



# Morning Star

## Summer 2024

Newsletter of the Vermont Astronomical Society



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

#### Announcements

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

Several **past meeting presentations and newsletter articles** on imaging, observing and equipment are posted on our website, check them out.

**Past newsletters** are posted on our website under What We Do.

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

#### Moving or Changing Email?

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

#### Hinesburg Observing Site

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

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

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

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

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

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

#### Observing List for HOS

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

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

#### Observing Certificates

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

#### Outreach

#### Acknowledgment Letter

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

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

#### Dues

Are due the first of each year.

**Associate Members \$15**

**Full Members \$25**

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

#### Connect On-line

[www.vtastro.org](http://www.vtastro.org)  
[Twitter@VTAstroSociety](https://twitter.com/VTAstroSociety)  
[Facebook.com/Vermont-Astronomical-Society-113053818706458/](https://www.facebook.com/Vermont-Astronomical-Society-113053818706458/)  
Email: [info@vtastro.org](mailto:info@vtastro.org) (Goes to the President and Secretary)  
[webmaster@vtastro.org](mailto:webmaster@vtastro.org) (Goes to Secretary and Webmaster)

#### Board Members

Terri Zittritsch	Pres	598-7226
Joe Comeau	VP	238-1664
Terri Zittritsch	Treas	598-7226
Paul Walker	Sec'y	388-4220
Bob Horton		238-7290
Keith Lawrence		453-5496
Jim Bosek		879-1697
Scott Turnbull	Webmaster	
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**Contributors:** James Bosek, Ken Brack, Gerry Davis, Joe Comeau, Barry Conolly, Carrie Cruz, Jeff Eitreim, Yvette Feig, Greg Erienne, Lawrence Garrett, Eben Gay, Peter Gillette, Marilyn Hackett, Brian S. Johnson, Maura Kelley, Dave Legrow, Gary T. Nowak, David Selinger, Eric Torraca, Scott Turnbull, Paul Walker, Jan Walker, Gregory Warrington, Richard Whitehead, Terri Zittritsch.  
(My apologies if I missed anyone)

**VAS Turned 60 Years Old on June 8, 2024**



**60th Anniversary Cake**  
**Image By Yvette Feig**  
Kate Yantz with the help of Richard Whitehead made this cake to help us celebrate the occasion. It was very creative, colorful, and yummy!



Image by Yvette Feig



Image by Barry Conolly

**One President Stepping Out and a New One Stepping In.**

Terri Zittritsch, our incoming president, is presenting Jack St. Louis, our outgoing president a plaque as a thank you and recognition of his years of dedication to the club. Including 3 stints as president totaling 21 years, about 1 year in 1975, 6 years starting in 2000 and 14 years starting sometime between 2010 and 2011.

## Stargazing and other Events

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All observing events are weather permitting unless otherwise stated.

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

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

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

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

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

#### The 2nd date is a rain date only

**June 14 or 15- 1st quarter Moon.**  
Gate opens 8:30 PM. Sunset 8:34 PM. Full darkness - N/A.

**July 12 or 13- 1st quarter Moon.**  
Gate opens 8:30 PM. Sunset 8:31 PM. Full darkness - N/A.

**September 6 or 7- Thin crescent Moon with Earthshine and Deep Sky.** Gate opens 7:15 PM. If you get there early enough (before ~7:30 ) you may catch a glimpse of Venus before it sets at ~7:40 PM. Deep Sky observing starts about 8:45 PM Sunset 7:16 PM. Full darkness 9:00 PM.

**September 27 or 28- Deep Sky**  
Gate opens 7:15 PM. Observing starts about 8:45 PM Sunset 6:35 PM. Full darkness 8:15 PM.

**October 4 or 5- Deep Sky.** Gate opens 7:15 PM. Observing starts about 8:00 PM Sunset 6:25 PM. Full darkness 8:15 PM.

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](mailto:info@vtastro.org) or  
[paulwaav@together.net](mailto:paulwaav@together.net)

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

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

### New Members

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

Herb Sinkinson  
Christopher Kline  
Kenneth Brack

### Meetings/Presentations

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

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

#### 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>

**July 8****2024 Solar Eclipse Wrap Up (1 of 2)**

The 2024 Solar eclipse was a great success here in Vermont. The high thin clouds we had did little to dampen the show or our experience of it. Considering the number of people who witnessed and imaged the event we are splitting this between 2 consecutive meetings.

Members will share their stories as well as some of their images of the event. Some members observed interesting behavior of animals as the sky darkened. An unexpected and not so pleasant consequence experienced by members in several places involved mosquitos! You may hear about several of these experiences.



2024 Solar from the Hinesburg Observing Site showing the Corona, two prominences and a section of the chromosphere.

Image by Paul Walker

**August 5****2024 Solar Eclipse Wrap Up (2 of 2)**

The 2024 Solar eclipse was a great success here in Vermont. The high thin clouds we had did little to dampen the show or our experience of it.

Members will share their stories as well as some of their images of the event. Some members observed interesting behavior of animals as the sky darkened. An unexpected and not so pleasant consequence experienced by members in several places involved mosquitos! You may hear about several of these experiences.

**September 9****Seestar S50 - Toy, Beginner Telescope or Outreach Tool**

By Dave Legrow

This presentation is about what you can expect from the Seestar. It is a small automatic, imaging only, telescope that one operates via a smartphone or iPad.

Dave will cover the specifications, translating them into realistic expectations. He will include some sample photos he has taken. Ease of use will be covered and hopefully include a live demonstration (may need a volunteer from the audience). This telescope is useful for outreach events. Dave will talk about what accessories are available and which ones are worthwhile.



Images by Dave Legrow using a Seestar S50, cropped. Sun, Moon, M3 globular cluster.

**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 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

**The Northern Lights**

By Carrie Cruz

In 1621, Galileo Galilei coined the phrase aurora borealis (aurora for goddess of the dawn, borealis for the Greek god of the north wind); he thought the Northern Lights were caused by sunlight reflecting off the Earth's atmosphere. About a century later, British astronomer Edmund Halley asserted that the lights were caused by luminous material seeping from cracks in the earth's crust. It wasn't until 1908 that the Norwegian Kristian Birkeland suggested the first accurate theory – and amazingly, this was only proven in 1967 when a US satellite recorded strange disturbances each time it passed over the poles.

Just as scientists look to the sky to study auroras today, in centuries past people have looked north and tried to make sense of the phenomenon, developing their own fanciful explanations.

The Cree Indians tell tale of the lights as departed souls trying to communicate with their loved ones still on Earth. For Swedish fishermen, an aurora sighting was a good omen as they believed the lights were the reflections of giant schools of herring swimming nearby. In Greek and Roman mythology, the lights signaled the start of a new day (odd, since the aurora mostly occurs late at night!)

## Board & Committee Meetings

### April

#### Board Meeting

Jack opened the meeting.

Terri has put her name in for the position of president (Jack is stepping down). Joe is running for re-election for VP, Bob, Keith, Jim and Scott are re-running for the Board at Large positions.

Jack will not be heading up the Recycled Optics. Keith has volunteered to manage the Program. For a donation to the club the telescopes in this program are available to anyone looking for a telescope whether they are a member of the club or not.

We agreed on charging \$25 per meal at the Annual Banquet and Meeting.

Jack will pass on the info for changing the codes on the combination locks at the site.

The Banquet meal choices will be a salad and Roast Chicken or Veggie Lasagna.

Terri will open a Zoom account for the club (~\$160). She reminded us about the indoor event scheduled the Dorothy Alling Memorial Library in Wiliston.

Joe did a technical astronomy presentation for Wake Robin, his wife, Molly, did a cultural presentation.

#### ACTION ITEMS:

Paul will send head count to St. John's Club (location of the Annual Banquet)

Paul will ask St. John's Club whether there is a TV screen downstairs we can use.

### May

#### Annual Meeting

Jack opened the meeting. He announced the Springfield Telescope Makers Convention (Stellafane) registration is open.

Jack read the President's Report. Started by mentioning that the first meeting of the club was on May 6, 1964 and that this meeting (May 6, 2024) is our 60th Anniversary.

Scott and Jim will take Jack's place on Ginny McGehee's 'Breakfast Table' morning show on WJOY AM (AM 1230).

### Candidates and Voting for Board Members:

Candidate for the position of President that is being vacated by Jack St. Louis: Terri Zittritsch

Candidate for Vice President: Joe Comeau (up for re-election)

Candidates for Board Member at large (all up for re-election): Bob Horton, Keith Lawrence, Jim Bozek and Scott Turnbull

We have 26 paid up Full Members (out of 31 total). A quorum is 14. We received 22 ballots, 21 ballots from paid up full members, which meets the quorum requirement. Not counted was 1 ballot from a non-paid up full member.

### Ballot Results:

0 Abstained. Terri received 19 votes. There was 1 write-in for Paul Walker for President. Bob, Keith and Scott received 21 votes. Jim received 20 votes.

### Officer and Board member reports:

Joe gave the VP's report. Paul gave the Secretary's, Site Committee and Newsletter reports. Terri gave the Treasurer's report. Bob gave an ode to Jack (he used ChatGPT as part of the process in producing it) Keith reported on the Library Loaner Scope Program. We have placed 30 scopes in area libraries, 5 of them last year.

Donna Lescoe honored Gary Nowak for his help in producing a solar eclipse presentation that she gave for the town of Starksboro where she lives.

Gary Nowak brought up the subject of whether we have finished outfitting the Russell Chmela telescope with 2 optical finder scopes, 2 unity finders and eyepieces as originally planned by the board. Because the scope is on an equatorial mount and the shape of the scope, the finders have to be mounted on the either so that one or the other is conveniently located regardless of where the scope is pointed. Paul Walker said there was currently one optical finder (donated by Bill Banke) and one unity finder. The board will discuss getting a 2nd optical finder, unity finder and eyepieces at the next board meeting.

### Motions:

Paul Walker made the motion that we accept the officer's reports as read.

The Vikings heralded the Northern Lights; for them it meant their god Odin had sent the Valkyries --mighty female angels of death, usually depicted as female warriors riding on horses through the skies-- to collect the souls of fallen soldiers to become warriors in Odin's personal army. The Vikings believed the aurora was light reflected off the Valkyries' battle armor. When the Northern Lights announced the Valkyries' arrival, it was cause for celebration; it was a great honor to die in battle, and an even greater honor to be chosen by the Valkyries.

A favorite aurora myth of mine comes from Finland, where it was believed that the light show is created by the arctic fire fox or "revontulet" (Finnish for fire fox) sprinting across the snow so quickly that it causes sparks to fly up and ignite the sky. An interesting point about this myth is that there is some truth to it, as an Arctic fox's fur can create tiny sparks of static electricity in the very dry air of northern Finland. Some versions of the story tell of a boy lost in the woods who finds his way home by following the light of the fire fox. Another tells of the Moon asking for help to light the night as she is not as strong as the sun. The animals of the woods joyfully become the constellations to help the Moon—all except for the fox, who simply cannot turn into stars. The Moon, however, has a special job for the fox, turning him all white with a glowing tail. As the fox leaps across the sky, he creates the Northern Lights to delight all those who can see him. There is a beautiful short animated video you can watch of this legend at <https://youtu.be/sN5goxeTfjc>.

With wonder, the aurora borealis have inspired folklore and legends across time and culture. Indeed, the lights are captivating and special—looking at the aurora, its easy to tap into our ancestral magical spirit.

Seconded by Terri Zittritsch. The motion passed.

Gary Nowak made the motion that we adjourn the meeting. Seconded by Terri Zittritsch. The motion passed.

**May  
Board Meeting**

Terri opened the meeting and read the agenda:

- 1) Plans to use our funds, both short term and long term. Eclipse is over, what is our next focus?
- 2) Outreach for 2024. Appointing a coordinator (doesn't have to be a board member)
- 3) Full membership - thoughts on how to get more people interested and engaged as full members
- 4) Getting a Treasurer
- 5) The recycled optics program without Jack - how/who to manage
- 6) Getting club swag - Marcia Bosek and Renata Banke have offered to help here.
- n) way down my list - how to make forum signup easier.

We discussed the need for a new Treasurer. Decided a blanket request to all members should be sent out as well as contact specific full members (see action items).

We discussed whether we need to designate funds that we would need to have available if we ever need to move our buildings to a new site. There was general consensus that we should do this. We don't know how much that should be.

Chmela telescope- Agreed to purchase a 2nd finder scope and a 2nd unity finder (see action items). We discussed the idea of getting a dedicated set of eyepieces for it. We agreed that for now we will continue to share the same eyepieces between the 18" and Chmela scopes. Paul will see if the eyepieces we have will allow us to pull some of these to be kept with the Chmela scope.

We could use a celestial globe at the site as a teaching aid when teaching about the movement of the stars and the celestial coordinate system (see action items).

Discussed the need to get on-line storage for club files so that it is possible

for the board to have ready access to them. Maybe some Google Drive space.

With a recent donation to the club from the Chmela estate we have a nice windfall (as reported at the Annual Meeting) (not the donation we received for the Russell Chmela Observatory). Paul suggested we take advantage of this to potentially grow our assets by putting some of the club's funds into a long-term investment. Paul advocated putting some in a stock mutual fund. The others were not comfortable with that type of investment and suggested a CD or Money Market.

Terri set up a Zoom account for the club.

We discussed thoughts for public outreach events. It was noted that ~90% of the events we participate in are initiated by libraries and schools contacting us and requesting events. Scott mentioned that there are a few particular libraries to which he sends notices/reminders. There are no events currently scheduled. Scott will keep watch for Boy Scout events and similar to which we may want to offer our participation. We are looking for an outreach coordinator and maybe an outreach committee. Note that it is not required for the coordinator or committee members to participate in the outreach events. It's not required that the coordinator be the committee chair but if we have a committee it will need a chair.

There is interest in getting some club "swag". Bob Horton's wife and Bill Banke's wife may be interested in working on this. Scott mentioned there is a website, Zazzle, where one can create and order swag. There are other sites as well.

Scott said that the Deborah Rawson Memorial Library in Jericho is interested in doing a summer astronomy event.

Keith will take over the Recycled Optics Program. Paul will maintain the Recycled Optics List.

Joe is planning to have his "Spontaneous Night Under the Stars" again later this summer.

Jim plans to step up his participation in outreach activities.

Paul mentioned that we could use a small shelf in the Teaching Dome for getting the cabinet of small drawers with

eyepieces and accessories off the floor. We could also use an eyepiece box for easier access to the eyepieces (labels on the drawers may be an alternative).

**ACTION ITEMS:**

Paul will contact Joel Greene and Bob Peacock about the need for a new Treasurer. Terri will contact Steve Grimsley, Richard Whitehead, Maura Kelley, Peter Gillette and Barry Connolly. Keith will contact Dennis Woos.

Paul will look into the 2nd optical and unity finders for the Chmela scope and a celestial globe for the site.

Paul will see if the selection of eyepieces we have in the 18" observatory will allow us to pull some to be kept with the Chmela scope.

**MOTIONS:**

None

**June  
Board Meeting**

**Agenda:**

- 1) May minutes review and acceptance.
- 2) Finances - where to use our money.
- 3) How to entice more Full members - membership count today.
- 4) Club swag -
- 5) Treasurer and outreach coordinator.
- 6) General business - around the room.

Terri opened the meeting.

A correction was made to the 5/22/2024 Board Meeting, it was Bill Banke's wife and Jim Bosek's wife who voiced some interest in working on swag for for the club, not Bill Banke's wife and Bob Horton's wife.

We continued our discussions of what we may want to spend some club money on.

It was mentioned that we need to know our current and historic income vs expenses (with a focus on dues based income) for any contemplated increases in yearly expenses.

Paul looked into 2nd optic and unity finders for the Russell Chmela Telescope but realized he had a question as to whether a straight through optical finder or a right-angle finder was preferred. After some thought and discussion recommended a straight through 8x50 optical finder as the one on the scope is a straight through model.

**Other suggestions put forth:**

- Coma Corrector for the 18". Paracor brand was recommended.
- The wood planks currently used for 3 observing pads at the Hinesburg Observing Site are not sitting as solidly in the ground as they used to. It was suggested replacing them with small concrete pavers (each about the size of bricks). They would not warp like wood can and will likely maintain a more solid footing over time.
- A GoTo Dob drive or push to Digital Setting Circles for the 18" to try to make the scope more user friendly and easier for more people to locate more than just the most familiar and easiest to find objects. A GoTo Dob driver is available but it is fairly expensive. There are also digital setting circles available for a more moderate price.
- A laptop (for Zooming the monthly meetings and for outreach presentations). The desirable criteria include network, HDMI and speaker connections, 8-16 GB of RAM, 500 TB solid state hard drive.
- Cloud storage for club files - meeting minutes, newsletters, by-laws, presentations, etc. currently on Paul's computer (yes, they are backed up, 2X) and some on other member's computers - to make them more readily available and to ensure they are backed up.
- GoTo equatorial mount at the site for member use. Though a nice idea, it was decided it is unlikely that members would have telescopes without a mount and even if they did would be unlikely to bring them to the site to use on said mount.

**How to entice members to become Full Members:**

What is the goal (purpose) for getting more full members? The goal is to get more members to be more active in the club. We need more of our members to be engaged with club activities, outreach activities and other club operations.

Thoughts on how to engage members:

Put out more observing suggestions/challenges to the members of lunar features, planetary and deep sky objects. Have more observing events for members.

**Swag:**

Jim hasn't talked to his wife yet about her level of interest in getting involved.

Kate Yantz name came up as a member with artistic abilities (she and Richard made the 60th anniversary cake for the Annual Meeting) and was suggested as a good person to approach about ideas for swag.

Maybe do a calendar of member images.

There have been indications for interest in hats and T-shirts. It has been more than about 30 years since we have done either. We have done club logo patches a couple times since then (40th and 50th anniversary) and it was suggested we do 60th anniversary patches.

We can query the membership for their thoughts and interest. For some items with a high interest and low cost we may order a quantity but for other items we may set it up where members order directly from the vendor.

At the recent lunar observing event at the site, a non-member participant mentioned a source for mirror making kits that they have recently used. Bob will look into it and consider holding a (telescope) mirror making class if there is sufficient interest.

Kate Yantz is interested in becoming a full member. 2 board members recommended her. She has been an associate member for about 1.5 years. She has helped clear brush at the observing site, has been to some observing events and to Stellafane.

**MOTIONS:**

Scott moved that we accept the May Board Meeting minutes with the correction noted above.

Terri seconded the motion. The minutes were approved.

Scott moved that we purchase a Paracor coma corrector for the 18" Ob-session (~cost \$500)

Joe seconded the motion. All approved it.

**ACTION ITEMS**

Terri will analyze the budget relating to current and future recurring income and expenses.

Terri will check into cloud storage options.

Scott will look into sourcing a laptop.

Terri will see about purchasing a Paracor coma corrector.

Paul will purchase some small concrete pavers to replace the wood planks currently used for 3 observing pads at the Hinesburg Observing Site.

Paul will order an 8x50 straight through finder and a Rigel Quickfind unity finder.

Terri will query the membership about interest in club swag.

Terri will send an email request for an outreach coordinator.

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**VAS Membership Committee**

No meetings this quarter.

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**Observatory Site Committee**

No meetings this quarter.

**Under the Stars & Planets**

**OBSERVER'S CORNER**

**Observing Tips**

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

**Equipment Tips & Recommendations**

**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](http://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](mailto: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](mailto:info@vtastro.org) if you are interested in taking advantage of this.

**Member's Observations**

We had a total solar eclipse, Northern lights and are waiting for a recurring nova to explode.

**Total Solar Eclipse-April 8, 2024**

**Mon, Apr 8, 2024, 11:07 AM  
Jack St. Louis**

Hope everyone gets to enjoy this event.

**Apr 8, 2024 at 3:49 PM  
Angele Mott Nickerson**

Holy heck guys! Vermont looked amazing! I watched your eclipse from my work in Oregon. I was so busy working in our planetarium I didn't even see our little eclipse. So excited for all of you!

**April 8, 2024 5:01 PM  
Dennis Woos**

Now I know why folks say that unless you've experienced totality you really haven't experienced it. Amazing!

**4/8/2024, 6:42 PM  
David Selinger**

We had a great time at the observatory today.

Many thanks to Paul, Maura and others who put this together.



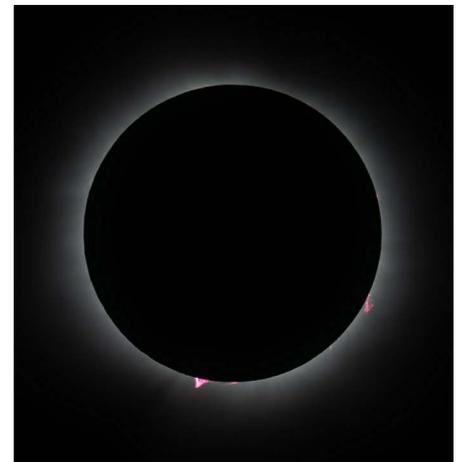
Image by David Selinger

**4/8/2024, 7:08 PM  
Gregory Warrington**

Hi all,

I'm looking forward to hearing some eclipse reports and seeing some pictures! I hope everybody got a chance to see it.

We were going to view from Shelburne but decided to decamp to Enosburg Falls at the last minute. Here's a grab straight from my camera (580mm DSLR, 1/60 f/11; cropped), taken through high clouds.



(see larger version on page 17)

**April 8, 2024 8:08 PM  
Brian S. Johnson**

So many large prominences! I wanted to spend more time myself observing the Corona through my 5" reflector. But when I saw the proms I made sure everybody in my little group got a chance too. I wasn't really expecting them based on what I saw in 2017. Really spectacular!!!

I look forward to seeing some images or video.

**April 9, 2024 7:41 AM  
Lawrence Garrett**

Greetings All;

Had nothing but imaging problems, with just a few keepers but I'm not complaining.

That image by Geogory is so much like my 20x80mm binocular view, I never suspected to see such "electric" colored prominences!

The Geese on the far riverbank across from us gave a "heads up" warning the eclipse was just 5 minutes away!!! Sure enough about 5 minutes after the event the "all clear" came from them as well.

Great images and reports all!!

**April 9, 2024 07:57 AM**  
**Scott Turnbull**

Well that was something, wasn't it!

I settled in at Deborah Rawson Memorial Library in Jericho. Brad was there with multiple scopes, too.

Here's link to video I cropped of just the totality sequence. No processing on it. I did add some music.

<https://www.instagram.com/reel/C5h3LTmg3ad/?igsh=MWlsamozZnRxbzM5dw==>

I had some imaging challenges both with the standalone DSLR with and the 70mm scope equipped with video imager. Most importantly, I ignored them and watched totality instead of troubleshooting settings.

I rate the experience two thumbs up. Would watch, again.

**4/9/2024, 8:49 AM**  
**Keith Lawrence**

My wildlife experience was with mosquitoes. We had quite a few arrive about 5 to 10 minutes before totality and they disappeared a few minutes after. Quite a view even with the thin clouds!

**4/9/2024, 9:59 AM**  
**Paul Walker**

We had a similar experience at the Hinesburg Observing Site. We were mobbed by mosquitoes, but they never went away after the eclipse! They did quiet down but didn't go back into hiding.

**4/9/2024, 8:51 AM**  
**Brian S. Johnson**

We had a Woodcock start doing its evening courtship display.

Also got absolutely mobbed by mosquitos right as totality began! Wasn't expecting that at all. They went away as the Sun brightened. I fear it's going to be a bad year for them...

**4/9/2024, 10:00 AM**  
**Gregory Warrington**

The wildlife reports are so interesting! Great video, Scott.

Here's a wide-angle time-lapse of the moon's shadow approaching and receding:

<https://youtu.be/YJOeYgTQFFQ>

I'm still trying to connect the angles at which the shadow approaches and departs with the angles of the C2 and C3 contact points.

I took the advice of Paul from his helpful presentation and tried to automate everything photographic ahead of time. For this time-lapse I set up a Go-Pro on a timer ahead of time and directed it to take one photo every half-second starting at totality. Given that it was wide-angle, I didn't worry about a filter and just left it exposed to the sun. Fortunately, it was possible to lock the exposure so that the camera wouldn't keep adjusting for the changing light. I then combined the photos into one time-lapse with 30 frames a second (so about 15x normal speed). Venus and Jupiter are briefly visible.

**April 9, 2024 10:14 AM**  
**Brian S. Johnson**

My sun funnel doing its thing.



**April 9, 2024 10:27 AM**  
**Gregory Warrington**

What'd you use for the membrane for the funnel?

**4/9/2024, 10:31 AM**  
**Brian S. Johnson**

Mylar drafting film.

There is a yellow filter in the train. Improves contrast of sun spots. And people expect a yellow sun ??

**4/9/2024, 10:36 AM**  
**Lawrence Garrett**

We were wondering what those Geese might do. Seems they had more on the ball than 80% of the people I talked to over the last 6 months.

Someone I know even planned a vacation away from Vermont despite being told that date for months.

**4/9/2024, 12:15 PM**  
**James Bosek**

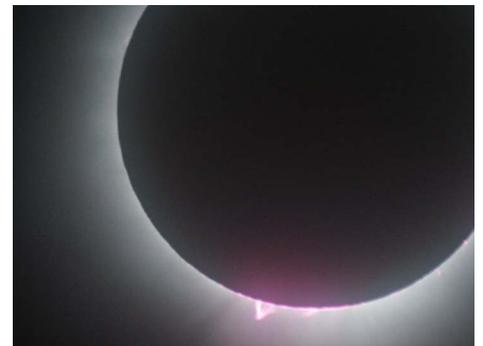
Marcia attends a weekly Tai Chi class and one of the participants told a story I truly wish I had witnessed. She said a flock of crows in the vicinity came unglued. Crows are on the top of the heap as far as intelligence in birds. The story sounds like the crows' reactions were not just a night time routine. Sounds like the crows "pooped their pants." If you hear stories like this let me know. [its even better when you hear Jim tell it]

**Apr 9, 2024, 1:36 PM**  
**Marilyn Hackett**

"Electric" colored prominences is such a perfect description! "Magnificent" is all I could add. And I wonder if there are scientists studying geese brains.

**4/9/2024, 1:59 PM**  
**Eric Torraca**

Hello all, frequent lurker Eric here. Took this in Essex Junction through my 5" Mak-Cass with an Olympus E-PL8. What a fascinating event. I was NOT expecting the color of those prominences. (see page 16 for bigger version)



4/9/2024, 3:10 PM

Jeff Eitreim

New member/future lurker here.

With some cloudiness moving in, we decided at 1P to drive East & North from Essex. Because why not? I was nervous I wouldn't get to see the corona very well if the clouds were thick enough. The clouds gave chase, and we ended up in a small turnout above farm fields not far from Jay Peak.

Greg, your image matched our 10x50 binocular views really well. And it seemed to me that the southern prominence/flare grew as we watched.

But maybe it was the moon's motion, revealing it more as it passed?

But DAT COLAH! I told my family they were fuchsia, but I only half believed it myself. Does anyone have any theories about the color? Did the high clouds play a role?

What a spectacular event, and how kind of mother nature to pull back the clouds for a few days.

4/9/2024, 7:22 PM

Lawrence Garrett

Had tracking troubles with my ETX EC but not enough to come away empty handed.

Great all around everyone!



See page 16 for larger version.

4/9/2024, 9:58 PM

Paul Walker

I too had issues. I had created a video for playback on my laptop to give me instructions for my planned imaging sequence but my laptop went to sleep part way through the eclipse! I knew I had better poke it once in a while when I started video but forgot to do so. Better yet I should have changed the sleep setting to never sleep! Luckily this was about half way through totality so I still got some good images. I also discov-

ered that, though I had set my 75-300mm zoom to 300mm, even have a couple test images of Sun prior to the partial phase showing this, the zoom moved on me so all the images were shot at only 205mm! If only I had followed the rule of taping the zoom so it couldn't change. Arg! So they are all of lower resolution than planned. And not to mention on the lead-in partial phase, I over exposed somewhat in an attempt to compensate for the clouds, not so much but what the 2 main sunspots are still visible.



This is called "The Diamond Ring". It is a shot from video, seconds before the Sun was completely covered by the Moon (2nd contact). The red chromosphere is visible "above" and below" the "diamond". The top of a red prominence is visible at the 5:30 position. This prominence was a major show stopper toward the end of totality. (larger version pg 18)

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**Aurora Borealis**

We finally had another great northern lights display the night of May 10/11. Caused by a series of Coronal mass ejections from a large sunspot group.

5/10/2024 11:30 AM

Brian S. Johnson

Besides Spaceweather.com, anyone know of a good site?

Just found this one.

<https://www.swpc.noaa.gov/communities/aurora-dashboard-experimental>

5/10/2024 12:07 PM

Peter Gillette

That's one of my favorites, Brian.

Another one to check out is the live webcams in Lapland. They're about 11 hours ahead of us, so they'll see it before we do, maybe

<https://lightsoverlapland.com/aurora-webcam/>

5/10/2024 4:59 PM

Paul Walker

Definitely keep an eye out, especially if you live north of Burlington (see predicted cloud cover below). Full darkness does not occur until a little after 10 PM but I would recommend keeping an eye out starting about 9 PM. And if you wake up after going to bed, poke your head outside. And maybe have your camera ready on a tripod. Of course being away from light polluted areas are best but if its bright enough that won't matter so much.

4/8/2024, 10:54 PM

Bob and Yvette

Paul,

Here are some photographs from today of you and your set-up.

Thank you so much for sharing your equipment and knowledge!

We truly had an amazing experience.

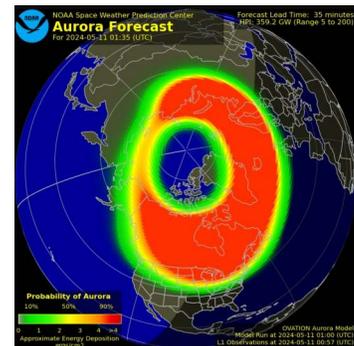
Thank you also for guiding us back to Middlebury!



5/10/2024 9:13:PM

Paul Walker

It's still too cloudy down here (Middlebury) and probably the sky too bright but here's the current aurora forecast. Northern Vermont is in the 90%+ probability region. The forecast is for 35 minutes in the future and updated, I think, every 5 or 10 minutes.



**Brian S. Johnson**  
5/10/2024 9:49 PM

Too cloudy in Grand Isle. At 21:49.

5/10/2024 10:04 PM  
**Brian S. Johnson**

WOW!!!!

5/10/2024 10:32 PM  
**Brian S. Johnson**

Straight up here. Still cloudy but you can see them through the clouds. Shifted from green to red.

5/10/2024 10:42 PM  
**Brian S. Johnson**

Just pointing my phone up.  
[Slightly brightened, also see page 29 for larger version]



5/10/2024 11:18 PM  
**Brian S. Johnson**

Much more subdued now.

5/11/2024 12:47 AM  
**Brian S. Johnson**

WOW whole northern horizon lit up. AMAZING

5/11/2024 1:18 AM  
**Brian S. Johnson**

If there is anyone still awake. Get outside NOW!

5/11/2024, 1:30 AM  
**Eben Gay**  
Post to VAS Forum

Panorama of the sky north of the causeway to South Hero. (image below),



slightly brightened. [see page 29 for larger version]

5/11/2024, 1:57 PM  
**Greg Erianne**

Reply to Eben's VAS Forum post:  
That's an amazing composition, Eben! Super job, and thanks for sharing it.

5/11/2024, 2:32 PM  
**Terri Zittritsch**

Reply to Eben's VAS Forum post:

Eben, that's a gorgeous image! Congratulations.

5/11/2024, 1:50 AM  
**Greg Erianne**

Post to VAS Forum  
I was able to get some video of the Aurora before it clouded up, but the file is too large to put here. This is the Instagram Link. I'll try to modify it so the file is a bit smaller and see if I can upload it to the FB site.  
Instagram link:

[https://www.instagram.com/reel/C60RthsSx4g/?utm\\_source=ig\\_web\\_copy\\_link&igsh=MzRIODBiNWFIZA==](https://www.instagram.com/reel/C60RthsSx4g/?utm_source=ig_web_copy_link&igsh=MzRIODBiNWFIZA==)

5/11/2024, 9:14 AM  
**Terri Zittritsch**  
Reply to Greg's VAS Forum post:

Greg, fabulous! That's cool to see how it undulates real time. I could see the aurora changing shape at times, but most of the time it looked static to me with just my eyes. This is very cool!

I must have 100 images. I went out to the corner to get a clearer view until around 1am.

5/11/2024 2:06 AM  
**Brian S. Johnson**

Best bit so far. Large ropes of light flashing horizon to horizon. Well down south into Serpens. WOW!

5/11/2024 2024 2:28 AM  
**Brian S. Johnson**  
Now down into Scorpius.

5/11/2024 2:57 AM  
**Brian S. Johnson**

Twilight is coming and Aurora is still naked eye visible. What a night!

5/11/2024 3:42 AM  
**Brian S. Johnson**

3:39 and I've seen the last wisps fade into the west.

5/11/2024 4:17 AM  
**Paul Walker**

Yep, I'm still awake! I stopped taking pictures about 4:08 AM! Glad to see at least one other person stayed up long enough to see the late show! And sorry for those who didn't. I haven't seen a display like this since the late 1980's.

5/11/2024 9:02 AM  
**Maura Kelley**

Sounds like I missed the peak - around midnight? as I didn't get out until 1:15 AM. I couldn't believe it! I would have stayed out all night!! only I had to get up early... so came in at 2-ish as clouds were moving in.

Wished I had checked my email earlier - Terri provided suggested best camera settings.

5/11/2024 9:34 AM  
**Paul Walker**

From the few people who have shared so far there seems to have been a wide range of experiences, partly due to differences in cloud cover and partly due to differences in the aurora itself, based on where one was located. This is the first aurora for me where there was some almost real time reporting of experiences.

5/11/2024 11:37 AM  
**Brian S. Johnson**

<https://1drv.ms/f/s!AkDyuNoxUfrK63zFbjtOgYanSePs> Not bad for just shoving a phone towards the sky. Hand held against my van or balanced on my knee. 2 to 10 second exposures.

I couldn't see the color except for very early on. Very dynamic movement across the whole sky the later it got and

the closer to dawn. I gave up when I couldn't see anything naked eye. Surprised to see color in my last shot.

05/11/2024 10:53 AM

Terri Zittritsch

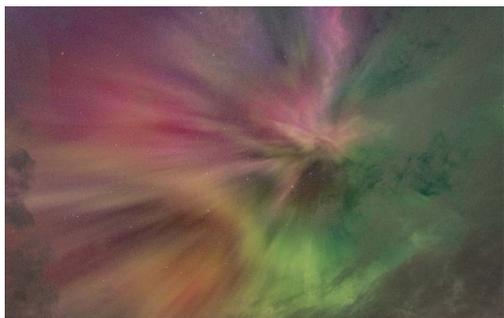
Post to VAS Forum

<https://vtastro.org/community/images/more-eclipse-images-from-williston/#post-888>

Some Images of the Aurora Borealis from Williston, Vt. What a treat for Vermonters to see two amazing natural phenomena in about 1 month's time. A great time to be alive!

Here is a sampling of the images I took. I took about 170 images and mostly in sequences so I can stitch them together, but that's going to take a little bit of time.

[3 of the 16 posted]



61A6051.jpg



61A6100.jpg



61A6227.jpg

See page 30 for a larger versions.

05/14/2024 5:40 PM

Peter Gillette

I'm really glad I took the time to look through your set of images! They remind me a lot of what I was seeing from Hinesburg, but with the bonus of a bit more illumination of the clouds from below, which is a plus, sez I.



Sunspot group 3364. This is the group responsible for the coronal mass ejections that produced the awesome auroral display. It was taken the morning after the display. See page 34 for a larger version.

05/14/2024 10:48 AM

Gerry Davis

Post to VAS Forum

<https://vtastro.org/community/images/more-eclipse-images-from-williston/#post-888>

On Friday evening (5/10/24) I had checked the sky about 9:30 PM from my house south of Taft Corners and saw no Northern Lights. I fell asleep about 11:15 checking e-mail on my desktop computer, awoke suddenly about 12:40, and saw an E-mail from a woman in the Vermont Astronomical Society noting great views of the aurora and a picture of the aurora. Since I was now awake and still dressed I grabbed my camera and hurried down to the playing fields behind the Williston Central School. Despite the bright flood lights, the view to the north was clear and the aurora was spectacular. It was amazing to see the stars peeking through the aurora. The show changed every few minutes, with colors shifting and columns of light moving across the sky. The dominant color was green, but with nice areas of magenta and highlights in blue ... Wow! Here are some of my photographs, all taken between about 1:00 and 1:45 AM 5/11/24. The clouds rolled in and the Lights seemed to shut down about 1:40, so I waited 10 minutes and left. All were taken with my Nikon Zf mirrorless full-frame camera and a 24-70mm lens at 24mm, f4, ISO 1600-2500, and 20-30 sec exposure.



[Slightly brightened, see page 32 for larger version]

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**T Corona Borealis**

T CrB is a recurring nova and is predicted to have its next outburst any time now. It has been seen in outburst at least 2 times in the past. Estimates for the time between outbursts range from about 78.4 to 80.5 years.

**To see current visual estimates and photometric measurements of T CrB go to AAVSO.org**, the website of the American Association of Variable Star Observers. Scroll down to Resources. There you will see "Pick a Star". Type in T CrB and select "Check recent observations". For the visual estimates, under the Filters column look for "vis".

**To create printable charts with comparison stars**, select "Create a finder chart". The default chart covers a field of view of only 1 degree. To create wider field charts select "Plot Another Chart". Under "Choose a Predefined Chart Scale" select a scale. On the right hand side, down a little, select "Plot Chart". Scale A is the largest, producing a 15 degree chart which shows T Corona Borealis and is good as a starting finder chart and provides comparison stars for when it brightens. You will likely want to print the AB, B, and C charts as well. **Note-** if you have are using a Schmidt-Cassegrain or a refractor telescope with a star diagonal you will want to change the chart orientation to "Reversed".

June 1, 2024-Paul Walker

I have been taking some pre-outburst images of T CrB. I have also done a few visual estimates. Appears to be still slowly fading. I have compared my estimates with ones on AAVSO's site.

Most of mine are lower than the visual estimates there.

My Visual Estimates:

2024-05-23 ~11 PM EDT **10.3 mag.**  
(comparison stars- 9.8, 10.6, 10.8) telescope 10" f/5.6

2024-05-26 ~10 PM EDT **10.5-10.4**  
(comp stars- 9.8, 10.6, 10.8) 10" f/5.6

2024-05-31 ~12:25 AM EDT **10.6**  
(comp stars- 9.8, 10.6, 10.8) 10" f/5.6

2024-05-31 ~11 PM EDT **10.5**  
(comp stars- 9.8, 10.6, 10.8) 12.5" f/4.9  
6/27/24 22:58 EST **10.6**

(comp stars- 9.9, 10.6, 10.8) 10" f/5.6  
7/1/24 23:11 EDT **10.5**

comp stars- 9.9, 10.6, 10.8) 10" f/5.6

### June 1, 2024-Larry Garrett

AAVSO - WebObs Search Results  
check avvso results here:  
[https://app.aavso.org/webobs/results/?star=000-BBW-825&num\\_results=200](https://app.aavso.org/webobs/results/?star=000-BBW-825&num_results=200)

I have been watching since March.  
Last estimate 10.2.

### June 1, 2024 Gary Nowak

I have been watching T CrB in giant binoculars since February 2024.

A few quick points here:

No one has actually saw the rise of T CrB in the 1866 and 1946 outbursts. 1946 observations were made when T CrB had already gone past peak and was observed at +3.2 magnitude. The 1866 observations were 1st made when T CrB was at +2.2 magnitude and on that same night went a bit brighter to +2.0 magnitude.

The predictions are based on the 1866 and 1946 Outbursts. If you accept the old astronomical records of the possible 28 Dec 1787 and the Autumn of 1217 Outburst of T CrB (which is open to some debate). Then if you fold these two (questionable) observations into the time line to predict the next outburst of T CrB, it points to a much longer period between outbursts.

T CrB could fade for several months before it has its dramatic rise. Since no one has actually seen the rise of this star, it could be a long period of time before the star makes its move. There are variable stars which have irregular periods.

The original prediction of T CrB rise was Feb – Sep 2024. This original prediction was later modified to Apr – Dec 2024. This original is based on a predicted period of  $78.8 \pm 0.4$  years. There are some who believe the predicted period is closer to  $80.1 \pm 0.4$  years.

So I would still observe T CrB in hopes of catching its rise. However it may be a long time before T CrB has its outburst and that outburst may not conform to the predictions.

Observing during the last two "clear" nights; did you notice a thin bit of "smokey" haze? I did notice a rather faint haze which reduced my Transparency by about 0.5 magnitude. (My Transparency was +5.2) So I couldn't see T CrB in my 25 X 100 giant binoculars due to the "smokey haze." I could only see down to about +9.4 magnitude and a probable +9.8 (?). So my last observation was that T CrB was fainter than +9.4 magnitude. I also used my 15 X 70 giant binoculars too.

Larry, you may want to try your 20 X 80 giant binoculars to watch for T CrB. I find that giant binoculars give a nice wide erect field of view and it is easier to see the comparison stars in the same field of view. Plus giant binoculars are lighter to carry than a telescope. My 15 x 70 have a  $4.5^\circ$  FOV, my 20 X 80 ( $3.5^\circ$  FOV) and my 25 X 100 ( $2.5^\circ$  FOV), so I can use all three look at T CrB.

Paul, you may want to try your 20 X 90 giant binoculars to watch for T CrB too.

### June 1, 2024-Paul Walker

Hi Larry,

Your mentioning that you were observing because of the predicted outbursts is why I started watching it.

Hi Gary,

I read the article in the March S&T. It will be interesting to see which prediction is closest.

I think it was 2 nights ago I noticed a haze at that I could see around the brighter stars. Last night I didn't.

For me it's actually easier to use one of my scopes. Last night I opted for the 12.5" as I was finding it a bit hard with my 10" using the method of defocusing the stars. In the article it

said this time there is an observation an average of every 12 minutes.

### June 1, 2024-Larry Garrett

Haze be gone! I did not notice any last night, but the night before for sure, but then again I was in that observing window for the asteroid occultation, under 15 degrees high, so not unusual. I did see last night Omega 1-2 Scorpius (finder stars) as RED in the 12.5" telescope at 1h27m last night, count for haze? The event was at 2h0m13s UT.

Paul I did not remember if I sent the AVVSO link or not, can't remember yesterday.

Gary, I've seen T CrB in all my optics except my C-8 and you are right the 20x80 are great, but I like doing the magnitude estimates in my 6" XT6 best. Not even a 30 foot walk with that telescope, both are on the ready.

I can now observe with the complete "rescue" collection, with my free XT6, perfect wooden stool, and now a mint condition small computer table, tilting part and all (good for summer viewing), the things people try to toss out at work, but I get in the way.

### 6/26/2024-Lawrence Garrett

Looking at the latest data on recurrent nova T CrB (pronounced "tee-core-bore") last night held an infrared magnitude I had yet to see since tracking this since March this year. And sure enough Spaceweather.com SpaceWeather.com (news and information about meteor showers, solar flares, auroras, and near-Earth asteroids) placed a major review of this coming event. Too many details for here, so click to spaceweather.com and check the sky every chance you can with at least binoculars.

### *Announcing T CrB pre-eruption dip - AAVSO -*

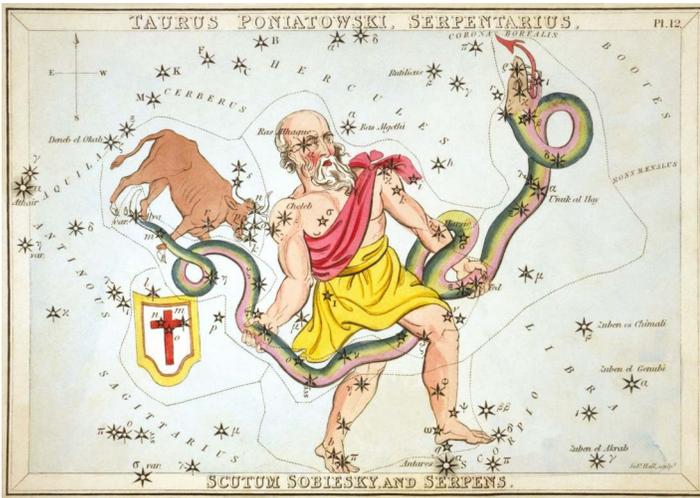
<https://www.aavso.org/news/t-crb-pre-eruption-dip>

### *Image of Coraenae Borealis showing T CrB and R CrB) on spaceweather.com:*

[https://spaceweathergallery2.com/indiv\\_upload.php?upload\\_id=209507](https://spaceweathergallery2.com/indiv_upload.php?upload_id=209507)

[The image also has 2 graphs on it. One showing before, during and after observations of 1946 T CrB outburst. The other showing recent observations of its brightness.]

## OBJECTS TO OBSERVE



## OPHIUCHUS GLOBULARS GALORE

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

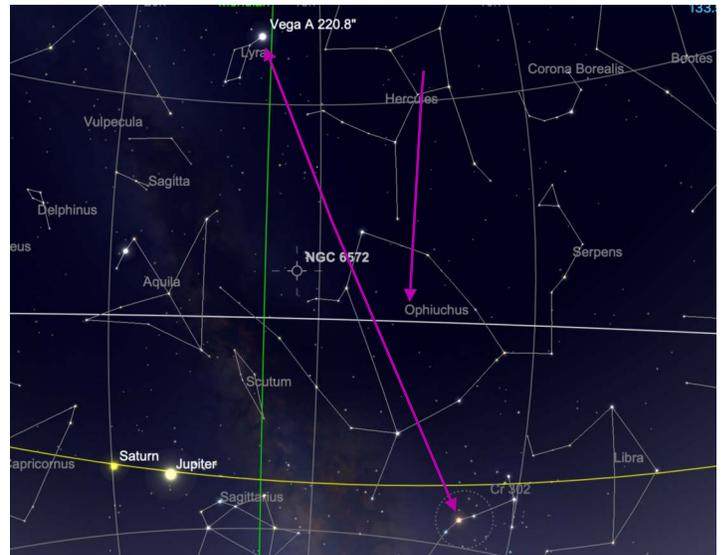
### Ophiuchus

Pronounced – off-ee-YOO-cuss

- The serpent bearer or serpent collector
- The Constellation is associated with Asclepius, the famous healer in Greek mythology.
  - Asclepius is a son of Apollo
  - Learned to be a healer by witnessing one snake healing another by bringing it herbs.
  - Staff of Asclepius is used to represent doctors and the World Health Organization
- Ophiuchus is one of the Hercules family of constellations
- Ophiuchus is usually depicted with Serpens, a separate constellation. In fact, Serpens is 2 constellations.
  - Serpens Caput – the head
  - Serpens Cauda – The tail
- Of the 88 constellations, Serpens is the only one to be split into 2 parts.
- 12 named stars and 9 Messier objects!

Eventually his charioteer, Iolaus would seal each stump after Hercules chopped off a head, the immortal head was buried under a rock!

Hercules used the Hydra's blood on his arrow tips for future labors.



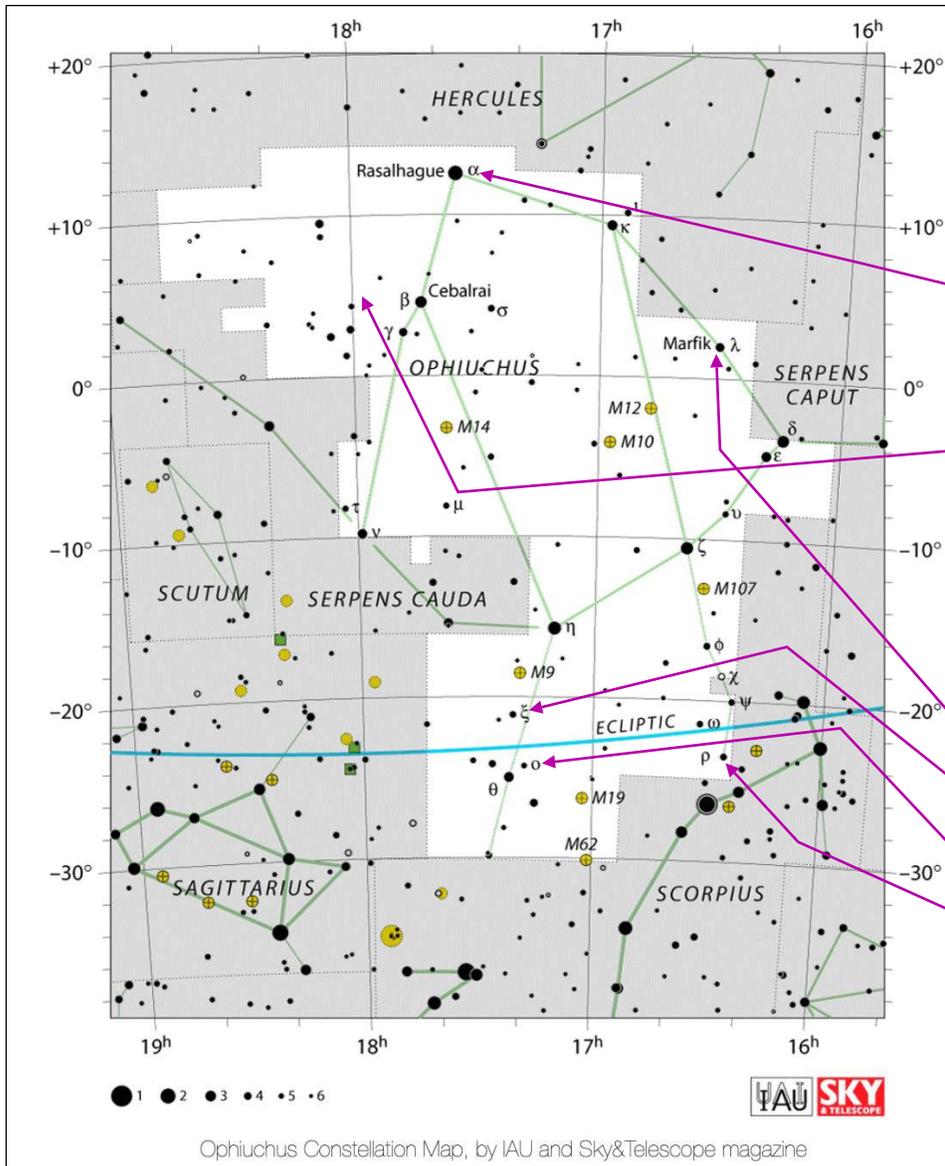
### Finding Ophiuchus

Spring and summer

When Vega and Arcturus are high in the sky Find Hercules between the two bright stars.

Ophiuchus is just South of Hercules. If you have a view of Antares, then Ophiuchus can be found between Antares and Vega.

Easy peasy!!



## Observing in Ophiuchus

### Bright Stars:

- Mag 2 Alpha Ophiuchi 'Rasalhague' or head of serpent collector
  - 48.6 light years from earth, an A5 III spectrum binary with a mag 5 companion @ 0.8" *split with a 180mm refractor?*
- Barnard's star - Variable Red dwarf of mag 9.54
  - largest proper motion of any star, 10.4"/year mvmt
  - Only 6 LY distant, moving 139 Km/s towards our sun
  - Dim and not very colorful*

### Double Stars:

- Lambda Ophiuchi Mag 5.2, 3.9; separation 1.9" *difficult split, 270x, 180mm scope*
- Xi Ophiuchi Mags 4.4, 8.9; separation 3.5" *could not split*
- Omicron Ophiuchi Mags 5.5, 4.6; Separation 10" *easily split 180mm in scope*
- Rho Ophiuchi Mag 5, 5.7; separation 2.9" *split at 160x, 180mm scope*



**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 on a separate guide scope.

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

**Software/Online Info**

► **Autostakkert3! (AS!) Stacking Software** – Lucky imaging with an edge for planet, the Moon and solar images. Works with still and video images. <https://www.autostakkert.com/>

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

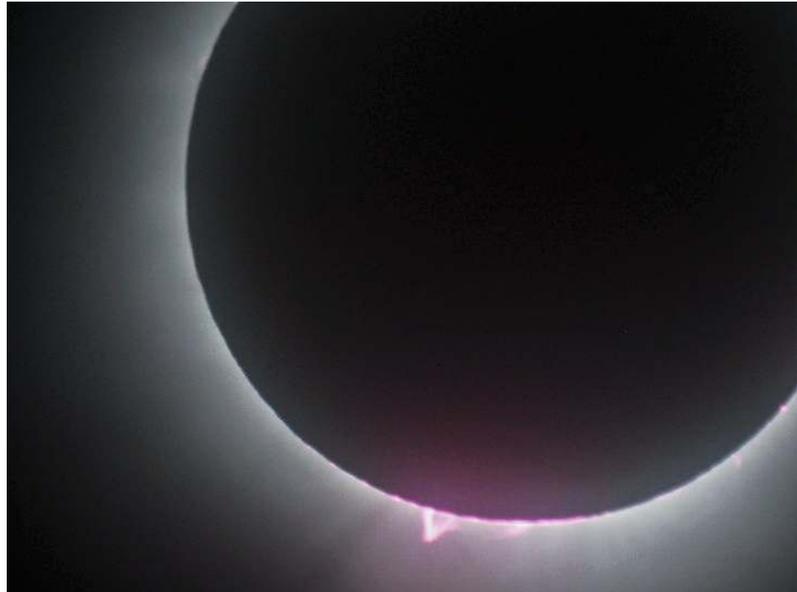
**Astrophotography How-To**

► **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](mailto:info@vtastro.org)

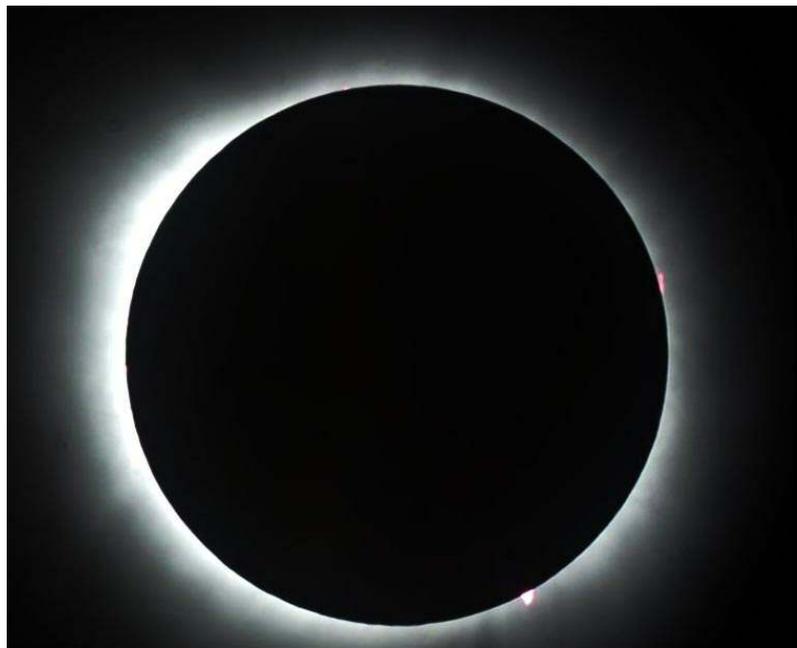
**Imaging Projects--**

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

**MEMBER'S IMAGES****Solar Eclipse Images**

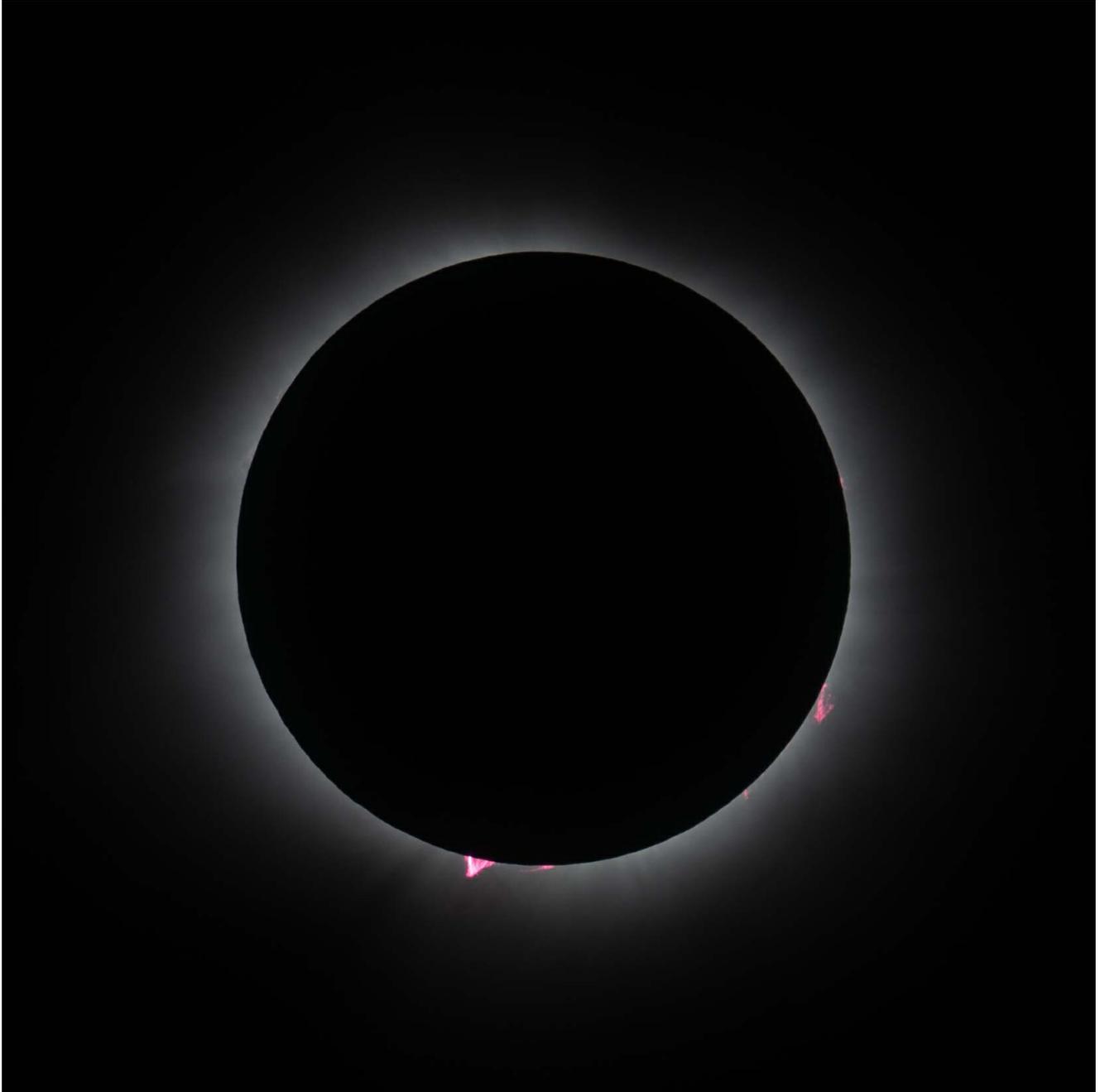
**By Eric Torraca**

Eric took this from Essex Junction through his 5" Mak-Cass with an Olympus E-PL8. "What a fascinating event. I was NOT expecting the color of those prominences." The large 'stole the show' prominence is bottom left. You can see the "hole" through it. A small one to its right, a few small ones to the far right and either the top of the chromosphere or some small prominences along the bottom.



**By Lawrence Garrett**

"Had tracking troubles with my ETX EC but not enough to come away empty handed." The top of the large prominence is on the bottom right. The top of another far right, just above center.



**Prominences and Inner Corona**

**By Gregory Warrington**

We were going to view from Shelburne but decided to decamp to Enosburg Falls at the last minute. Here's a grab straight from my camera (DSLR, 580mm, 1/60 f/11; cropped), taken through high clouds. Taken about mid-eclipse.

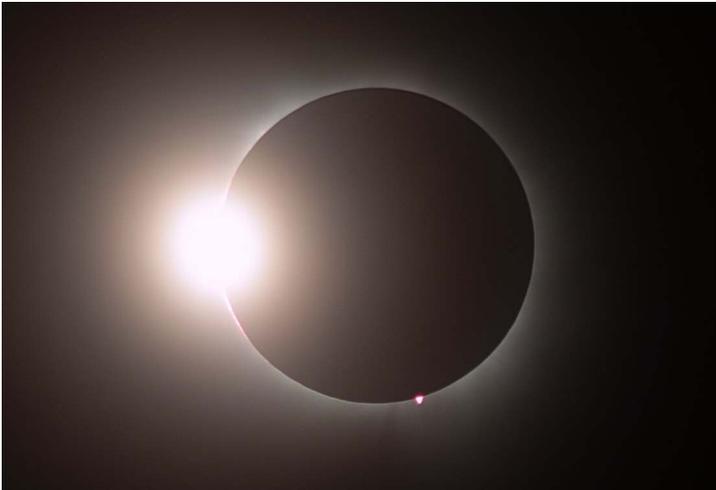
See my wide-angle time-lapse of the Moon's shadow approaching and receding on YouTube: <https://youtu.be/YJOeYgTQFFQ>

## A Sequence of Images from 3 Seconds Before to 22 Seconds After 2<sup>nd</sup> Contact

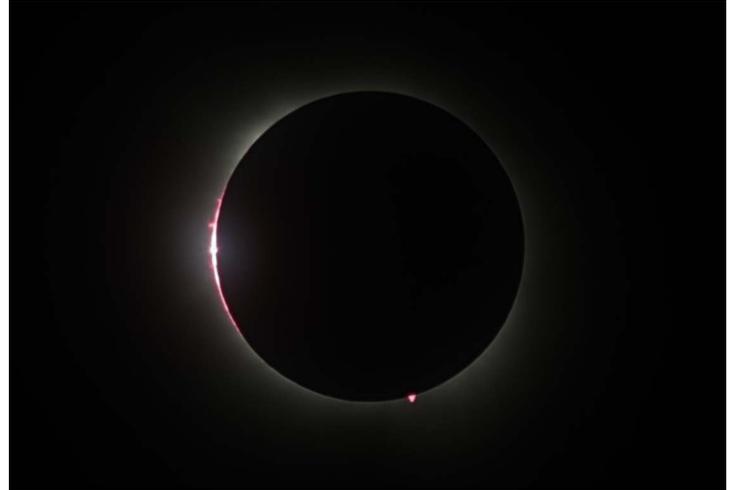
By Paul Walker

Posted on VAS Forum-<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

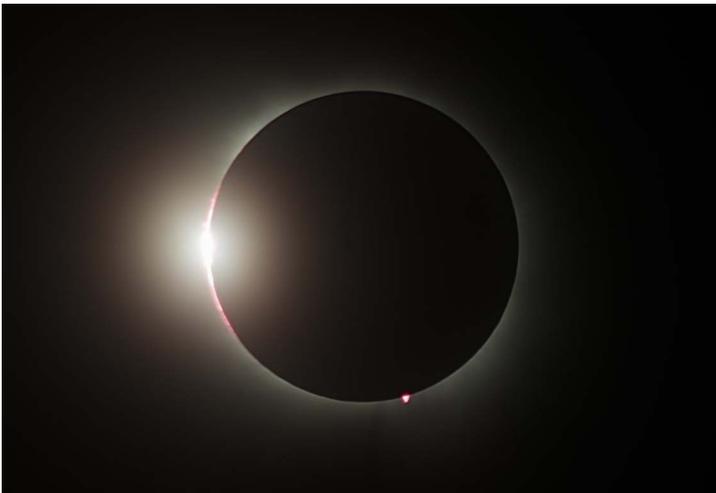
Camera info for all images: Canon T7i, 75-300mm zoom set to 205mm, @ f/6.7, ISO 100, video mode, 3x "digital" zoom (615mm e.f.l.). I took a video starting about 7 seconds before totality, total length is about 34 seconds. I was changed the exposure time every 1 to 2 seconds so I would have a large range of exposures to work with. I started exposure at 1/180 sec and decreased it to 1/4000 sec. then increased it back up to 1/350 sec for 16 steps. I chopped the video into 23 segments based on the exposure times (I apparently increased the exposure 7 more steps than planned, to 1/30 sec). From each of these I created stacked images. Below are a selection of these images. These are cropped about 60%.



The Diamond Ring, ~3 seconds before totality.  
Large prominence poking out on the lower right.



~1/3 second later. Bailey's Beads. Totality started during or immediately after the 0.66 sec clip from which this image was made.



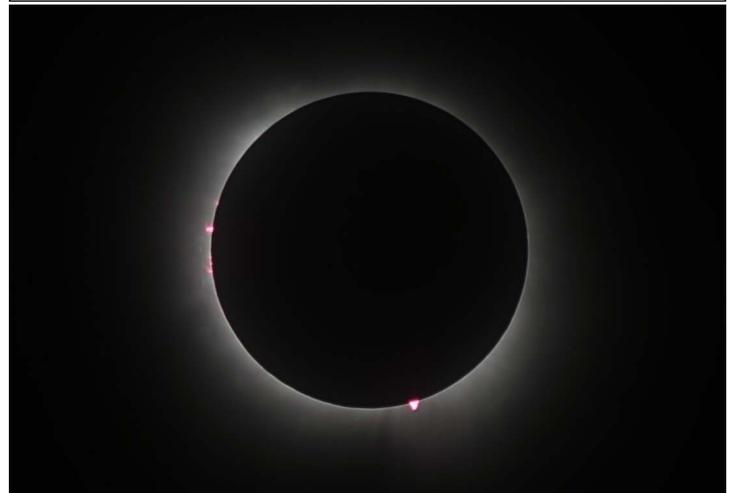
~ 1 second later, ~2 seconds before 2nd contact, shorter exposure.  
The chromosphere is visible above and below the fading diamond.



About 3 seconds after 2nd contact, shorter exposure.  
The the chromosphere is showing nicely.



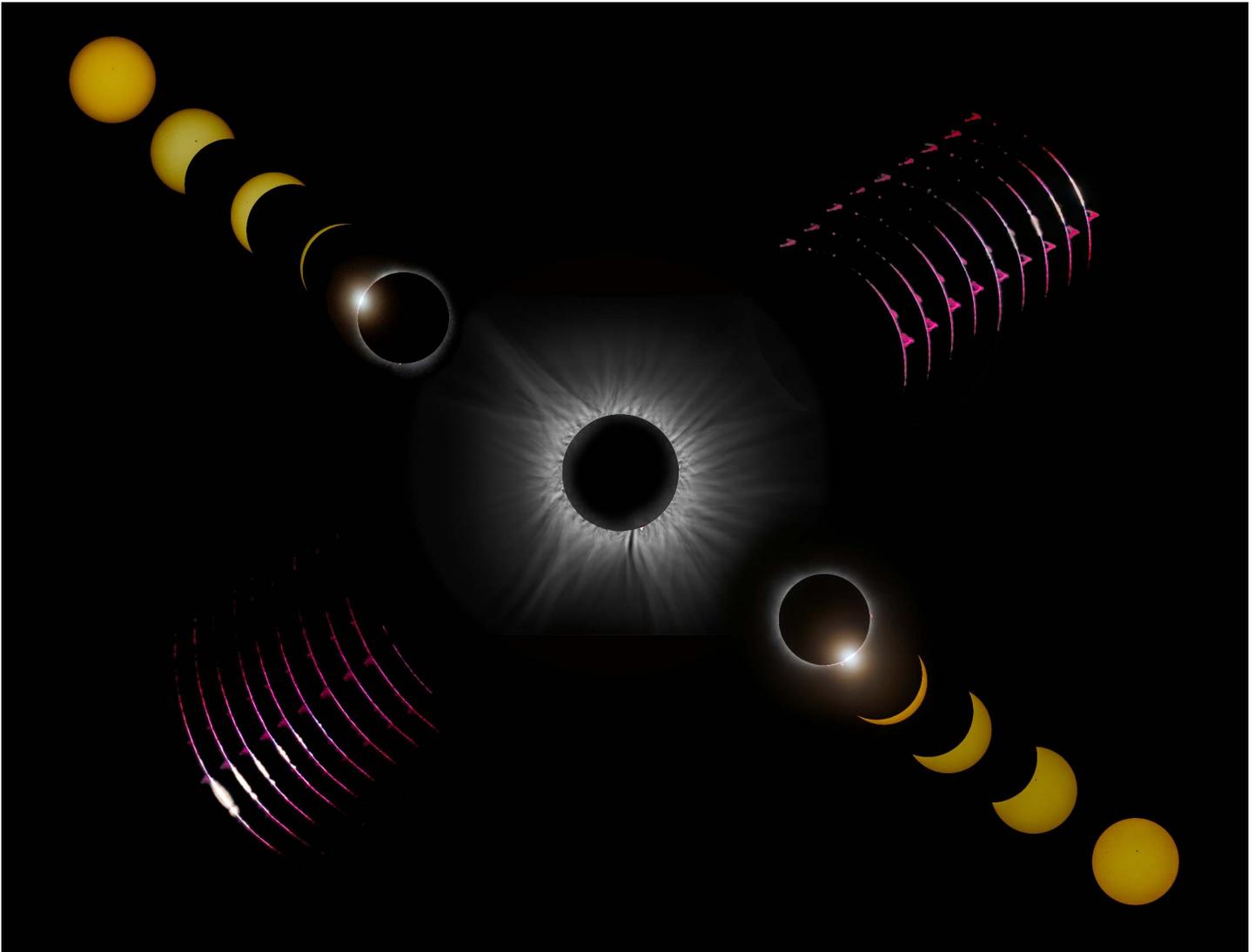
Another 1/2 second elapsed time with a shorter exposure time.  
A prominence is poking out just above the Bailey's Beads.



Here we leap ahead another 22 seconds and increase the exposure.  
The inner corona is visible and a few prominences on the left.



Eclipse Collage from Shelburne  
By Joe Comeau



**An Eclipse Collage  
by Terri Zittritsch**

**Posted on VAS Forum-**

**(the posted image is 8500 x 6482 pixels and has a whole lot more detail then shown here):**

**<https://vtastro.org/community/images/an-eclipse-collage/#post-882>**

Recommend downloading it so you can do a controlled zoom-in for the details.

Here is a collage I created with quite a number of images. I tried to get all aspects of the Eclipse in this image including both C2 and C3 (2nd and 3rd contact) beads, partial phases, diamond rings and of course totality. I also wanted to do something different than I've seen in other collages. Keeping everything the same scale really makes the beads difficult to see so I increased the size of the two sets of beads images. I also increased the size of the totality a bit as well.

Not sure if it works or not, but it's an experiment.

**Comments posted:**

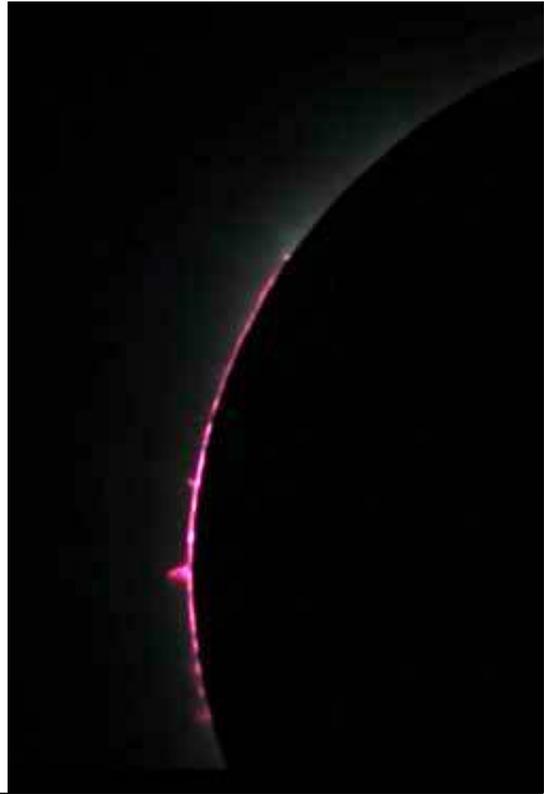
Nice, Terri! Very unique and creative. I don't think I've ever seen this displayed this way before. Great job.  
Greg

Wow, Terri, that's quite unique! It took me a moment to digest it, but it shows some great features you caught very well. Heck of a lot better than my weak attempt at a collage, at least so far....

-Peter-



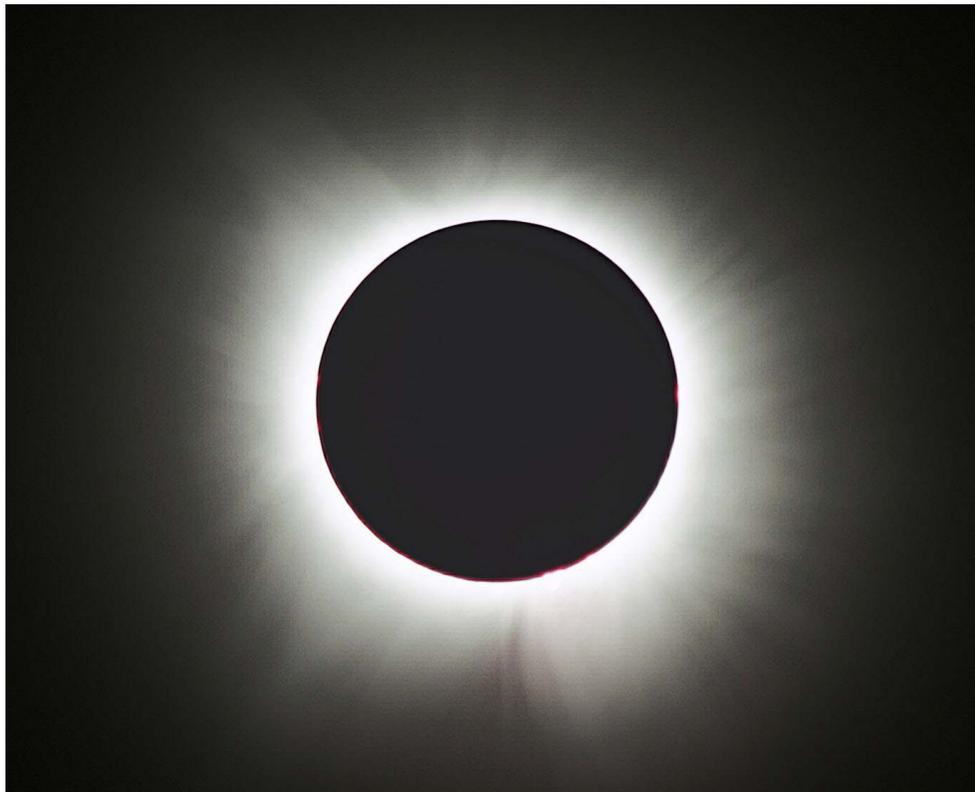
**Bailey's Beads**



**Chromosphere and Prominences**

by **Lawrence Garrett**

Both images cropped, right hand image brightened a little for the newsletter.



**Mid-Corona**

by **Paul Walker**

Posted on VAS Forum-<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

This is a stack of 23 shots taken at 3:28:02 PM EDT, 9 seconds after mid-totality.

I darkened the disk of the Moon in this image to improve the aesthetics.

Astro-modified Canon T7i, custom white balance, , 75-300mm zoom @ 205mm, f/6.7, ISO 100, cropped

**More Solar Eclipse Images**  
by Terri Zittritsch

Posted on VAS Forum-

<https://vtastro.org/community/images/the-great-american-eclipse-from-williston-vt/#post-880>

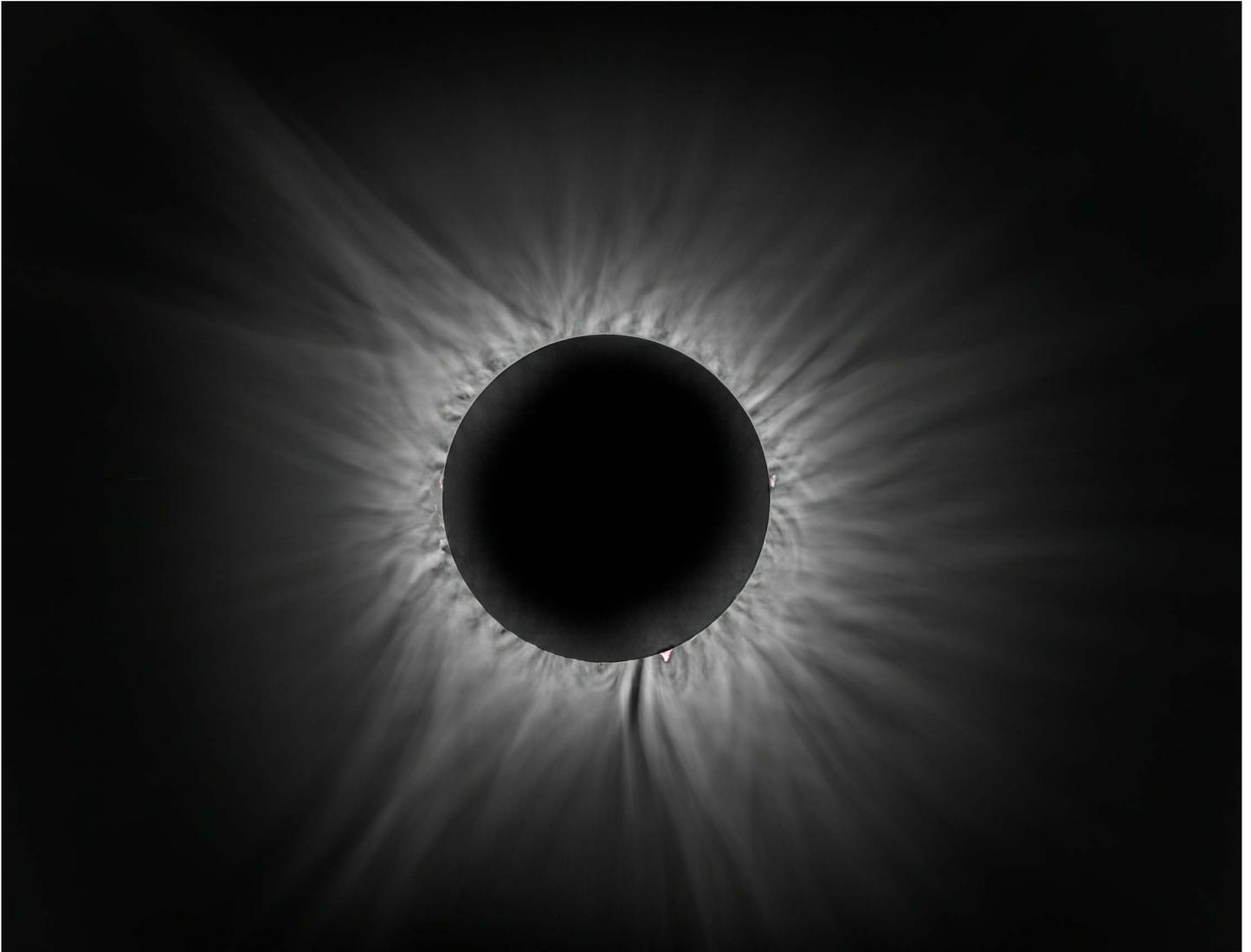
We had a fantastic time with many neighbors and out of town family! No one went away disappointed in the show we saw.

I automated all of my imaging so I didn't touch a camera or a setting during the eclipse and decided I'd get what I get. The clouds and the reflection from the clouds damped the corona a bit, but not the enthusiasm. My images below were taken with an Astro-Physics Stowaway with field flattener and Canon Ra mirrorless camera. I used my Astro-Physics Mach2 mount. I have 100's of shots.



**Prominences and Inner Corona**

Enhanced to bring out details in the inner corona showing how the ionized gas follows the magnetic field lines. Note the loops in the field, in particular the ones associated with (and helping to creating) the large prominence near the bottom.



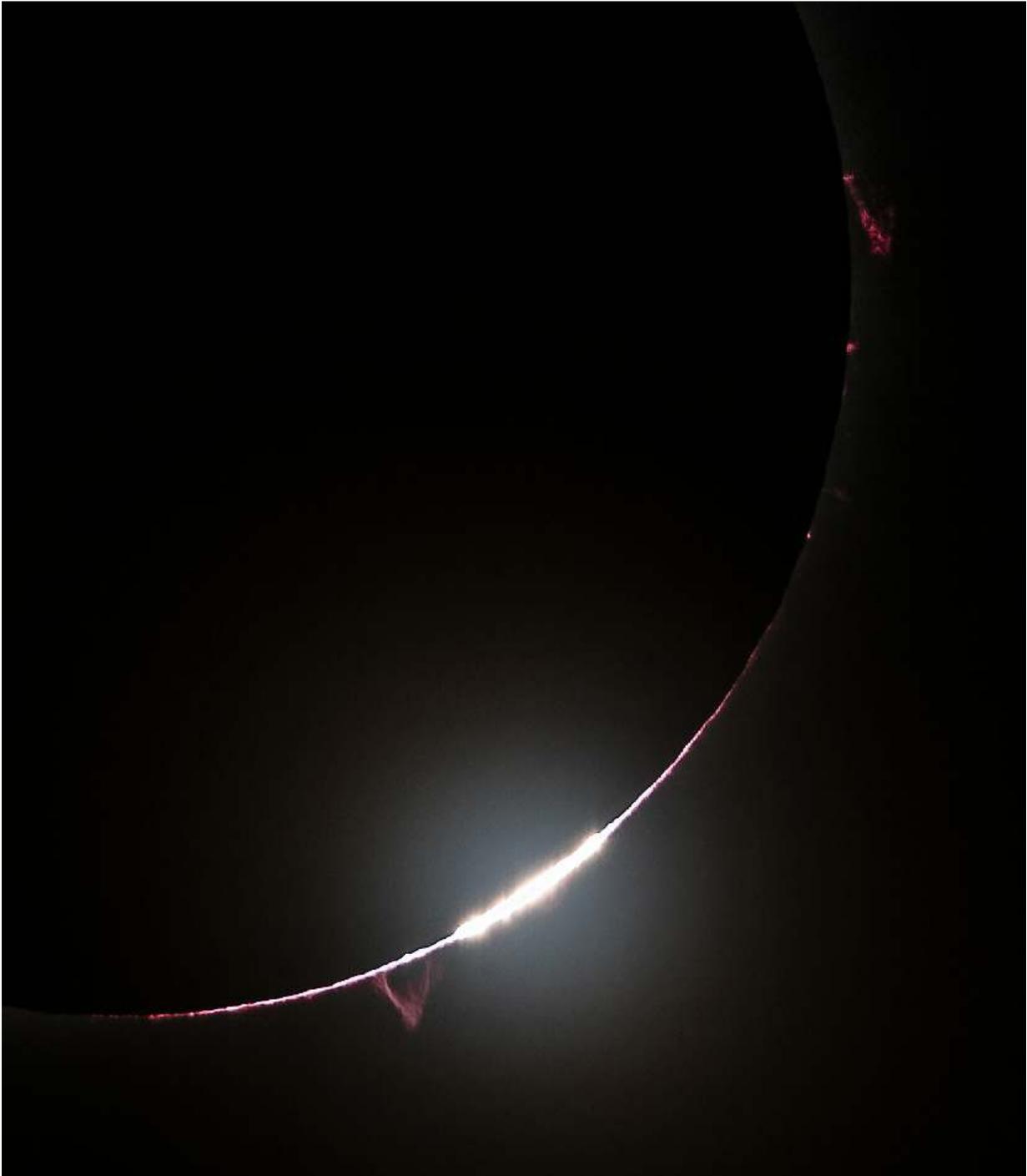
**From Prominences to Outer Coronal Streamers  
by Terri Zittritsch**

**Posted on VAS Forum-**

**<https://vtastro.org/community/images/the-great-american-eclipse-from-williston-vt/#post-880>**

Terri managed to pull off the processing for this image very well. It's a very difficult image to produce in general but was made more difficult by the high thin clouds we had.

This is a composite of several images of different exposure times. It is processed to bring out details throughout the corona. From the magnetic loops near the Sun's surface to the long coronal streamers.



**Bailey Beads, Prominences and Chromosphere at 3rd Contact  
by Terri Zittritsch**

**Posted on VAS Forum-**

**<https://vtastro.org/community/images/the-great-american-eclipse-from-williston-vt/#post-880>**

Here Terri has a nicely timed and exposed shot about 1-2 seconds after 3rd contact. The image scale provides a good detail on the prominences.



**3rd Contact Dimond Ring  
by Terri Zittritsch**

**Posted on VAS Forum-**

**<https://vtastro.org/community/images/the-great-american-eclipse-from-williston-vt/#post-880>**

A few seconds later Terri caught this shot of the departing Diamond Ring.



**Extended Corona**  
**By Warren Walker (Paul's brother)**

Taken from Cabot, VT. The clouds were a little thinner there allowing a better view. The disk of the Moon has been darkened for aesthetics and an Unsharp Mask function has been applied 2 times to bring out the coronal streamers more.

Pentax K-3, Sigma APO DG 70-300mm zoom, f/6.7,  
0.3 second exposure, -1 stop, ISO 200,  
(5 shot bracket at 1 stop intervals).



My wife, Jan, opted to stay home to view the eclipse where she was only 1.6 miles from the southern edge of the shadow and totality lasted 48 seconds.

The day before, I put my 8" f/4 "astrograph on the Atlas go-to mount. Early the morning of the eclipse I put a solar filter on it so my wife could use the scope-see the partial phases close up. Before leaving for the club's Hinesburg Observing Site, I lined it up on the Sun and showed her how to use the hand controller to re-center the Sun in case that was necessary (it wasn't).

As totality began Jan could hear other people in the neighborhood shout out, startling her a little. She had seen the 2017 eclipse with me from Tennessee with a small group of people.

The image to the right is one she took with just her cell phone from my observatory deck in our backyard. That's the north end of our house. As with the top image I tweaked the Moon and Venus. She took it near mid eclipse. Being so close to the southern limit, half the sky was in sunlight and half in the Moon's shadow.

## Totality By Paul & Jan Walker

Posted on VAS Forum-  
<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

I set up one of my cameras to take wide angle shots every 15 seconds. This shot is near mid-totality.

"Sunset" color are visible on the clouds on the horizon. Venus is to the lower right of the eclipsed Sun just of the center of the image. Jupiter is out of the frame to the upper left. I darkened the Moon and brightened Venus to better represent their visual appearance. Not visible here, but very obvious visually was the large very bright electric pink prominence on the lower right edge of the Sun.

That's me at the bottom right looking at the display of my camera. You can make out the silhouettes of the heads of a few other other people. To my left, wearing a hat is Yvette Feig at my 8" f/6 Dob. This about the time she wondered out loud why she could no longer see anything in the scope. Both her significant other Bob Murray and I responded, "Take the filter off?". Shortly after this I got a look through the 8" at the large (very bright) prominence. Next thing I knew, the even brighter chromosphere under and on either side of it came into view. Then it was back to the camera to try to catch 3rd contact, but too late.





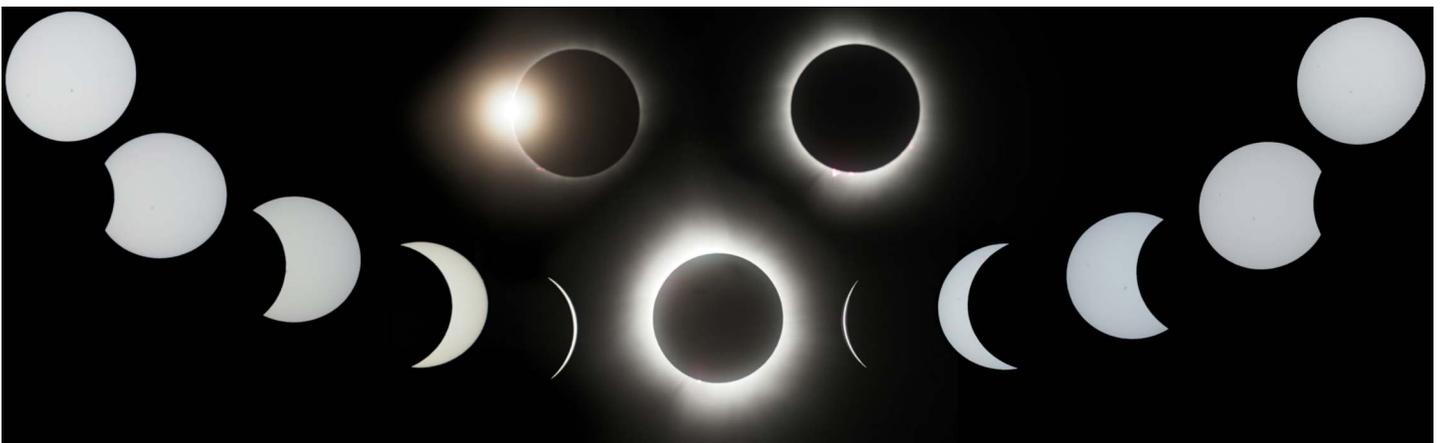
**31 at the Hinesburg Site on Eclipse Day**

**Image By David Selinger Text by Paul Walker**

Hard to believe there was 8-9 inches of snow here just 3 days earlier. I was up the Friday before to check out the snow and shovel it out from in front of the gate and off the deck.

Totality lasted 2 minutes 47 sec at the site. We had 28 people sign in at the site for the eclipse. 10 members and 18 non-members. I know there were at least 31 people total (and 1 dog). In this picture I can count 29 which does not include David or me (both of whom signed it). And I am pretty sure there is 1 more person outside the left edge of the image.

We had at least 4 folks from Hinesburg and even 1 person from the United Kingdom (they were also here to run in the Boston Marathon). One family even brought their barbeque grill to cook lunch!



**The Eclipse Smile**

**By Eben Gay**

**Posted on VAS Forum-**

<https://vtastro.org/community/images/aurora-from-the-causeway-to-s-hero/#post-890>

We end the eclipse images with this collage of Eben's images that reminds us of the big smiles we had on our faces and the gleam in our eyes!

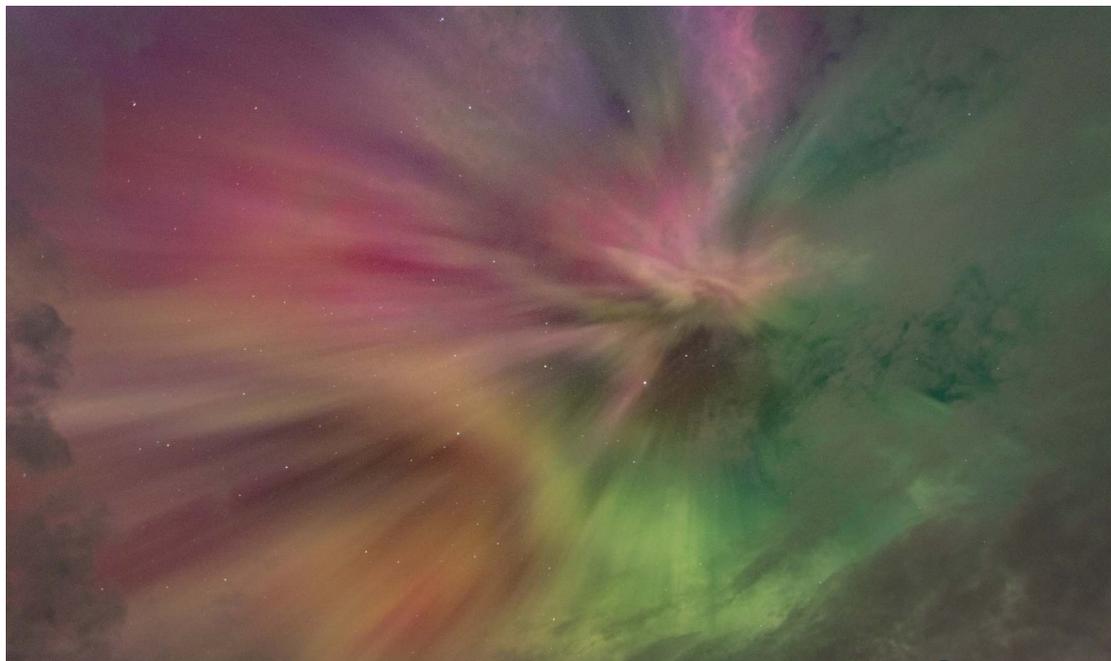
**Aurora Borealis Images  
(Northern Lights)**



**5/10/2024 10:42 PM**  
**By Brian S. Johnson**  
Just pointing my phone up. [Brightened some for the newsletter.]



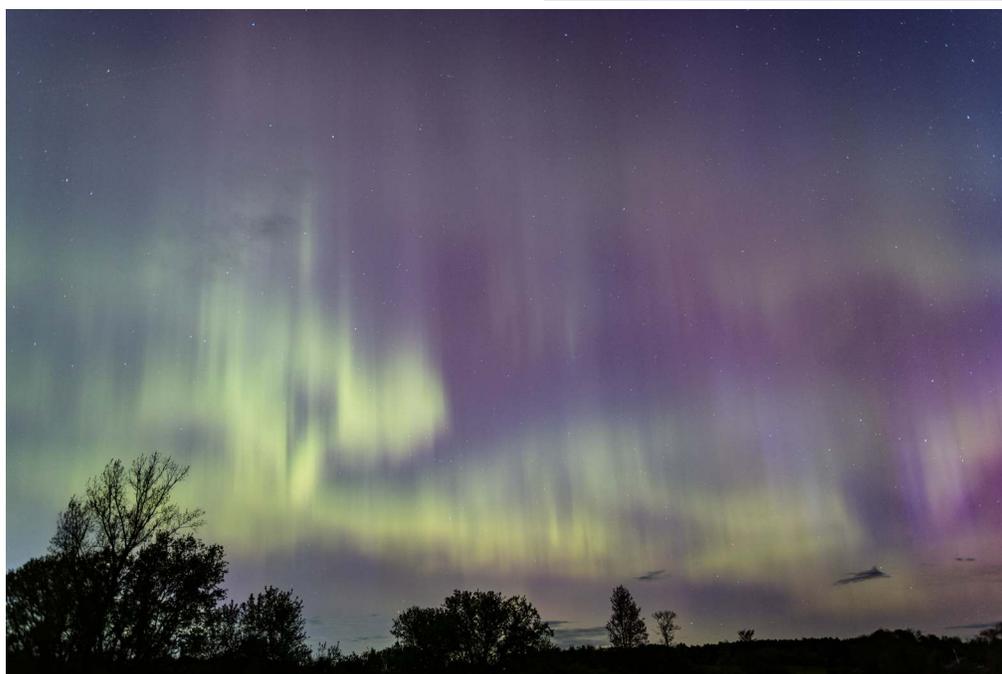
**5/11/2024, 1:30 AM**  
**By Eben Gay**  
**Posted on the VAS Forum**  
<https://vtastro.org/community/images/aurora-from-the-causeway-to-s-hero/#post-891>  
Panorama of the sky north of the causeway to South Hero. [Brightened some for the newsletter.]



05/11/2024 10:53 AM  
By Terri Zittritsch

Posted on the VAS Forum  
<https://vtastro.org/community/images/more-eclipse-images-from-williston/#post-888>

Some Images of the Aurora Borealis from Williston, VT. What a treat for Vermonters to see two amazing natural phenomena in about 1 month's time. A great time to be alive!





**05/11/2024 10:53 AM**  
**By Terri Zittritsch**

**Posted on the VAS Forum**  
<https://vtastro.org/community/images/more-eclipse-images-from-williston/#post-888>

Note that this one has the same foreground as the bottom one on the previous page but has a whole different look.

**05/10/2024 10:52 PM EDT**  
**By Paul Walker**

**Posted on VAS Forum-**  
<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

I took some images starting at 10:30 that showed some green and red northern lights. This is the first one worth showing. It is looking north north-east. Visually I could only see a general glow in the north with no discernable color.

Astro-modified Canon T7i, custom white balance, , 18mm, F5.6, 30s, ISO 1600, IMG\_4049. Image enhanced.



**05/11/2024 12:45 AM EDT**  
**By Paul Walker**

**Posted on VAS Forum-**  
<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

After midnight the activity picked up with green curtains in the north. Compare this exp/iso to the image above. The colors were very muted visually and the curtains were ill defined. Due to the general glow and thin clouds I am guessing.

My observatory deck and 3 roll-off sheds are in the foreground, lit up by my headlamp.

Canon T7i, 21mm, F3.5, 10s, ISO 800, IMG\_4120. Enhanced.



05/11/2024 2:25 AM EDT

By Paul Walker

Posted on VAS Forum- <https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

I first noticed the auroral corona (crown) about 2:06 AM though it didn't brighten enough for good images until 2:24. This looks entirely different than any other features one sees in an auroral display. However, it is in fact curtains like the ones seen to the north, only viewed from directly underneath. Constellations visible: L-R are Lyra, Hercules, Corona Borealis, top of Bootes. Astro-modified Canon T7i, custom white balance, 21mm, F3.5, 3s, ISO 3200, IMG\_4263. Enhanced.



Gerry Davis 2024

05/10/2024 10:48 AM

By Gerry Davis

Posted on VAS Forum-

<https://vtastro.org/community/images/northern-lightshow/#post-897>

Go to page 11 the or the forum link to see Gerry's story about his experience with this auroral display.



05/11/2024 2:48 AM EDT

By Paul Walker

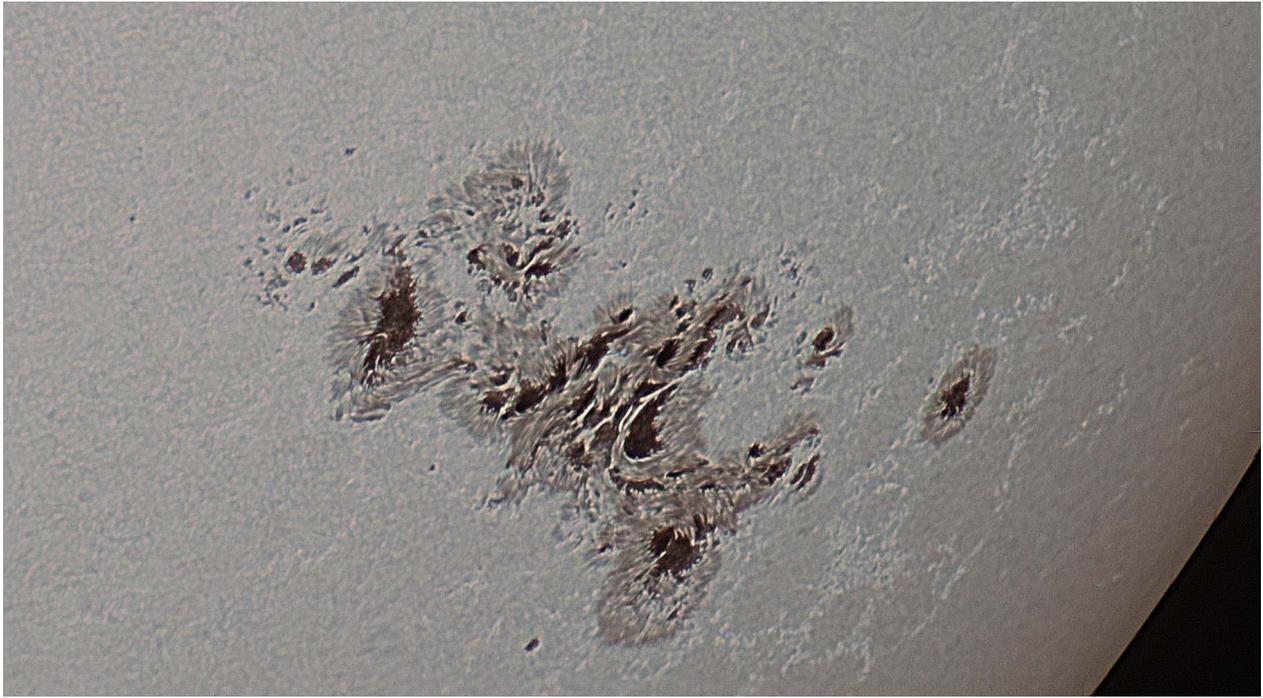
Posted on VAS Forum-

<https://vtastro.org/community/images/solar-eclipse-2024-04-08-at-hos/#post-875>

This shows how far south the display reached. The heart of Scorpio (Antares) and Scorpio's claws are above the tall tree. Libra is to Scorpio's right and Ophiuchus above.

This image reaches almost up to the auroral corona which is just a little outside the top left corner. Note the 2 bright-ish stars in the upper left corner. They are in Hercules and can be seen in my image of the corona (top of the page 33) where they can be seen at the bottom of the image, just left of center.

Astro-modified Canon T7i, custom white balance, 18mm. f3.5. 3s, ISO 3200. IMG\_4301. Enhanced.



**Sunspot Group 3364**  
**By Paul Walker**

Taken the morning after the auroral display of May 10/11, 2024.

I had interference by clouds while taking video of this so some of clips morning had to be cut short and were less than the 5 minute length I usually do. The moments of good seeing were also quite limited, reducing the number of good frames in each clip. To compensate for this I used movie editing software, both cut out the sections of clips with clouds and to combine all the clips into one long video.

I took 6 video clips which after editing provided a total of 18 minutes. Usually I use 10-20% (~900-1800 frames) of a five minute clip if the seeing was good. For this image I stacked the best 3% of the 18 minute video (969 out of 32,304 frames). I also stacked 6% and processed it exactly the same as the 3% stack but it produced an image with slightly lower contrast.

A drawback to doing it this way is that the 18 minutes of video was gathered over 54 minutes (10:49 - 11:43 AM). Features tend to change enough over this time span to blur the image a little.

I can't open the MPG format produced by my Canon T7i camera with my movie editing App so I use PIPP to convert it to an uncompressed AVI file before editing it and saving the results as an AVI file. I then use Autostakkert! to stack the best frames.

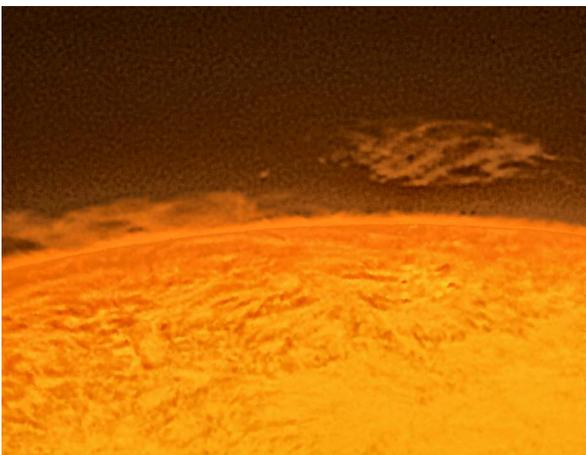
10 in f/5.6, Astro-modified Canon T7i, 2x Barlow producing 2.8x of optical magnification (3730 mm fl at f/14.8), producing a resolution of 0.19"/pixel, 3x digital magnification (does 1/3 crop of the sensor). The smallest features visible are represented by 3 pixels or 0.6" of arc.

Convert to AVI - PPIP

Editing, cut out clouds, combine clips into 1 AVI file - Serif MoviePlus X6

Stacking - Autostakkert!3

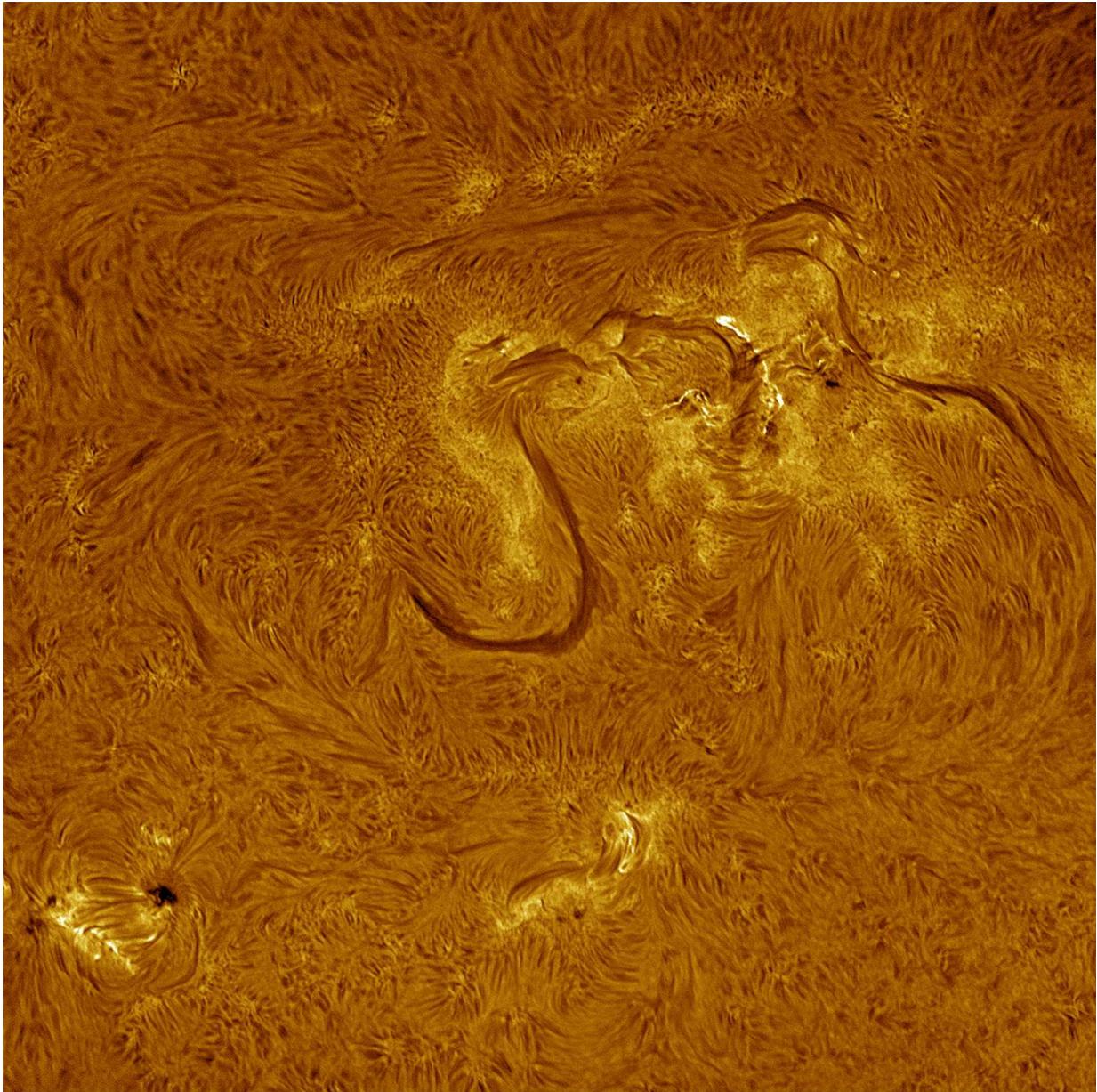
Other - Picture Window Pro 8



**Braided Prominence**  
**By Peter Gillette**

Last Thursday, 5/23, I spent some time observing and photographing the sun, and thought this shot was pretty good, and a bit unique. Not great, by many standards, but one of my better ones of late.

ASI 678MC camera behind a Quark Chromosphere filter on a 120mm f/8 refractor. Best 20 from 200 subs, worked in AstroSurface. Still have a long way to go, to get things really dialed in, but not bad.



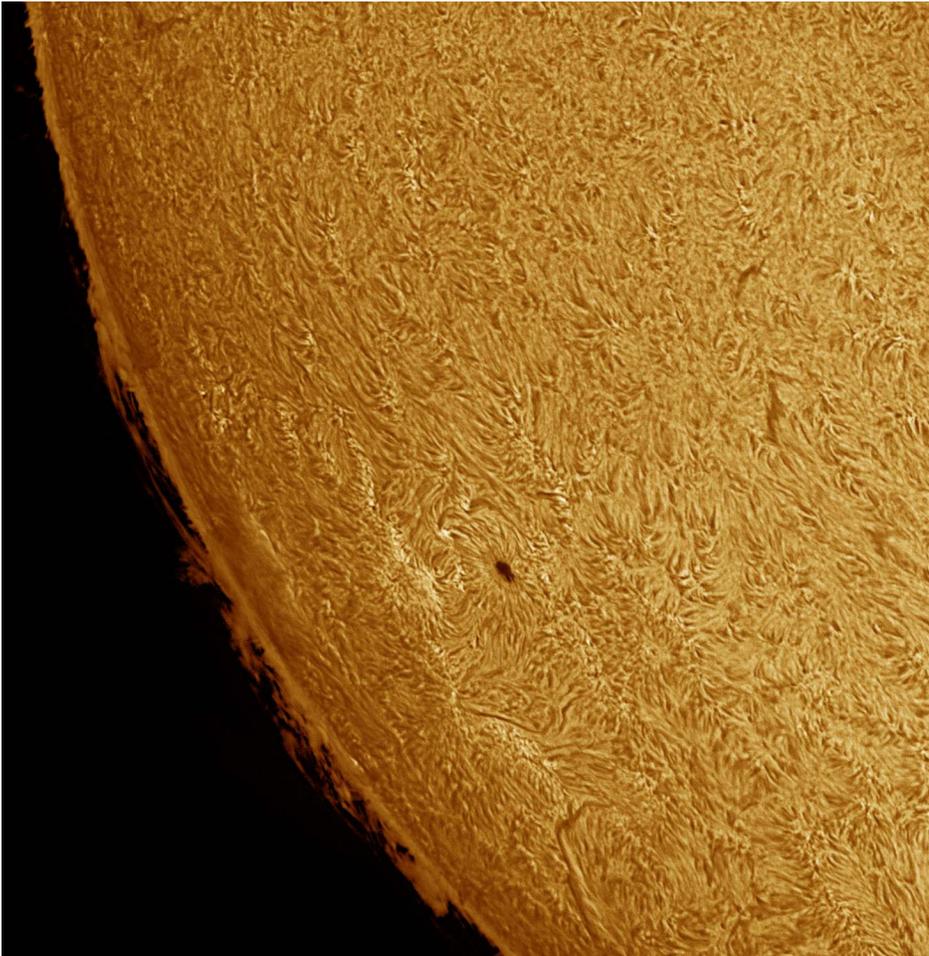
**Filaments Around an Active Sunspot Group  
By Terri Zittritsch**

**Posted on the VAS Forum**

**<https://vtastro.org/community/images/some-more-solar/#post-903>**

Hi all, I wanted to capture some of the big sunspot activity before it's gone. It seems to be quieting down already from it's first pass.

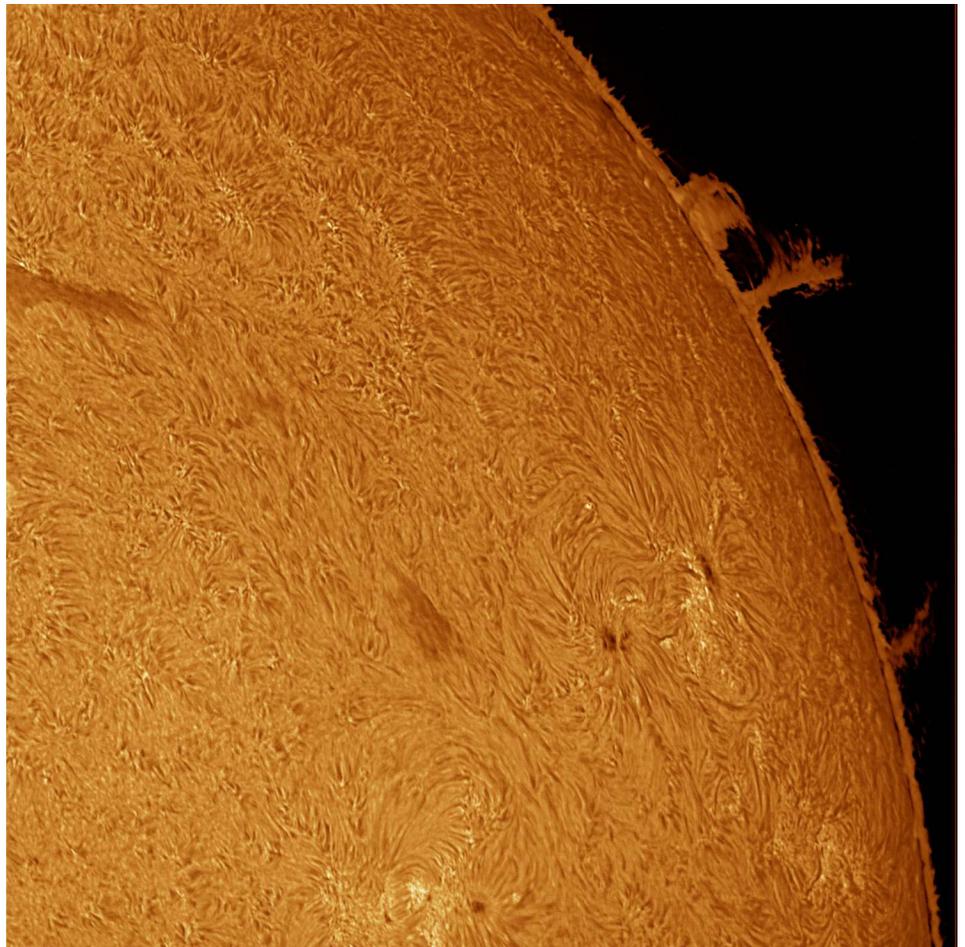
Taken with a 140mm TEC and Quark Chromosphere H-Alpha filter and PlayerOne Saturn-M camera. Stacked and wavelet processing in AstroSurface-V2, Colored in photoshop.



**Prominences and  
the Chromosphere  
By Terri Zittritsch**

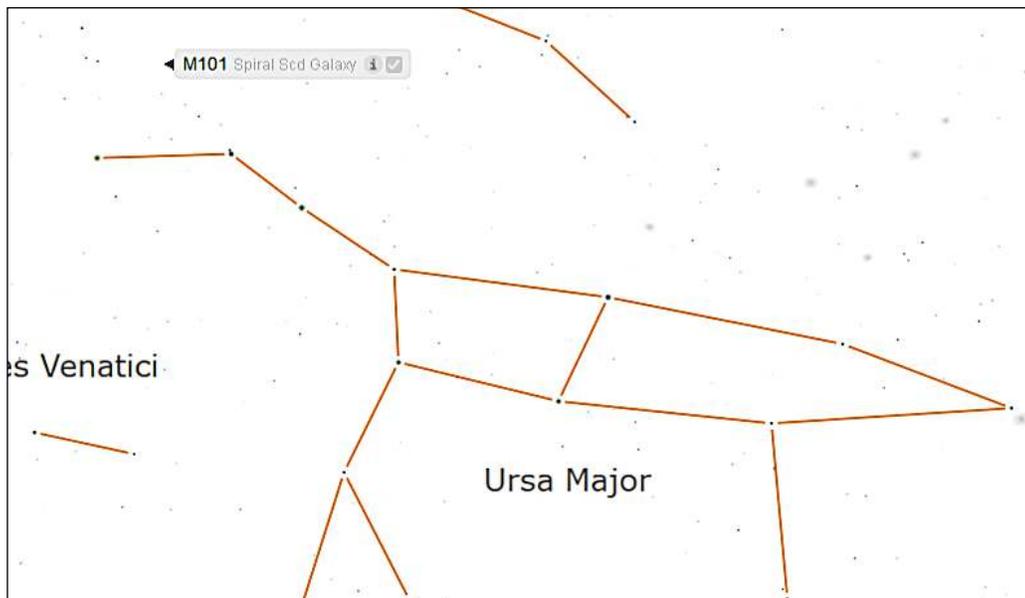
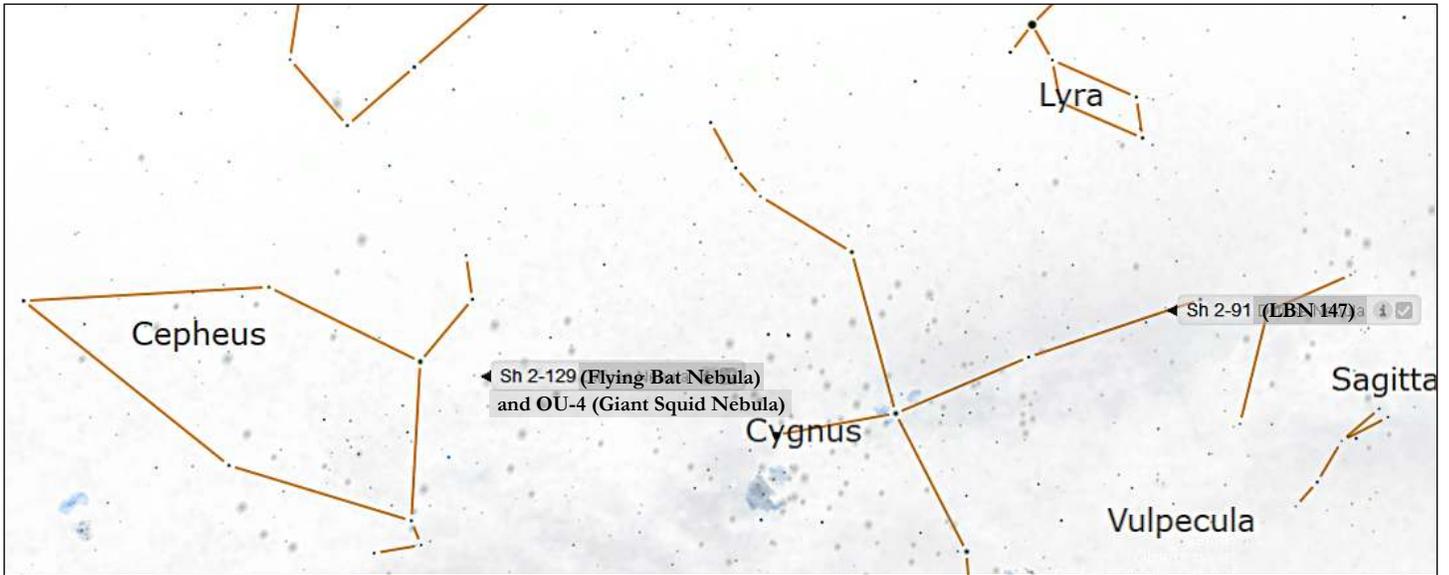
**Posted on the VAS Forum**  
[https://vtastro.org/community  
/images/some-more-  
solar/#post-903](https://vtastro.org/community/images/some-more-solar/#post-903)

Taken with a 140mm TEC and  
Quark Chromosphere H-Alpha  
filter and PlayerOne Saturn-M cam-  
era. Stacked and wavelet process-  
ing in AstroSurface-V2, Colored in  
photoshop.



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

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



**Sh2-91 (LBN 147) Two Ways**  
**By Greg Erianne**

Posted on the VAS Forum-  
<https://vtastro.org/community/images/sh2-91-also-lbn-147-and-part-of-snr-065-205-7/>

I wanted to include an HOO version of Sh2-91 for comparison with the modified SHO version I posted earlier. I also changed both orientations to more of an actual 'sky' orientation, since this object is on the lower portion of the larger SNR.

Sh2-91 (LBN 147) is a small part of a very large supernova remnant, SNR 065.2+05.7, and is located near Albireo in the constellation Cygnus and about 2,500 light years (ly) from Earth. This part of the supernova remnant (Sh2-91) has a diameter of about 230 ly and its age can only be roughly estimated at 20,000 to about 400,000 years since there are several parts to the entire supernova remnant.

Capture Dates: 6/27 & 7/1

Askar 107PHQ with 0.7x reducer (fL = 524mm)  
 ASI2600MM Pro (Monochrome camera)  
 ZWO 7-position 2" Electronic Filter Wheel (EFW)  
 ZWO AM5 mount with guiding via SV106 and ASI178MM

**Filters**

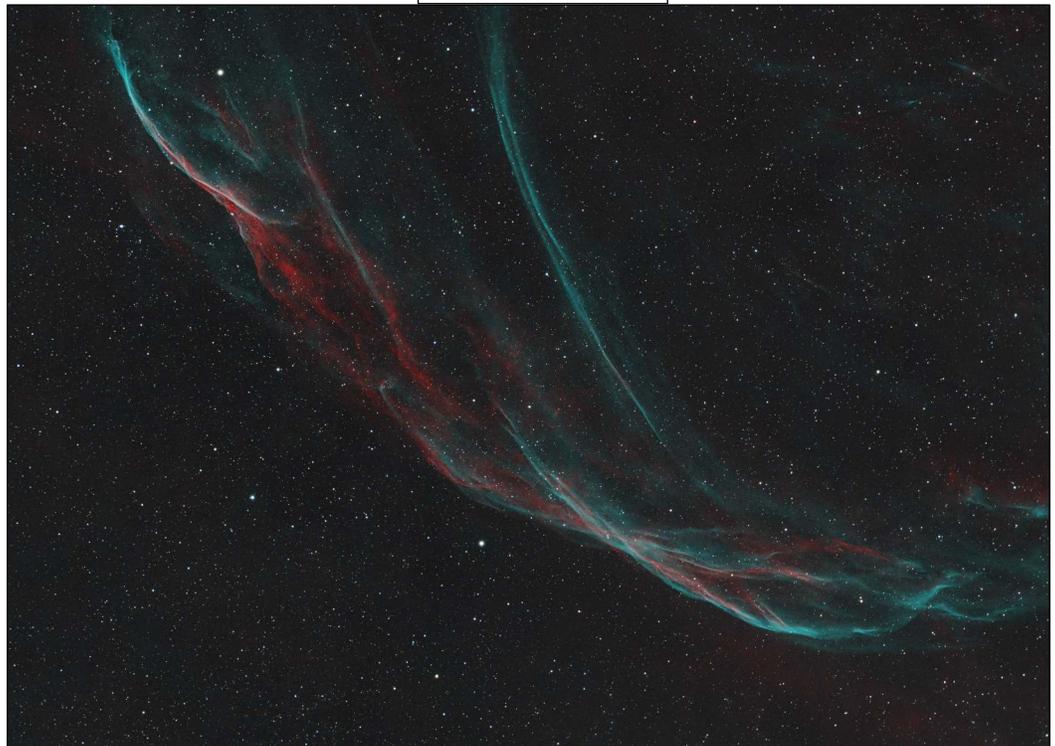
Antlia 3nm Narrowband OIII 2":  
 26×300" (2:05)  
 Antlia 3nm Narrowband H-alpha  
 2": 26×300" (2:05)  
 Antlia 3nm Narrowband SII 2":  
 10×300" (0:50)  
 Antlia LRGB-V Pro series RGB  
 filters for RGB stars (0:20)

Total Integration: 5:20

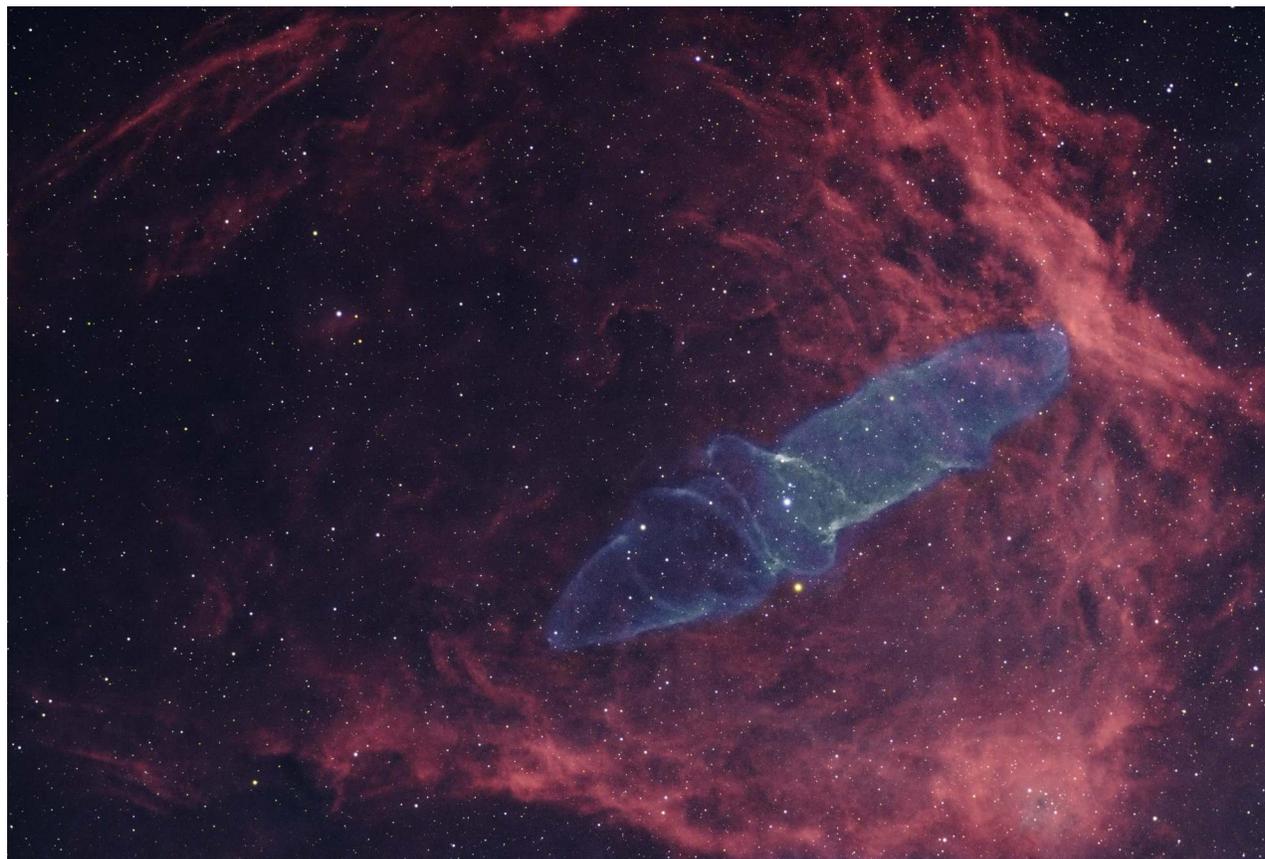
Pre- and post-processed in PixInsight. Additional post-processing in Photoshop for generation of reduced size jpeg.



**SHO Version**



**HOO Version**



**Sh2-129 (Flying Bat Nebula) and OU-4 (Giant Squid Nebula)**

**By Greg Erianne**

**Posted on the VAS Forum-**

**<https://vtastro.org/community/images/sh2-129-flying-bat-and-ou4-giant-squid-nebulae/#post-923>**

Sh2-129 (Flying Bat Nebula, red, hydrogen alpha) and OU-4 (Giant Squid Nebula, blue/cyan, oxygen III) is about 2300 light years (ly) away in the Constellation Cepheus. At the center of OU-4, which is believed to be about 100,000 years old, is a very bright triple star system called HR 8119. Multiple bow shocks can be seen, and some theorize that this is a planetary nebula (PN), but its size of about 50 ly is atypical for PN which are usually 1-3 ly (or less) in diameter.

OU-4 is quite a beautiful, but very dim, nebula. I've enhanced/brightened it somewhat in order to be able to appreciate its complex structure against the backdrop of Sh2-129.

Capture Dates: 5/24, 5/30, 5/31, and 6/3/2024

Moon age: 9.84 days; Avg. Moon phase: 41.54%

Askar 107PHQ with 0.7x reducer (fL = 524mm)

ASI2600MM Pro (Monochrome camera)

ZWO 7-position 2" Electronic Filter Wheel (EFW)

ZWO AM5 mount with guiding via SV106 and ASI178MM

Filters:

Antlia 3nm Narrowband OIII 2": 98×300" (8:10)

Antlia 3nm Narrowband H-alpha 2": 25×300" (1:20)

Antlia 3nm Narrowband SII 2": 25×300" (:20)

Total Integration: 9:50

Pre- and post-processed in PixInsight. Additional post-processing in Photoshop for exposure adjustments and generation of reduced size jpeg.



**M101 in Ursa Major**  
**By Richard Whitehead**

M101 or the Pinwheel galaxy is a face on spiral galaxy that's about 21 Million light years distant. It's about twice the diameter of our Milky way galaxy. A popular target for amateur astrophotographers, it looks an easy target, but the very large dynamic range, from bright blue massive stars and star formation areas to faint wispy arms make this more of a challenge. As with many deep sky galactic images, my favorite part is looking at the hundreds of background galaxies some of which are hundreds of millions of light years away if not billions.

**Tech stuff:**

Location Animas, NM, USA

Telescope. Planewave CDK14

Mount Astro-Physics 1600 GTO AE

Camera QHY 600

LRGB Image (Ha would not register)

Lum 124 x3 min

Red 34 x5 min

Green 24 x5 min

Blue 24 x5min

All unguided

Processed in Pixinsight and tweaked in Photoshop



## NASA News

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

### Updates on the Hubble Space Telescope – Doing More with Less

The Hubble Space Telescope recently celebrated the 34<sup>th</sup> Anniversary of its Launch in 1990. After an ignominious beginning with flawed optics the HST was serviced by a Shuttle crew in 1993 to correct its focus. Since the update the HST has produced 1.6 million observations and broadened our understanding of the cosmos. Four additional Shuttle crew service missions took place, with the last being in 2009. Since then the HST has been quietly getting the job done with the resources it has on-board.

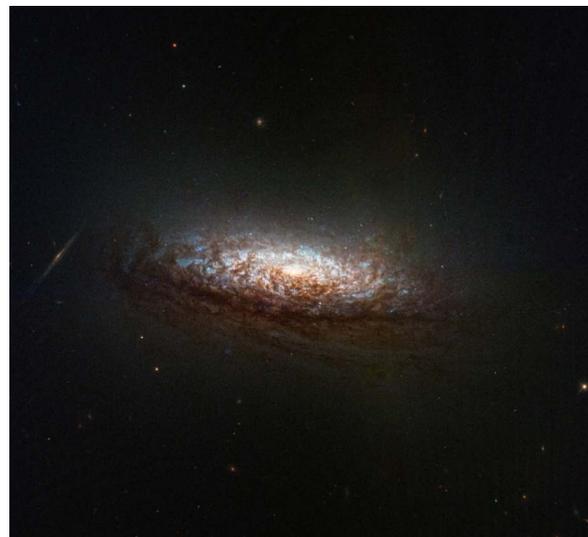
The HST has been aging well, for the most part. The one subsystem that has experienced the most degradation is the pointing control that relies on gyroscopes to slew the telescope to its target and then hold it steady for imaging. The HST has a total of six gyroscopes on board, designed to provide redundant control of three orthogonal axis. Three active gyroscopes are required to most efficiently direct the telescope to simultaneously slew on all axis to a given imaging vector. The devices are gas-bearing gyroscopes that offer the combination of extremely low noise with very high stability and resolution. Gas-bearing gyroscopes are the most accurate in the world and Hubble uses the best available. All six gyroscopes were replaced during the 2009 service mission. Three of the six gyroscopes had failed by 2018, leaving the HST with no redundant pointing capacity.

Most recently another gyroscope has become unreliable, repeatedly becoming uncalibrated and reporting erroneous rates. Hubble had once before operated with only two gyroscopes during the run up to the delayed 2009 service mission. One-gyro operations were demonstrated in 2008 for a short time with no impact to science observation quality.

To extend the service life for the HST, this June NASA implemented a low resource pointing methodology that only requires a single gyroscope be used. The resulting methodology slows the rate at which the HST can be brought on target or slew to track a target. Use of a single gyroscope allows the remaining gyroscope to be held in reserve and spread the remaining life-cycle of the gyroscopes across the remaining resources.

On June 18th the first images generated utilizing the new pointing methodology were released. This new image features NGC 1546, a nearby galaxy in the constellation Dorado. The galaxy's orientation gives us a good view of dust lanes from slightly above and backlit by the galaxy's core. This dust absorbs light from the core, reddening it and making the dust appear rusty-brown. The core itself glows brightly in a yellowish light indicating an older population of stars. Brilliant-blue regions of active star formation sparkle through the dust. Several background galaxies also are visible, including an edge-on spiral just to the left of NGC 1546.

“Hubble’s new image of a spectacular galaxy demonstrates the full success of our new, more stable pointing mode for the telescope,” said Dr. Jennifer Wiseman, senior project scientist for Hubble at NASA’s Goddard Space Flight Center in Greenbelt, Maryland. “We’re poised now for many years of discovery ahead, and we’ll be looking at everything from our solar system to exoplanets to distant galaxies. Hubble plays a powerful role in NASA’s astronomical toolkit.”



#### For additional information:

<https://science.nasa.gov/mission/hubble/observatory/missions-to-hubble/>

<https://science.nasa.gov/missions/hubble/nasa-releases-hubble-image-taken-in-new-pointing-mode/>

**Services**

**Planetarium Shows**

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

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

**Light-duty Machining**

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

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

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

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

**Wanted**

**For Sale**

**13.1" Coulter Optical primary mirror and matching secondary** that I'd like to sell, preferably to someone local (Burlington Area). There are some obvious defects they've both acquired over the years and successive rebuilds, so they are far from pristine but I think they'll serve someone well for a decent size light bucket.

**\$100 or best offer.**

Contact Eric Torraca at [eric.torraca@gmail.com](mailto:eric.torraca@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.

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



**6" F/8 Criterion Dynascope Newtonian Reflector**, no mount

**Your's for a donation of \$40.**



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

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

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

**Extras:**

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

**Asking \$2100.**

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

Pick up near Rutland, VT

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

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

Used with a 14" SCT.

Paid \$360 for them some years ago.

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

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



**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.

- 2 – 10" full-thickness blanks - **\$125 each** (+ shipping if necessary)
- 10" thin blank - **\$125** (+ shipping if necessary)
- 6" F10 – aluminized (A) - **\$20** (+ shipping if necessary)
- 4" F? – aluminized (B) - **\$20** (+ shipping if necessary)
- 6" F? – aluminized (C) - **\$20** (+ shipping if necessary)
- 4" F? – aluminized (D) - **\$20** (+ shipping if necessary)
- 6" F? – aluminized (flat coat) on both sides (E) - **\$20** (+ shipping if necessary)
- 4" F? – not aluminized (F) - **\$20** (+ shipping if necessary)
- 6" F? – aluminized (G) - **\$20** (+ shipping if necessary)
- 2 – Ektar 4" F1.5 Kodak projection lenses, rear lens on one is cracked - **\$30** each (+ shipping if necessary)

If interested or for more information, contact Neil Perlin at [lcvts@gmail.com](mailto:lcvts@gmail.com)

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



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

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

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

**VAS Surplus Items**

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

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

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



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



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

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

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

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



Celestron XL Series 1.25" eyepieces:

7 mm

5mm

Barlow

Altair Altra Flat eyepieces:

10mm

Altair Lightwave 1X Field Flatteners

Altair GP-CAM, 1.25" USB camera

Celestron Power Tank

**Asking \$1700.**

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

**VAS Surplus Items**

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

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



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