Howard Astronomical League Monthly Meeting

July 17th, 2025

Tonight's Agenda, July 17th, 2025

- Introductions
- Announcements
  - 2025 Star Parties, Recent & Upcoming Events
  - Book of the Month – Krystal Rolon
  - Remote Telescope Survey – Chris Todd
  - The Seestar "Very Small Array" Project – Rich Russin
- Featured Speakers – Chris Todd, Richard Orr, Steve Jaworiwsky
- What's Out in the Sky This Month…
  - Shallow Sky – Jim Tomney
  - What's up In Space – Wayne Baggett
- Members' Astro-Images and Sketches
- Wrap-up & Discussion

HAL Star Parties…

2025 Schedule of Star Parties

March
- March 8 – Public –
- March 29 - Members

April
- April 5 - Public (Jupiter/Europa shadow transit)
- April 26 – Members -

May
- May 3 – Public-
- May 24 - Members
- May 31 - Member Mentorship Night

June
- June 7 – Public
- June 21 - Members

July
- July 5 - Public (Mercury near greatest eastern elongation)
- July 26 – Members Host: Jared Case

August
- August 2 – Public Hosts: Jose Urias, Ken Everhart, Krystal Rolon
- August 23 - Members

September
- September 13 - Public (No moon)
- September 20 - Members (Saturn at opposition)

October
- October 4 - Public (International Observe the Moon Night, Moon 93.7% full)
- October 18 - Members

November
- November 1 - Public
- November 15 - Members

Regional Star Party info…
https://skyandtelescope.org/astronomy-resources/annual-stargazing-events/

Recent/Upcoming Events

- Public Star Party Held 7/5/25
  - After several rainy public star parties, our July star party had clear skies and was well attended!
  - About 15 telescopes and approx. 200 people joined us throughout the evening.
  - People focused on the Moon, Mars, Caldwell 20 (The North American Nebula), M57 (The Ring Nebula), M13, etc.
  - Solar System Display Table (Arjun) and Activities Tent (Krystal) were very active
  - Maryland Public Television interviewed several members of HAL about the club and its role in the community (show may air in December/January timeframe… stay tuned for notice)
- Impromptu Star parties on 7/4 and 6/21
- August 29th, Star Party at the Howard County Nature Conservancy
- September 20th, Astronomy Festival on the Mall

Book of the Month

Title:

- Bright Galaxies, Dark Matter, and Beyond: The Life of Astronomer Vera Rubin

Author:

- Ashley Jean Yeager

Length:

- 236 pages

Audience Level:

- Beginner Friendly
- Intermediate
- Experienced

July 2025

Bright Galaxies, Dark Matter, and Beyond

The Life of Astronomer Vera Rubin

Ashley Jean Yeager

Long-time club member Bennie Palmer recently donated this scope to HAL

The rig consists of the following gear:

- Astro-tech AT130EDT (130mm triplet, f/7, 910mm f.l., with case)
- Astro-tech 0.80 Focal reducer/field flattener (910*.8=728 mm effective focal length, 728/130=5.6 effective focal ratio)
- ZWO ASI2600MM Pro camera
- ZWO 7 x 2” filter wheel
- Optolong 2” LRGBSHO filters
- ZWO EAF
- ZWO ASI AIR
- iOptron CEM 70 mount (with case)
- iOptron tri-pier
- ZWO OAG-L
- ZWO ASI174MM mini
- Two dew heater straps
- Scope Roller wheels
- An additional Vixen accessory case

What should the club do with this scope?

Options the board has discussed:

- Sell or auction it, either piecemeal or as a complete package
- Use it for public outreach, similar to the Meade 16” (it is on a tripod with wheels)
- Send it to Starfront Observatories to be used by the membership to do astrophotography from excellent dark skies (would cost $300/month)

Do you have other ideas?

There are many aspects to each of these options, and the board is seeking input. It’s your club; make it what you want it to be by participating in the discussion!

SeeStar – “Very Small Array” Project

Matthew Peters, Rich Russin

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Topics: The Human Retina, Astronomical Drawing at the Eyepiece, Astronomical League Observing Programs

Chris Todd, Richard Orr, Steve Jaworiwsky

- Chris Todd was HAL President 2013, 2014 & 2016
- Rich Orr is a longtime HAL member and astro-sketcher extraordinaire
- Steve has been an amateur astronomer for over 50 years and has been a member of HAL since 2001. His first telescope was a modest 6-inch Newtonian. He now uses a 16-inch DOB for deep sky observing, and he also has a 4-inch refractor which he uses mostly for solar observing. Steve has an observatory in West Virginia with dark skies where he does his deep sky observing. He first starting working on the AL's observing programs in 1990 and has completed 22 of them so far.

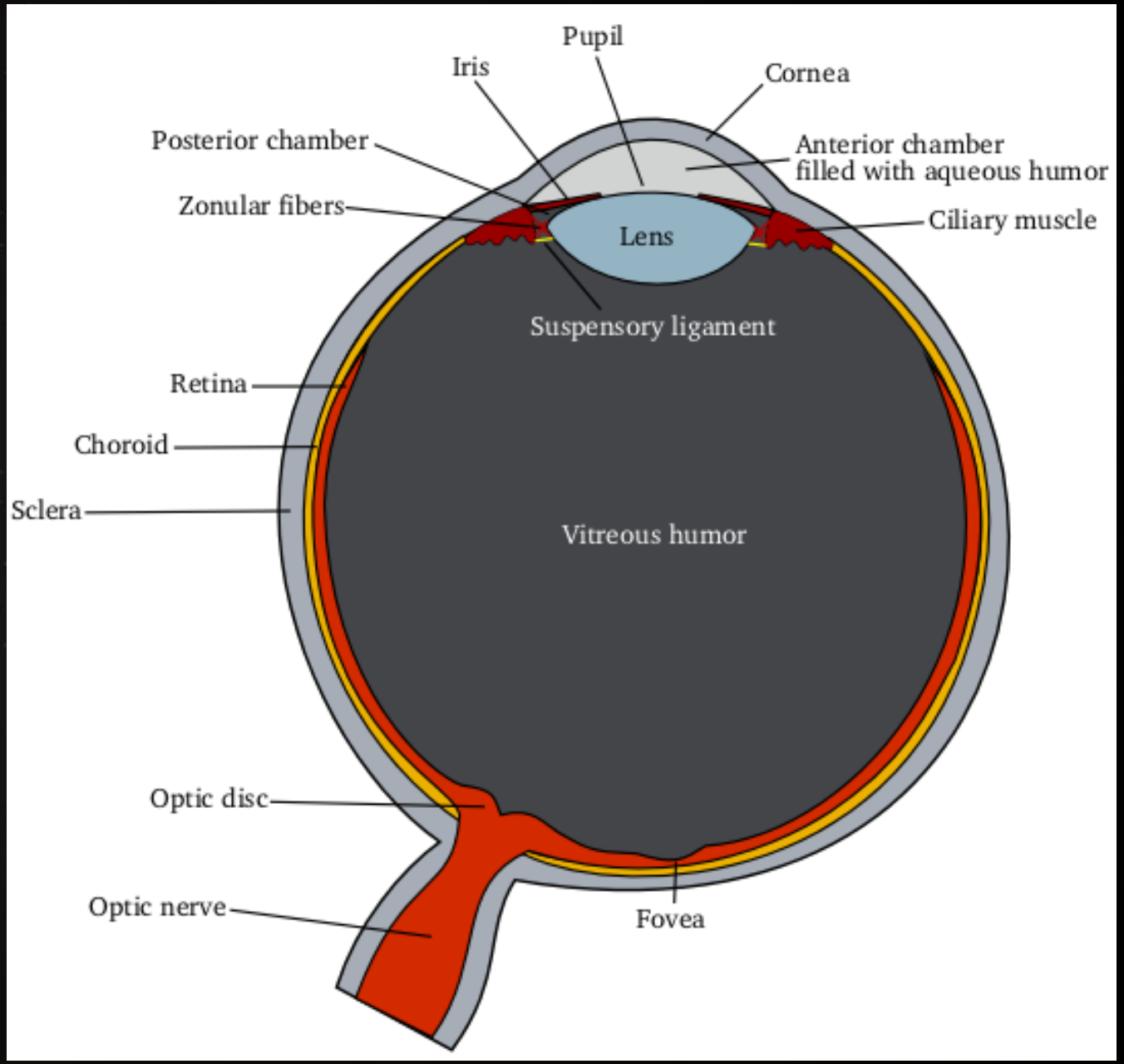
The Retina

How it works and how
astronomers can take advantage
of its structure and function

Brief outline

- Discuss the structure and function of the retina, focusing on the answer to three questions:
  - What is dark adaptation?
  - Why do we use red flashlights?
  - How and why does averted vision work?

Basic structure of the eye:



http://en.wikipedia.org/wiki/Image:Schematic_diagram_of_the_human_eye.png

Photoreceptors – Rods and Cones

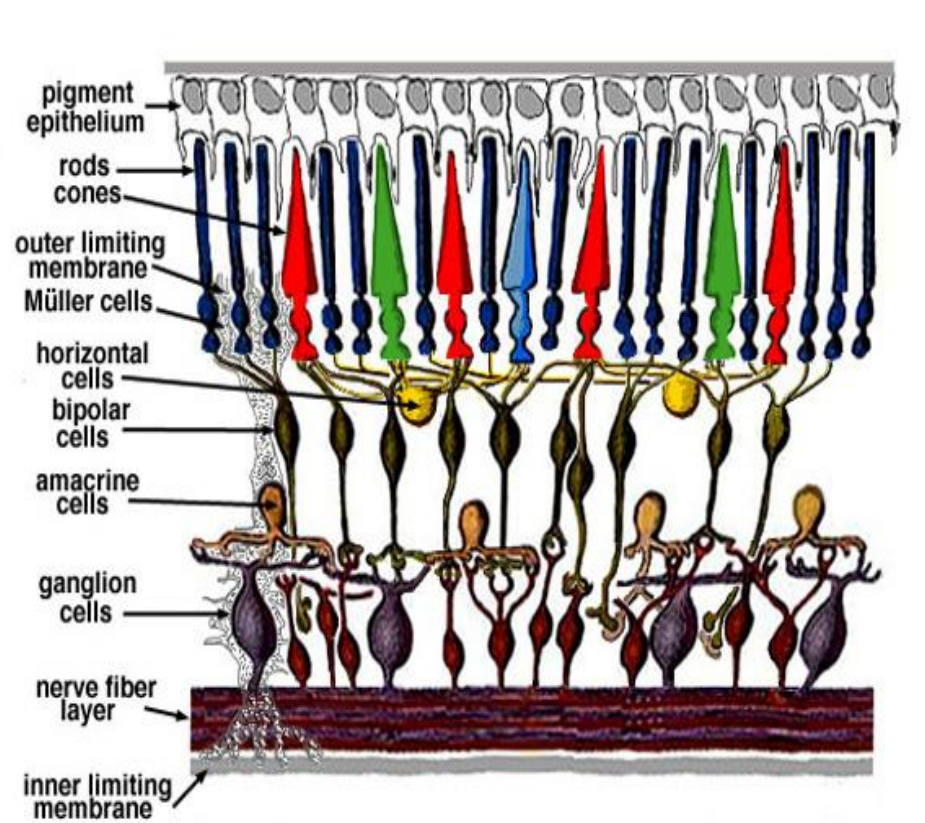


Fig. 2. Simple diagram of the organization of the retina.

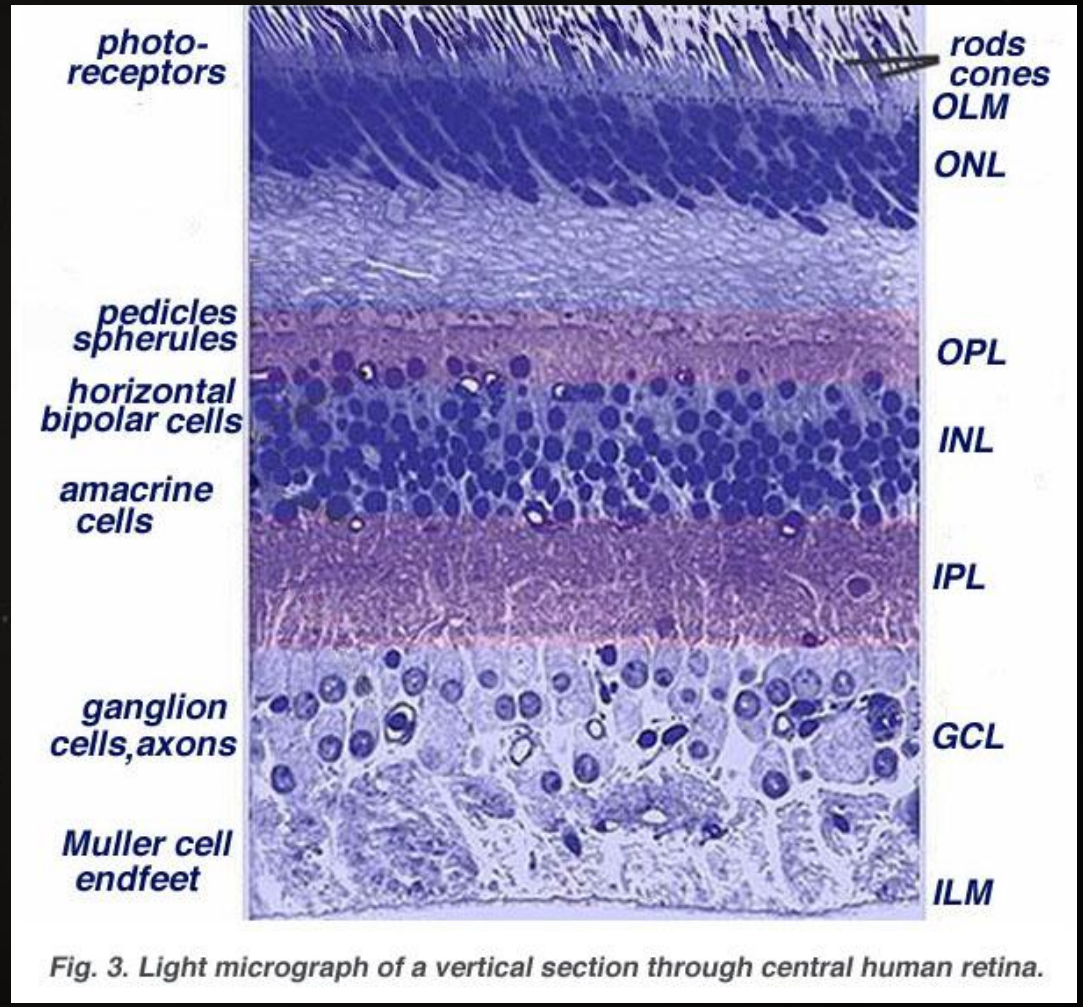
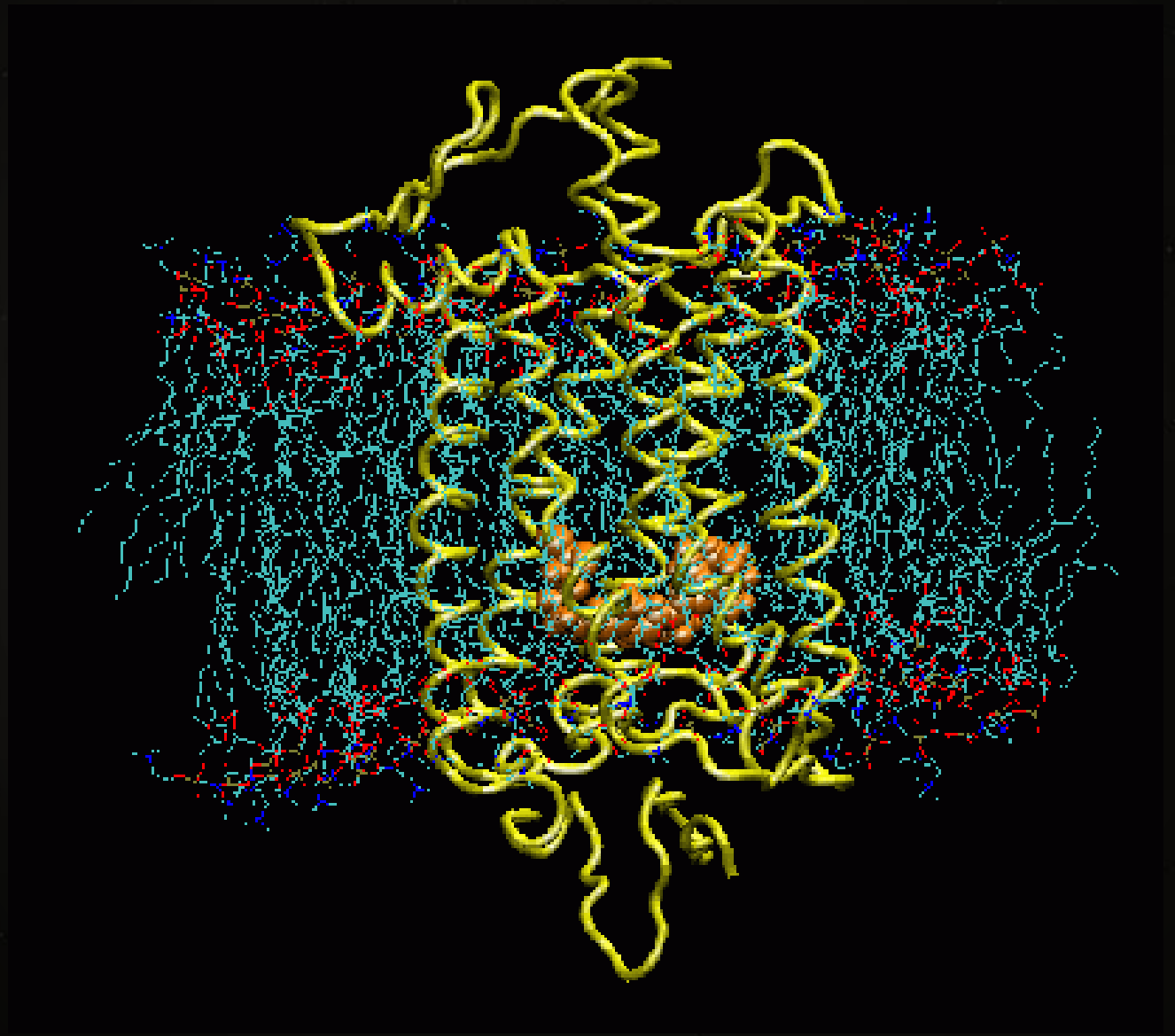


Fig. 3. Light micrograph of a vertical section through central human retina.

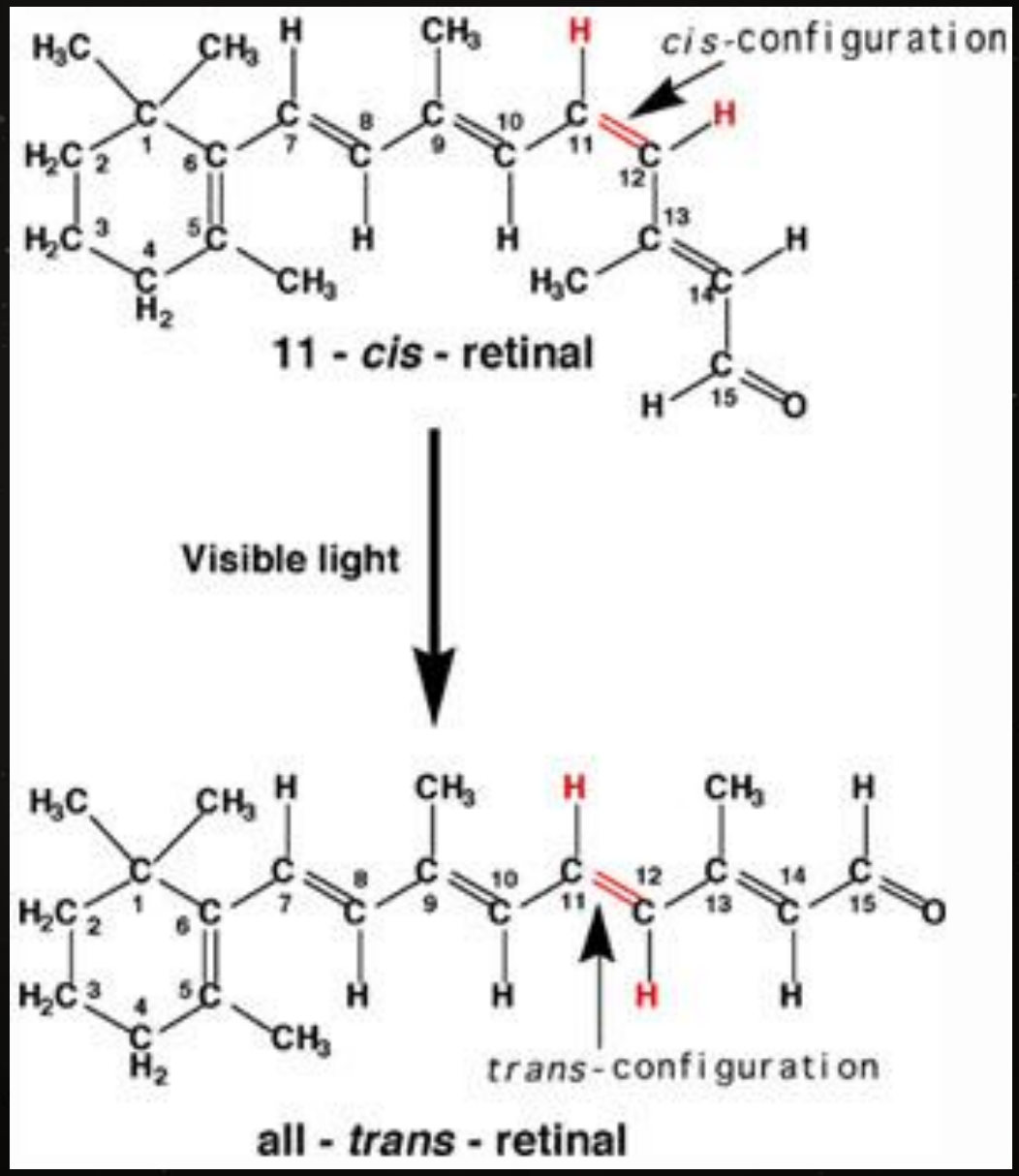
Diagrams taken from: http://webvision.med.utah.edu/sretina.html

Rhodopsin – the light-detecting molecule in rods



http://www.ks.uiuc.edu/Research/rhodopsin/

Retinal Isomerization – Phototransduction in Action



Phototransduction Part 2

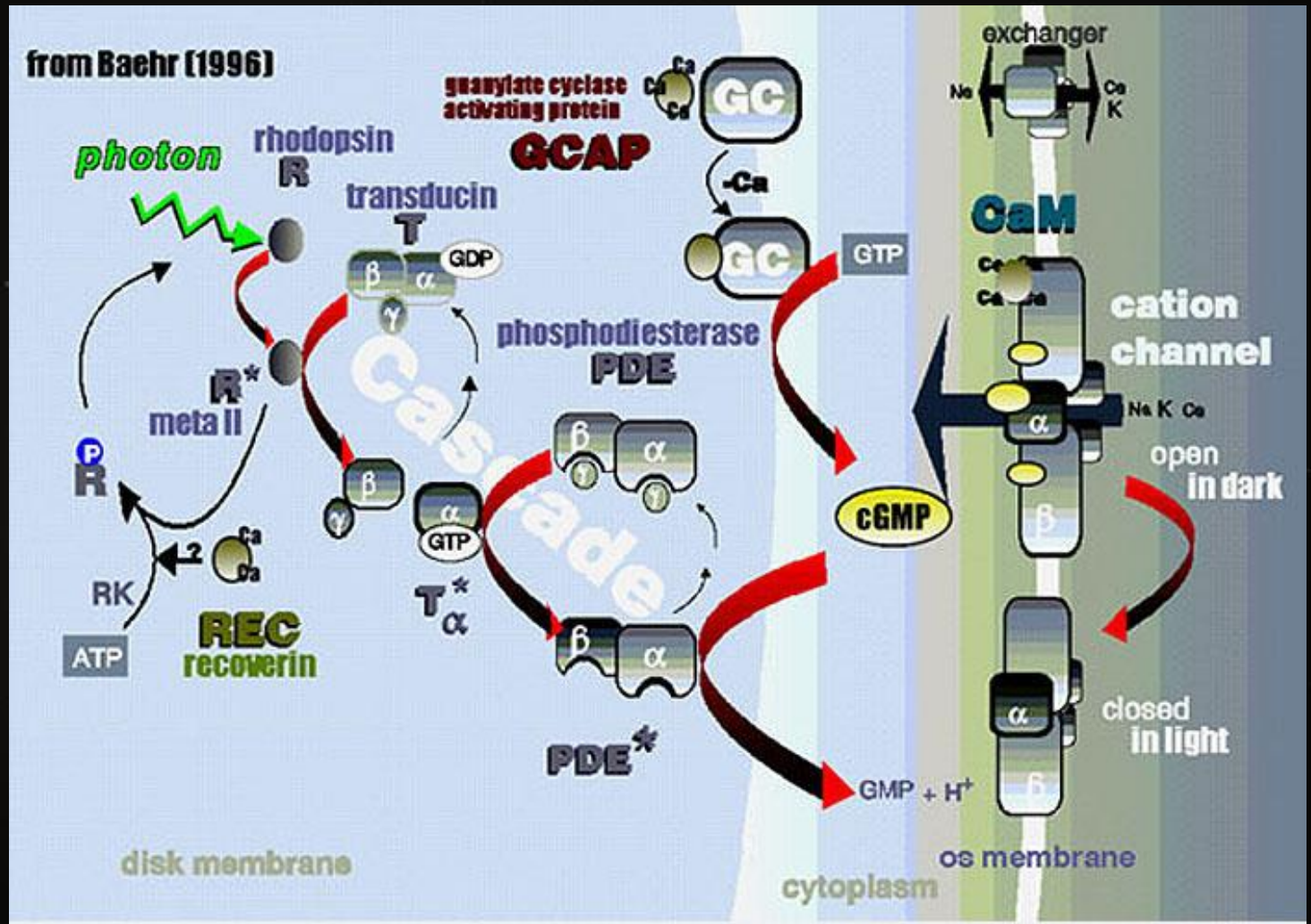


Fig. 10. Activation of rhodopsin by photons of light and the phototransduction cascade that results in closing of cGMP gated channels in the outer segment,membrane.

http://webvision.med.utah.edu/imageswv/cascade.jpeg

What is dark adaptation?

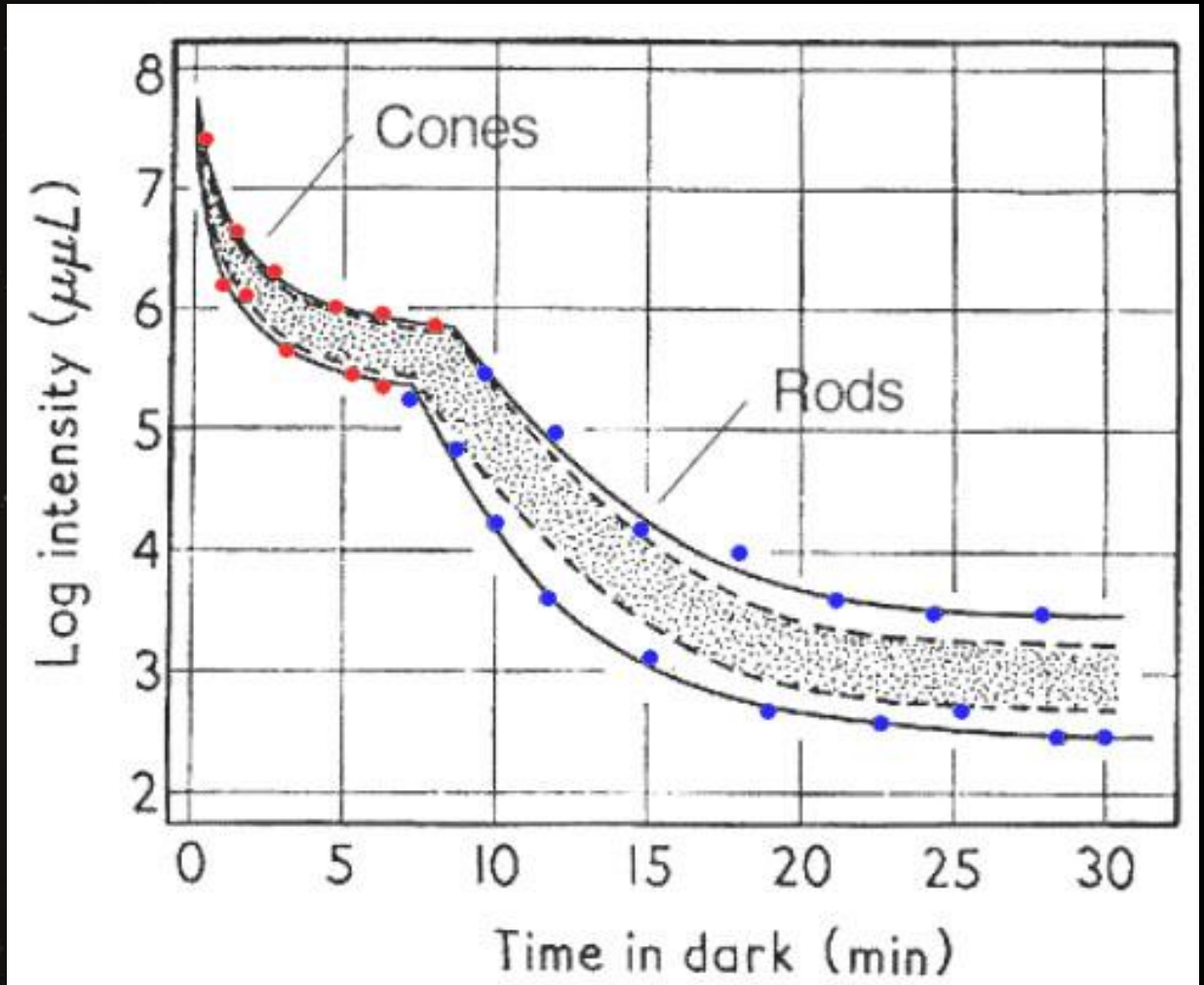


Figure 1. Dark adaptation curve. The shaded area represents 80% of the group of subjects. Hecht and Mandelbaum's data from From Pirenne M. H., Dark Adaptation and Night Vision. Chapter 5. In: Davson, H. (ed), The Eye, vol 2. London, Academic Press, 1962.

http://webvision.med.utah.edu/imageswv/KallDark1.jpg

Why do we use red flashlights?

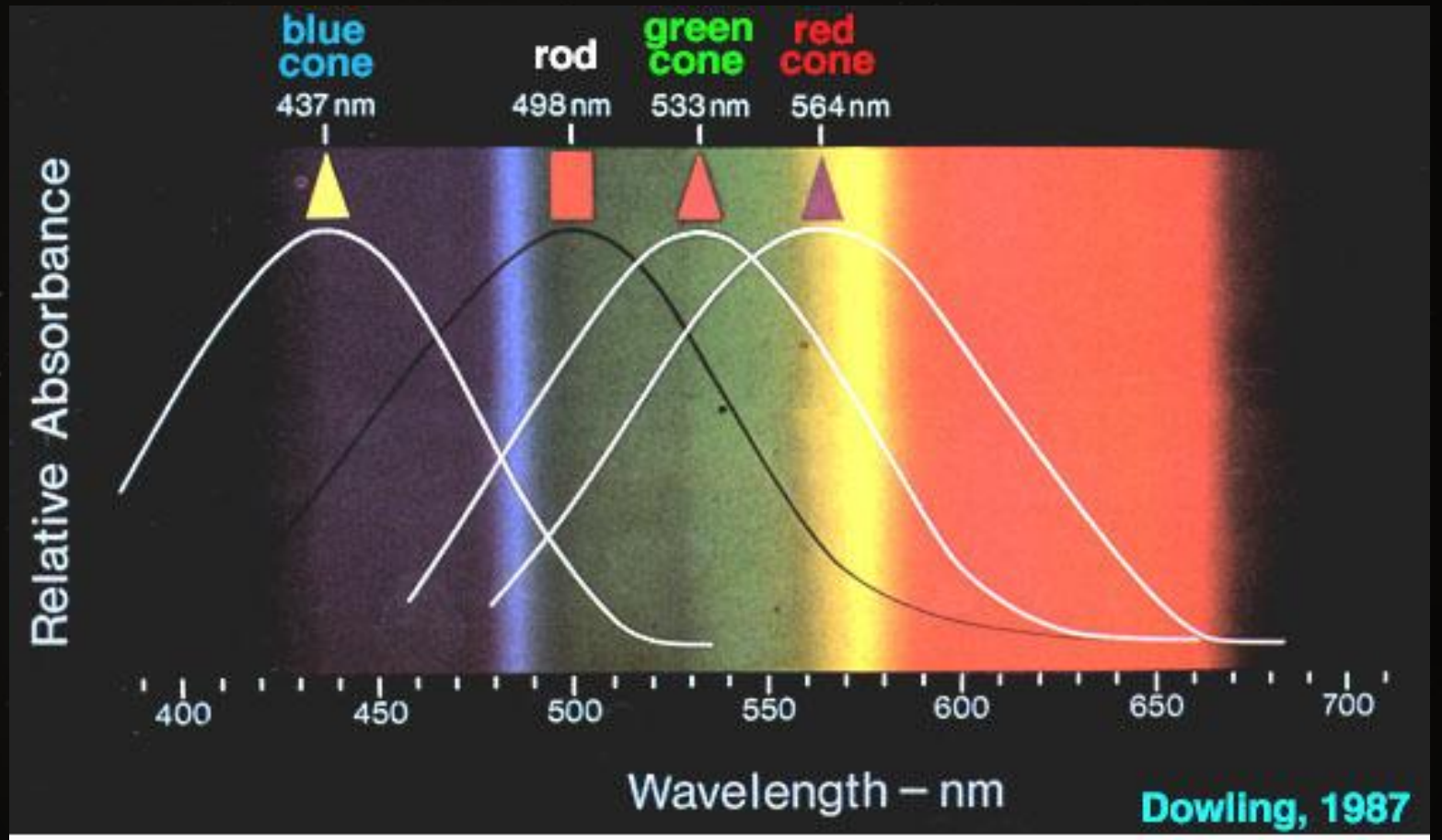


Fig. 14.The peak spectral sensitivities of the the 3 cone types and the the rods in the primate retina (Brown and Wald, 1963). From Dowling's book (1987).

http://webvision.med.utah.edu/imageswv/spectra.jpeg

How does averted vision work?

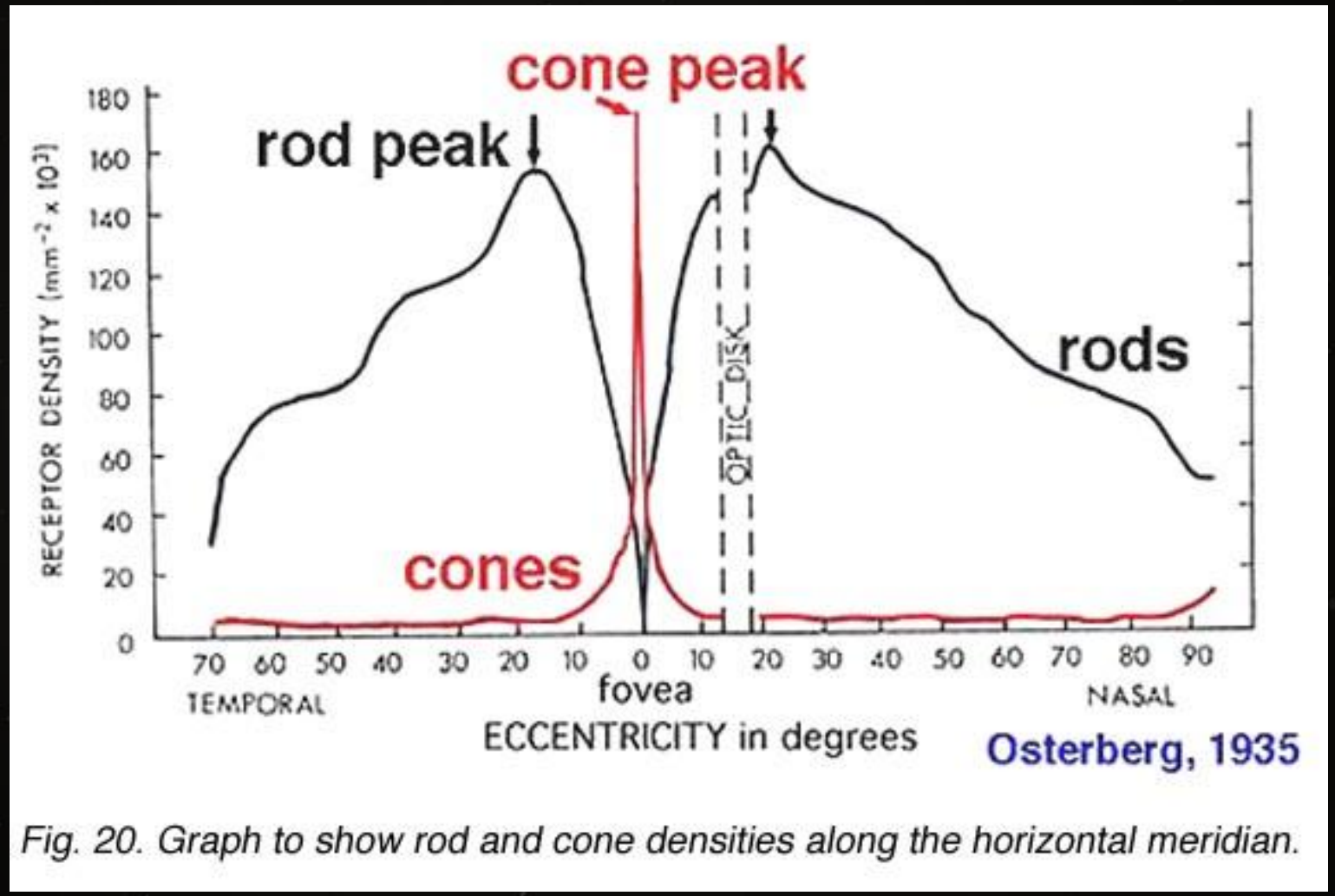


Fig. 20. Graph to show rod and cone densities along the horizontal meridian.

http://webvision.med.utah.edu/imageswv/Ostergr.jpeg

Homework

- Is averted vision equally effective regardless of the direction to which you avert your eyes?
- If not, in which direction should you look (up, down, left or right of the subject) for averted vision to be most effective?
- Why would averted vision be more effective in one direction than others?
- How far must you avert your eyes for maximal effectiveness?
- What do these results tell you about the structure of the retina?

ASTRO-DRAWING
By
Richard Orr

https://www.flickr.com/photos/dragonflyhunter/

Why do I Sketch?

1. Makes me a better observer
2. I see more detail
3. Relaxing -- Stress Relief
4. Provides a Good Record of the night

Rules & How to

1. There are no rules
2. Find what medium works for you
3. Be comfortable when sketching
4. Take your time

*“Why should we sketch the skies …. When we have such incredible imaging tools at our disposal, capable of capturing such astonishing details? However, when you are involved in astronomical imaging with all the required equipment, you will often find yourself immersed in an orchestra pit of computers, displays, and data. You will also spend much time aligning your equipment and calibrating your shots – all while a beautiful clear night sky rolls over your head in quiet majesty.”**

*Astronomical Sketching – A Step-by-Step Introduction, Handy, Moody, Perez, Rix and Robbins – Patrick Moore’s Practical Astronomy Series page xiii

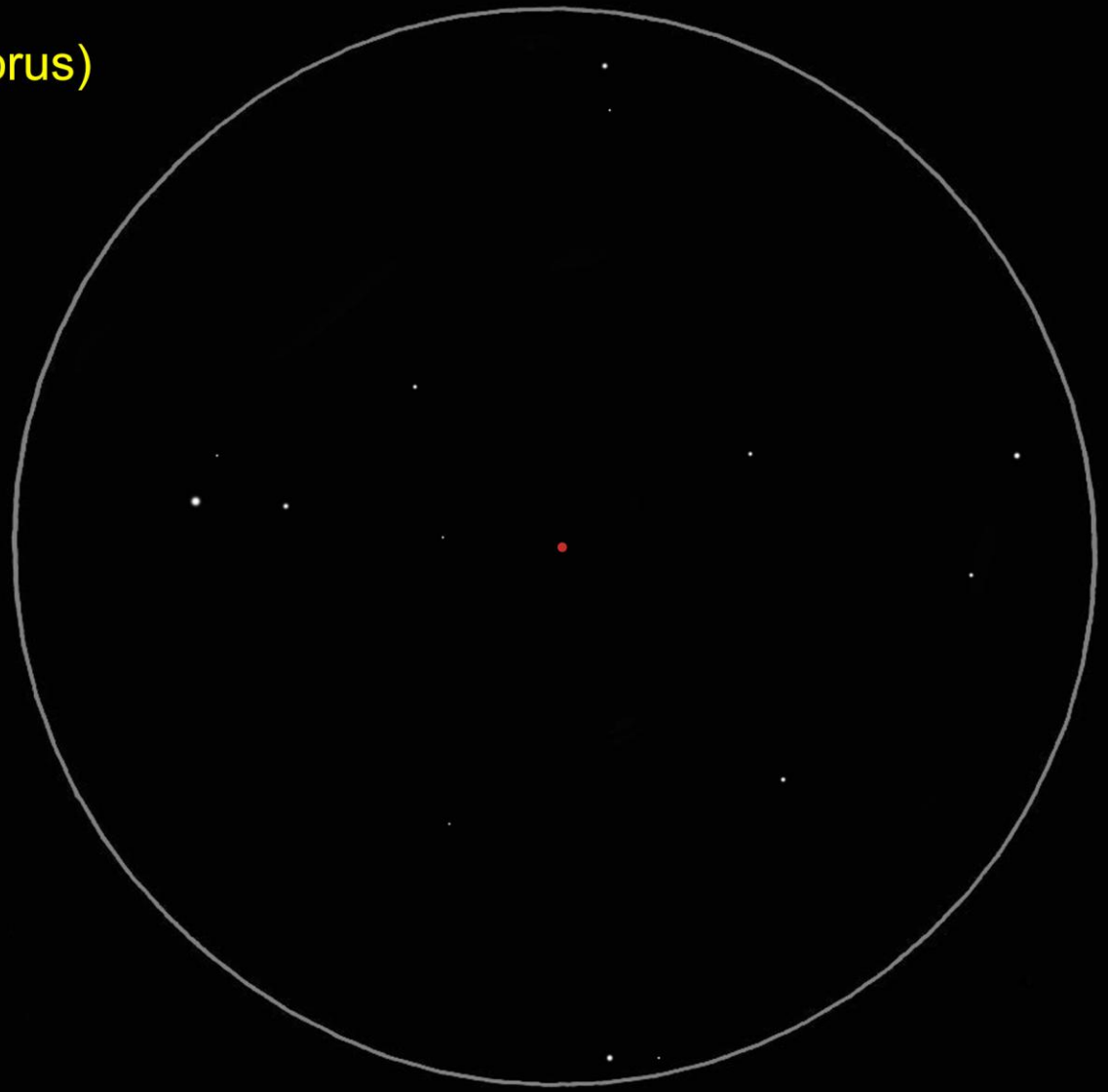
Hind's Crimson Star (R Leporus)

Mira-like Variable Carbon Star

Constellation:	Lepus
Magnitude Range:	5.5 to 11.7
Magnitude at Drawing:	7.5
Variable Period:	418 to 441 days
Distance:	1,350 light years
Size:	400x sun's
Luminosity:	6,689x sun's
Spectral Type:	C7

Telescope:	155mm Refractor
Eyepiece:	13mm Ethos (84x)
Field of View:	0.9 degrees
Orientation:	Diagonal View

Date:	26-December-2019
Time:	00:10 to 00:30 EST
Location:	Deck of House
Drawing by:	Richard Orr



Winter Albireo (h3945)

Other Names: HR 2764, 145 Canis Majoris
Double Star

Constellation: Canis Major
Magnitude: 4.8 & 6.8
Separation: 27 arcseconds
Colors: Orange-Gold & Blue
Distance: 260 light years

Telescope: 155mm Refractor
Eyepiece: 8mm Delos (137x)
Field of View: 0.52 degrees
Orientation: Diagonal View

Date: 23-January-2018
Time: 19:30 EST
Location: Deck of House
Drawing by: Richard Orr

Sirius (Alpha Canis Majoris)

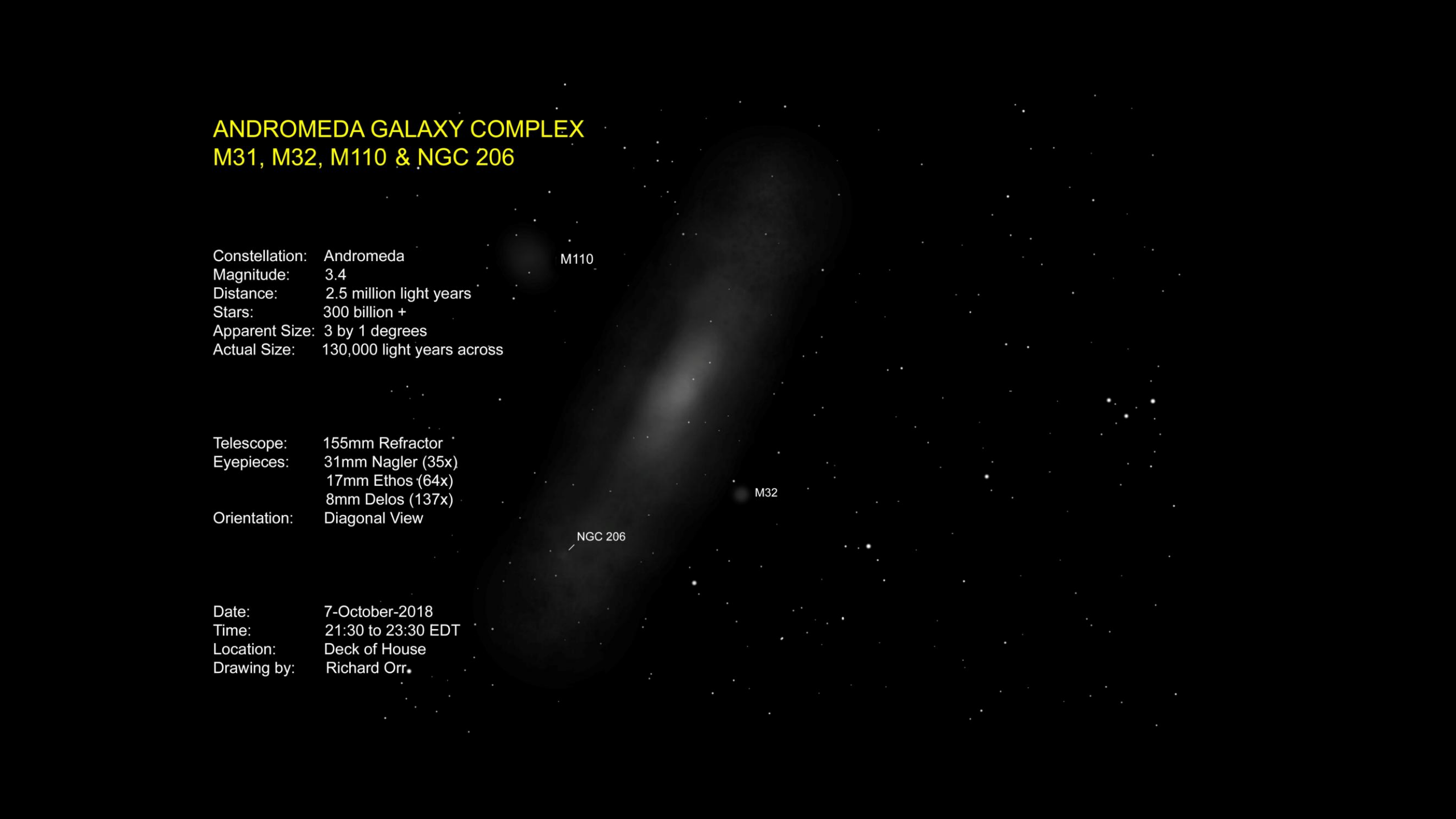
Dog Star & Pup Double Star

Constellation: Canis Major
Magnitudes: -1.46 & 8.5
Separation: 12 arcseconds
Orbital Period: 50 years
Ages: 237 million years
Size Sirius A: 1.73x suns
Size Sirius B: Slighty smaller than Earth
Spectral Types: A1V & DA

Telescope: 155mm Refractor
Eyepieces: 8mm Delos (137x)
4.5mm Delos (243x)
Field of View: 0.52 degrees (8mm)
Orientation: Diagonal View

Date: 09-November-2019
Time: 01:05 to 01:45 EST
Location: Deck of House
Drawing by: Richard Orr

ANDROMEDA GALAXY COMPLEX
M31, M32, M110 & NGC 206



Constellation:	Andromeda
Magnitude:	3.4
Distance:	2.5 million light years
Stars:	300 billion +
Apparent Size:	3 by 1 degrees
Actual Size:	130,000 light years across

Telescope:	155mm Refractor
Eyepieces:	31mm Nagler (35x)
	17mm Ethos (64x)
	8mm Delos (137x)
Orientation:	Diagonal View

Date:	7-October-2018
Time:	21:30 to 23:30 EDT
Location:	Deck of House
Drawing by:	Richard Orr

M104 (NGC 4594)

Sombrero Galaxy

Constellation: Virgo
Magnitude: 8.0
Distance: 34 million light years
Actual Size: 70,000 light years across
Apparent Size: 7.1 by 4.4 arcminutes

Telescope: 155mm Refractor
Eyepieces: 22mm Nagler (50x)
6mm Delos (182x)
Field of View: 1.6 degrees (22mm)
Orientation: Diagonal View

Date: 13-March-2019
Time: 01:00 to 02:35 EDT
Location: Deck of House
Drawing by: Richard Orr

M 103 = NGC 581

Open Cluster
Magnitude: 7.4
Distance: 10,000 light years
Size: 6.0 arcminutes
Stars: 170+

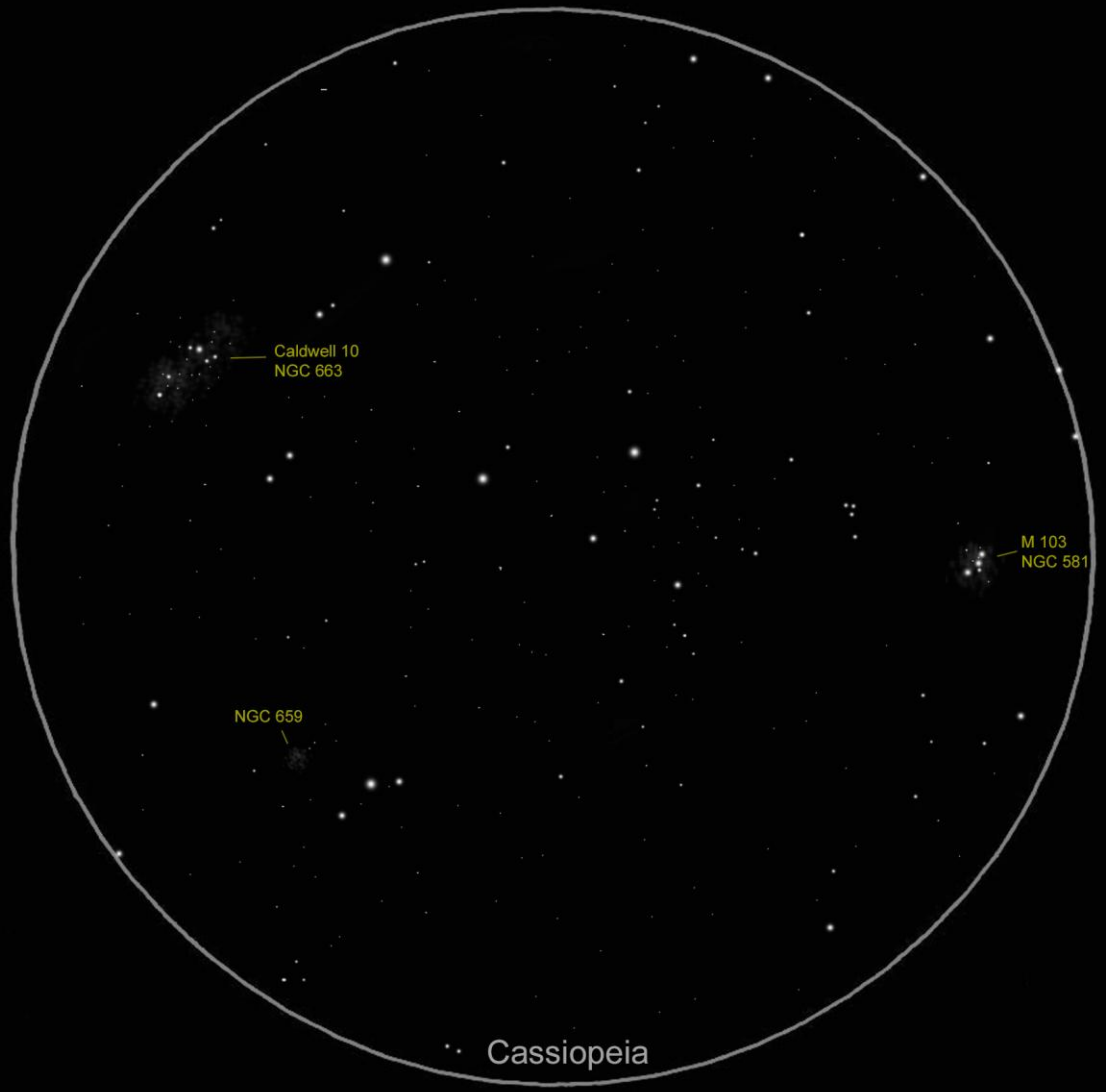
Caldwell 10 = NGC 663

Open Cluster
Magnitude: 7.1
Distance: 6,850 light years
Size: 16.0 arcminutes
Stars: 400+

NGC 659

Open Cluster
Magnitude: 7.9
Distance: 8,200 light years
Size: 6.0 arcminutes
Stars: 186+

Binoculars: 31x by 100mm
Field of View: 2.1 degrees
Orientation: Correct Image
Date: 18-August-2023
Time: 21:50 to 23:00 EDT
Location: Alpha Ridge Park
Drawing by: Richard Orr



Double Cluster (Caldwell 14) (NGC 884 & NGC 869)

Constellation:	Perseus
Magnitude:	5.3 & 4.5
Distance:	7,5000 ly & 7,200 ly
Age:	14 million & 6 million years old
Number of Stars:	300 each

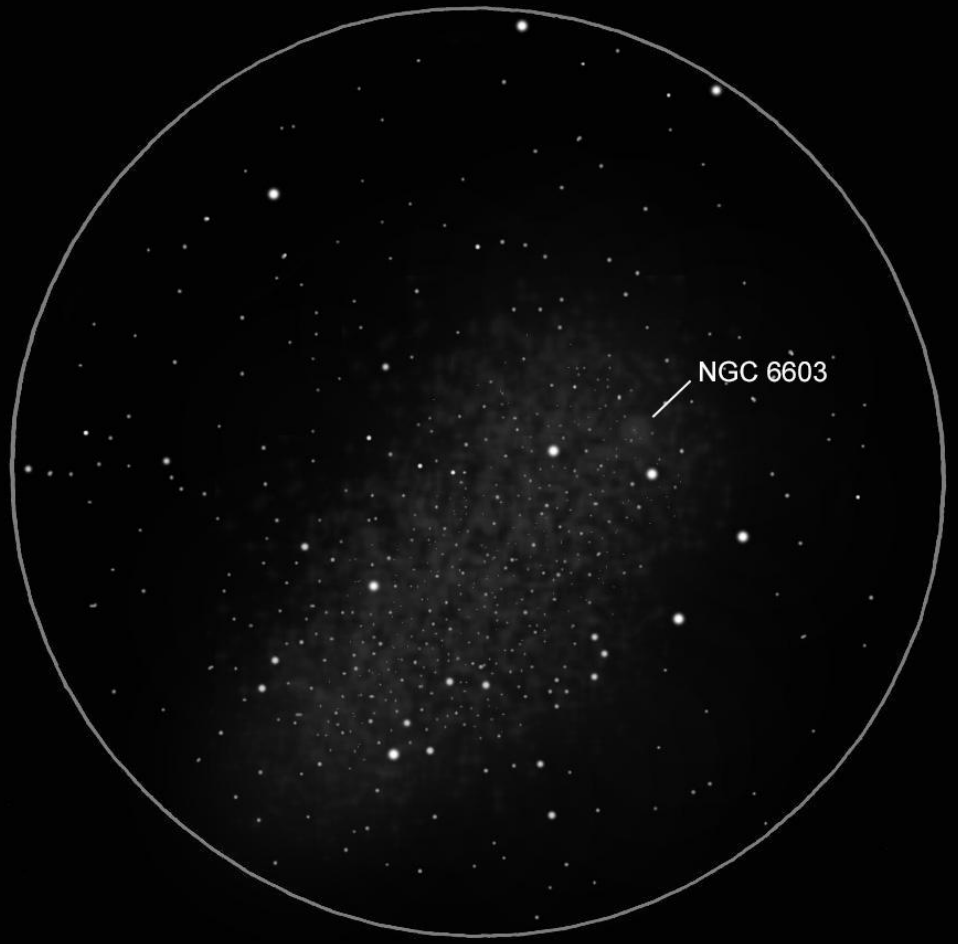
Telescope:	85mm Refractor
Eyepiece:	13mm Ethos (43x)
Field-of-View:	1.8 degrees
Orientation:	Diagonal View

Date:	27-December-2017
Time:	18:00 to 21:00 EST
Location:	Deck of House
Drawing by:	Richard Orr

M24

Small Sagittarius Star Cloud
Distance: 10,000 light years
Actual Size: 350 light years
Apparent Size: 1 by 2 degrees
Date: 9-July-2018 (morning)

Telescope: 155mm Refractor
Eyepiece: 41mm Panoptic (27x)
Field of View: 2.4 degrees
Orientation: Diagonal View
Location: Deck of House
Drawing by: Richard Orr



M20 (NGC 6514)

Trifid Nebula and Cluster

Constellation:	Sagittarius
Magnitude:	6.3
Distance:	5,400 light years
Size (Nebula):	20 arcminutes
Size (Cluster):	28 arcminutes

Telescope:	155mm Refractor
Eyepieces:	17mm Ethos (64x)
	8mm Delos (137x)
Field of View:	1.5 degrees (17mm)
Filters:	OIII & Nebustar Type 2
Orientation:	Corrected Image

Date:	01-July-2019
Time:	01:15 to 02:30 EDT
Location:	Deck of House
Drawing by:	Richard Orr

Flame & Horsehead

Emission & Dark Nebulae

Constellation: Orion

Date: 02-November-2022
Time: 01:45 to 03:15 EDT
Location: Deck of House
Drawing by: Richard Orr

Telescope: 155mm refractor
Eyepiece: 55mm Plossl converted to 67mm (16x)
Night Vision: TNVC-Tele Vue System
Filter: Hydrogen-Alpha (6nm)
Field of View: 2.5 degrees
Orientation: Diagonal View

NGC 6544 (Globular Cluster)

Magnitude: 7.8
Distance: 8,800 light years
Size: 9.2 arcminutes

NGC 6553 (Globular Cluster)

Magnitude: 8.6
Distance: 19,600 light years
Size: 8.2 arcminutes

Constellation: Sagittarius
Telescope: 110mm Refractor
Eyepieces: 22mm Nagler (35x)
6mm Delos (128x)
Field of View: 2.31 degrees (22mm)
Orientation: Diagonal View

Date: 29-August-2019
Time: 20:45 to 21:15 EDT
Location: Alpha Ridge Park
Drawing by: Richard Orr

NGC 288

Globular Cluster

Constellation: Sculptor

Magnitude: 9.37
Distance: 29,220 light years
Apparent Size: 13.8 arcminutes
Real Size: 104 light years across
Age: 13.5 billion years

Telescope: 110mm refractor
Eyepiece: 18.2mm Delite (42x)
Night Vision: TNVC-Tele Vue System
Filter: Multi-band Moon & Skyglow
Field of View: 0.95 degrees
Orientation: Diagonal View

Date: 27-October-2022
Time: 22:35 to 23:35 EDT
Location: Alpha Ridge Park
Drawing by: Richard Orr

C/2020 F3 (NEOWISE)

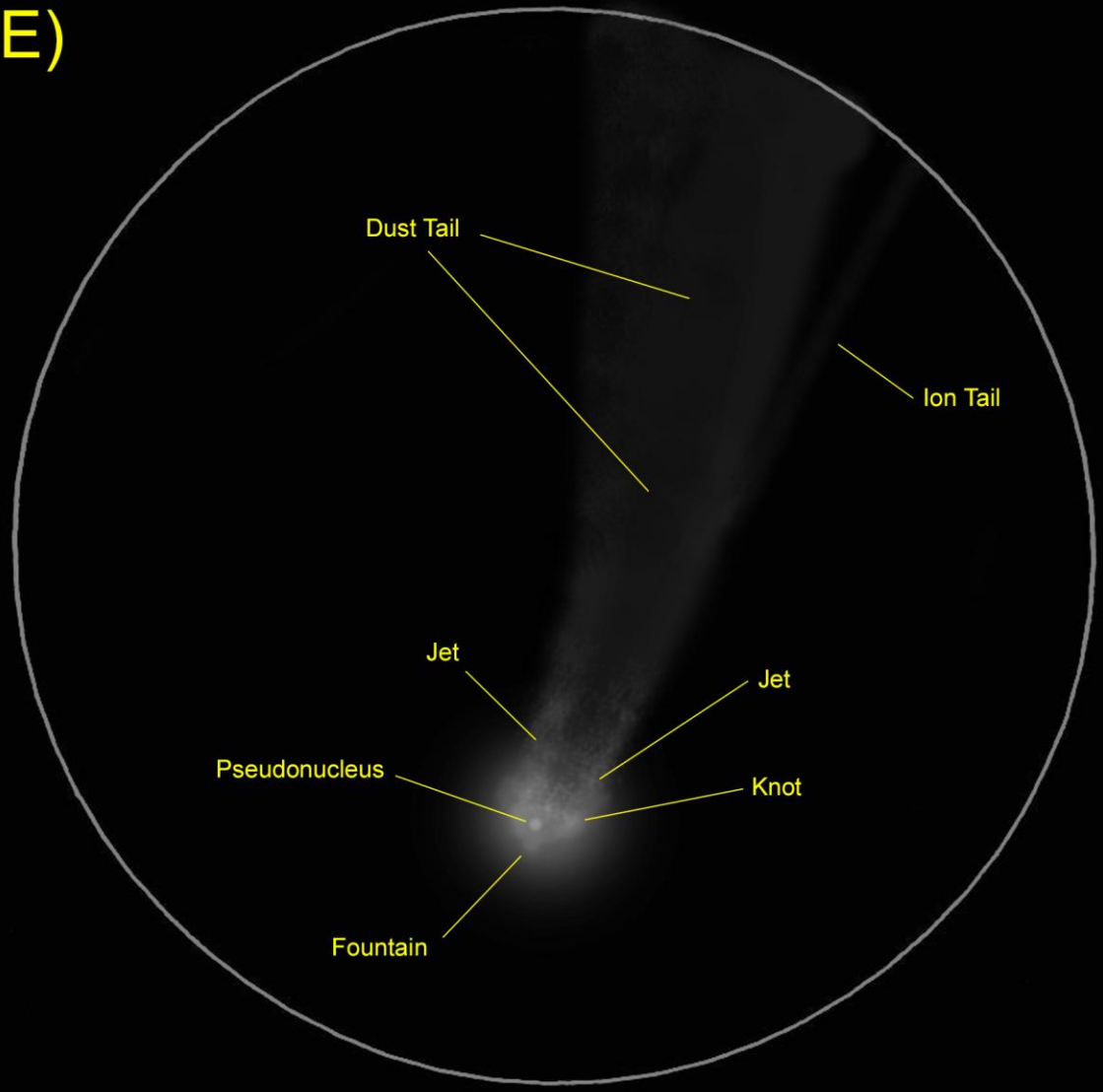
Comet

Date: 15-July-2020
Time: 04:00 to 04:45 EDT
Constellation: Lynx

Magnitude: 1.2 (my estimation)
Distance: 74, 363, 600 miles

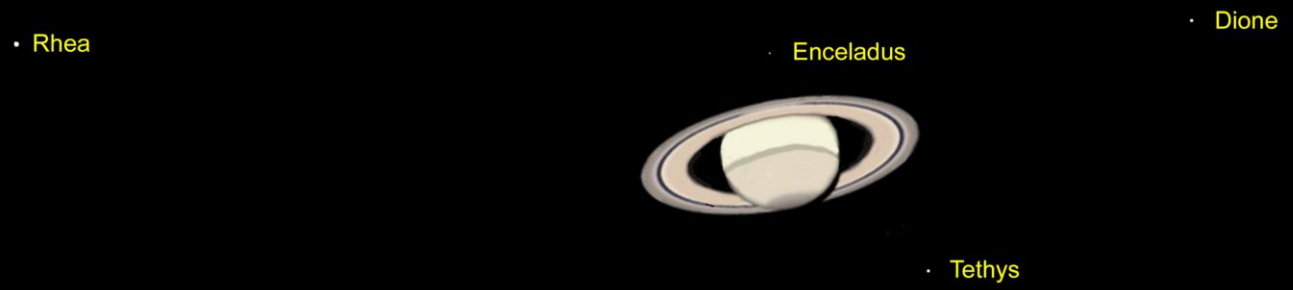
Telescope: 110mm Refractor
Eyepiece: 4.7mm Ethos (164x)
Field of View: 0.67 degrees
Filter: Lumicon Comet
Orientation: Diagonal View

Location: Carrs Mill Park
Drawing by: Richard Orr



Saturn

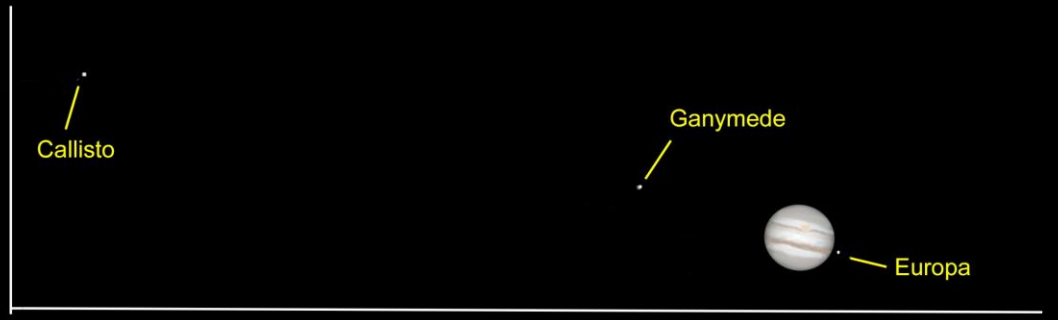
Date: 20-October-2020
Time: 20:35 to 21:15 EDT
Location: Deck of House
Drawing by: Richard Orr



Magnitude: 0.56
Distance: 929,558,672 miles
Size: 38 x 15 arcseconds

Telescope: 155mm Refractor
Eyepiece: 6mm Delos/barlow (309x)
Orientation: Inverted Image (South Up)

JUPITER & MOONS

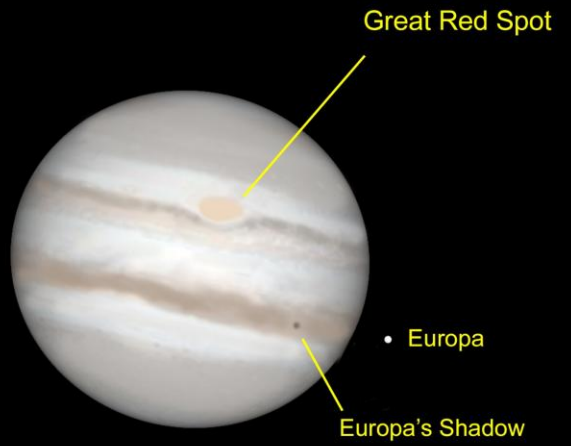


Date: 29-June-2020
Time: 04:45 (0415 to 05:10) EDT

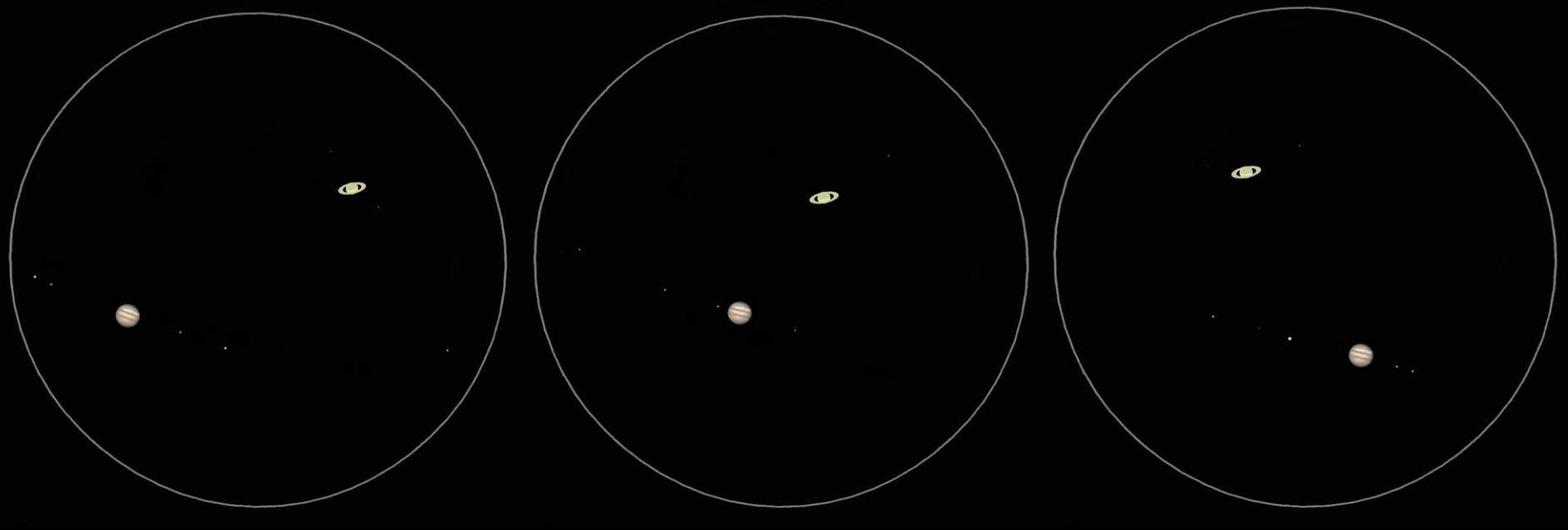
Magnitude: -2.73 (Jupiter)
Magnitude: 5.3 (Europa)
Magnitude: 4.6 (Ganymede)
Magnitude: 5.6 (Callisto)
Distance: 390,414,390 miles
Size (Jupiter): 47 x 44 arcseconds

Ganymede

Telescope: 155mm Refractor
Eyepiece: 10mm Delos w/barlow (186x)
Filters: Green #58 & Blue #80A
Orientation: Inverted Image (South Up)



Location: Deck of House
Drawing by: Richard Orr



December 22, 2020
17:30 EST

December 21, 2020
17:30 EST

December 20, 2020
17:30 EST

Jupiter & Saturn 2020 Conjunction

Telescope: 85mm Refractor
Orientation: Correct Image (North Up)
Eyepiece: 4.7mm Ethos (119x)
Location: Deck of House
Field of View: 0.91 degrees
Drawing by: Richard Orr

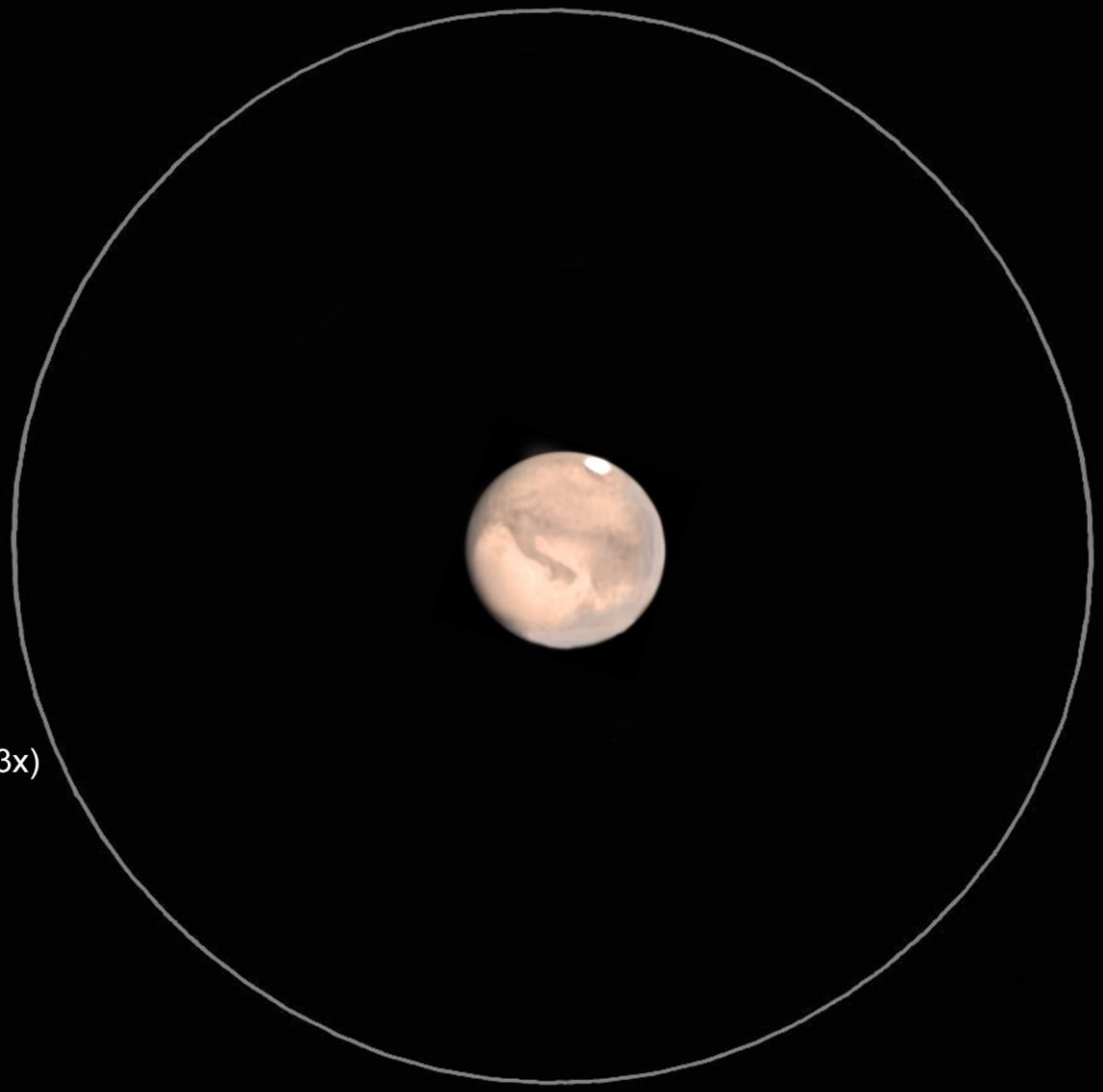
MARS

Date: 3-October-2020
Time: 1:35 to 02:40 EDT
Constellation: Pisces

Magnitude: -2.52
Distance: 39,041,439 miles
Size: 22.5 arcseconds
Phase: 99%
CM: 356 degrees (02:00 EDT)

Telescope: 155mm Refractor
Eyepiece: 4.5mm Delos w/barlow (413x)
Filters: Telvue Mars B, Red #25
Blue #80A, Green #58
Orientation: Inverted Image (South-Up)

Location: Deck of House
Drawing by: Richard Orr



Mars

Date: 04-November-2020
Time: 00:25 to 01:30 EST

Magnitude: -2.04
Distance: 44,618,787 miles
Size: 19.5 arcseconds
Phase: 0.98%
CM: 73.3 degrees (@ 01:00 EST)

Telescope: 155mm Refractor
Eyepiece: 4.5mm Delos/2x barlow (413x)
Filters: Mars B, Red #25
Green #58, Blue #80A
Orientation: Inverted View (South Up)

Location: Deck of House
Drawing by: Richard Orr

MARS

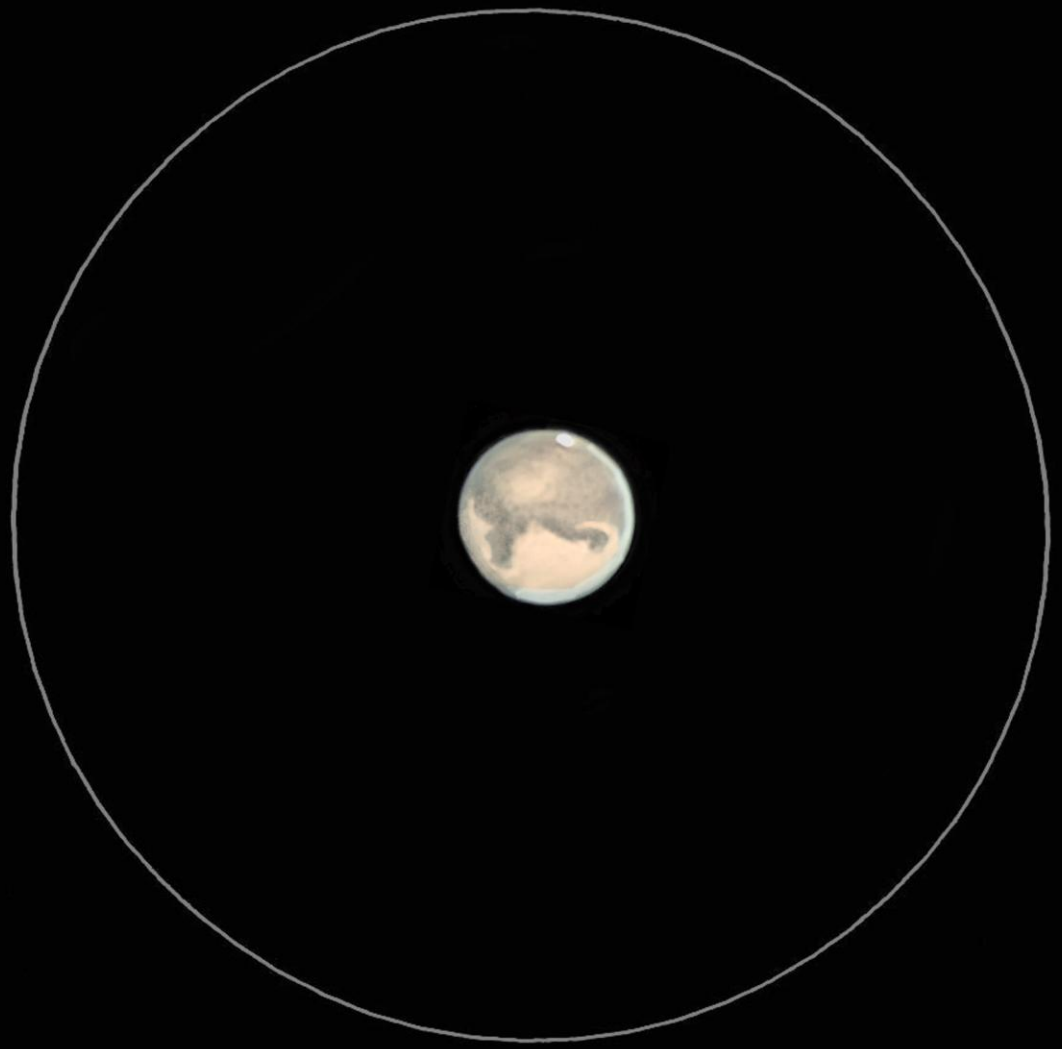
Date: 09-October-2020
Time: 00:30 to 02:15 EDT

Constellation: Pisces

Magnitude: -2.6
Size: 22.5 arcseconds
Phase: 100%
CM: 304 degrees (02:00 EDT)
Distance: 39,041,439 miles

Telescope: 155mm Refractor
Eyepiece: 3.5mm Delos/barlow (530x)
Filters: Mars B, Red #25
Green #58, Blue #80A
Orientation: Inverted (South Up)

Location: Deck of House
Drawing by: Richard Orr



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- Featured Speakers – Chris Todd, Richard Orr, Steve Jaworiwsky
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  - Shallow Sky – Jim Tomney
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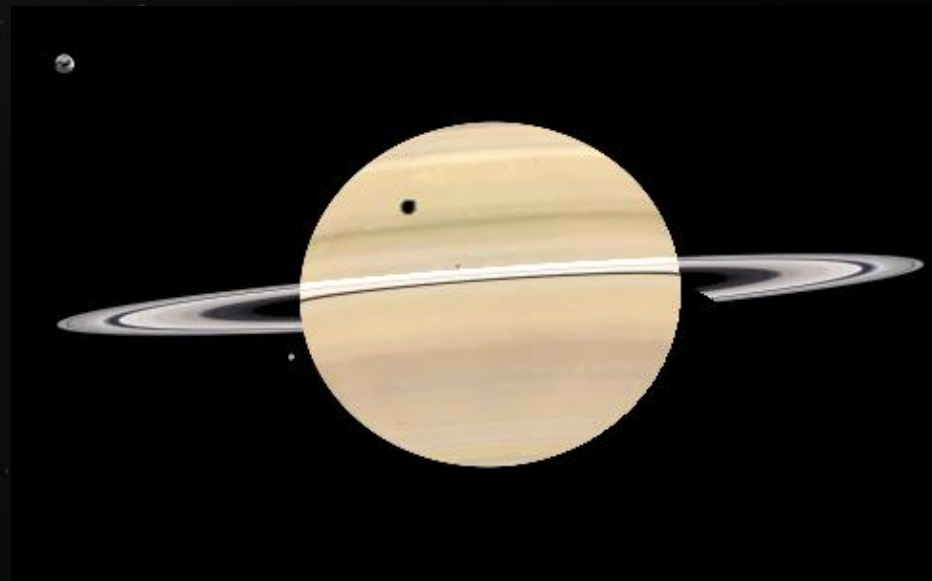
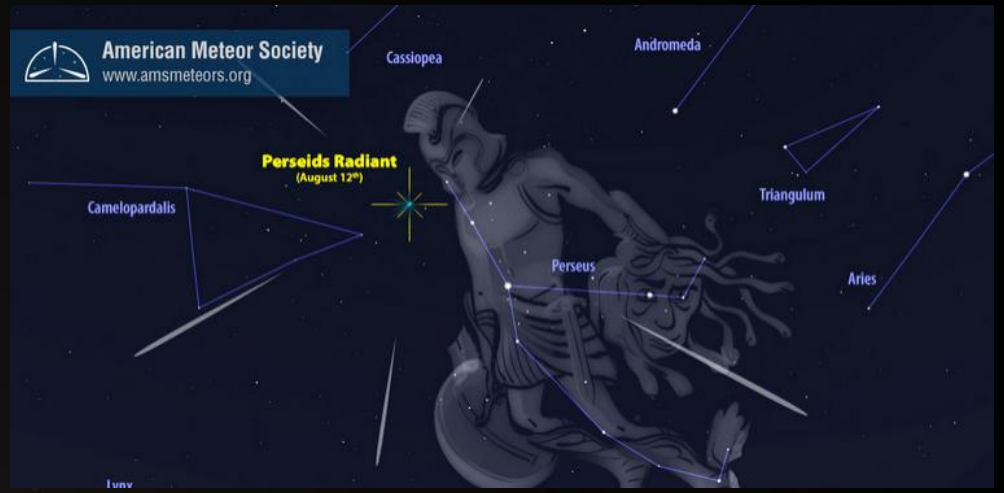
Shallow Sky Highlights for July-August 2024

- *Mercury is currently not well placed for observation*
- *Venus is in morning sky sporting a gibbous phase*
- *Mars is tiny (5-6”) and poor visual target, challenging imaging target*
- *Jupiter is climbing out of the solar glare and visible before sunrise*
- *Saturn is in the morning sky heading towards a Sept 21st opposition*
  - ***Titan transit tomorrow morning starting at 3am until 8am***



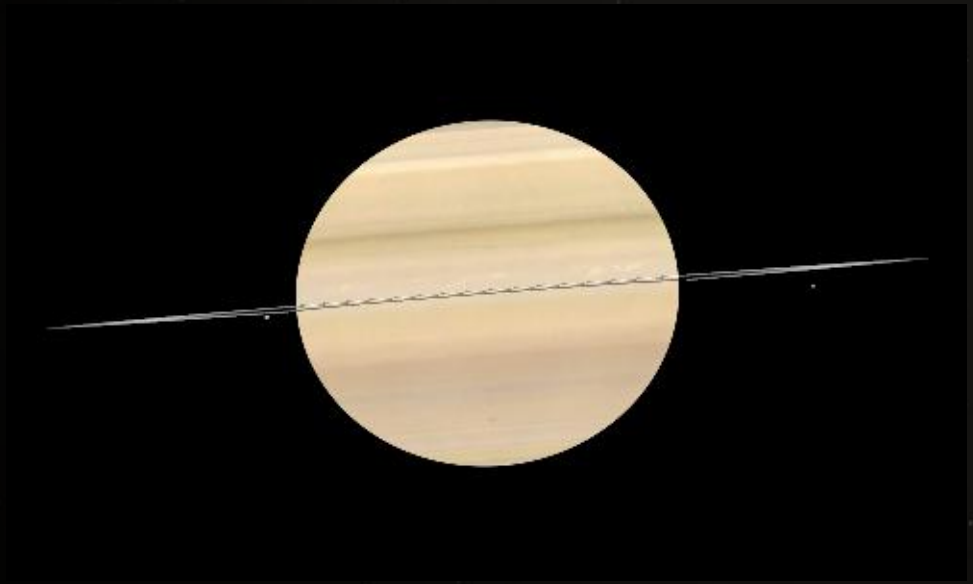
It’s Perseids Time Again



- One of the most reliable meteor showers – 60/hr
- Peak is Tuesday August 12th at 4pm so observe either pre-dawn of the 12th or 13th
- Waning gibbous Moon will interfere somewhat
- The days on either side of the peak can also see up to 20-30 meteors an hour. In 2021, there was an outburst the day after the peak that exceeded the peak.
- Be comfortable – lounge chair works great. Don’t forget a pillow and – depending on the temps – a light blanket. Insect repellant may be advisable as well.
- Binoculars are not needed but can allow you to inspect the “smoke train” that some of the brighter ones will leave.

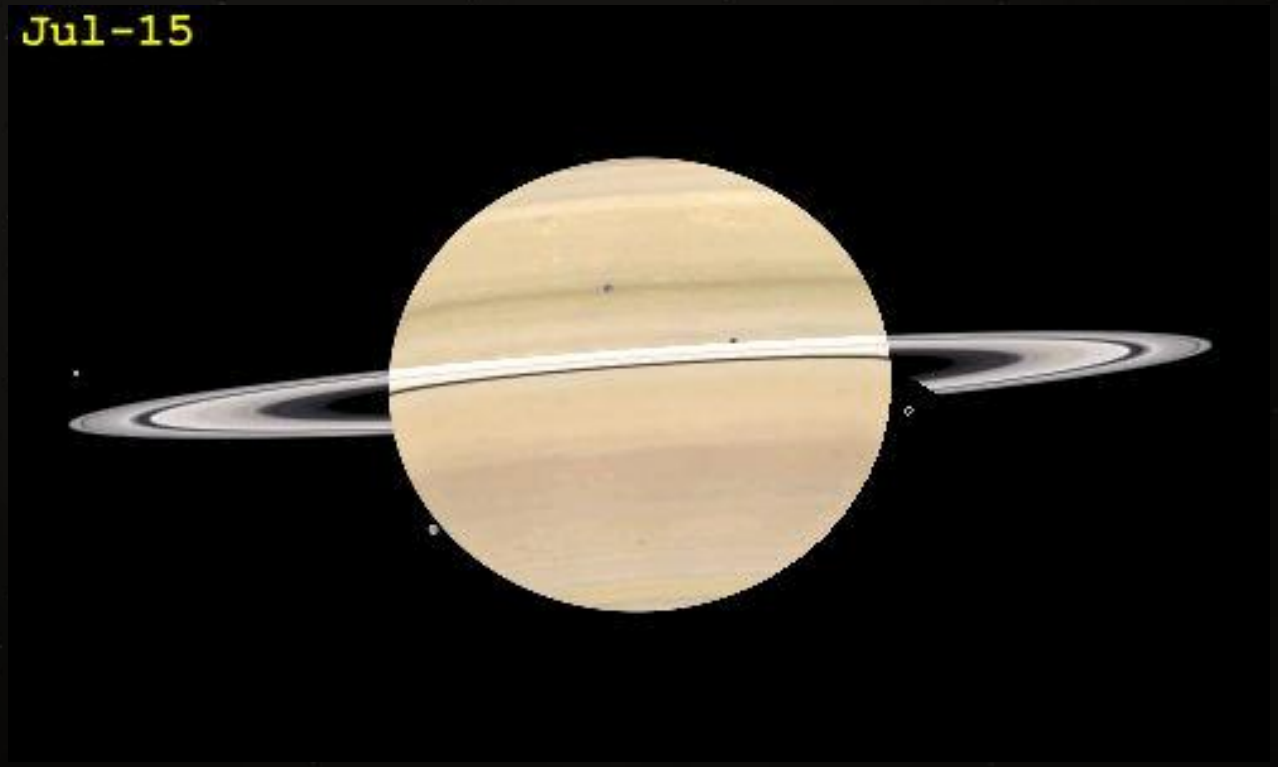
Ring Watching Exercise

- Saturn reached its autumnal equinox on March 23rd
  - Rings were “edge-on” that date
  - For the next 7 years the orbit will continue to tilt the southern hemisphere towards us.



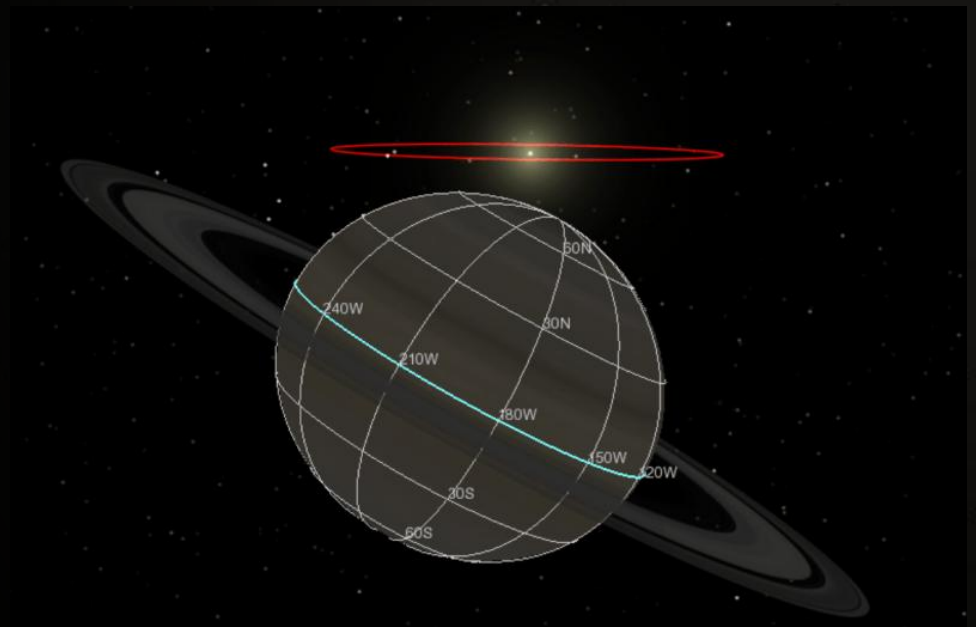
Ring Watching Exercise

- BUT – here is what an observer of Saturn will be seeing this coming apparition. The rings will close up, as if Saturn is heading to its equinox which we know happened late last March. Then after December they rapidly open up. What's happening??



Celestial Mechanics

- Consider that we are an inner planet when viewed from Saturn.
- Also remember that the orbital plane of a planet is inclined to the Sun
  - That is why we do not get a transit every time Venus or Mercury reach their inferior conjunction (point where they lie between Sun and Earth)

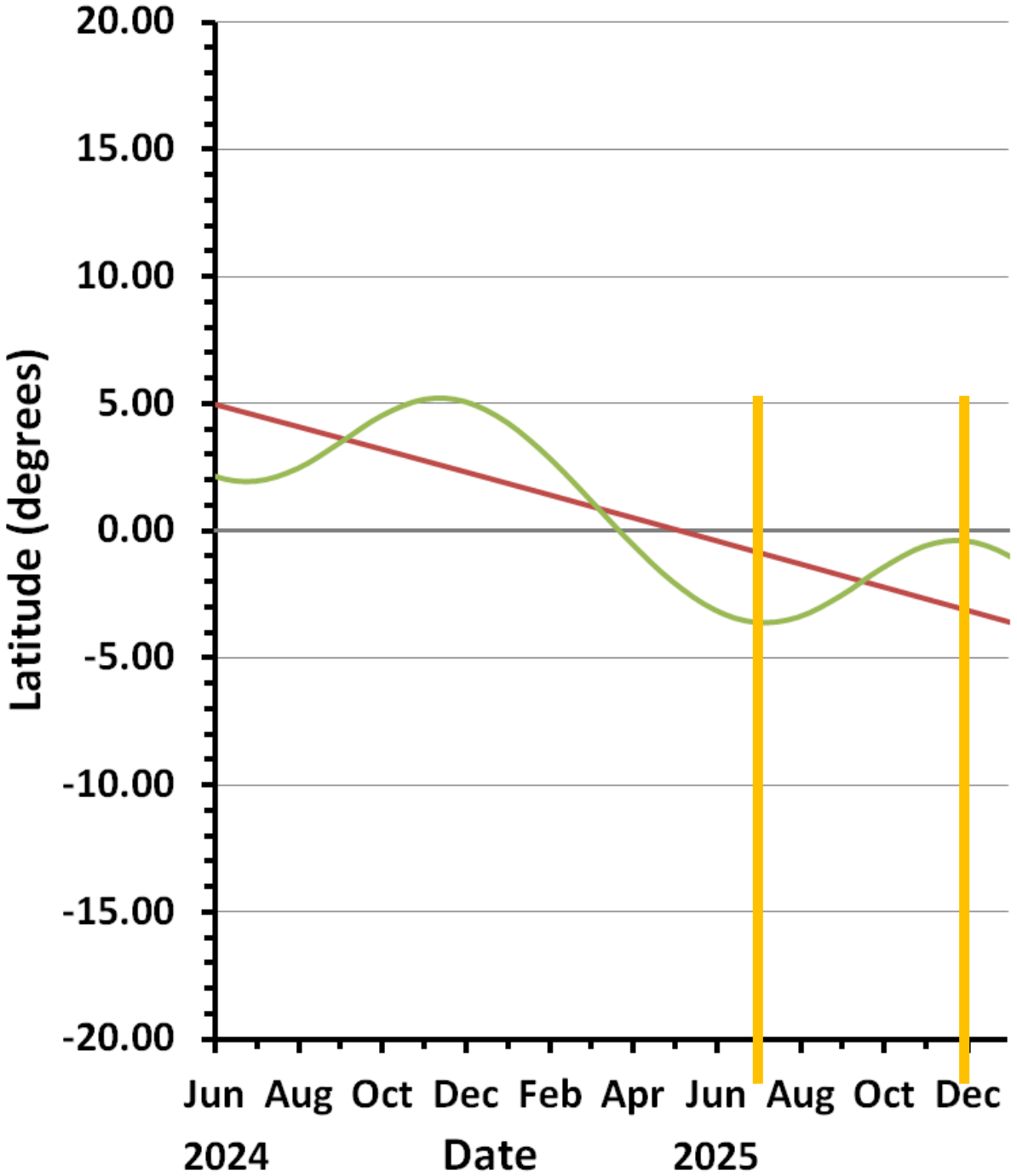


- As seen from Saturn, Earth bobs up & down as we circle the Sun.
- In Saturn's sky, our Declination oscillates above or below that of the Sun

[The Oikofuge: Galileo, Disappearing Rings, And The Seasons Of Saturn]

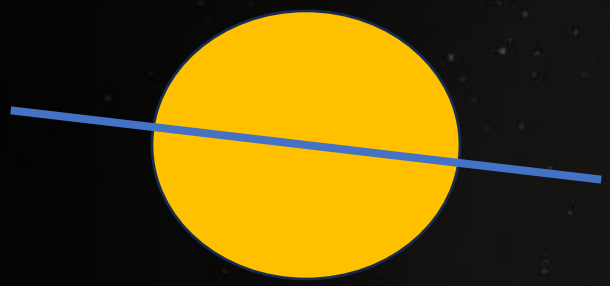
Celestial Mechanics

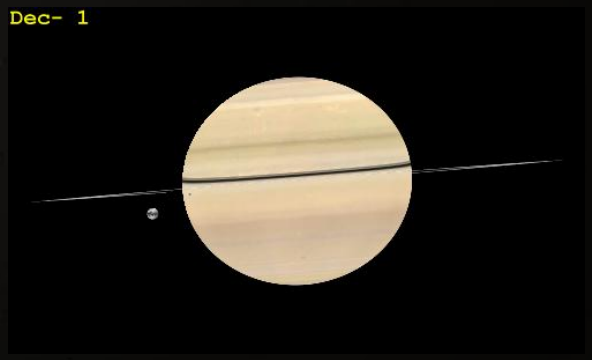
- This chart plots the Declination of the Sun (red) compared to that of Earth (green)
- From July to December, we are trekking northward in Saturn's sky
- As we do, the rings appear to close up from our vantage point
- After December, we reverse course and the rings will appear more open



The Oikofuge: Galileo, Disappearing Rings, And The Seasons Of Saturn

Celestial Mechanics





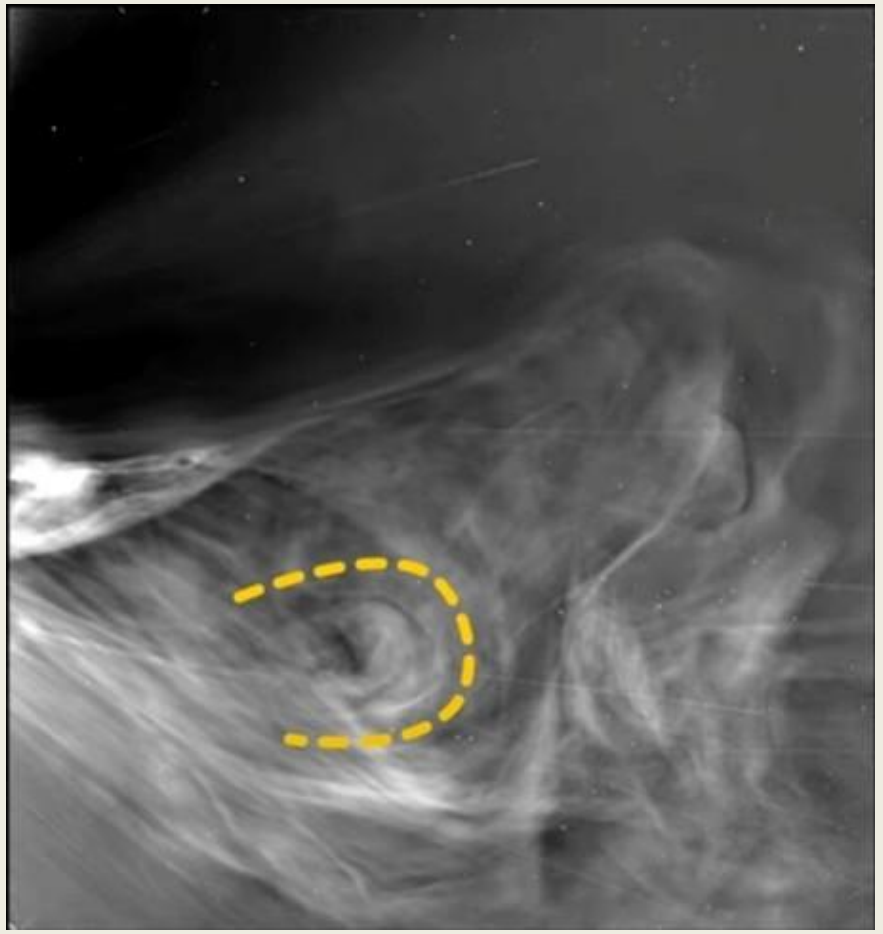
[The Oikofuge: Galileo, Disappearing Rings, And The Seasons Of Saturn]

What's Up in Space Headlines

July 17, 2025

Parker Solar Probe Closest Images of Sun

- Images obtained 3.8 million miles (6.1 million km) from the solar surface on December 24, 2024
  - Wide-Field Imager for Solar Probe (WISPR)
- Observed the solar wind and Coronal Mass Ejections (CMEs)
  - Mostly protons and electrons
  - Wind velocity: over 1 million mph (1.6 million kph)
  - Causes auroras and radiation for astronauts
- Will help us better understand space weather
  - Protect electrical infrastructure on Earth
  - Protect satellites in orbit
  - Protect astronauts



NASA/Johns Hopkins APL/Naval Research Lab

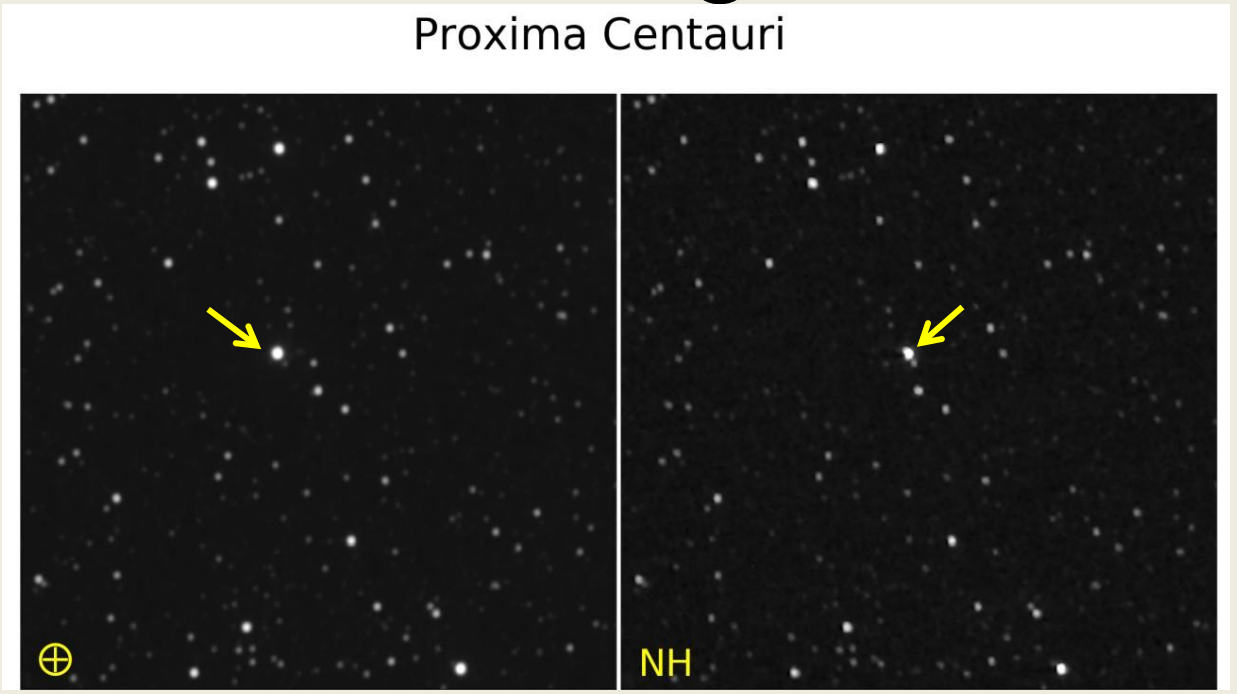
More Info at
https://science.nasa.gov/science-research/heliophysics/nasas-parker-solar-probe-snaps-closest-ever-images-to-sun/

What's Up in Space Headlines

July 17, 2025

New Horizons Tests Interstellar Navigation

- Far enough from the Sun that nearest stars have shifted noticeably
- Simultaneous images of Proxima Centauri and Wolf 359 from Earth and New Horizons (LORRI instrument)
  - New Horizons was 47.1 au from Earth
  - Proxima Cen parallax was 32.4" (0.768" from Earth) and Wolf 359 was 15.7" (0.415" from Earth)
- Located NH in space to about 0.4 au
  - Not research-grade parallaxes, but a good demonstration



Lauer, T.R., et al., 26 June 2025, submitted to AJ, https://arxiv.org/pdf/2506.21666. (Figure 1; arrows added)

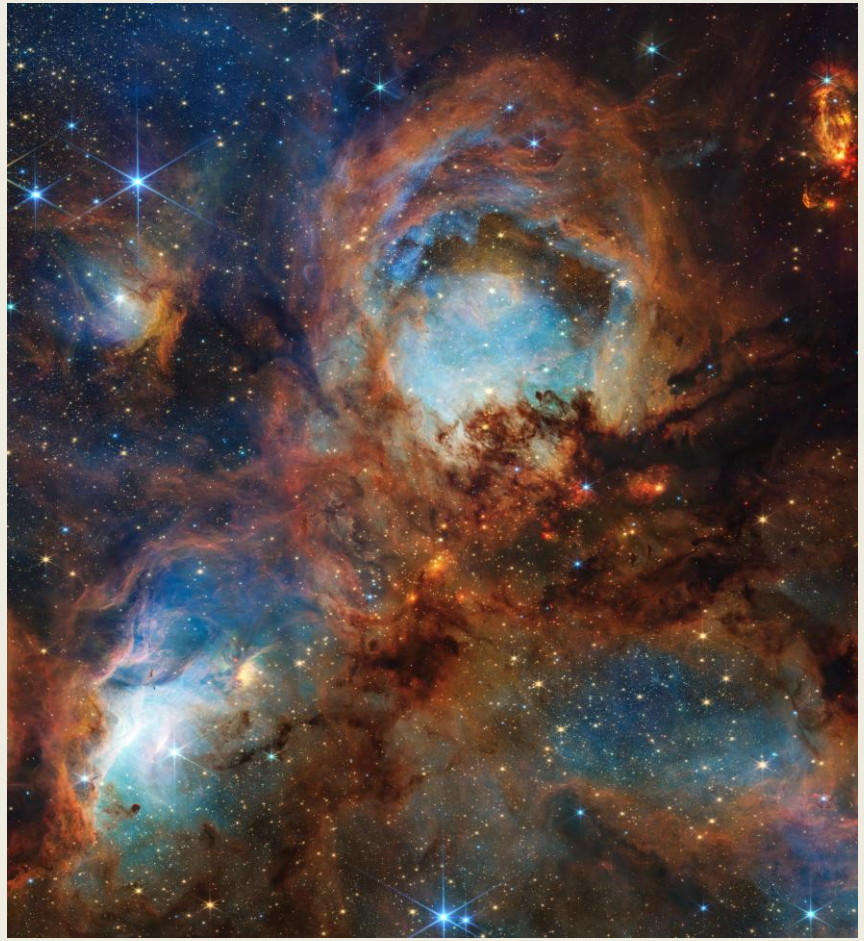
More Info at https://phys.org/news/2025-07-horizons-successful-deep-space-stellar.html

What's Up in Space Headlines

July 17, 2025

JWST Commemorates Three Years of Ops

- JWST began science operations in July 2022 after six months of Commissioning activities
- To exemplify the science from the observatory, this NIRCam image of the Cat's Paw Nebula was released on July 10, 2025
- Shows young, massive stars carving voids from the interstellar gas and dust in each of the paw's "toe beans"
- Ten of JWST's surprising results can be found at https://science.nasa.gov/missions/webb/3-years-of-science-10-cosmic-surprises-from-nasas-webb-telescope/



NASA, ESA, CSA, STScI

More Info at
https://webbtelescope.org/contents/news-releases/2025/news-2025-129#section-id-2

Tonight's Agenda, July 17th, 2025

- Introductions
- Announcements
  - 2025 Star Parties, Recent & Upcoming Events
  - Book of the Month – Krystal Rolon
  - Remote Telescope Survey – Chris Todd
  - The Seestar "Very Small Array" Project – Rich Russin
- Featured Speakers – Chris Todd, Richard Orr, Steve Jaworiwsky
- What's Out in the Sky This Month…
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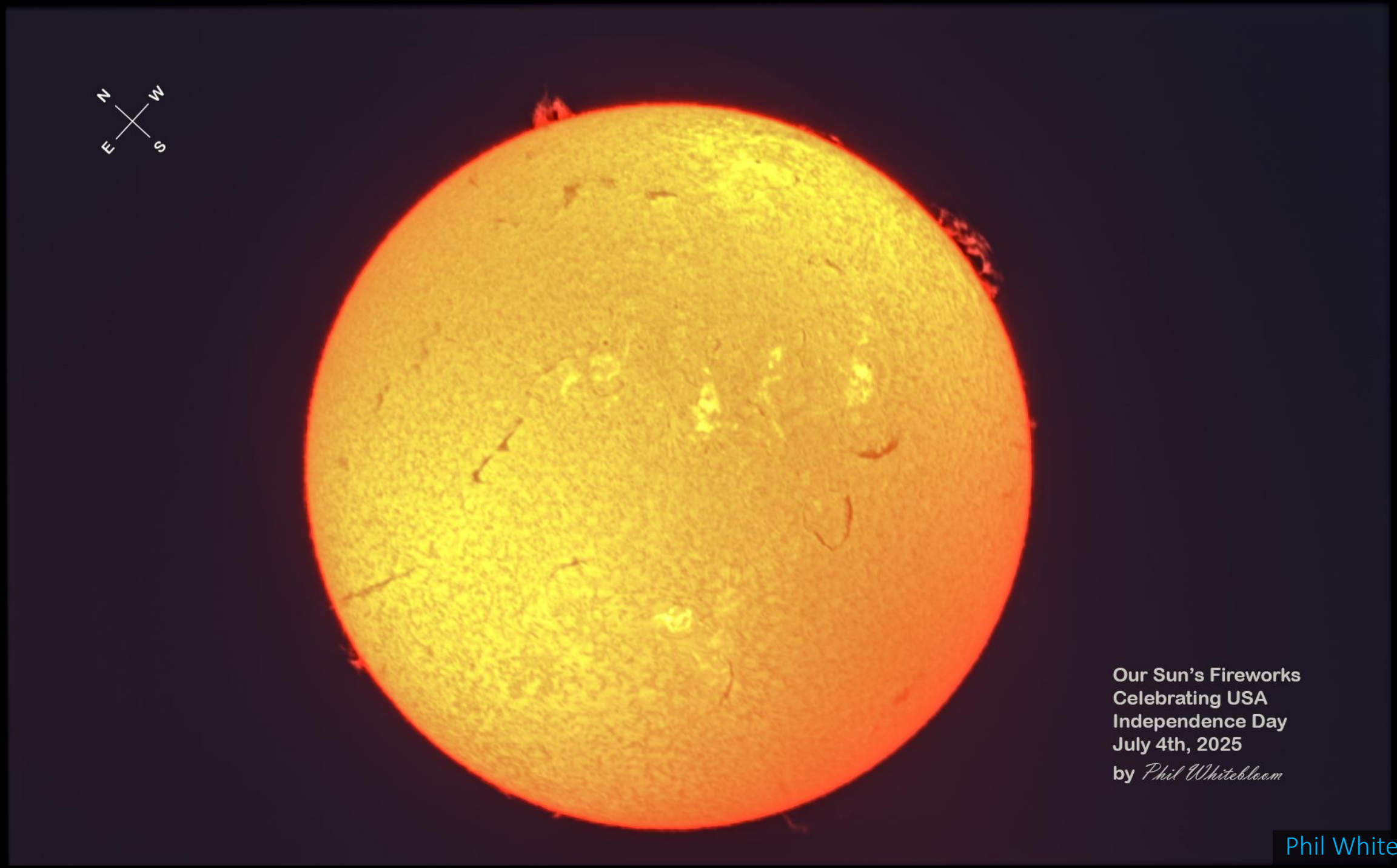
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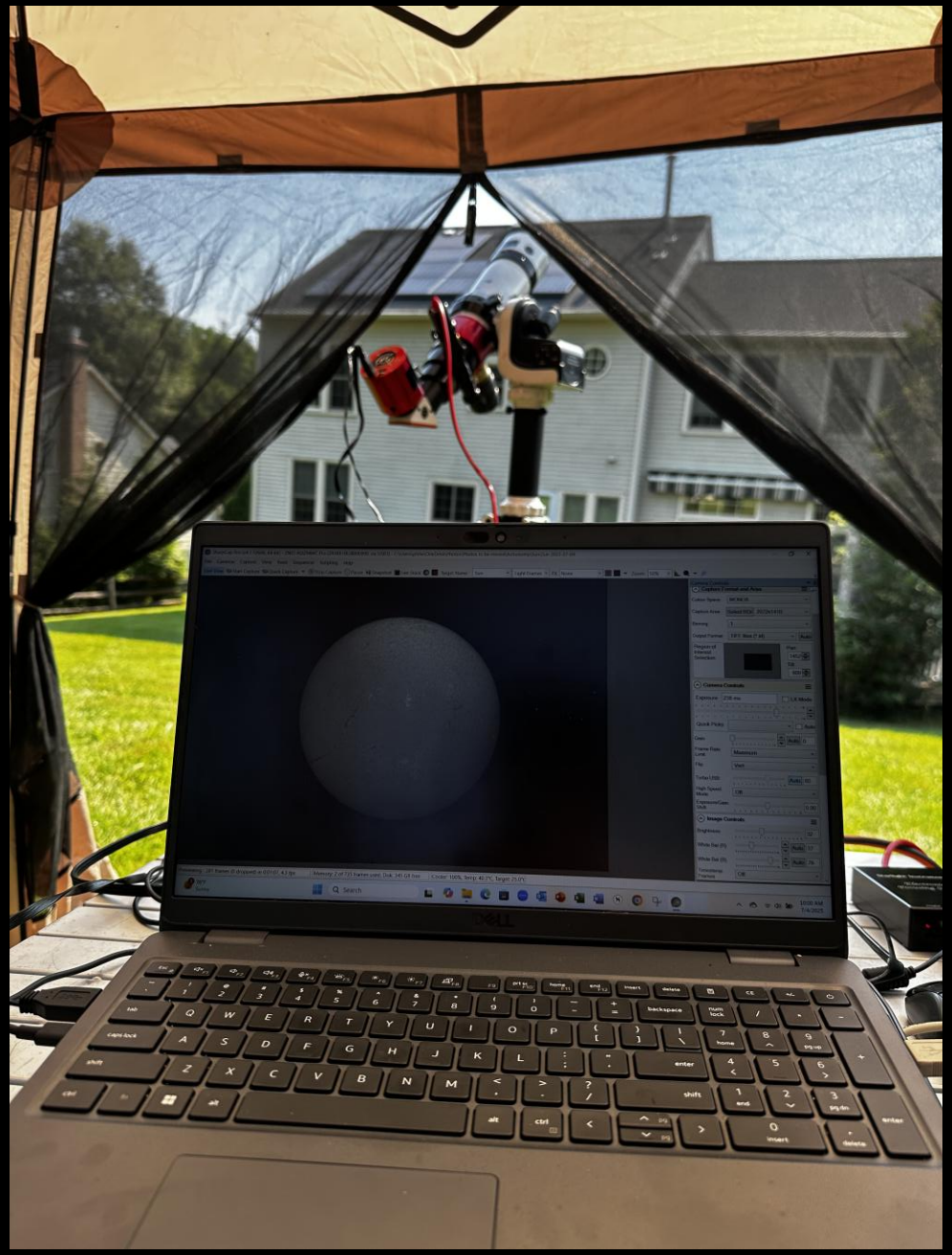
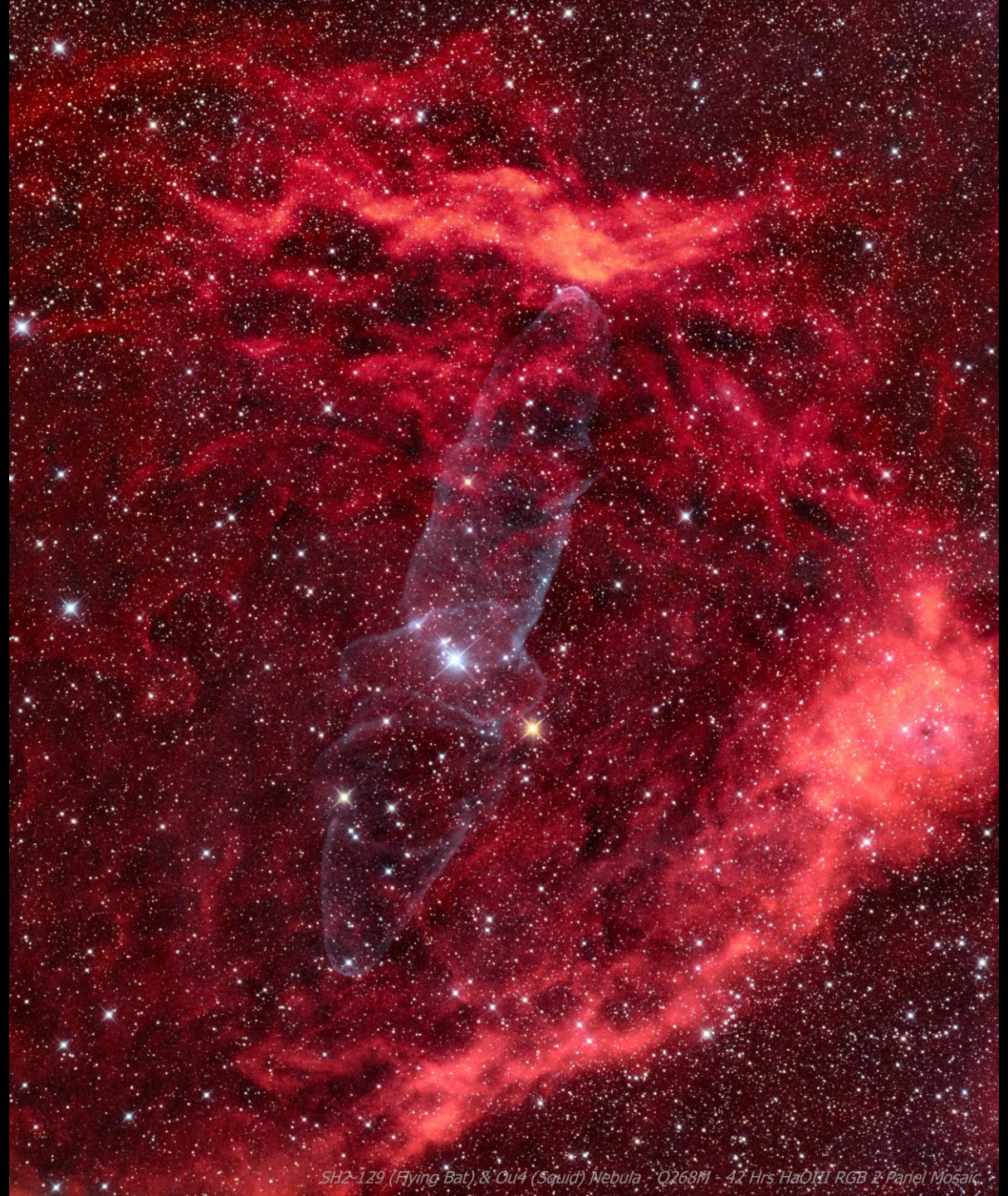
Our Sun's Fireworks
Celebrating USA
Independence Day
July 4th, 2025
by Phil Whitebloom
Phil Whitebloom



Phil Whitebloom



M5

Gene Handler


Victor Sanchez

Victor Sanchez

M5

Victor Sanchez

Wayne Baggett

◁ STAR BUBBLE

Jim Johnson

Roughly 70,000 years ago, intense stellar winds from the Wolf-Rayet star EZ Canis Majoris blew its outer layers into space, resulting in the faintly glowing nebula in Canis Major known as Sharpless 2-308. Its bluish color is due to the dominance of doubly ionized oxygen.

DETAILS: *Tele Vue-NP101is refractor and ZWO ASI6200MM Pro camera. Total exposure: 7.33 hours through narrowband filters.*

▽ SUNSCAPE

Christian Viladrich

Several tall, looping prominences spring from AR 3768 at the Sun's western limb on August 2, 2024. Many smaller wisps of plasma cover the solar surface in this high-resolution image.

DETAILS: *300-mm custom solar Newtonian and ZWO ASI462MC camera. Stack of 150 video frames recorded through double-stacked calcium-K filters.*

Jim Johnson

Jim Johnson

Thank you