



Roanoke Valley Astronomical Society

Amateur Astronomy News and Views
In Southwestern Virginia



Volume 41—Number 9

September 2024

RVAS August Meeting Notes

A Two-Parter: Next Generation Telescopes Sequel & Astrophotography Equipment and Processing

By Erin Elliott, Secretary

First, a note about the August meeting minutes and Zoom recording: You can view this month's Zoom recording by [clicking this link](#). The passcode to view the video is: ^q6S+#85. You can find a timestamp for each segment of the meeting next to the corresponding section header. For example, **What's Up? | 0:20:22**. Also for your convenience, you can find a full list of the segments and timestamps below:

- **What's Up? | 0:20:22**
- **Program #1 | 0:34:41**
- **Program #2 | 1:02:46**
- **RVAS Picnic on Saturday, September 28 @ 3:30pm | 01:29:07**
- **New Meeting Location | 1:31:31**
- **Member Observation Reports | 1:32:54**
- **Astrophotography | 1:36:13**

Agenda (7:30)

- 7:00 Celestial Café
- 7:30 Agenda
- 7:31 Visitor / Guest / Member recognition
- 7:34 Leadership Reminder
- 7:35 What's Up September (Dr. John Wenskovich)
- 7:50 Dr. John Wenskovich Part II:
"The Next Generation of Space and Ground-Based Telescopes"
- 8:30 Dr. Clem Elechi:
Equipment & processing over the years
- 8:45 Sep 28 Picnic
- 8:50 VWCC Meeting Room for October
- 8:52 Visual Observing reports
- 8:54 Monthly Astro-photos

August Meeting Agenda – Michael Good Slide

After wrapping up the Celestial Café, the meeting began at 7:30pm with an introduction by RVAS President **Michael Good**, along with Membership Coordinator **Frank Baratta**. They welcomed members and guests to the August meeting. Michael started the evening by going over the agenda, which included two speakers and programs in the lineup.

Attendance: There were 39 members and 1 guest in attendance. 17 individuals were in person and 23 attended virtually.

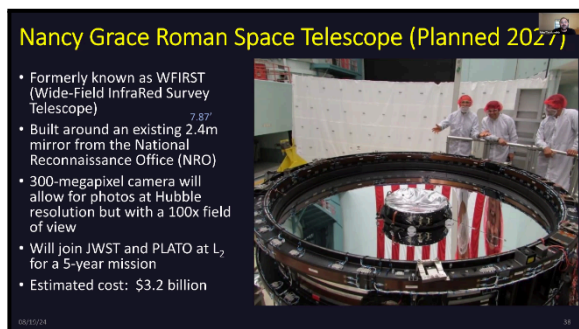
What's Up? | 0:20:22: Before turning to our program for the evening, Michael asked **John Wenskovich** for his "What's Up?" program on

what the skies of September have in store for us. John's "What's Up? Highlights" in this issue provide a summary of the program. You can watch a recording of his program by [clicking here](#). Here you can find a link to the Astronomical League Program mentioned in John's presentation: [Nova Observing Program](#).

Program #1 | 0:34:41: We welcomed back **John Wenskovich** this month to finish up his program from last month titled, *The Next Generation of Space and Ground-Based Telescopes*. You can find his biography in the August 2024 newsletter.

Space Telescopes

- Gigantic Telescopes of the 21st Century Overview
- SPHEREx (planned 2025)
 - o "Spectro-Photometer for the History of the universe, Epoch of Reionization, and ices Explorer"
 - o Will perform an infrared, all-sky survey with a spectrophotometer
 - o Specs
 - o 2-year mission in low Earth orbit
 - o Estimated cost \$425 million
 - o List of science goals
- PLATO (planned 2026)
 - o "PLANetary Transits and Oscillations of stars"
 - o Specs
 - o 4-year mission (plus possible 4-year extension) at L2
 - o Estimated cost: €500 million
 - o List of science goals



Nancy Grace Roman Space Telescope – PowerPoint screenshot

- Nancy Grace Roman Space Telescope (planned 2027)

- o Formerly known as WFIRST
- o Built around an existing 2.4m mirror from National Reconnaissance Office
- o Photos at Hubble resolution at 100x field of view
- o Estimated cost \$3.2 billion
- o 5-year mission at L2
- o List of science goals
- ARIEL (planned 2029)
 - o "Atmospheric Remote-sensing Infrared Exoplanet Large-survey"
 - o ESA mission
 - o Will observe 1000 exoplanets and survey of their atmospheres
 - o Specs
 - o Estimated cost €200 million
 - o Also going to L2
- AXIS (planned 2032)
 - o "Advanced X-ray Imaging Satellite"
 - o Effectively planned to be successor to Chandra X-Ray Observatory
 - o Early stages of the project
 - o List of science goals
 - o Estimated cost \$1 billion
 - o Low earth orbit telescope
- ATHENA (planned 2035)
 - o "Advanced Telescope for High-ENERgy Astrophysics"
 - o ESA-led X-ray observatory mission
 - o Seeks to address two questions
 - o Headed for L2
 - o Estimated cost: €1.17 billion
- LISA (planned 2035)
 - o "Laser Interferometer Space Antenna"
 - o Specs
 - o NASA/ESA mission, but NASA had to withdraw
 - o Estimated €1.5 billion
- We can still get excited about concepts!
 - o LUVOIR
 - "Large UltraViolet Optical Infrared Surveyor"
 - Science goals
 - Launch in 2039?
 - o Habitable Worlds Observatory
 - Science goals
 - Objectives
 - Tentative specs

- Launch in the 2040s?

Ground telescopes

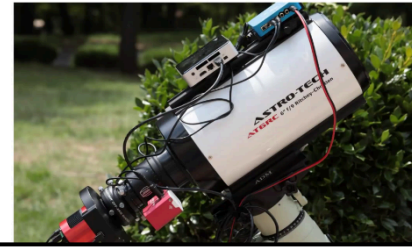
- Square Kilometre Array (planned 2030)
 - o Intergovernmental, international radio telescope under construction in both South Africa and Australia
 - o Specs
 - o History
 - o Two Frequency bands
 - o Two major phases
 - o 16 countries have membership
 - o Estimated cost: \$3 billion
 - o Precursor Facilities (used to develop and test the technology)
 - o Science goals

Coming Soon (Maybe) but Not Discussed

- On the ground
 - o Magdalena Ridge Optical Interferometer
 - o Kunlun Dark Universe Survey Telescope
 - o Qitai Radio Telescope
 - o Einstein Telescope
 - o Cherenkov Telescope Array
- In the sky
 - o TOLIMAN
 - o AstroSat-2
 - o LiteBIRD
 - o Spektr-UV
 - o Xuntian
 - o Origins Space Telescope
 - o ULTRASAT
 - o FARSIDE
 - o Lynx

You can view the first part of John's program from July 2024 in full by [clicking this link](#). You can find a video of our August meeting by [clicking here](#), which includes the second part of John's program. You can also find a list of timestamps to easily access the second part of John's program.

Typical setup



Clem Elechi astrophotography set up – PowerPoint screenshot

Program #2 | 1:02:46: We welcomed RVAS Member, Clem Elechi, to present an overview of his experience with astrophotography. He shared with us how the equipment he uses to capture and process data has evolved over the years, as well as how he has managed some of the trends in the hobby over time.

- Typical setup
 - o Dedicated (monochrome) astro-camera
 - o Electronic filter wheel
 - o Off-axis guider
 - o Replacement focuser
 - o Focus motor
 - o Mini PC
 - o Power box
 - o Weather monitor
 - o Wyze camera
- Original set up
 - o Used a Canon modified DSLR in place of the computer
- Camera comparison between DSLR vs Dedicated Camera
 - o DSLR
 - Available
 - Simple to use
 - Self-contained
 - Non-astro use feasible
 - Relatively inexpensive
 - Uncooled
 - o Dedicated Camera
 - Strictly for Astro
 - Some learning necessary
 - Even “cheap” cameras are not so cheap

- Needs external power
 - Needs external viewer
 - Cooled
- Advantages of a dedicated (monochrome) camera
 - o Extends range of possible targets
 - o Increases flexibility in image capture
 - o More possibilities in image editing
- Procedure
 - o Control software
 - o “Remote” imaging
- What to image? Tools used to decide
 - o What I missed last year
 - o Astrobin
 - o Books, magazines
 - o Telescopius
 - o CCD Guide
 - o Directed query
- Locating object
 - o Finderscope (previous process)
 - Slew to known star
 - Center in crosshairs
 - *Sync*
 - Slew to target
 - o Platesolving (current process)
 - Take image
 - Solve
 - Slew to target, take image
 - Solve again and measure error
 - Slew again if positioning error is greater than allowed error
- Focusing
 - o Bahtinov mask
 - o Autofocus curve
- How long to expose?
 - o CCD vs CMOS
 - Very long exposures not needed with CMOS cameras (vs CCD cameras)
- Before dark set up
 - o Get the framing
 - o Set up the sequence in software
- Example of framing using Messier 13 image
- Ideas on what could be next to the set-up

- o Dual scope setup
- o OSC camera
- o Full frame/medium format camera
- o Harmonic drive mount
- o Smart telescope
- o INDI
- o Remote imaging
- o Collaborative imaging

RVAS Picnic on Saturday, September 28 @

3:30pm | 01:29:07: Due to funding and staff layoffs, Belk Observatory had to cancel our original plans for the RVAS Picnic. This year the picnic will be at the pavilion and grounds of the Colonial Presbyterian Church, which is located just a 4-minute drive from Virginia Western Community College. RVAS will provide pizza, drinks, and tableware. We ask that you bring a salad or dessert to share. The gathering will begin at 3:30pm with Solar observing followed by food being served at 5:00pm. After sunset, and if it is a clear evening, those interested will have the option to head up to Cahas Mountain Overlook on the Blue Ridge parkway for night observing. **In order for us to plan for the number of pizzas and resources needed, members planning to attend the picnic should email Michael Good at: president@rvas.org in advance and provide their name and the number of adults, teens and children coming.** Also note that this will take place instead of our September meeting, and we will not be meeting at VWCC on Monday, September 16.

New Meeting Location | 1:31:31: Our meeting space is moving from VWCC ST112 to ST212, and will have an elevator available. It is on the second floor in the same STEM building in which we currently hold meetings. The first meeting that will take place in the new location is on Monday, October 21. Our meetings will continue to meet at ST212 for the foreseeable future.



Zoom Screenshot – Ed Dixon photo

Member Observation Reports |

1:32:54: Michael Martin just finished up that Astronomical League program, [Carbon Star](#). He said it is an interesting program with variable carbon stars. Some of them were a bright ruby red and some were like pieces of coal you could barely see. It was different from other programs, but still enjoyable.

Mike Hutkin just started the [Sunspotter](#) program through Astronomical League. It is made of two parts: part 1 is 5 different days of sunspots and sketching; part 2 is 20 solar images or sketching.

Caleb White was at Douthat State Park to see the Perseids during peak. He had

his camera out to get pictures of the meteor shower, but he was surprised to instead catch pictures of the aurora with Ursa Major.

Astrophotography | 1:36:13: We thank **Tom Cerul, Ed Dixon, Michael Good, and Ben Hartman** for providing their work this month. We had a variety of images focusing on near and deep sky objects.

To provide each image with the focus it deserves, we are sharing the submissions in a separate article in this newsletter. Do not miss checking out the rest of these images.

Next month: Our RVAS Annual Picnic will take place on Saturday, September 28 at 3:30pm. This event will take place of our monthly meeting at VWCC. We look forward to seeing you on September 28th at Colonial Presbyterian Church (see above for more details), which is a short drive from VWCC.

The meeting was adjourned at 8:56 pm.

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of observational and photographic astronomical activities. **Meetings are held at 7:30 p.m. on the third Monday of each month. See calendar on last page of newsletter for location. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. For information regarding joining RVAS, including annual dues, [click here](#). Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

Officers/Executive Committee/Editor/Webmaster

Michael Good, President (president@rvasclub.org)
William Krause, Vice President (vicepresident@rvasclub.org)
Erin Elliott, Secretary (secretary@rvasclub.org)
Frank Baratta, Treasurer (treasurer@rvasclub.org)
Nancy Vogelaar, Officer at Large #1 (officeratlarge1@rvasclub.org)
Caleb White, Officer at Large #2 (officeratlarge2@rvasclub.org)
Michael Hutkin, Past President (pastpresident@rvasclub.org)
Ed Dixon, Newsletter Editor (editor@rvasclub.org)
Erin Elliott, Webmaster (webmaster@rvasclub.org)

RVAS Member Anniversaries

Congratulations to the following members who reach the indicated number of consecutive years with the RVAS since joining or re-joining during the month of September:

Vince and Pamela St. Angelo (1996) - 27 years
Jim Rollings (2015) - 8 years *
Peter and Betty-Paige Rosenfeld (2015) - 8 years
Ed Dixon (2019) - 4 years
Shannon Durham (2019) - 5 years
Sasha Mintz (2021) - 2 years
Mallory, Edwin and Caleb White (2021) - 2 years
Robert Gould and Paola Montoya (2023) - 1 year

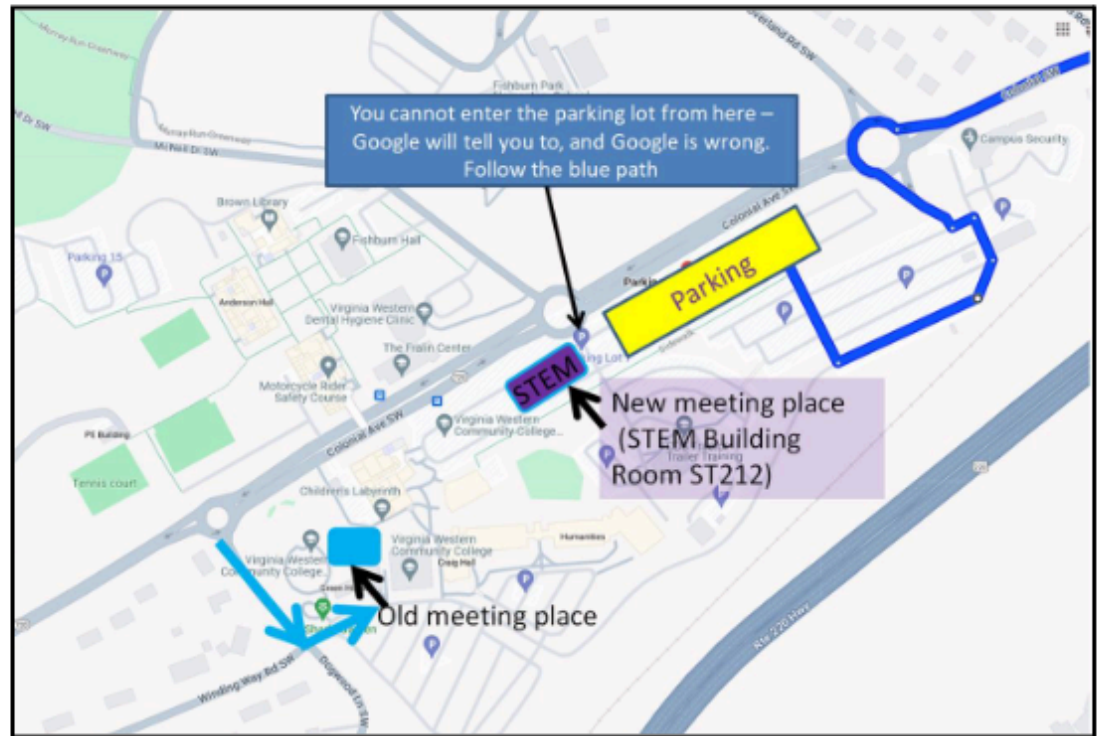
* Jim Rollings is the Society's only Honorary member.

Thanks to all of you for being RVAS members!

Directions to RVAS Meeting Location

Virginia Western Community College STEM Building, Room ST212
3094 Colonial Ave SW, Roanoke, VA 24015

VWCC is located in the southwestern area of the City of Roanoke. The STEM Building is accessed via the roundabout at Overland Drive and Colonial Avenue, near Campus Security at the top right of the map. The STEM Building is at the opposite end of the Colonial Avenue parking lot from Campus Security. Follow the darker blue path from the roundabout and park anywhere in the lot.



Note: Google provides incorrect guidance to access the parking lot from the roundabout at McNeill Drive. That roundabout **does not** provide an entrance to the parking lot.

Note: This is a change from the previous location. It is now on the second floor in the same STEM building where we previously held meetings. The first meeting that will take place in the new location is on Monday, October 21. Our meetings will continue to meet at ST212 for the foreseeable future.

What's Up? Highlights

September 1 to 30, 2024

Including, but not limited to, information presented at the September 19 meeting.

To watch the recording of this meeting segment, [click here](#).

This Month:

September 2024 features the outer planets rising earlier and earlier, with Saturn being visible nearly all night throughout the month as a result of its opposition (with Neptune's less-spectacular opposition following two weeks later). At the beginning of the month, Jupiter and Mars rise just after midnight, but Jupiter becomes an official "evening" object by the end of the month with a 10:41pm rise time. To wrap up the planets, Uranus also continues to rise earlier in the evening moving towards its opposition in November, while Venus remains a lower evening sky object throughout the month, eventually outlasting twilight. The morning skies of September 8th and 9th feature close pairings of Mars+M35 and Mercury+Regulus respectively (for an extra challenge, try to spot the Leo I dwarf galaxy near Regulus!). Fall is officially here on the 22nd, with the Autumnal Equinox arriving on 8:43am. The days around the equinoxes are the best times to try to spot the

zodiacal light, so let's hope for clear skies! Finally, a potentially exciting comet (C/2023 A3 Tsuchinshan-ATLAS) reaches perihelion on the 27th, and it might become a bright naked-eye comet next month as it approaches perigee on October 12th.

Celestial Events:

- September 6: Daytime lunar occultation of Spica (11:37am-12:23pm)
- September 8: Close pairing of Mars + open cluster M35
- September 8-9: Saturn opposition
- September 9: Close pairing of Mercury and Regulus
- September 21-22: Neptune opposition
- September 22: Autumnal Equinox 8:43am
- September 27: Perihelion of Comet C/2023 A3 Tsuchinshan-ATLAS

Sunset and Twilight:

- Sunset ranges from 7:47pm (1st) to 7:03pm (30th)
- Evening twilight ends from 9:18pm (1st) to 8:30pm (30th)

Lunar Phases and Apsides:

- New Moon: September 2, 9:56pm
- Apogee: September 5, 10:53am (252,408 miles)
- First Quarter: September 11, 2:06am
- Full Moon: September 17, 10:36pm
- Perigee: September 18, 9:23am (222,007 miles)
- Last Quarter: September 24, 2:52pm

RVAS Former Member October Rundle Wins The Horkheimer/O'Meara Journalism Award

October (“Toby”) Rundle, 14, was adjudged the winner of the Horkheimer/O’Meara Journalism Award. Toby was an award-year 8th grader at the Roosevelt Middle School in Oceanside, California, and is a former member of the Roanoke Valley Astronomical Society. Toby received a plaque and a \$1,000 cash prize for the following essay, “Black Holes: What’s the Hype?”:

Black holes are easily one of the most “out of this world” phenomena observable by society today. They have a rightful place among the most mysterious cosmic objects in the known universe. What’s the appeal? What is it about these massive concentrations of matter that captures human attention? To begin, we should make one thing clear: black holes are not holes, but extremely dense clusters of mass with gravity so strong that nothing – not even light – can escape. There’s so much about black holes that’s unknown, and humans are all about that mystery



**HORKHEIMER/O’MEARA
JOURNALISM AWARD
WINNER: OCTOBER RUNDLE**

Think about Star Wars, The Matrix, E.T. the Extra-Terrestrial, anything like that. Humans and science fiction have always gone hand-in-hand, our interests and fascinations being reflected in music, films, novels, and other art forms. We’re creative; we’ve been making up stories and theorizing since we were first able to think. As a species, we have this constant thirst for more information, more knowledge. That’s the reason we’re aware of the universe beyond our planet in the first place. We’re constantly trying to make sense of nonsensical things, which brings us back to black holes: the perfect outlet for human fixation.

These paradoxical, mind-bending occurrences break down the laws of physics as we know them. They’re inherently invisible, but scientists have found that they can be detected by the way they affect and shape their surroundings, such as the movement of stars or the formation of galaxy clusters. There’s also the possibility of anything venturing too close being pulled in and “spaghettified,” a theorized process involving a spacecraft, planet, star, or the like being vertically stretched and horizontally compressed, as the name would suggest. Of course, as sentient beings, we’re naturally drawn to the exploration of foreign things like this and the pursuit of unraveling their mysteries. However, there’s a fine line between intrigue and fear. It’d very well drive one insane to constantly have lingering thoughts of some dark, looming beast that could effortlessly swallow our entire Solar System. Taking into consideration how little we know, there’s lots of room for paranoia and anxiety.

For more information on this honor see the September issue of the Astronomical League Reflector magazine.

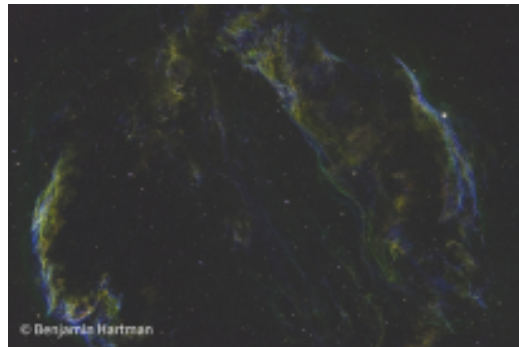
August 2024

Ctrl- Click on the picture see the source file and additional information

David Thomas



Ben Hartman



Ben Hartman



Ed Dixon



Ed Dixon



Ben Hartman



Ed Dixon



Ed Dixon



Ed Dixon



Ed Dixon



Ed Dixon



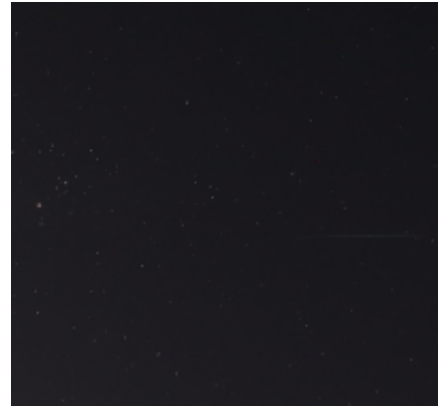
David Thomas



David Thomas



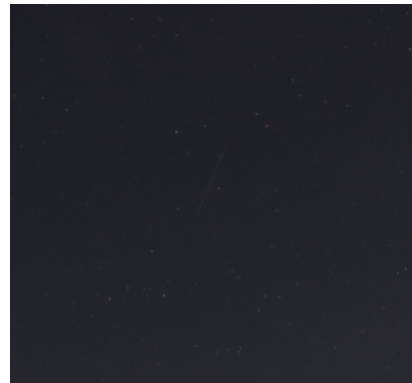
David Thomas



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David Thomas



Tom Cerul



Tom Cerul



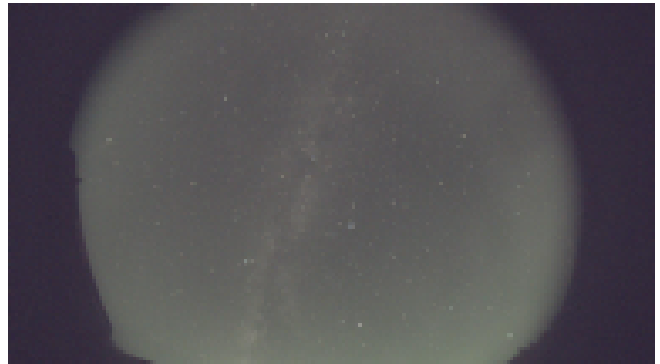
Ben Hartman



Ben Hartman



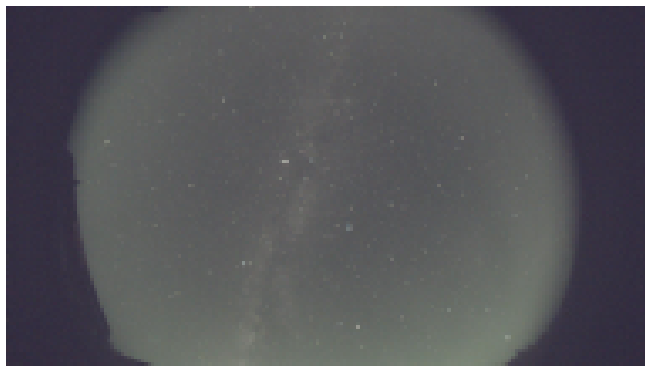
Ben Hartman



Ben Hartman



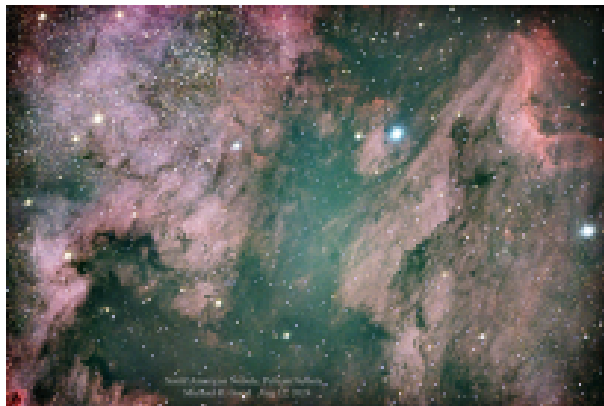
Ben Hartman



Ed Dixon



Michael Good



Caleb White

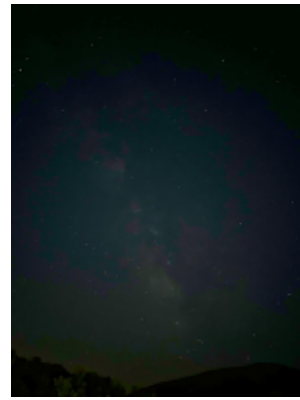


David Thomas

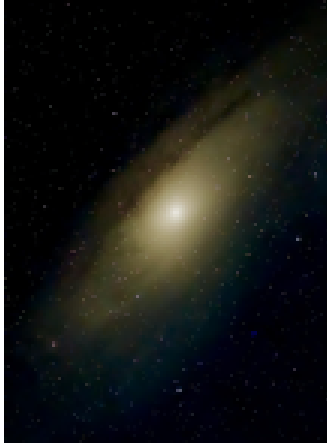


Ed Dixon

Tara Wu



Ed Dixon



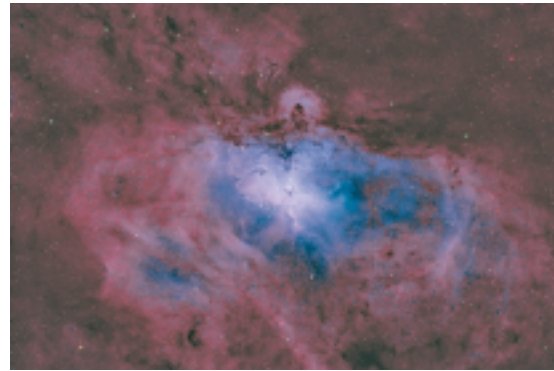
Michael Good



Ed Dixon



Tom Cerul



Tom Cerul

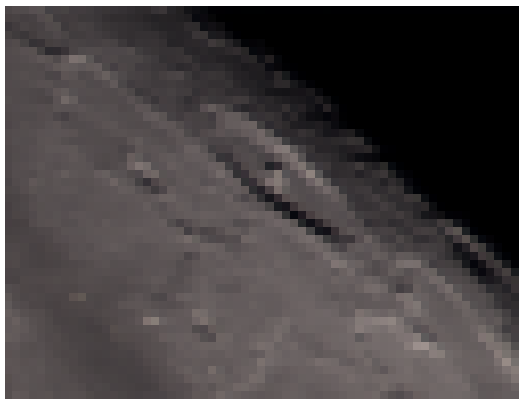
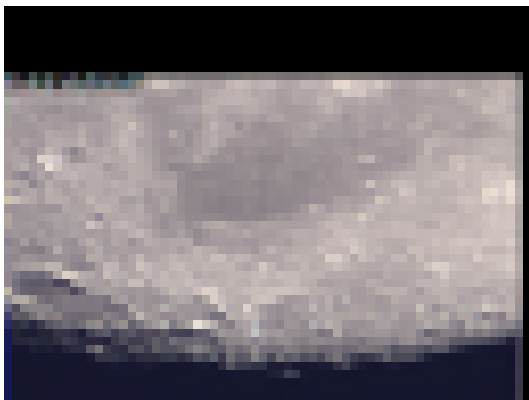


Tom Cerul



Ben Hartman

Ben Hartman



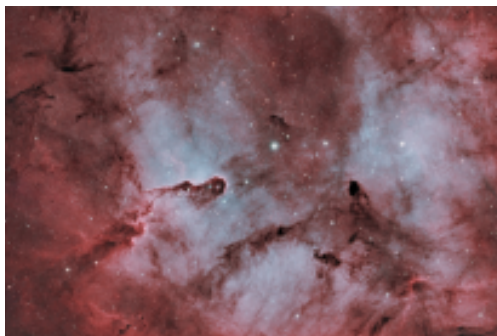
Ben Hartman

Michael Good



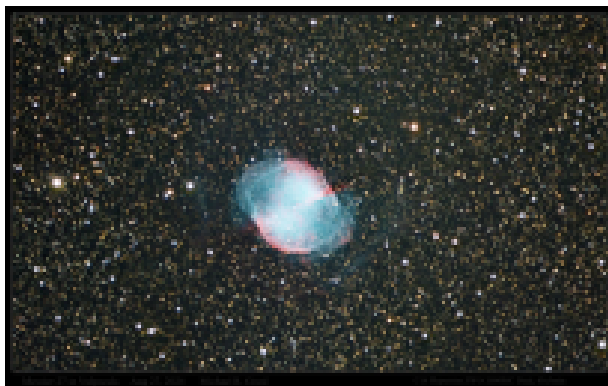
Tom Cerul

Tom Cerul



Ben Hartman

Michael Good



David Thomas



Ed Dixon



Monthly Calendar

RVAS Annual Picnic and Star Party: Saturday, September 28th, 3:30 p.m. Pavilion and Grounds of Colonial Presbyterian Church, 3550 Poplar Drive, Roanoke, VA. (Takes the place of the regular monthly meeting.) It's our premier outdoor annual event for members and their families. The site is just two miles southwest and one block off the same road from our Virginia Western Community College meeting place. This year, it's a grand pizza party, with prize drawings and giveaways, daytime and evening observing, and lots more! See elsewhere in this issue for additional details about the event, and watch for emails with maps/directions and further information.

Weekend Observing Opportunities: The following information on Fridays and Saturdays that may be suitable for observing is provided as a courtesy to Society members and other readers. The Society assumes no responsibility for the health or safety of anyone venturing out to stargaze, and cautions all who may do so to observe appropriate health and safety precautions.

- **Friday and Saturday, September 6th & 7th.** Sunset is at 7:40 p.m. Astronomical twilight ends at 9:10 p.m. The Moon sets at 9:15 and 9:40 p.m., respectively.
- **Friday and Saturday, September 27th & 28th.** Sunset is at 7:08 p.m. Astronomical twilight ends at 8:34 p.m. The Moon sets at 5:02 and 5:31 p.m., respectively. **(Note: Sept. 28th is the Annual RVAS Picnic and Stargaze for our members and their families. See above and elsewhere in this issue for additional details.)**
- **Future Weekend Observing Opportunities: October 4th & 5th; 25th & 26th.**

Astro-Quiz

Complete the following sentence: All binoculars with the same magnification and same diameter objective lens size have the same _____.

Answer to Last Month's Quiz: Last month we offered a multiple choice question with four pairs of constellations and to choose the pair for which neither constellation was crossed by the celestial equator. The answer was choice (2) Libra and Scutum. In all, 15 constellations are crossed by the celestial equator. Proceeding eastward from Ophiuchus (which is centrally placed in mid-August at 9:00 p.m.), the others are Serpens ("Cauda," the tail), Aquila, Aquarius, Pisces, Cetus, Taurus, Eridanus, Orion, Monoceros, Canis Minor, Hydra, Sextans, Leo, Virgo and Serpens ("Caput," the head). Serpens, the serpent, is actually a single constellation of two parts, held by Ophiuchus, the serpent-bearer, with part of the serpent visualized as coiled around or crossing behind Ophiuchus' torso. Have a question and answer to suggest, email it to treasurer@rvasclub.org.