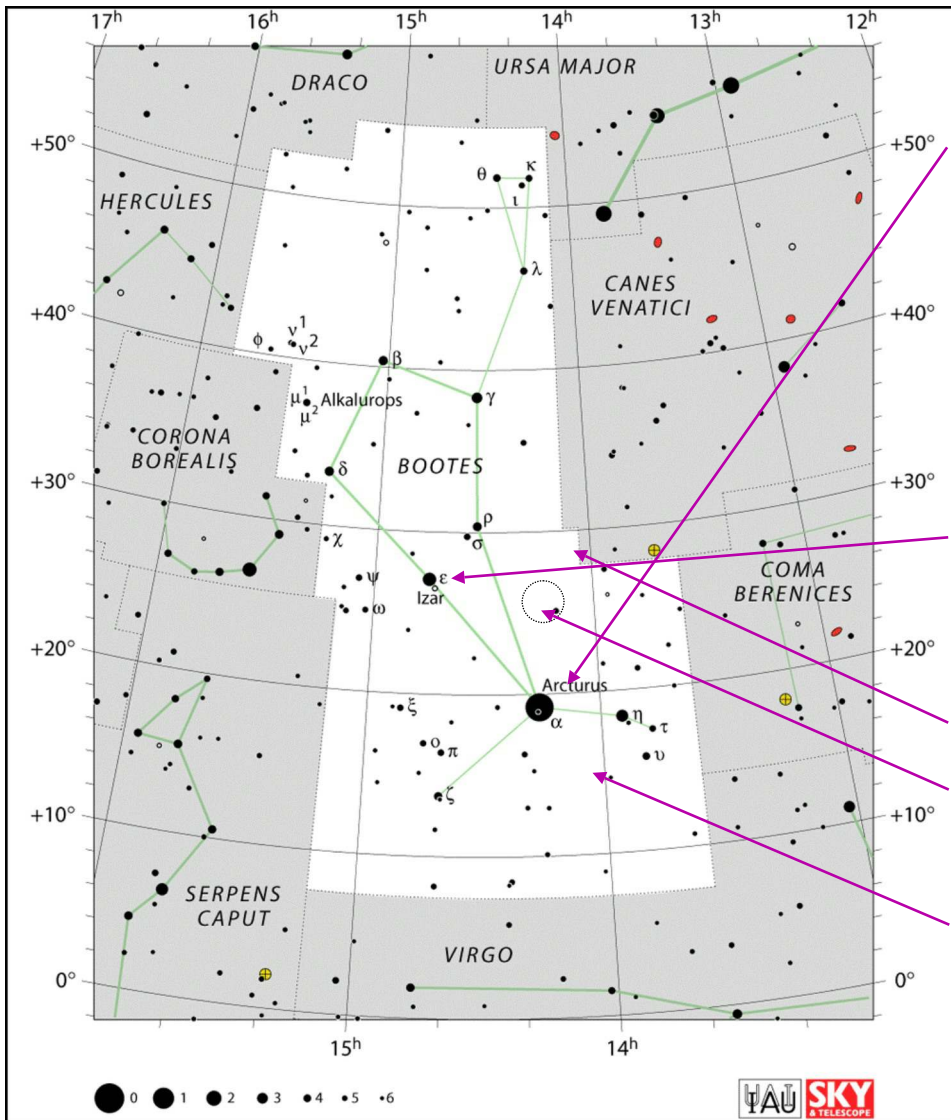
- Bright stars – none – the brightest stars are mag 4

Messier / NGC Objects

- M53 - Globular cluster (7.6)
- M64 – Black Eye galaxy (8.4)
- NGC 4565 – Needle galaxy (9.1)
- M85 – Lenticular galaxy (9.0)
- M88 – Spiral galaxy (9.4)
- M91 – Spiral galaxy (10.1)
- M98 – Spiral Galaxy (9.9)
- M99 – Spiral Galaxy (9.7)
- M100 – Spiral galaxy (9.3)

- Northern end of Markarians chain of galaxies
- Coma cluster of Galaxies

- Melotte 111 Coma star cluster



Observing in Boötes

Bright Stars:

- Arcturus – Alpha Boötes, means bear watcher and follows the great bear Ursa Major around the pole. It's brightest star in the northern sky - Mag 0.05, third brightest star after Sirius and Canopus – orange giant of class K1 III. At 37 ly from Earth it's the closest giant star.
- Boötes has 10 formally named stars: Arcturus, Nekkar, Seganus, Izar, Pulcherima, Muphrid, Alkalurops, Merga, Nadlat

Double Stars:

- Epsilon Boötes, Izar (2.9") – One of the finest doubles in the sky. A mag 2.7 K0 orange giant and mag 5.1 A2 main sequence star.

Deep Sky Objects:

- NGC5466 – Mag 9.0 Globular cluster - Blue horizontal branch of stars
- Boötes Void – 250 million light years in diameter void thought to be empty until recently. Now known to contain at least 60 galaxies.
- Boötes 1 dwarf galaxy, mag 13.1 discovered only in 2006, orbits the Milkyway and believed to be tidally disrupted by it. Boötes 1 is 720 light years across.

Information Sources

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

ASTRO-IMAGER'S CORNER

All things astrophotography, for the beginner to the expert.

Imaging Tips

► (repeat) If one is taking short exposures, the polar alignment is not as critical as it is for long exposures. There will be a little bit of image rotation from frame to frame but most stacking software can de-rotation these images. Polar alignment becomes more important for long exposure times and especially when one uses an autoguider..

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/> I have found it works better than Registax for stacking Moon and Sun images and as good or better for the planets. -- Paul Walker.

► **PIPP (Planetary Imaging PreProcessor)** <https://pipp.software.informer.com/> Among other things this can be used to convert an MP4 video from a DSLR camera of a planet or the surface of the Moon that can't be used in Registax or Autostakkert3! to an uncompressed AVI format video that can. It also 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. It can combine a sequence of

time-lapse images and into a video. (see YouTube tutorial below)

Astrophotography How-to



<https://www.allaboutastro.com/how-to-learn-astrophotography.html>

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

<https://www.youtube.com/watch?v=z67DfADSWvA>

▶ 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

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.

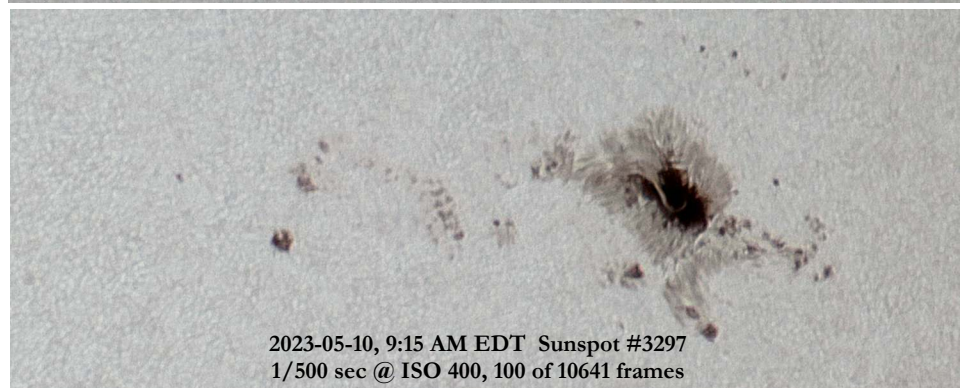
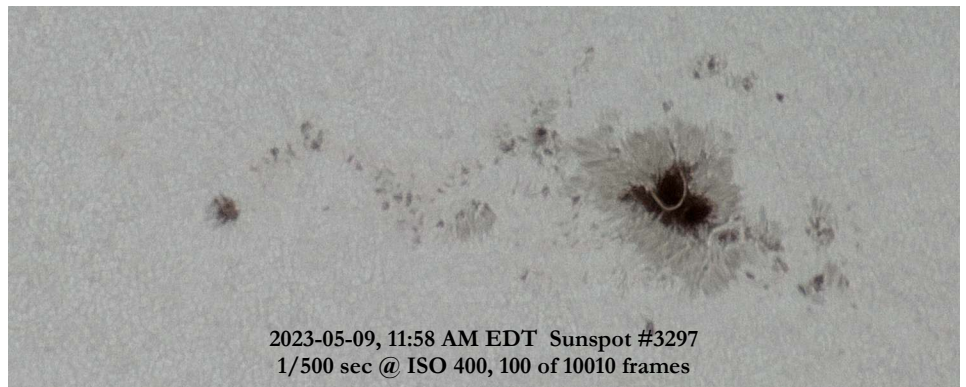
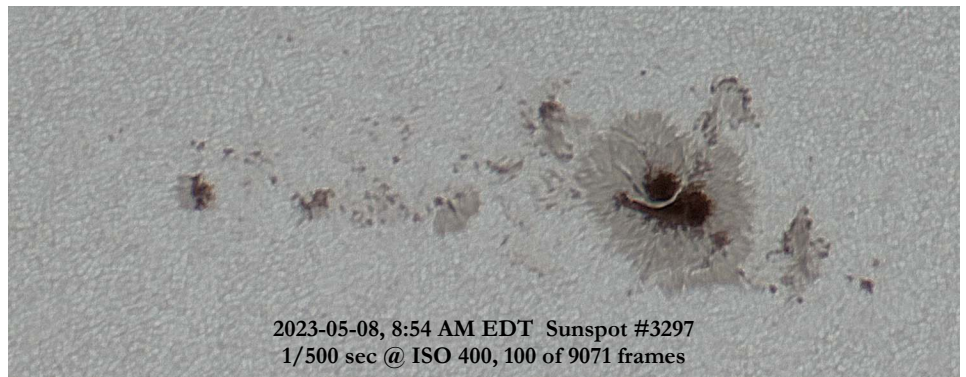
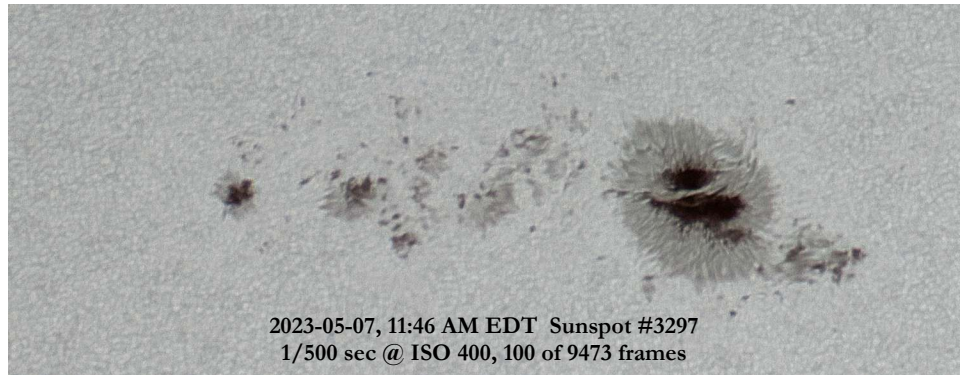
MEMBER'S IMAGES

White-Light Solar

There are lots of sunspots on the Sun most days now. One can go to <https://www.spaceweather.com/> to see what there are for sunspots.

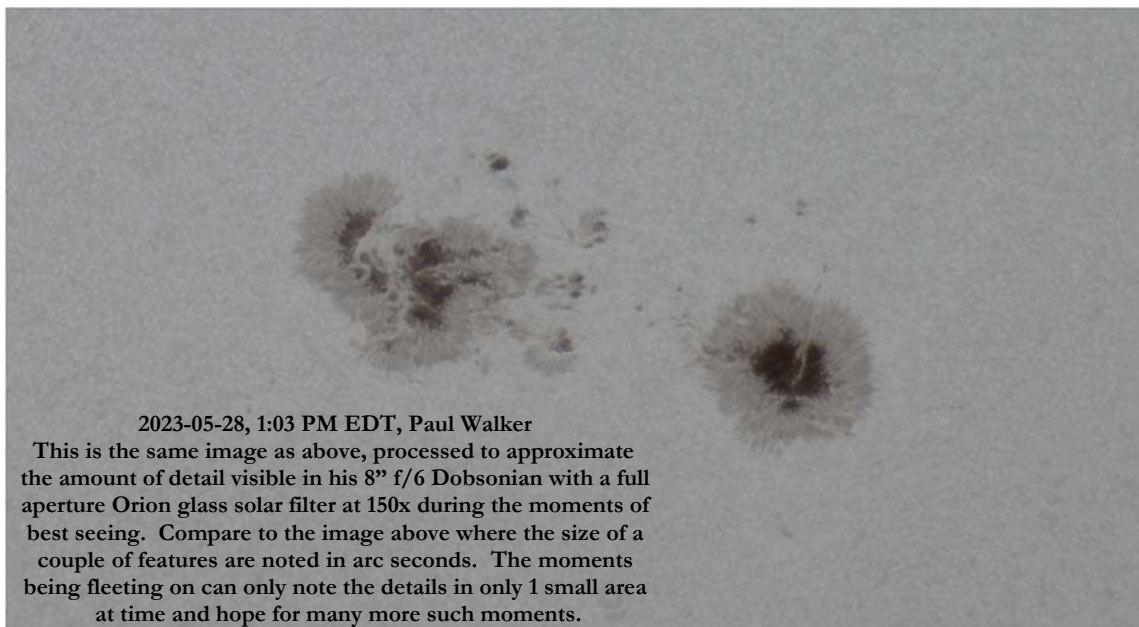
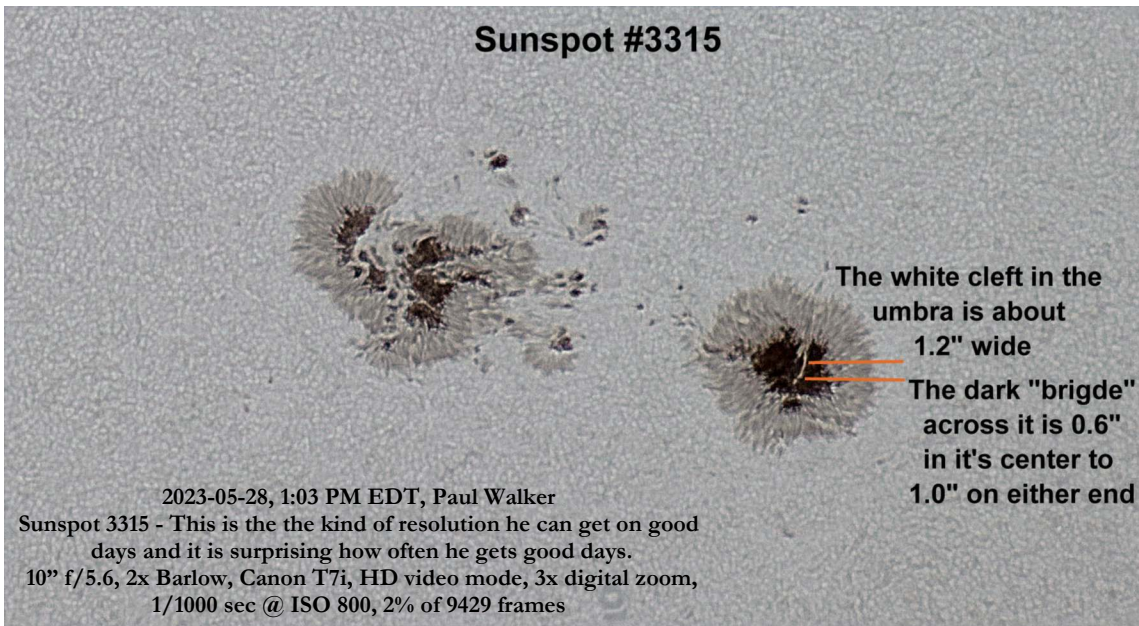
May 6-10 - Paul Walker - We had 5 days in a row in early May that were good for solar viewing and imaging. Additionally we also lucked out in that a large sunspot (#3297) had recently rotated into view around the sun's western limb, the anchor of a large complex sunspot group.

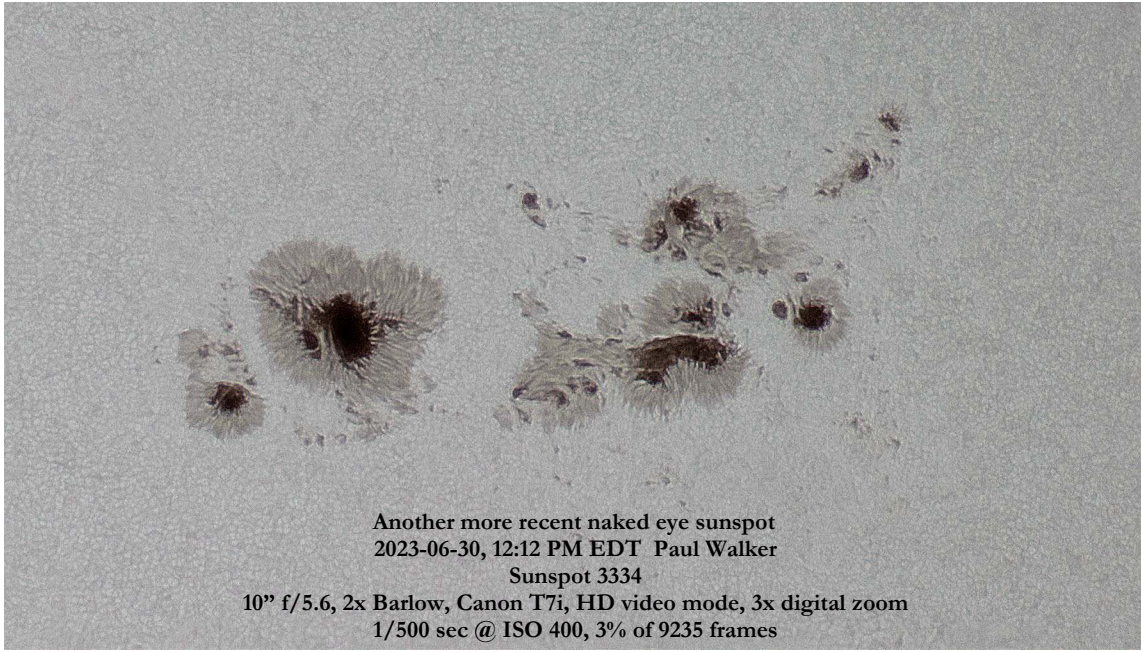
I took the following images over these 5 days. Cropped to fit on the page. There are clear changes as well as similarities each day. Taken through 10" f/5.6 with Baader AFS 200 solar filter and a 2x Barlow (2.65x eff). Used a Canon T7i (24Mp) in HD video mode and 3x digital zoom (providing a resolution of 0.2"/px).





Note the bright plagues which are most visible when on the limb like this.
2023-05-10, 12:25 PM EDT
Sunspots 3301 & 3302
10" f/5.6, 2x Barlow, Canon T7i, HD video mode, 3x digital zoom, 1/400 sec @ ISO 400, 100 of 12024 frames



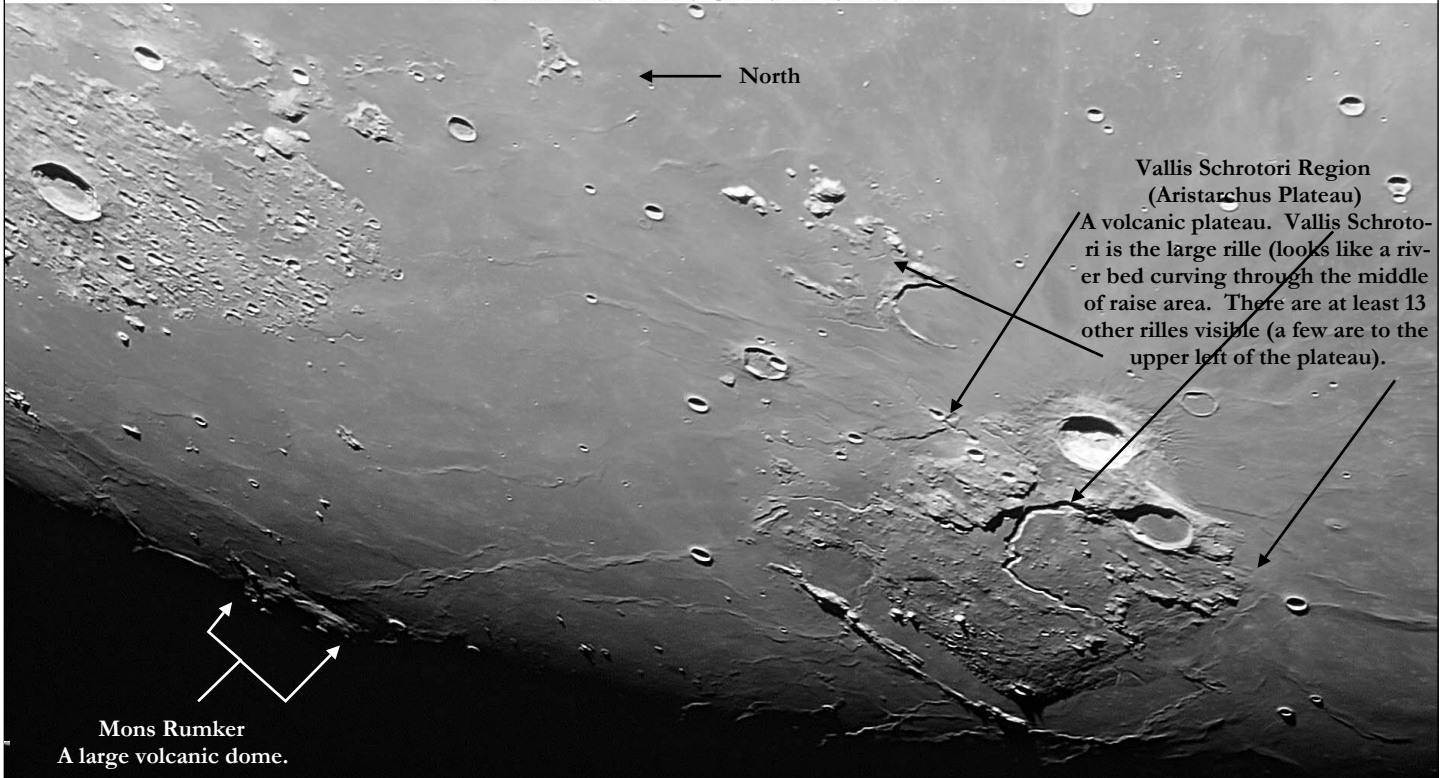


Moon Shots (not the rocketry type)

By Paul Walker

Though we have had some cloudy and rainy weather, as with the Sun, we have had several good opportunities for observing and imaging the Moon. Using the same equipment and technics I am using on the Sun (taking long videos but only stacking a small percentage of them, only the best frames), I have been able to produce images of the Moon with the kind of details that I had only dreamed of. I have viewed Vallis Schrotori many times, it being among my favorite lunar features. I never knew about the many smaller rilles in this region until I produced this image. I have since used it to visually identify several of them. Another volcanic dome I only recently was made aware of it marked to the lower left.

2023-04-03-0328UT_Mons Rumker & Vallis Schrotori
 Lunation: 12.42 Colongitude 57.7deg Sub-solar Lat: -0.6deg
 Paul Walker, Middlebury, VT, USA, paulwaav@together.net
 10" f/5.6 Newt. (1407mm) w/Meade 2", 2X Barlow (2.65X prime), 1/250 sec @ ISO 3200
 0.20 arc sec/pixel (0.37 Km)
 Stack- 10% of 3119, B&W (Lum ch from color image)
 Canon Rebel T7i (EOS 800D) modified (Visible + H-Alpha sensor filter)
 Stacked (AutoStakker!3), Wavelets (Registax 6), Unsharp Mask (Picture Window Pro 7)



Eastern Mare Imbrim, Plato, Vallis Alpes and Hadley Rille/Apollo 15 Landing Site (2023-03-30)

This contains my best shot of Plato and the small craters on its smooth floor (upper right corner). Joe Comea has a better image, see the Fall 2022 Morning Star, pg 19 (you can find it on our website @ vtastro.org). A ref. image with the sizes of the Plato craterlets, in kilometers, on that page as well. If you zoom in you can see 3 craterlets down the center of Plato in the 2.1-2.5 Km (1.3-1.5 mi) range. The smallest craterlet is near the left edge a little below center. This one is only 1.75 Km (1.1 mi)

Vallis Alpes is the wide valley to the upper right. Down its center you can just make out parts of a very narrow rille 0.58 Km (0.36 mi) wide.

To the lower right is Hadley Rille/Apollo 15 Landing Site flanked by mountains on both sides. Hadley Rille is 2.5 Km (2 mi) wide and easily seen here. Apollo 15 is on the right side of the rille at the upper end where it bends ~90 deg. to the upper left.

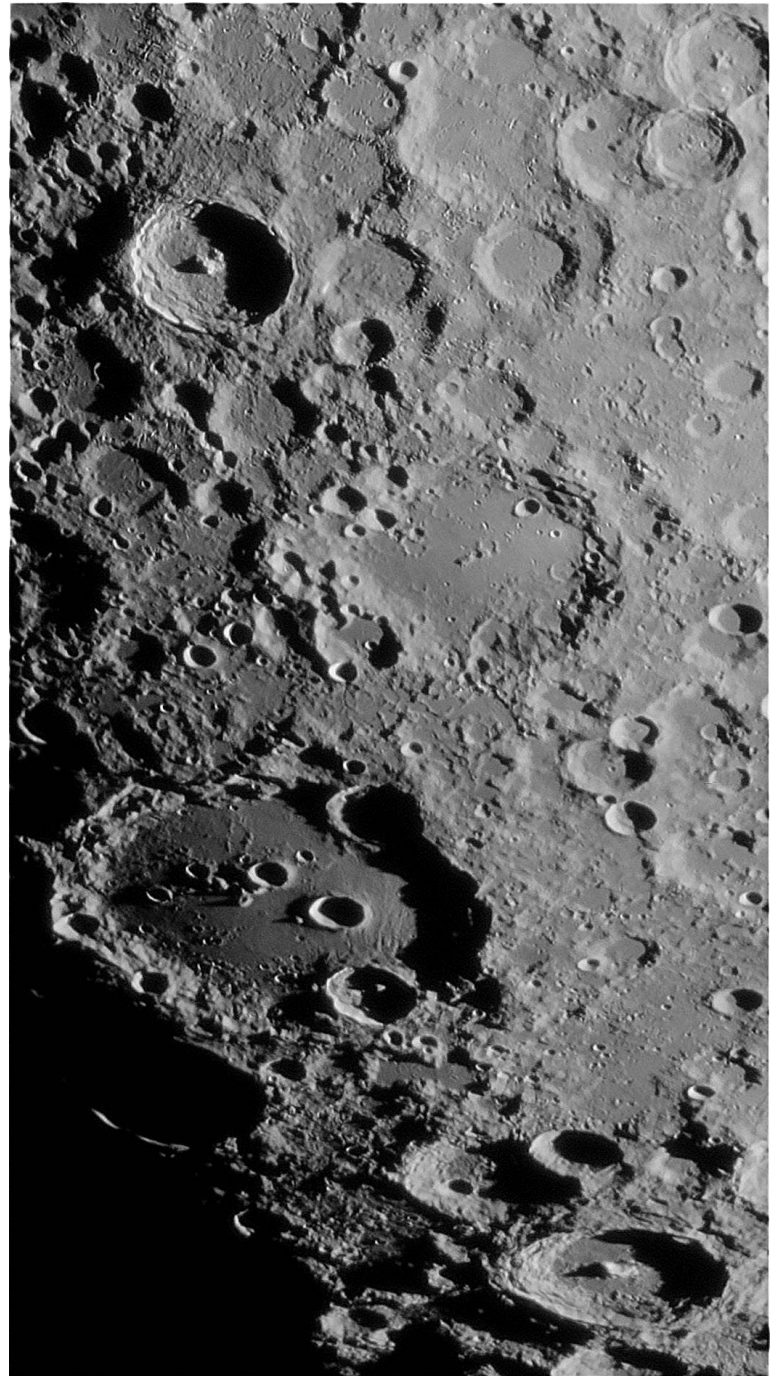


Tyco and Clavius Craters (2023-03-30)

Tyco is the prominent crater to the upper left. It has a well defined central peak. The terraces on the crater wall are clearly visible. Something I had not noticed in other images I have of Tyco is the relatively smooth area just to the right of it which is clearly regolith that flowed out when Tyco was created ~108 million years ago, partially obscuring adjacent craters.

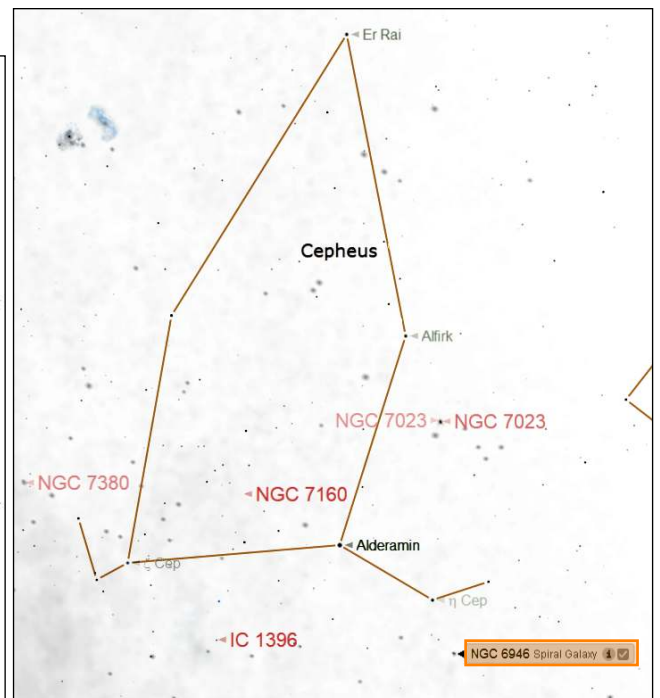
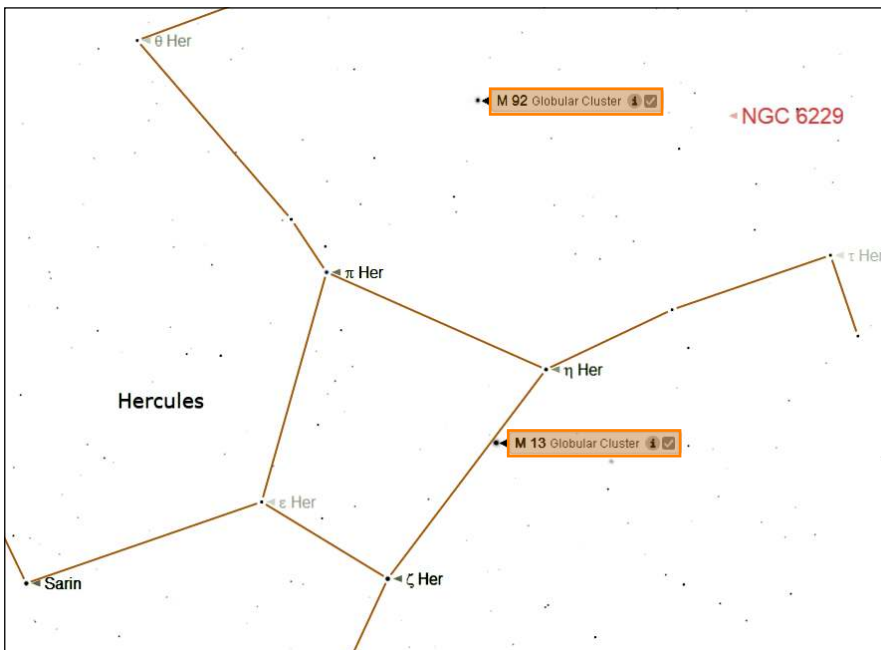
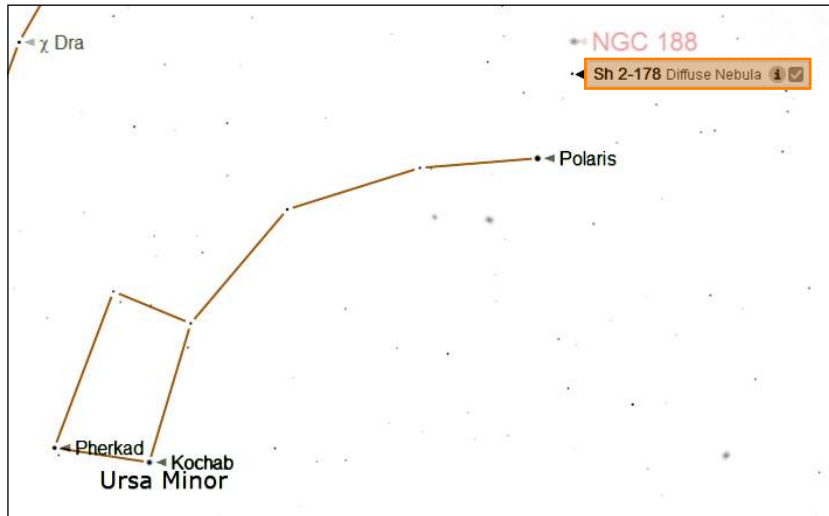
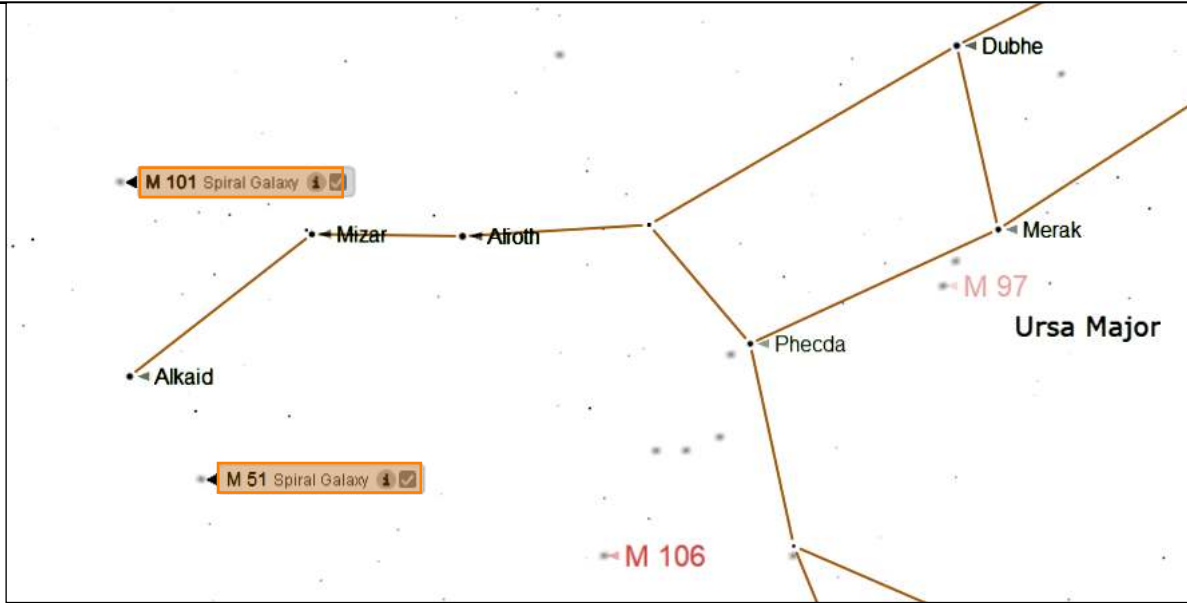
Clavius is to the lower left, it is the largest crater the image. It is at the other end of the age range at about 3.9 billion years old. Clavius is one of my favorite features with its curving row of progressively smaller craters nearly evenly spaced out. A site to behold in almost any telescope.

Also in this image is Moretus crater to the lower right. It has a similar morphology with a central peak and terraced inner walls. It was formed sometime in the Eratosthenian Period (3.2 to 1.1 billions years ago). It is highly fore shortened and often difficult to identify visually in a telescope. North is up in both images.



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

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



Supernova in M101 (SN 2023ixf)

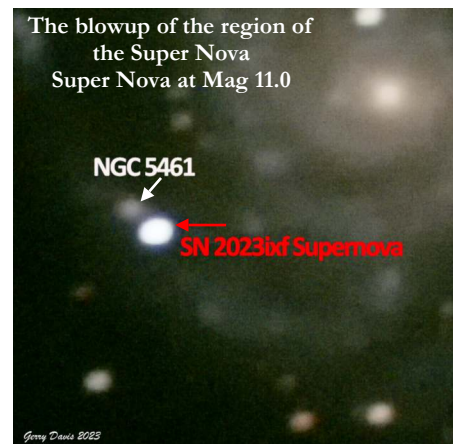
By Gerry Davis

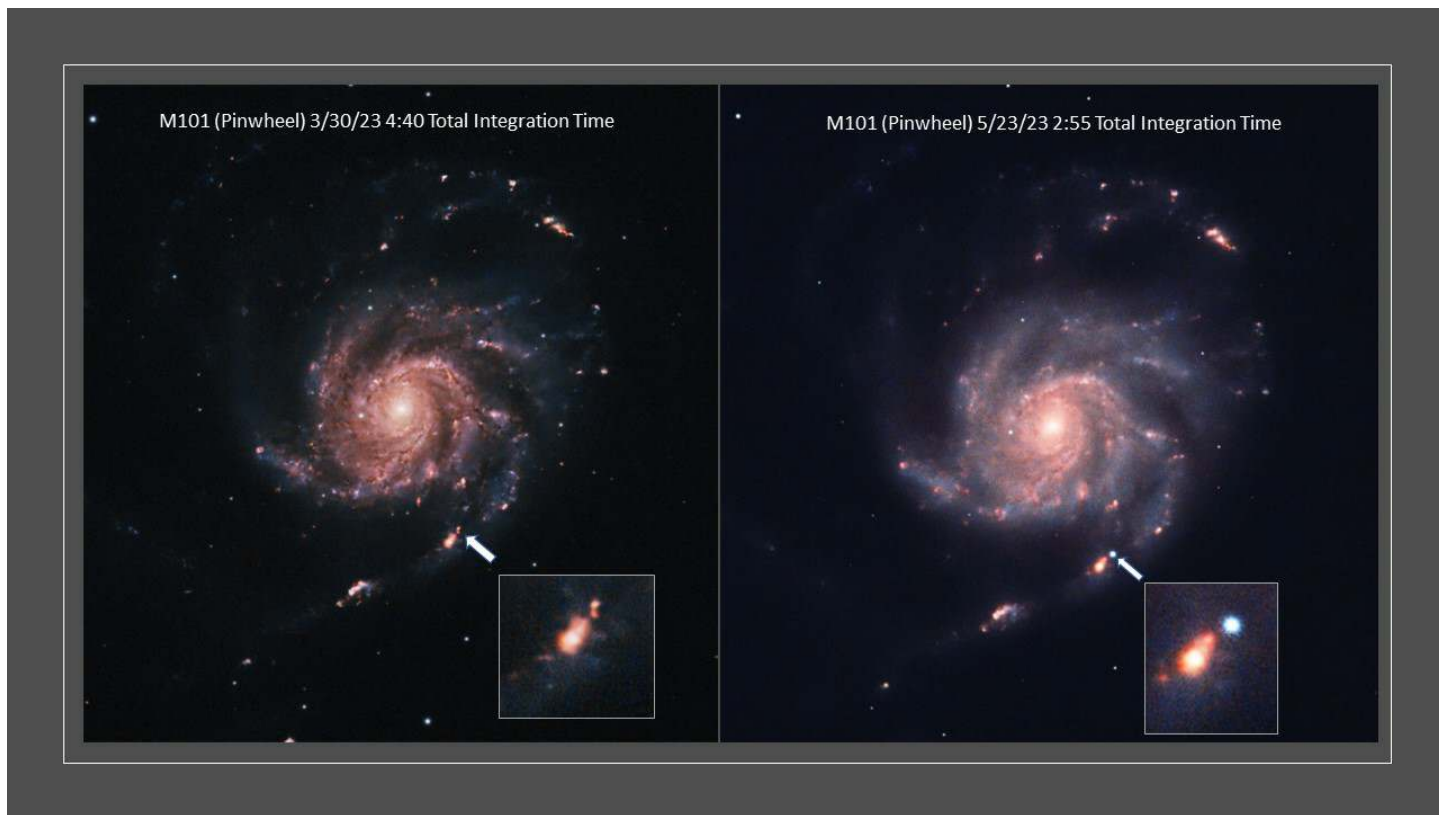
A new Super Nova was discovered by the Japanese amateur astronomer Koichi Itagaki May 19, 2023, and I photographed it on May 29 and 31, 2023.

A supernova is the “last hurrah” of a dying massive star at least five times the mass of our Sun. As the star exhausts its supply of fuel for nuclear fusion it collapses into a dense core, becomes intensely hot, and explodes with great brightness lasting from hours to months.

The new supernova, SN 2023ixf, is in the Pinwheel Galaxy, Messier 101, in the constellation Ursa Major. M101 is a giant spiral disk of stars, dust and gas located 25 million light-years away from Earth. It is 170,000 light-years across and contains at least one trillion stars. M101 is nearly twice the diameter of our Milky Way and shines with a magnitude of 7.9. The new super nova was barely magnitude 14.9 when first noted and has now brightened to at least 11.0 – 11.5.

I first photographed M101 in May 2022, exactly a year before the super nova occurred, as shown below. The new very bright spot in the lowest spiral arm can be seen readily in the May 2023 images. The photographs were taken with my William Optic GT71 refractor telescope (focal length 418 mm) and a ZWO ASI533MC Pro color camera, guided with a WO 50mm guide scope and ZWO ASI120mini camera, all controlled with a ZWO ASI AIR computer. The mount was an iOptron CEM25 for the 2022 image and a portable Sky Watcher Star Adventurer GTi mount in 2023. Each image is the composite of 30 – 40 3-minute exposures.





**Supernova in M101 (SN 2023ixf)
By Greg Erianne**

I thought this was kind of interesting, so I thought I'd share it. I imaged M101 at the end of March (before the supernova) and then again last night and wanted to compare images. The image quality doesn't come anywhere near what Terri had in her image, but at least the supernova is visible.

I also couldn't really process both images to look the same since I had so much more time on 3/30 than last night (5/23). But I think you'll get the idea.

Askar 107PHQ telescope, ASI2600MC Pro (OSC camera), ZWO AM5 mount with guiding via ASIAir Plus using an ASI178MM mini scope and a 60 mm F/4 guide scope.

3/30/23 - Light Frames [Total Exposure 4 hr 40 min]

- Antlia RGB Triband Ultra filter -- 600 sec x 22 frames.....[Total Exposure 3 hr 40 min]
- No filter (UV/IR cut filter only from ASI2600MC) -- 180s x 20 frames [Total Exposure 1 hr

5/23/23 - Light Frames [Total Exposure 2 hr 55 min]

- Antlia RGB Triband Ultra filter -- 300 sec x 35 frames.....[Total Exposure 2 hr 55 min]

All light frames calibrated with dark, flat, and bias frames

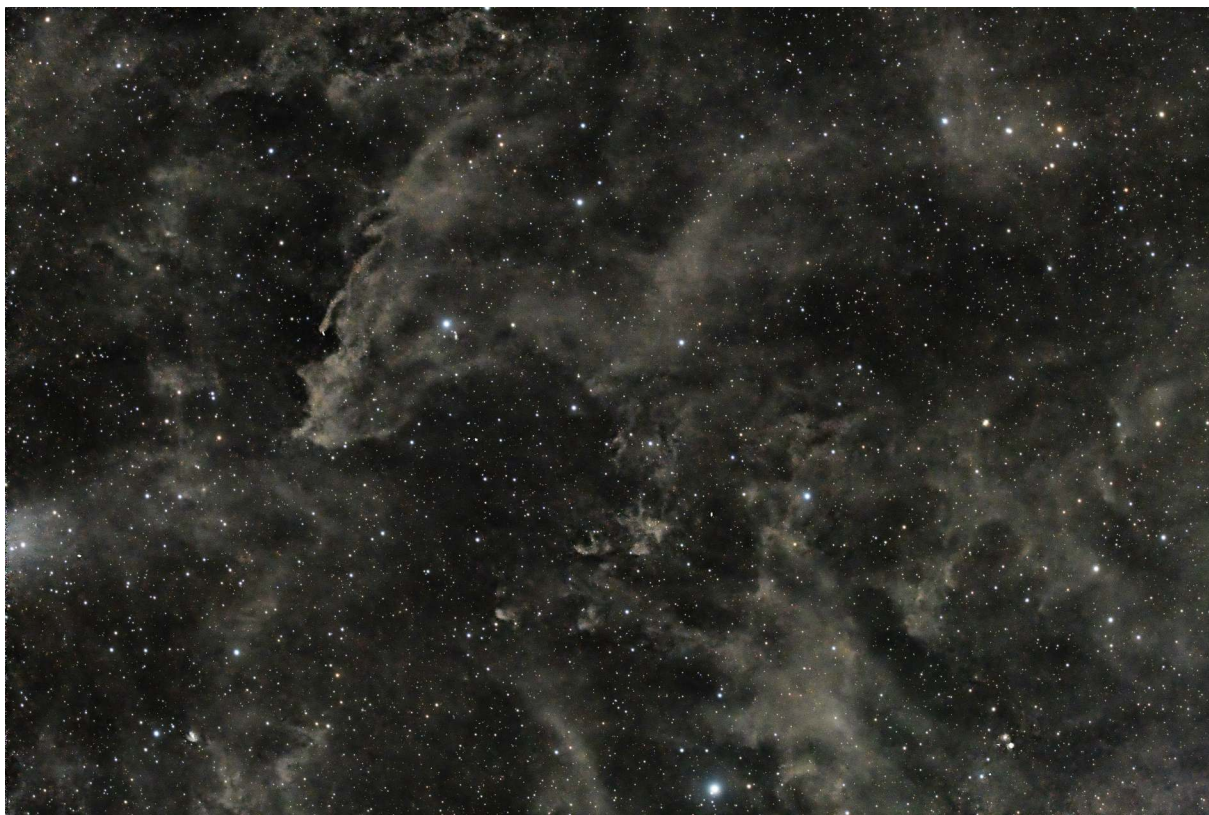


**Supernova in M101 (SN 2023ixf)
By Terri Zittritsch**

Hi all, I took advantage of the beautiful skies to see if I could capture the supernova in M101. It is cool to be able to image a supernova so soon after it was discovered by Japanese astronomer Koichi Itagaki. But in reality the star, previously not visible as an individual star now designated SN2023ixf, went supernova some 21 million years ago. That's because that is how long the light from M101 took to get to our solar system due to the extreme distance.

This is the closest supernova to us in the last 5 years and the second one to occur in M101 in the last 15 years. Astrophysicists have since determined that SN2023ixf is a type II supernova, which means it's a massive star that has run out of nuclear fusion material. Given that fusion has stopped, the star no longer creates the outward pressure necessary to offset the immense gravitational forces, so the star collapses onto itself creating the supernova we see.

I imaged M101 and supernova with a TEC180FL refractor reduced to 960 mm fl and F/5 with an Astro Physics quad element tele-compressor. The scope was mounted on an Astro-Physics 1100GTO with encoders and I used no guiding or sky model. The individual exposures were 2 minutes long and taken with a ASI2600MC one shot color camera. I imaged M101 for just 40 minutes or so per night over several nights as my nightly targets were different as I've previously imaged M101, but I wanted to capture this very cool event!



Sh2-178
By Greg Erainne

Sh2-178 is associated with the giant filamentous molecular gas cloud known as the Polaris Flare in the Milkyway. This can be seen in the region of the Ursa Minor and around Polaris.

This is only a 90-minute integration and was better than I expected, especially since this gas and dust is difficult to tease out during image processing.

Askar 107PHQ telescope with Askar 0.7x reducer.

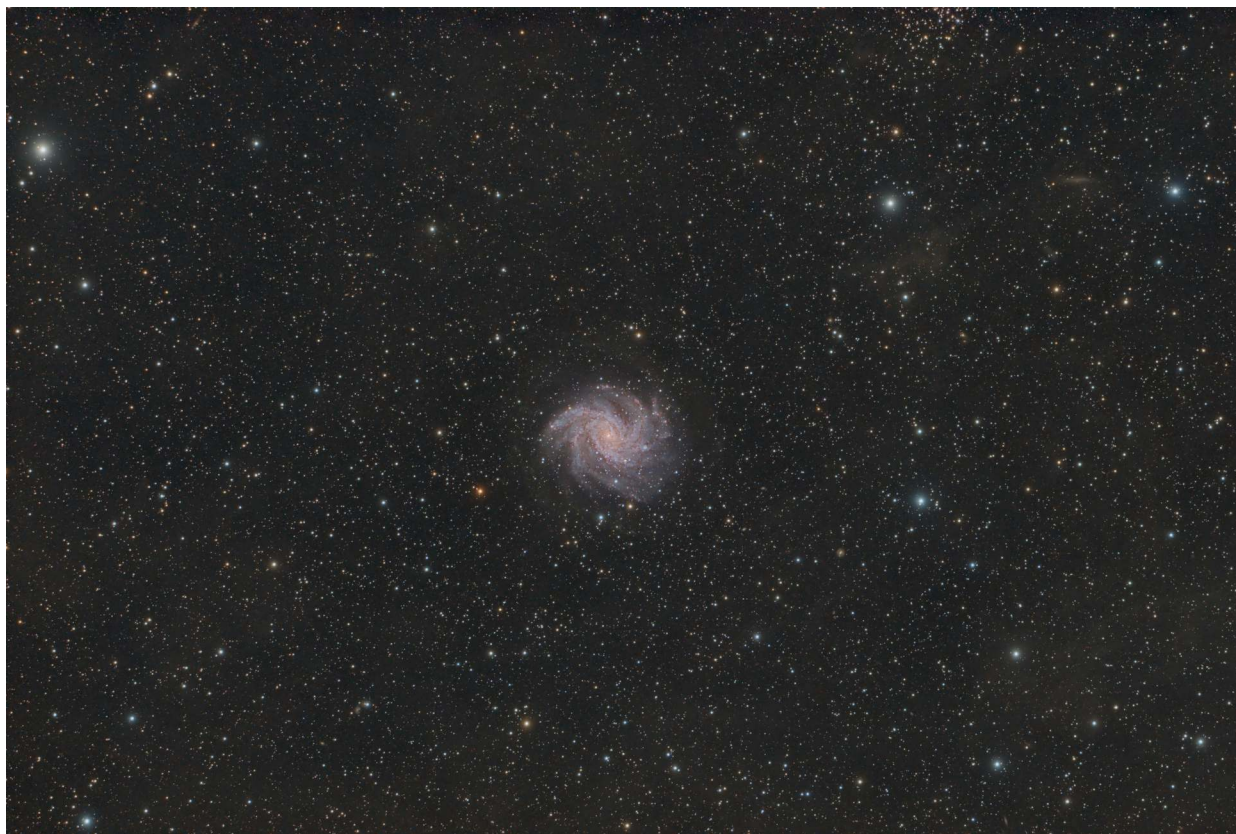
ASI2600MC Pro (OSC camera), no filter.

ZWO AM5 mount with guiding via ASIAir Plus using an ASI178MM mini and a 60 mm F/4 guide scope.

120 sec x 45 [Total Exposure 1 hr 30 min]; calibrated with dark, flat, and bias frames.

Pre- and post-processed in PixInsight.

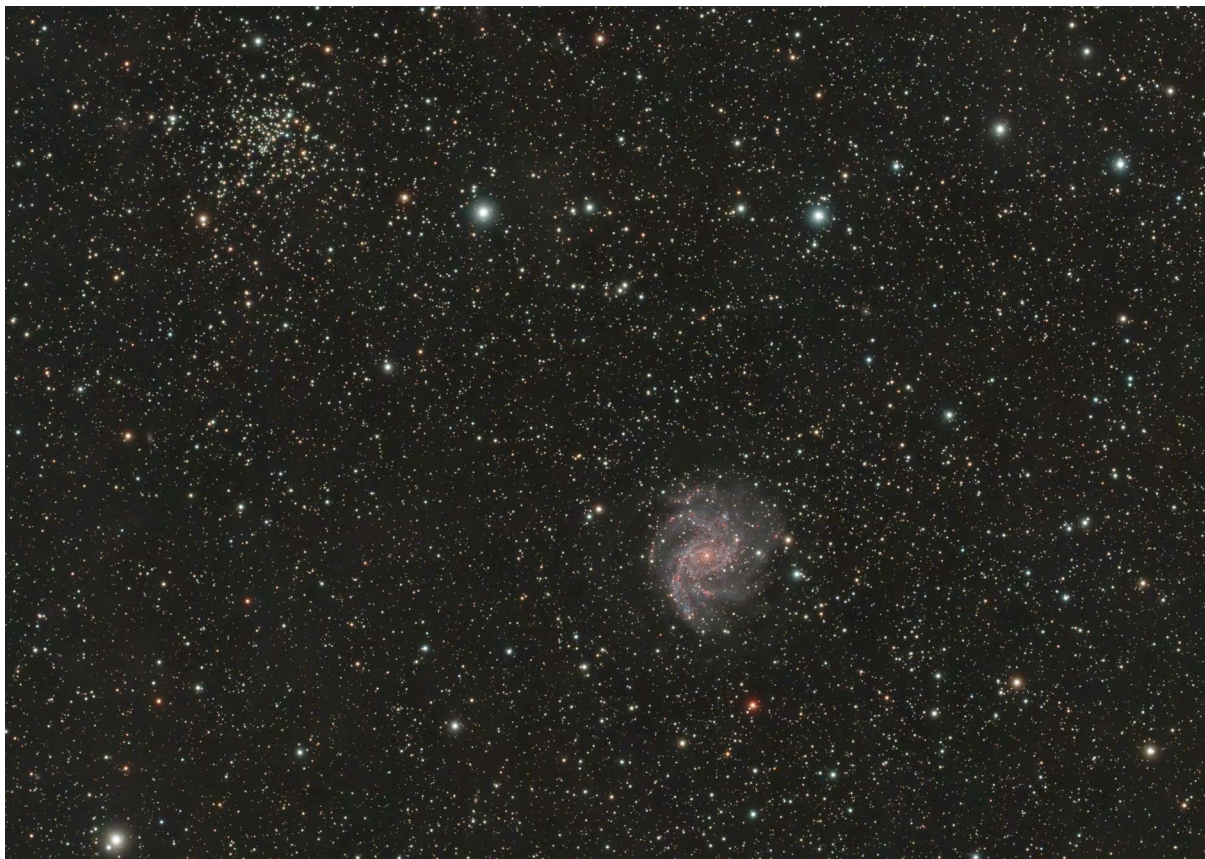
Additional post-processing in Photoshop for completion of star-halo removal, color balance, and generation of final jpeg.



NGC 6946 (The Fireworks Galaxy)
By Terri Zittritsch

This is my second time around with the Fireworks galaxy. The first time around was with an 11" SCT but I didn't have my OAG (off axis guider) running yet so I ended up with eggy stars. This time I used a OSC camera on my TEC180. Results are a little better. The stars are round and I'm getting a bit of background IFN (integrated flux nebula)(the faint brownish clouds of dust in our galaxy) and dark nebula. It could take a lot more exposure. I was running the 180mm at F/5 using the AP QTCC reducer/flattener. I used the ASI2600MC camera and AP 1100 mount unguided. Exposures were 2 minutes and I took 90 of them for a total of 3 hours of integration. The Fireworks Galaxy gets its name because it's had the most supernovas recorded of any other galaxy, at least during the time that humankind has recorded such things.

The Fireworks Galaxy is 25 million ly from our solar system and approximately 20,000 light years across. Its apparent magnitude is 9.6, so pretty challenging through the eyepiece. It's not the most attractive galaxy given its color.



NGC 6946 (The Fireworks Galaxy)
By Greg Erianne

Terri has a good description of the Fireworks Galaxy above, so I won't repeat it here, and her angst about processing this galaxy is right on the money, it's difficult.

NGC 6939 is an open cluster in the constellation Cepheus, is approximately 4,000 light years away and it is over a billion years old. I thought it a shame not to include it since it's a pretty cluster and was so close to the Fireworks Galaxy.

Capture Dates: 5/29/23, 5/30/23, and 5/31/23

Askar 107PHQ

ASI2600MC Pro (OSC camera)

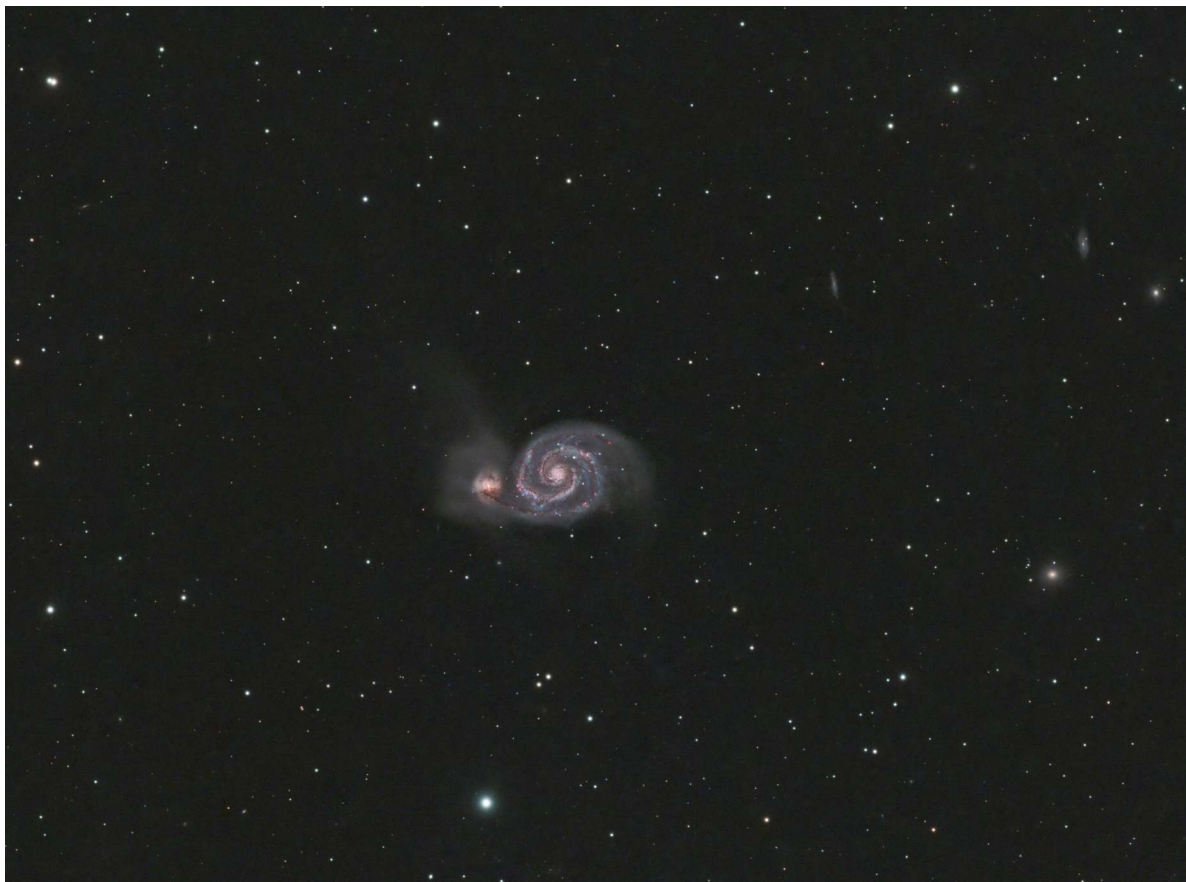
ZWO AM5 mount with guiding via ASIAir Plus using an ASI178MM mini and a 60mm F/4 guide scope

Light Frames [Total Exposure 6 hr 6 min] used Antlia Triband Ultra RGB filter -- 180 sec x 122 frames

All light frames calibrated with dark, flat, and bias frames

Pre- and post-processed in PixInsight

Additional post-processing in Photoshop for exposure adjustments and generation of jpeg



Whirlpool Galaxy (M51a, NGC 5194)
By Greg Erianne

The Whirlpool Galaxy is an interacting grand-design spiral galaxy and is located in the constellation Canes Venatici. It was the first galaxy to be classified as a spiral galaxy, is 76,900 light-years in diameter, and is between 23 and 31 million light-years away from Earth. It interacts with the small, yellowish galaxy, NGC 5195 (seen to the left of M51 in the photo). NGC 5195 is believed to cause disturbance in the magnetic field lines of M51. Both galaxies are so prominent they may be seen through binoculars (with a sufficiently dark sky).

Several other galaxies can be seen nearby in the photo.

Capture Date: 5/5/23

Askar 107PHQ telescope

ASI2600MC Pro (OSC camera)

ZWO AM5 mount with guiding via ASIAir Plus using an ASI178MM mini and a 60 mm F/4 guide scope
Light Frames (Total Exposure 1 hr 45 min) used Antlia Triband Ultra RGB filter -- 600 sec x 21 frames

All light frames calibrated with dark, flat, and bias frames

Pre- and post-processed in PixInsight

Additional post-processing in Photoshop for exposure adjustments and generation of jpeg



M92
By Terri Zittritsch

This is M92, an often overlooked, although hardly less spectacular, globular cluster in the constellation Hercules. It's mostly overshadowed by the Great Hercules Cluster, M13. But this is a beautiful globular in its own right. Next time you're out hunting for M13, take a small detour to look at M92, you'll not be disappointed.

My image of M92 is the result of 3.25 hours of image integration. I used a TEC 180FL scope reduced to F/5 with an Astro-Physics quad-TCC reducer/corrector with an ASI2600MC one shot color camera. I used an Astro-Physics 1100GTO mount with encoders and instead of guiding I created a quick sky model.



M13

By Terri Zittritsch

Hi all, Given how well this one shot color camera did on M92, I thought I'd give it a go on M13 again. I previously shot it with a mono camera and LRGB filters. I have about 3 hours of 90 seconds of exposures on this version of M13. The camera, an ASI2600MC OSC. The scope is a TEC180FL with an astro-physics quad telecompressor/reducer which gave me a focal length of 907 mm and a focal ration of F/4.9 which is nice for imaging. I did the imaging unguided on an Astro-Physics 1100GTO mount with absolute encoders.

M13 has been one of my favorite visual objects over the years. M13 is about 25,000 light years from us and is about 145 light years across.

At magnitude 5.8 it can be seen naked eye as a puff of light in dark sky locations.

Space Science Roundup



NASA News

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

Your Order has been Shipped- OSIRIS-REx to Make Delivery Sept 24

NASA's OSIRIS-REx, the first U.S. mission to collect a sample from an asteroid, will return to Earth on Sept. 24, 2023, with material from asteroid Bennu. When it arrives, the OSIRIS-REx spacecraft will release the sample capsule for a safe landing in the Utah desert. The pristine material from Bennu – rocks and dust collected from the asteroid's surface in 2020 – will offer generations of scientists a window into the time when the Sun and planets were forming about 4.5 billion years ago.

On Oct. 20, 2020, NASA's OSIRIS-REx spacecraft fired its thrusters to nudge itself out of orbit around Bennu. After about a four-hour autonomous descent OSIRIS-REx contacted the surface. It then fired a burst of nitrogen gas that stirred up dust and rocks, which were captured by the sample-collection head. Finally, OSIRIS-REx fired its thrusters and safely backed away from Bennu.

On May 10, 2021, the spacecraft departed Bennu and headed back toward Earth to drop off the sample-return capsule. When it arrives here on Sept. 24, 2023, OSIRIS-REx will release its sample capsule to land on Earth in the Utah desert, but the spacecraft, itself, will not land. With the sample delivered, the spacecraft will set off on a new mission, OSIRIS-APEX (OSIRIS-APophis Explorer), to explore asteroid Apophis.

In anticipation of NASA's OSIRIS-REx asteroid sample delivery this fall, the team held their first round of rehearsals April 17 to April 27. The goal was to practice retrieving the spacecraft's sample capsule from a simulated landing site at Lockheed Martin's campus near Denver.

For the final dress rehearsal in August, they'll drop the test capsule from a helicopter onto a 10-mile (16-kilometer) by 9-mile (14-kilometer) area in Utah and time how long it takes the recovery team to find it and bring it back to the processing location.

When the sample returns, 233 scientists globally will receive samples for analysis in their labs. They will address dozens of questions about asteroids, the early solar system, and the origins of life. You can see these questions reflected in the full name of the mission and spacecraft: Origins, Spectral Interpretation, Resource Identification, and Security-Regolith Explorer.

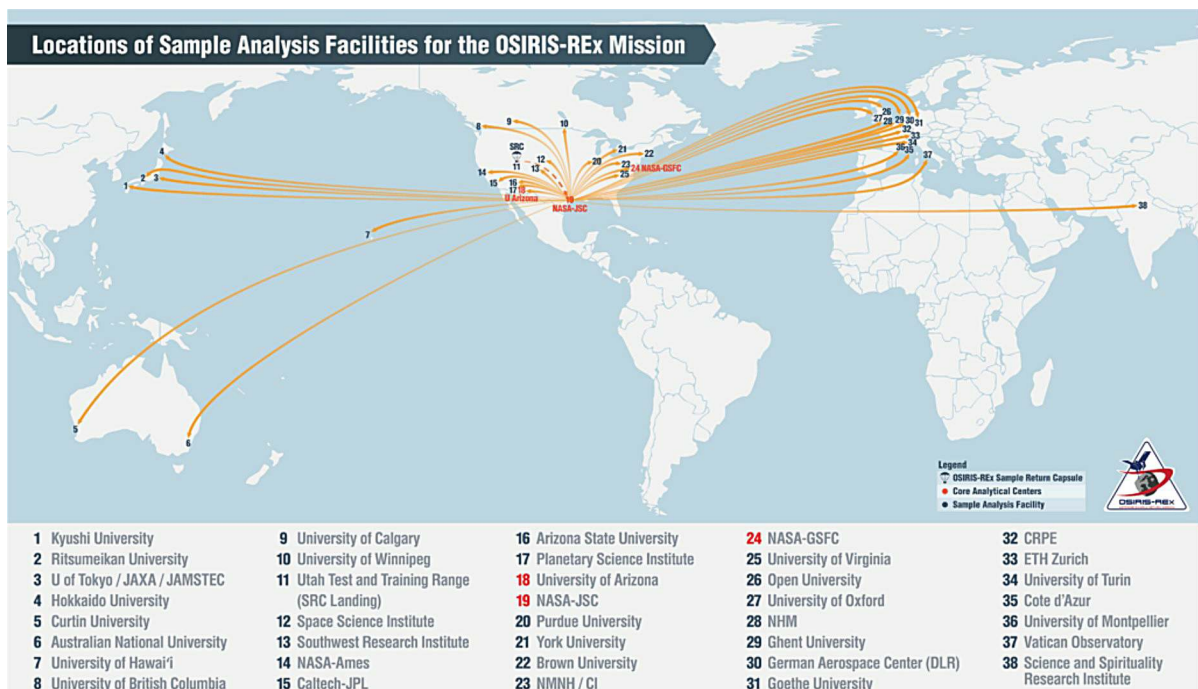


Figure 1 - This graphic shows a global map of destinations for the asteroid Bennu sample, which will arrive on Earth on Sept. 24, 2023. Below the map is a list of the institutions that will be the first to receive samples for a diversity of scientific investigation.

<https://blogs.nasa.gov/osiris-rex/>

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

Custom machining of brackets / adapters and modifications to existing hardware for astronomy purposes.

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

I have a mini milling machine and a mini lathe.

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

Wanted

For Sale

REDUCED PRICE

Selling for a friend – **Celestron Nexstar Evolution 9.25" F/10 SCT Bundle** as originally purchased from Highpoint Scientific. Includes OTA, mount with wifi so it can be controlled with a smart phone or tablet, heavy duty tripod, Astrozap dew shield, red dot finder, 15 piece eyepiece and filter set. Has had very little use due to current owners health issues. This bundle currently sells for \$3100. at Highpoint.

Asking \$2100.

Also available is a heavy duty (home-made) tripod dolly – \$175.00

Pick up near Rutland, VT

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

VAS Surplus Items

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



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

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.



4.5" F/8 Meade 4504 Newtonian Reflector with rings, no mount.

Your's for a donation of \$40.

Jack St. Louis 802-857-5049 or jack.st.louis@comcast.net

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 donation of \$25.00.



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

Jack St. Louis 802-857-5049 or
jack.st.louis@comcast.net

Telescope mirrors and a couple mounting cells

3.5" f/10 with 3/4" diagonal.

6", probably f/8.

8", probably f/8, in nice cast aluminum cell.

10" f/9, 1/10 wave (measured by Bob several years ago), Beral coating that is in good condition though the edge has several chips (edge not beveled) and a note from the coater says there are a few scratches and it is not fully polished (may be saying that because of the scratches). From St. Michael's College.

Other than the 10" f/9 I cannot vouch for the figure of the mirrors.

The only one that may be Pyrex is the 8" mirror, I'd have to pull it out of the cell and look again. The rest have the slight greenish-yellow tint of plate glass.

Make an offer on any of the items.

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

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 or see Jack St. Louis at any monthly meeting.

Celestron NexGuide Autoguider

I purchased used at the Stellafane Swap Tables as a backup to the one I am using, however, I forgot had already purchased a backup at the Swap Tables the previous year. I don't really need 2 spares.

\$140 OBO. (\$300 new)

It is a stand alone autoguider, does not use a computer, connects directly to your mount's autoguider port. Has an screen for displaying stars and menu.

Note: to use this you will likely need a an 80-90mm guide scope to find a star to guide on (I use a 90mm and get down to mag 7). You will also likely need a way to aim the guide scope at a suitable star. There is now a commercially available guide scope aligner, Google Lftscop.

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