

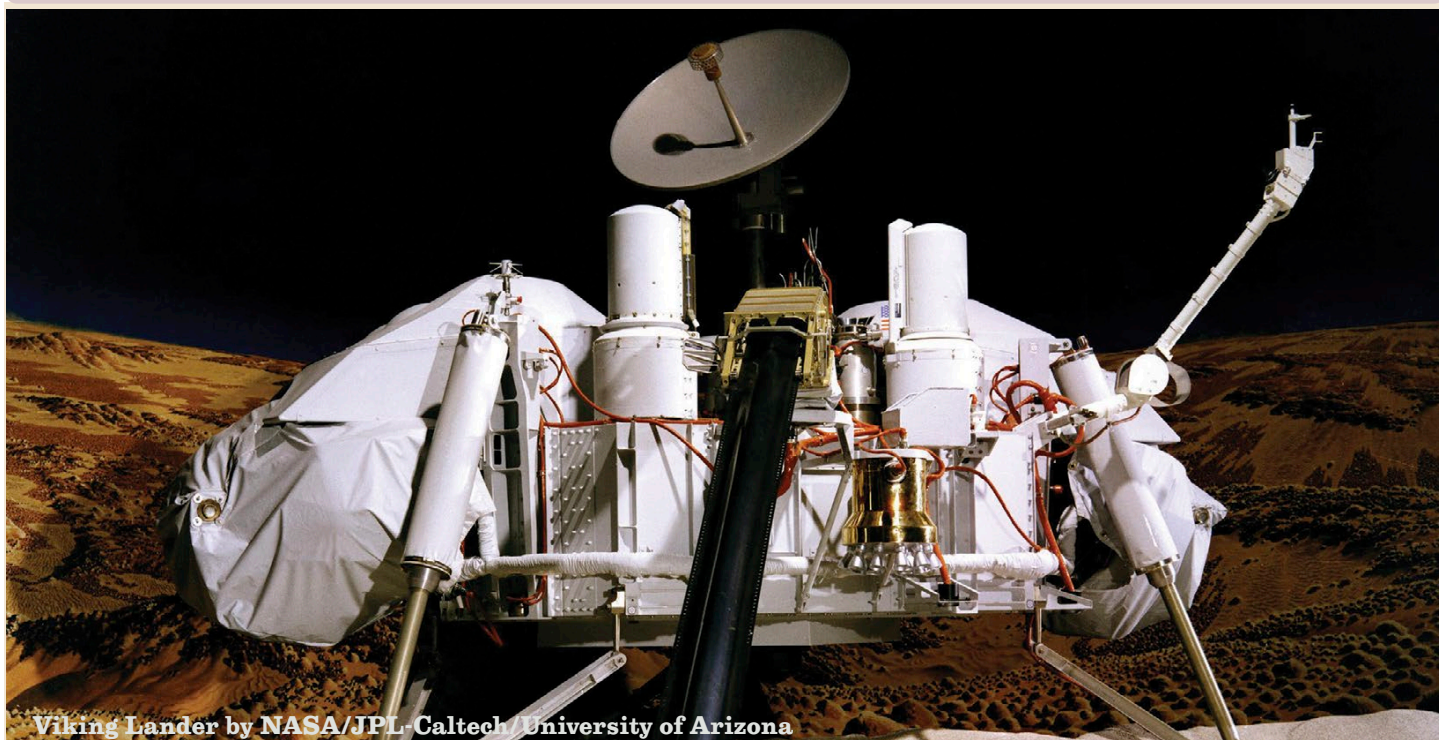
LONGMONT ASTRONOMICAL SOCIETY

MARCH 2023

ROSETTE
BY EDDIE HUNNELL

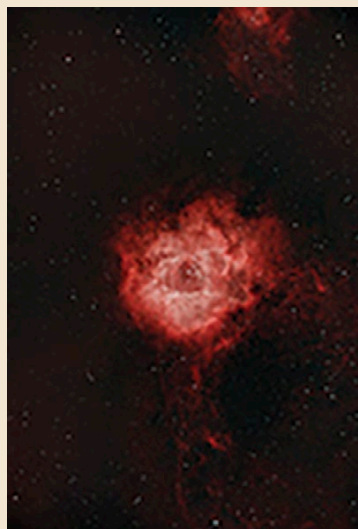
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LAS Meeting Thursday, March 16 at 7 pm
Presentation by Martin Butley on Exploring Mars



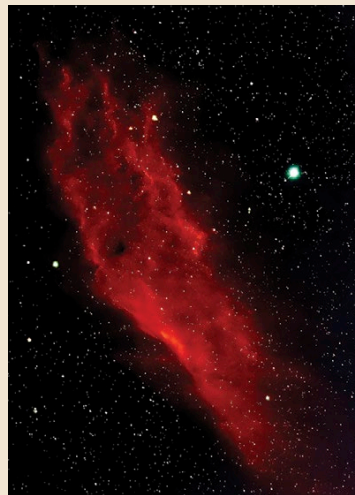
Viking Lander by NASA/JPL-Caltech/University of Arizona

Front Cover “Rosette” by Eddie Hunnell



Eddie was able to use his AM5 mount for the first time and was able to get only 12 subs (10 min each) of the Rosette using the L-enhanced filter. He recently bought the xxxXterminator PixInsight add ons: BlueXterminator, StarXterminator, and noiseXterminator. He thinks the BlurX and NoiseX tools are incredible and worth the \$200 price.

Back Cover: “California Nebula” by Jim Elkins



Jim imaged the California Nebula with his Vaonis Vespera (50 mm f/4) telescope using its dual band nebula filter on Feb. 19th. It was post processed with Affinity Photo 2, Topaz Photo AI (to denoise & sharpen) and MacOS Photos App (to brighten). Image is a stacked photo of 551 exposures at 10 seconds each for a total exposure of 1.53 hours.

Two passes of CovelENS software’s mosaic mode to create the . The software was allowed to do 2 passes to create the 2.5 degree long mosaic.

About LAS

The Longmont Astronomical Society Newsletter ISSN 2641-8886 (web) and ISSN 2641-8908 (print) is published monthly by the Longmont Astronomical Society, P. O. Box 806, Longmont, Colorado. Newsletter Editor is Vern Raben. Our website URL is <https://www.longmontastro.org> and the webmaster is Sarah Detty. The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987.



The Longmont Astronomical Society is affiliated with the Astronomical League (<https://www.astroleague.org>). The Astronomical League is an umbrella organization of amateur astronomy societies in the United States.



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LAS Officers and Board Members in 2023

- | | |
|-----------------------------------|--------------------------------|
| • Vern Raben, President | Board Members: |
| • Hunter Morrison, Vice President | David Elmore, Gary Garzone, |
| • Eileen Hall-McKim, Secretary | Mike Hotka, Brian Kimball, and |
| • Bruce Lamoreaux, Treasurer | Tally O'Donnell |

Appointed Positions 2023

Sarah Detty, Webmaster; Bruce Lamoreaux, Library Telescope Coordinator;
Bill Tschumy, Public Outreach Coordinator; Vern Raben, Newsletter Editor

The Planets in March

Mercury

Mercury is visible due west after sunset for 3 or 4 days at the end of this month. It is about -1.4 magnitude in brightness and 5.5 arc sec across.

Venus

Venus is visible after sunset in the west. It is about magnitude -4 in brightness and the waxing crescent disk is about 13 arc sec across. Conjunction with the Moon on 23rd.

Mars

Mars keeps getting smaller and dimmer. It is 8.2 arc sec across on the 1st but only 6.4 arc sec across by the 31st. It dims from 0.4 magnitude in apparent brightness to 1.0 magnitude by the end of the month.

Jupiter

Jupiter is around 34 arc sec across this month and -2.1 magnitude in apparent brightness. Conjunction with the Moon on the 22nd. It disappears into the bright evening twilight around the 24th.

Saturn

Saturn reappears in the morning sky around the 28th of this month. It is magnitude 1.0 in apparent brightness and its disc is 16 arc sec across. It will be in conjunction with Moon on the 23rd.

Uranus

Uranus is in constellation Aries. It is magnitude +5.8 in brightness and its disc is 3.5 arc sec across.

Neptune

Neptune is not visible this month.

Spring Equinox

Spring equinox is March 20 at 3:24 pm MDT.

Coincidentally ...

Mars, Uranus, Venus, and Jupiter will appear in an approximate vertical line on the 14th.

Lunar Phases in March

- Full moon: March 7 at 5:42 am
- Third quarter: March 14 at 8:09 pm
- New moon: March 21 at 11:24 am
- First quarter: March 28 at 8:49 pm

Bright Nebula in March

- M42, Orion Nebula in Orion, mag. 4.0
- NGC 1432, Maia Nebula in Taurus, mag. 3.9
- NGC 1435, Merope Nebula in Taurus, mag. 4.2
- NGC 1499, California Nebula in Perseus, mag. 5.0
- NGC 2238, Rosette Nebula in Monoceros mag. 5.5
- NGC 2264, Cone Nebula in Monoceros, mag. 3.9
- NGC 7822, bright nebula in Cepheus, mag. 8.0
- IC434, Horsehead Nebula in Orion, mag. 7.3
- IC 1805, Heart Nebula in Cassiopeia, mag. 6.5
- IC 1848, Soul Nebula, in Cassiopeia, mag. 6.5
- Caldwell 9, Cave Nebula in Cepheus, mag. 7.7

Galaxies in March

- M31, Andromeda spiral Galaxy in Andromeda, mag. 3.3
- M33, Pinwheel Spiral Galaxy in Triangulum, mag. 5.8
- M81, Bodes Galaxy, Spiral Galaxy in Ursa Major, mag. 6.8
- M32, Elliptical Galaxy in Andromeda, mag. 7.9
- M51, Whirlpool Galaxy in Ursa Major, mag. 7.9
- M63, Sunflower Galaxy in Canes Venatici, mag. 8.5.

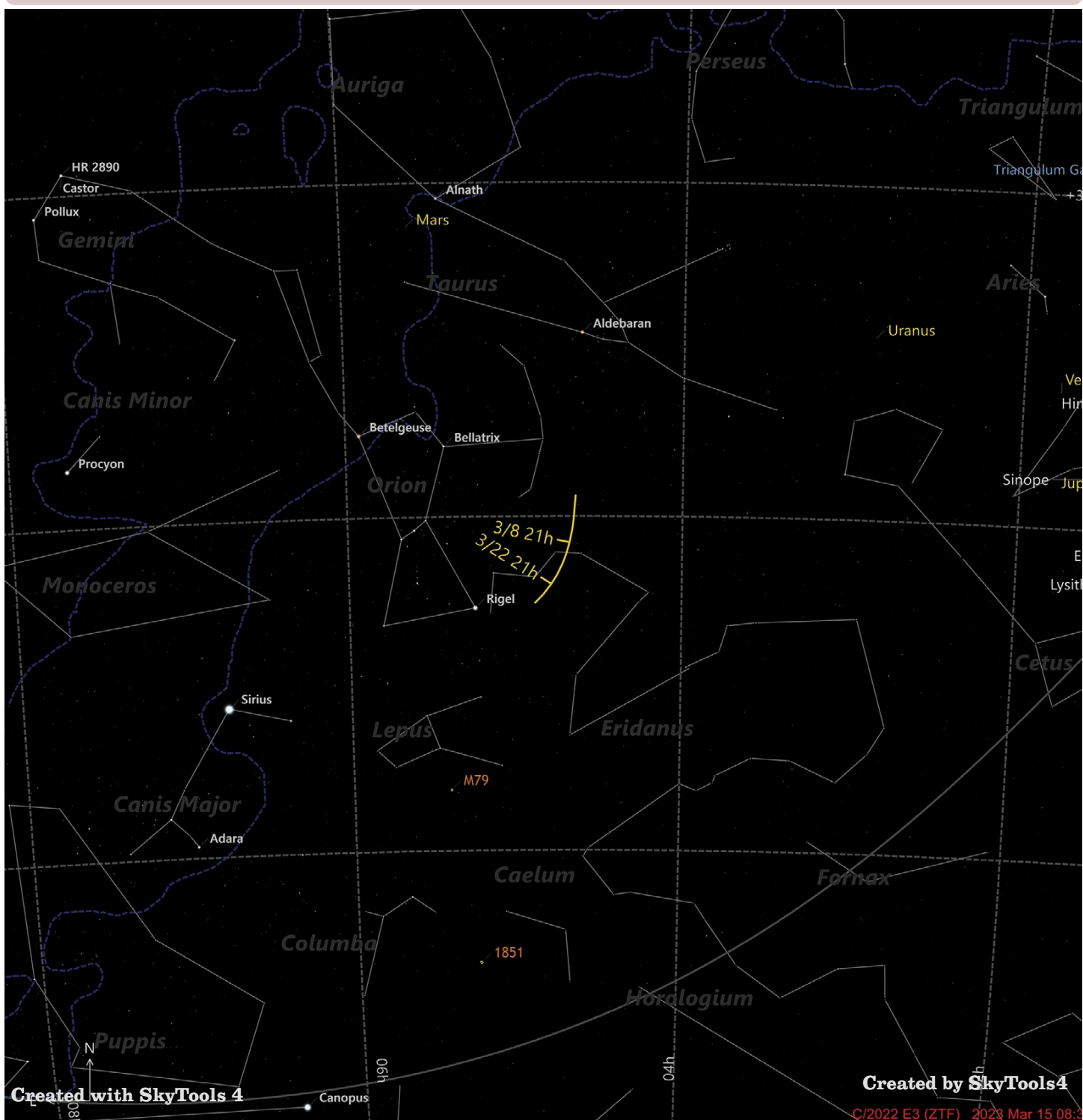
Globular Clusters in March

- M3 in Canes Venatici, mag. 6.2
- M53 in Coma Berenices, mag. 7.6
- M 79 in Orion, mag. 7.7
- NGC 5466 in Bootes, mag. 9.0
- NGC 6229 in Hercules, mag. 9.4
- NGC 5053 in Coma Berenices, mag. 9.5

Planetary Nebula in March

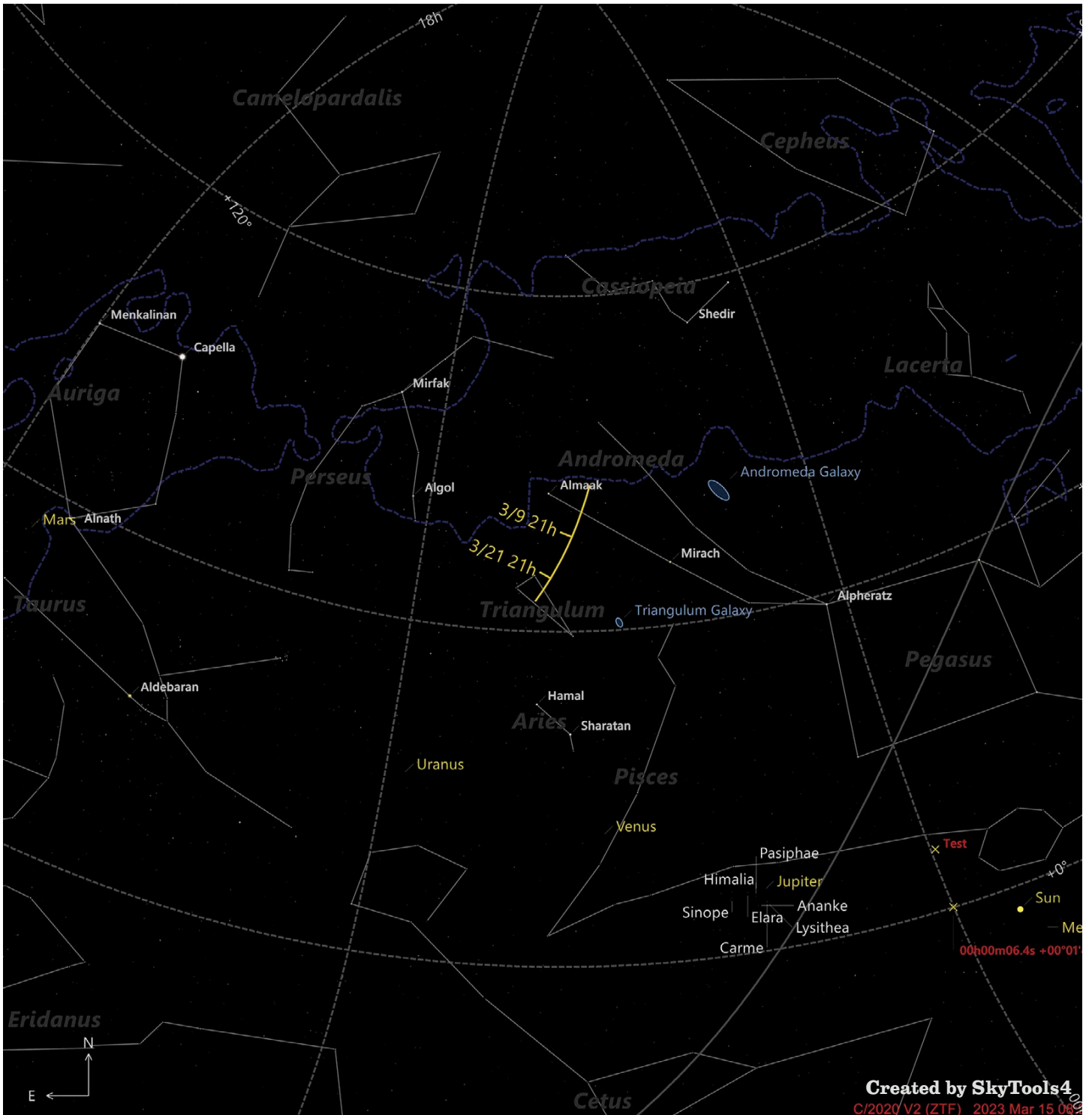
- NGC 3242, Ghost of Jupiter in Hydra, mag. 7.3
- NGC 6543, Cat's Eye Nebula in Draco, mag. 8.1
- NGC 2392, Eskimo Nebula in Gemini, mag. 9.2
- NGC 2440 in Puppis, mag. 9.3
- NGC 1535 in Eridanus, mag. 9.4
- M97, Owl Nebula in Ursa Major, mag. 9.8
- M76, Little Dumbbell Nebula in Perseus, mag. 10.1
- Abell 21, Medusa Nebula in Gemini, mag. 10.2
- NGC 40, Bow-Tie Planetary Nebula in Cepheus, mag. 10.6

Comet C/2022 E3 (ZTF)



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	8:20 pm	04h39m43.1s	+00°47'53"	Taurus	8.5	5.9
Mar 7	8:21 pm	04h41m16.1s	-01°56'18"	Eridanus	9.0	5.0
Mar 13	8:31 pm	04h43m36.0s	-03°54'59"	Eridanus	9.5	4.3
Mar 19	8:37 pm	04h46m30.4s	-05°25'24"	Eridanus	9.9	3.8
Mar 25	8:41 pm	04h49m52.0s	-06°37'46"	Eridanus	10.3	3.5
Mar 31	8:46 pm	04h53m35.1s	-07°38'22"	Eridanus	10.8	3.1

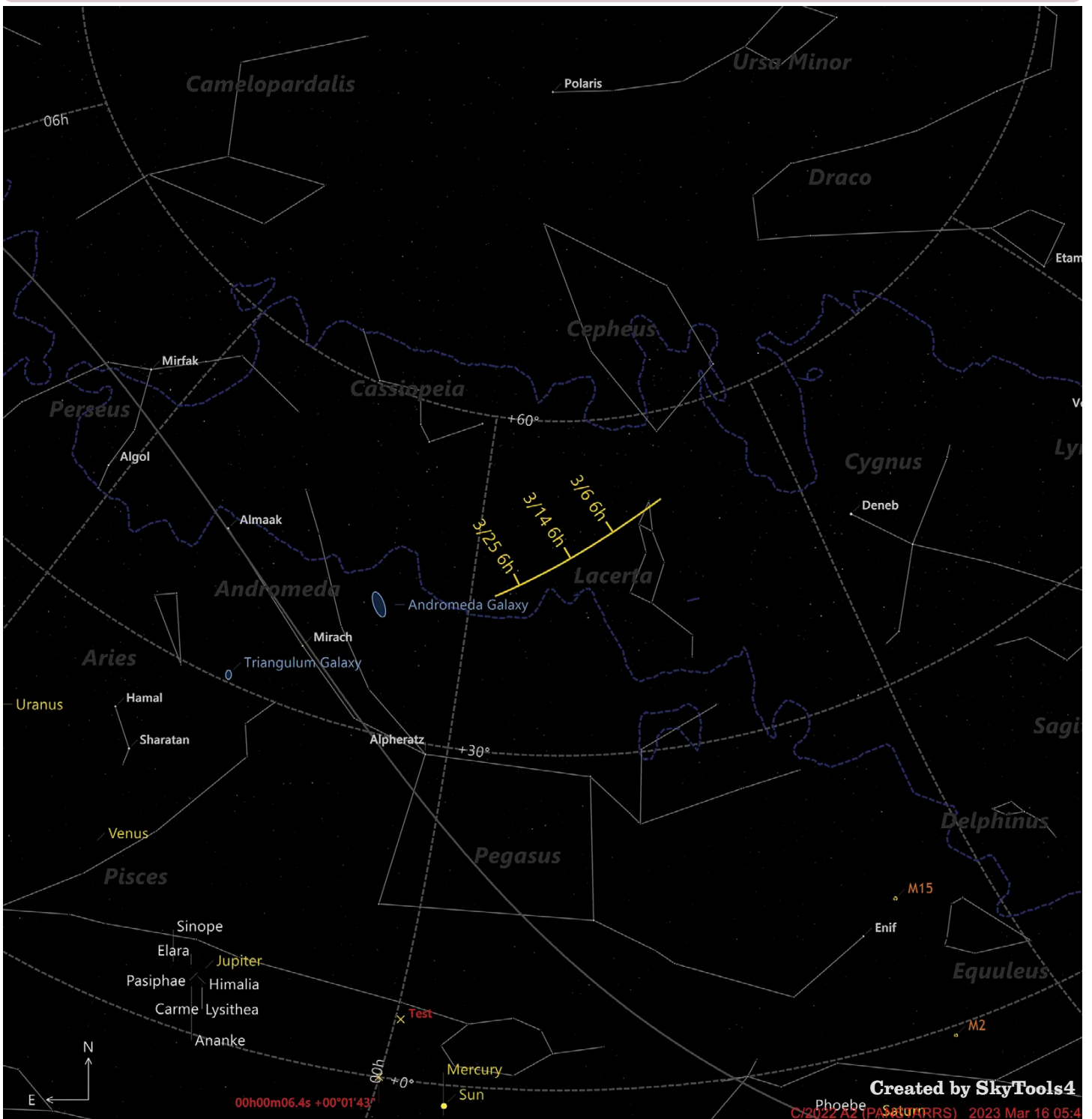
Comet C/2020 V2 (ZTF)



Created by SkyTools4
C/2020 V2 (ZTF) 2023 Mar 15 08:29

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	8:18 pm	01h48m15.8s	+41°32'51"	Andromeda	10.1	1.8
Mar 7	8:20 pm	01h52m48.5s	+39°17'05"	Andromeda	10.1	1.8
Mar 13	8:30 pm	01h57m29.1s	+37°15'30"	Andromeda	10.1	1.7
Mar 19	8:36 pm	02h02m14.6s	+35°26'25"	Triangulum	10.2	1.7
Mar 25	8:41 pm	02h07m03.1s	+33°48'02"	Triangulum	10.2	1.6
Mar 31	8:46 pm	02h11m52.5s	+32°18'43"	Triangulum	10.2	1.6

Comet C/2022 A2 (PANSTARRS)

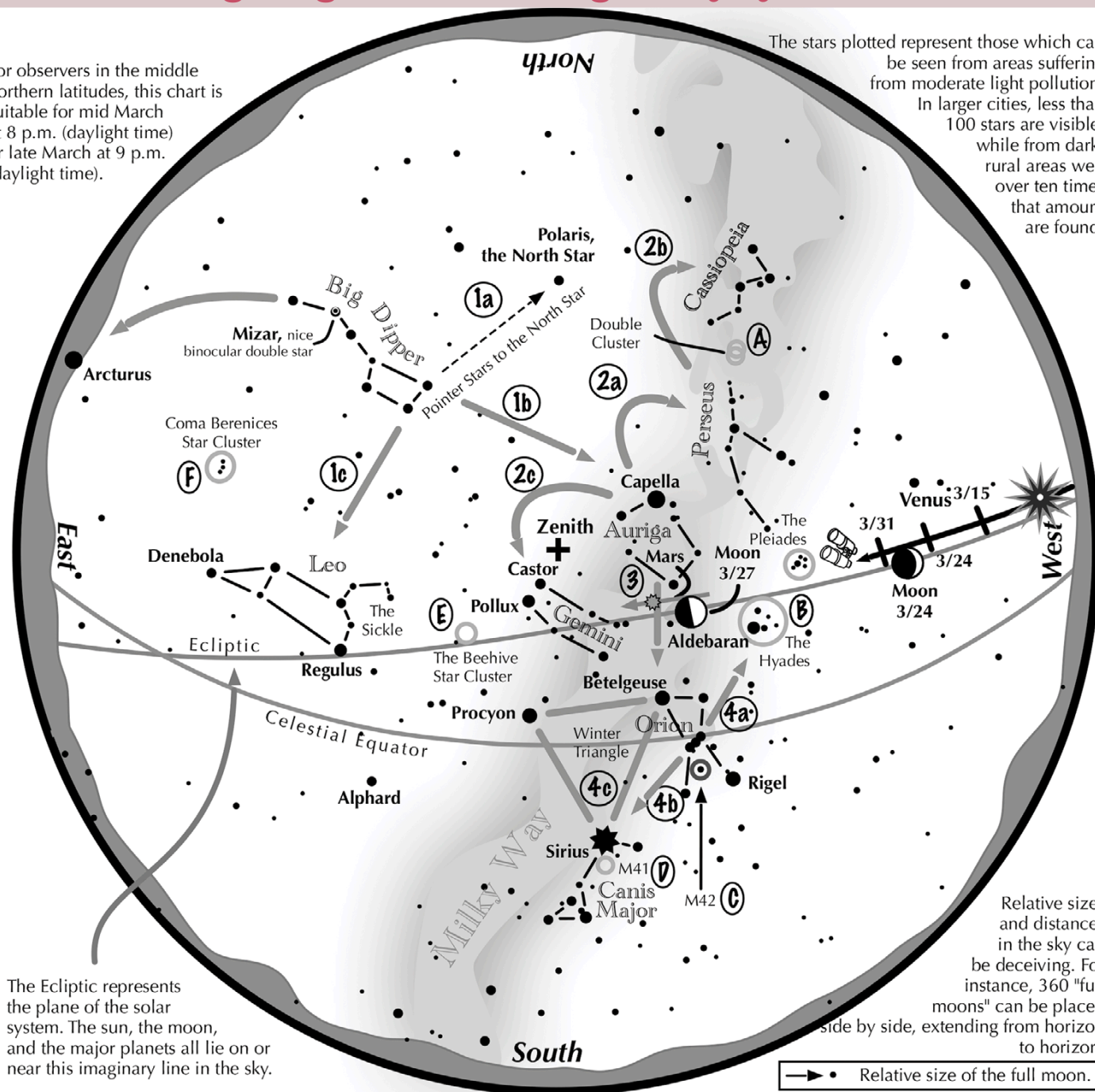


Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	6:09 am	22h33m10.2s	+51°07'24"	Lacerta	10.0	2.0
Mar 7	6:02am	22h53m34.5s	+49°23'59"	Lacerta	10.1	1.9
Mar 13	5:51 am	23h11m00.2s	+47°48'45"	Andromeda	10.2	1.9
Mar 19	5:41 am	23h26m05.3s	+46°22'25"	Andromeda	10.3	1.8
Mar 25	5:31 am	23h39m17.2s	+45°04'55"	Andromeda	10.4	1.7
Mar 31	5:20 am	23h50m56.4s	+43°55'38"	Andromeda	10.5	1.7

Navigating the March Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for mid March at 8 p.m. (daylight time) or late March at 9 p.m. (daylight time).

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the March night sky: Simply start with what you know or with what you can easily find.

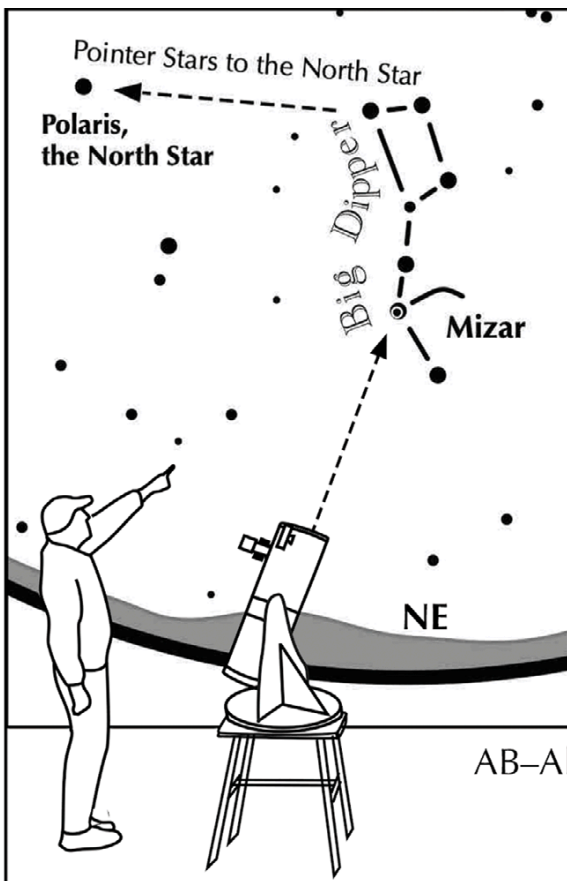
- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star. Its top bowl stars point west to Capella in Auriga, nearly overhead. Leo reclines below the Dipper's bowl.
- 2 From Capella jump northwestward along the Milky Way to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius. It is a member of the Winter Triangle.

Binocular Highlights

A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** M42 in Orion is a star forming nebula. **D:** Look south of Sirius for the star cluster M41. **E:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **F:** Look high in the east for the loose star cluster of Coma Berenices.



Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.



Other Suns: Mizar



How to find Mizar on a March evening

Look northeast toward the Big Dipper. The second star from the end of the Dipper's handle is Mizar. The 4th magnitude Alcor is immediately next to it.

Suggested magnification: >40x
Suggested aperture: >3 inches

Mizar

A-B separation: 14 sec

A magnitude: 2.2

B magnitude: 3.9

Position Angle: 153 °

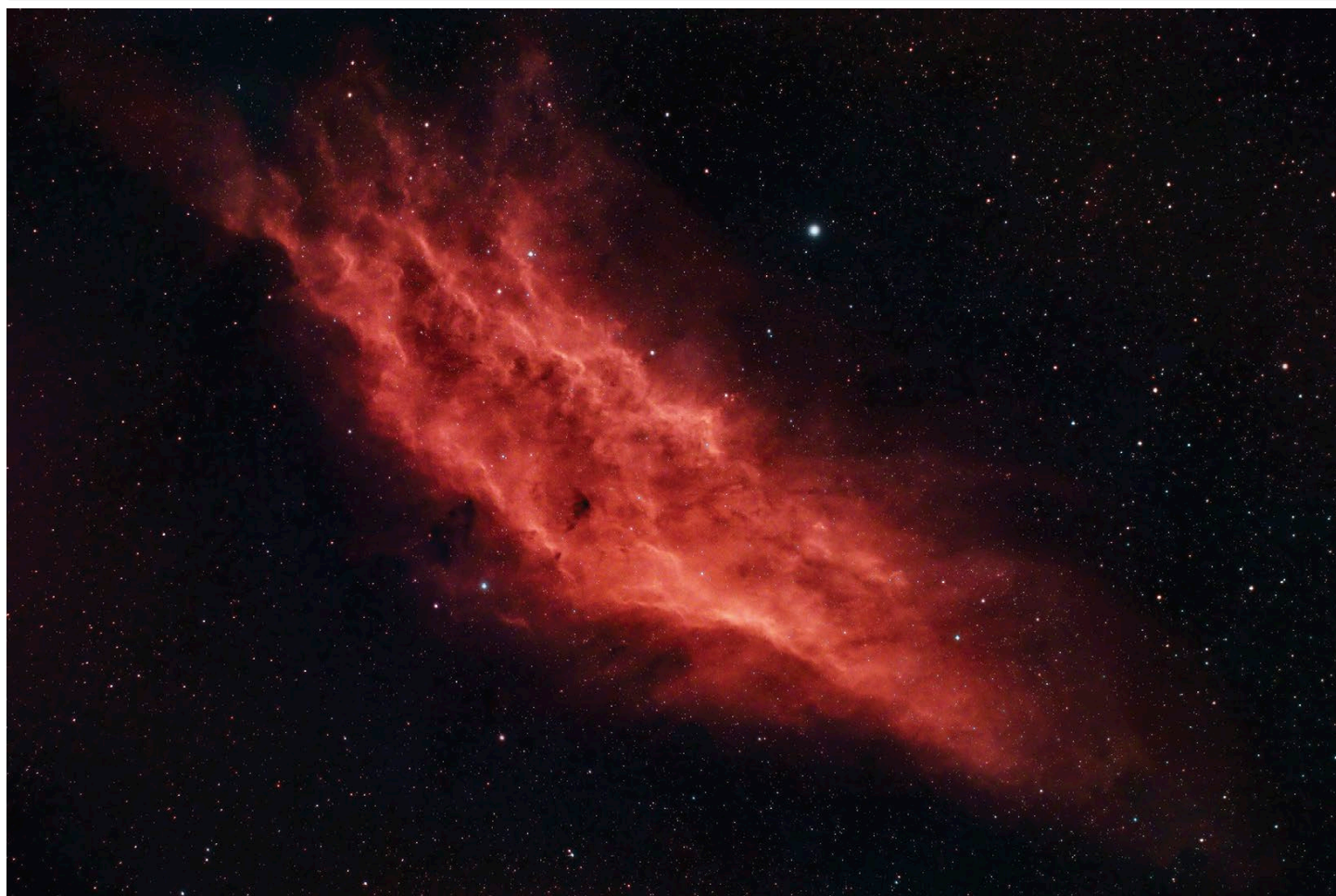
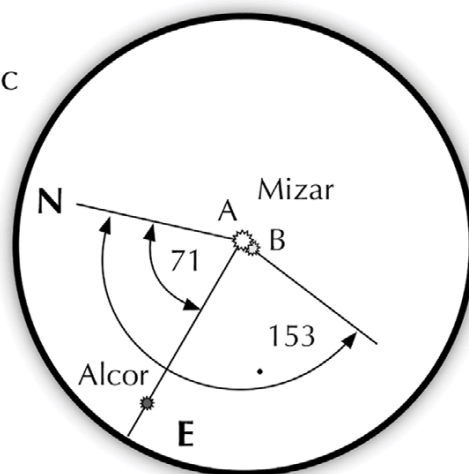
A color: white

B color: pale green?

AB-Alcor separation: 11 min

Alcor: 4.0

PA: 71°



NGC 1499, California Nebula by Rolando Garcia. 2.5 hours of 5 min. exposures with Stellarvue 70T with 0.8 reducer

Secretary Notes Thursday, Feb. 16, 2023

by Eileen Hall-McKim

I. Introduction

LAS President, Vern Raben opened the meeting and introduced the officers, board members and appointed positions.

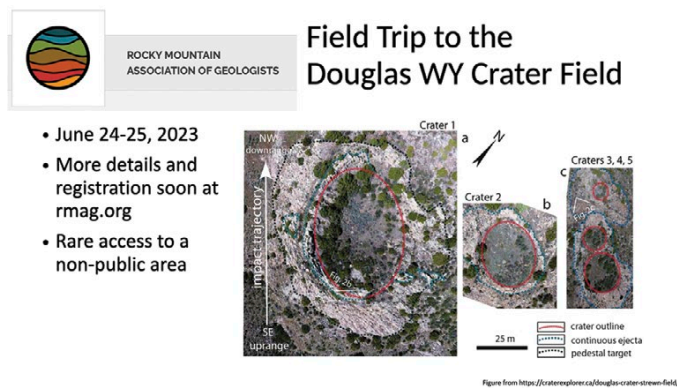
22 people attended by Zoom.

II. Guest presentation: Dr. Ben Burke

Dr. Burke is a geochemist and geologist, an affiliate professor at Colorado School of Mines, collaborating professor at Iowa State and also an amateur astronomer and member of the Denver Astronomical Society. He begins his talk with an announcement of invitation for LAS members to join a field trip to the Douglas, Wyoming Crater Field with the Rocky Mountain Association of Geologists.

This is a rare access event to a non-public area, to see impact craters not accessible to public.

- June 24-25, 2023
- More details and registration soon at rmag.org



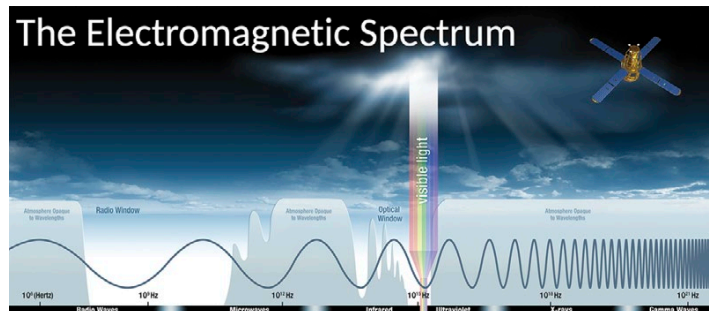
Spectroscopy: Using Light to Determine Star and Planetary Compositions by Dr. Ben Burke

What is Spectroscopy?

Spectroscopy is the science of using transmitted and reflected light to infer the composition, temperature, mass, and luminosity of an object.

In astronomy spectroscopy is the technique of splitting light (or more precisely electromagnetic radiation) into its constituent wavelengths, making interpretations based on that

- In chemistry and physics spectroscopy is the study of matter using electromagnetic radiation (light)



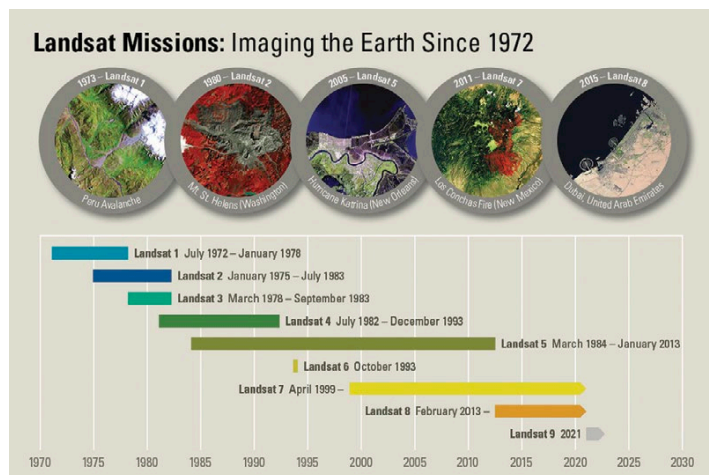
NASA: https://science.nasa.gov/ems/01_intro from <https://smd-prod.s3.amazonaws.com/science-red/s3fs-public/thumbnails/image/EMS-Introduction.jpeg>

Emitted Light, Absorbed Light, & Reflection

Emitted such as pixels (light emitting diodes) of your screen emit a green light.

Absorbed light and Reflected light work together, sunlight absorbs every color, but some colors we see such as green in plant life are reflected.

Spectroscopy in Images: Multi-spectral Data from Landsat

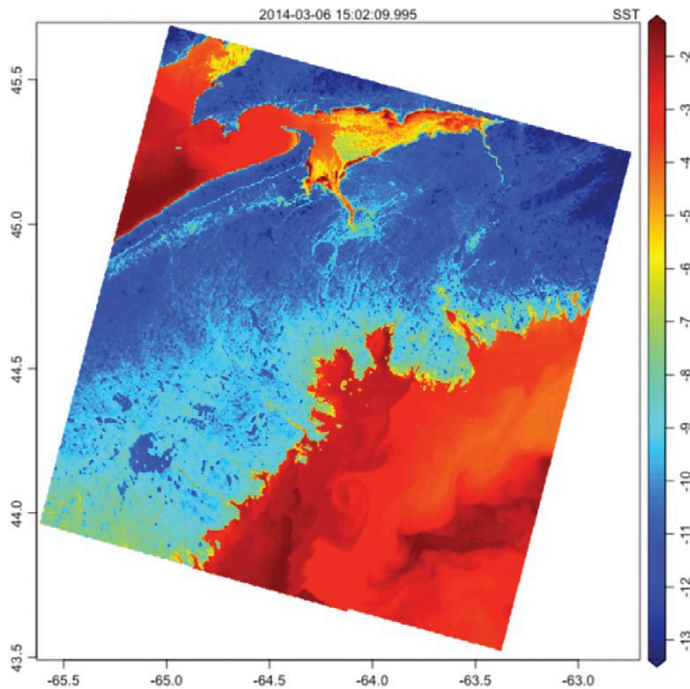


Near real time Landsat 7, 8, & 9 data at <https://earthnow.usgs.gov/observer/>

Landsat Image data set is available to all of us from 1972-2021.

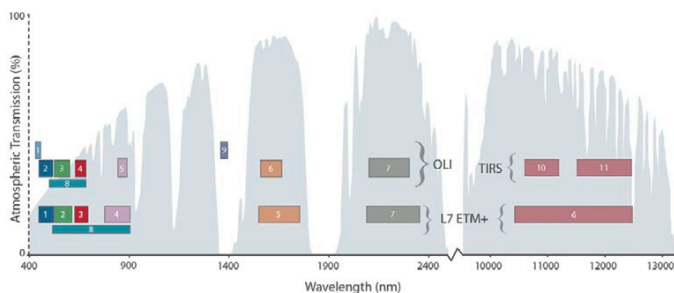
Number of different channels measuring different wavelength <https://earthnow.usgs.gov/observer/>

Thermal Absorption and Reflection



- Absorption and reflection also happens outside the visible spectrum
- The image here shows a blue land surface (Nova Scotia) and warmer ocean waters surrounding it (Color scale in degrees Celsius)

Not all light makes it in or out: Atmospheric Absorption

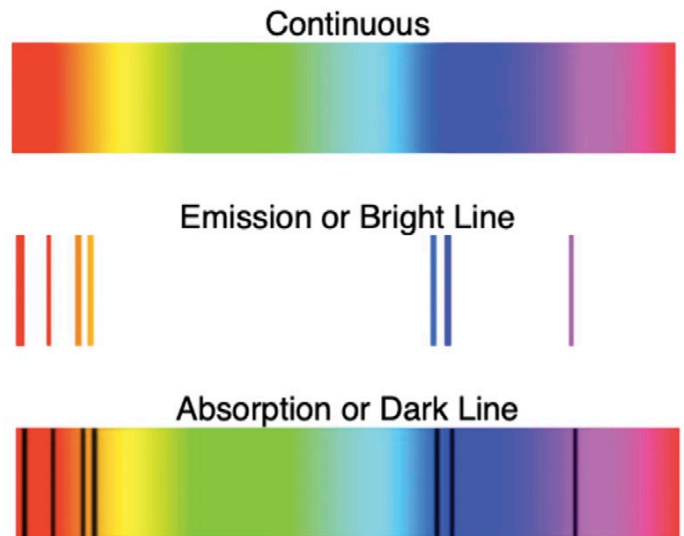


- Some light affected by atmospheric absorption, as seen as big dips on plot
- When looking at spectra of planets something to be mindful of, when looking through an earth based telescope, not usually an issue when looking at star spectra

Emissions Spectra

- What we would see using a spectral attachment to our telescopes and using software
- When gas is heated very hot, different elements have unique emissions, such as lighter ones we are most interested in: Hydrogen, Helium and Carbon

Putting it all together: Spectral Types

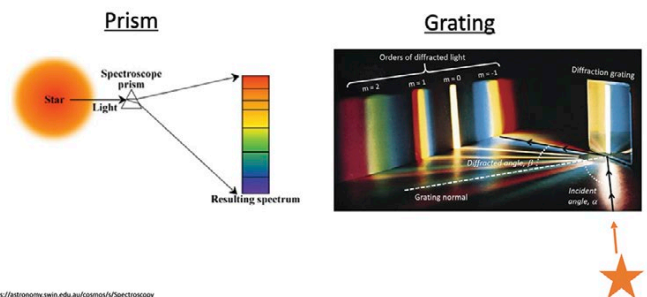


<https://imagine.gsfc.nasa.gov/science/toolbox/spectral1.html>

- Three types of spectra: Continuous, Emission or Bright Line and Absorption or Dark Line
- These are the three kinds of spectra that we can deal with as amateur astronomers

Spectroscopy Methods: Prisms & Grates

Spectroscopy Methods: Prisms & Grates



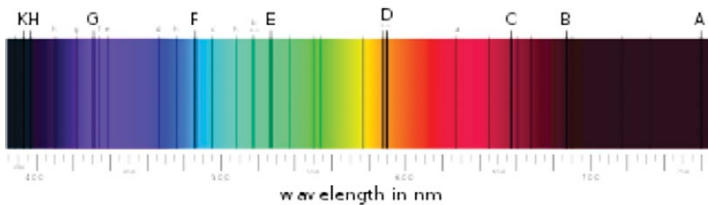
- Prism- simplest form of splitting light, where science of spectroscopy originated from
- Use of Gratings- what a lot of astronomers use, are commercially available

History of Astronomic Spectroscopy: Sunlight

- Started with study of sunlight, by many European scientists in Italy, Germany and France. Worked on understanding the nature of light and what it really is.
- 17th century: Several scientists including Kircher (1646), Marci (1648), Boyle (1664), Grimaldi (1665) and Newton (1666-1672) worked on the nature of light
- 19th century: Joseph von Fraunhofer (1815) – discovered solar absorption lines, known now as the

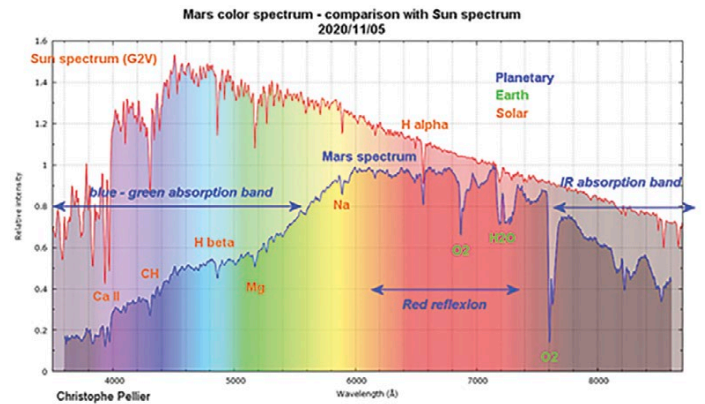
Fraunhofer lines

- quantified wavelength scale
- early example of quantification of the wavelength scale within physical sciences, by comparison, Geology at that time a descriptive science but not very quantifying
- General realization that different elements (like salts) when burned, emit different spectra; was able to be quantified in lab conditions



History of Astronomic Spectroscopy: To the Stars

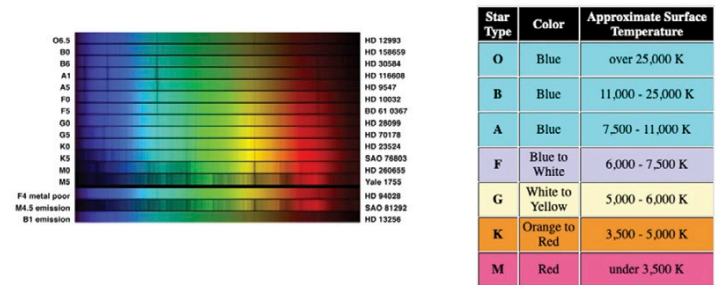
- Husband and wife team of England, William and Margaret Huggins discovered:
 - Stars are composed of the same elements as those present on Earth (1861)
 - Determined the axial speed of Sirius by the red shift of the spectra (1868)
 - First to collect spectrum of a planetary nebula (1864)
- The Huggins also discovered X-Rays and X-ray Spectroscopy in the late 19th Century



<https://www.cloudynights.com/topic/739859-some-mars-spectra-taken-with-alpy600-colors-of-the-planetfilters-use/>

- A lot of interest in hyper-spectral imagery of the Moon and other 'solar system mining', looking at different spectral profiles of craters on the moon, looking for presence of different minerals on the surface. See Sivakumar, et al. Geo-science Frontiers 8 (2017) 457-465 for more on this
- These are examples of tracing planetary composition from spectra

Example of Star Spectral Types



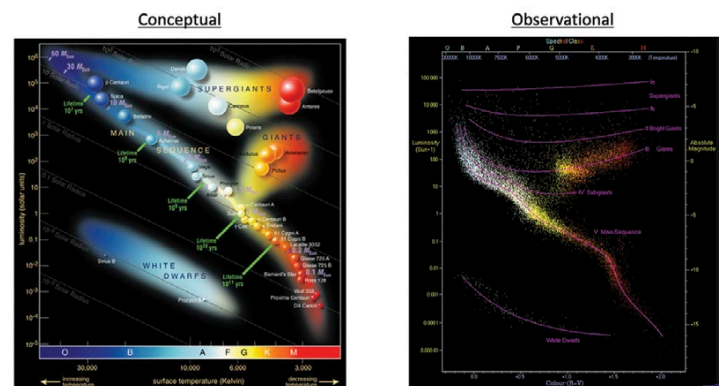
Spectra from Kitt Peak / WIYN 0.9 meter telescope (National Optical Astronomy Observatory via https://www.e-education.psu.edu/astr0801/content/l4_p2.html)

Looking at different spectra of different star types, blue hotter ↑ reds cooler ↓

Planetary vs Stellar Spectroscopy

- What we see as absorbed and reflected back from planets also depends a little bit on the atmospheric chemistry of that planet
- Examples of Mars Planetary Reflectance (Christophe Pellier Book). Information can be inferred from observing planetary spectra. For example, observing Mars over time as weather changing, possibly detect spectra changes, also for Neptune, Uranus: good citizen science research

Star Spectral Types: The H-R Diagram



Universe Today

- X-axis – surface temperature, increasing T (blue) ← → decreasing T (red)
- Stars are characterized by their surface temperature and then by luminosity Y-axis
- One type of star that doesn't plot are white dwarfs, below the main sequence

Spectroscopy for Amateur Astronomers- How to make spectral observations

Dr. Burke describes and shows the results, with an example of Vega, of using a spectroscopic grating and interpretation of software with a small telescope from a suburban location.



spectral grating and software from www.rspec-astro.com

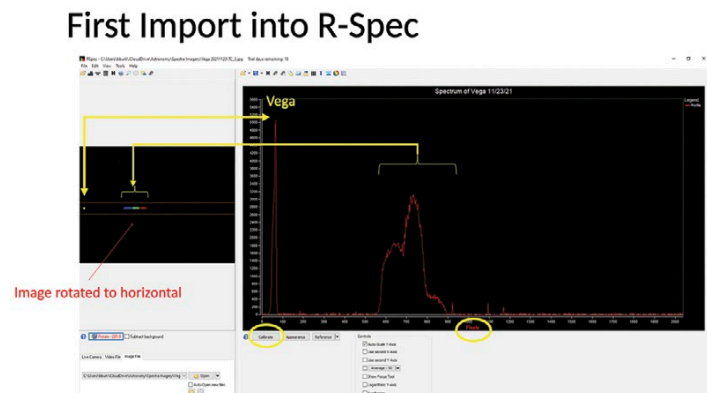


Celestron Powerseeker 127EQ

Necessary items:

- Telescope (not necessarily expensive)
- Spectral grating (~\$195)
- Camera (Basic is fine-example: Orion StarShoot 5)
- Spectral interpretation software R-Spec (30-day free trial, then \$109 lifetime, windows based only) *Key is having this software

Example of Spectrum of Vega

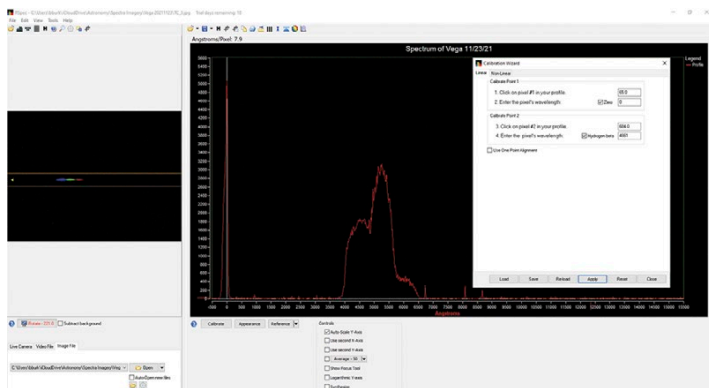


Wikimedia Commons

First views when you have your spectral gratings on and are looking through your camera, may not look like much but when you import into R-Spec, will see different calibration techniques and zoom into different views.

Works well for points of light, whether planets or stars. Software has a library that allows for calibration

We are first looking at a pixel count and relative reflectance, has to be calibrated to wavelength with the software and this is how to go from pixel counts to angstroms



Best Practices

- Use a focal reducer on planets to get a “point” of light
- Sharp focus is important
- Correct for instrument response
- Start with Vega- easy Balmer lines!
- Remember emission vs reflection vs absorption (stars vs planets)

For more on this, check out:

- www.planetary-astronomy-and-imaging.com/en/ - lots of good content on planetary spectra by Christophe Pellier
- www.rspec-astro.com – A resource for beginner spectroscopists

Concluding Thoughts

- Amateur spectroscopy is a rewarding way to take your observing from pretty views to starting to quantify the universe around you
- Can be done with low magnification and with or without tracking
- No special computing power needed- an average, modern home computer (windows) will run the necessary software
- Have fun and happy observing!

III. Presentation on Upcoming Annular and Total Solar Eclipses by Vern Raben

Two rare solar eclipses coming up within roughly the next year will cross large areas of the US and Mexico

October 14, 2023 – Annular Solar Eclipse, long path of annularity crosses the US -northwestern to southwestern, starting in Oregon and passes through Texas. The nearest best viewing for us likely in Utah, but also New Mexico, Albuquerque, Farmington, Santa Fe in or near the path of annularity, but with higher average cloud cover. Also known as the ‘Ring of Fire’ an annular solar eclipse occurs when the new moon passes between Sun & Earth when at its furthest point (apogee) from Earth, creating a spectacular fiery ring. In Utah, the Annularity begins at 9:10 am, mid 10:31 and ends at 12:01pm, with 4m47s of annularity.

Average Cloud cover for Utah at this time is very low at 16% making it an ideal place for a chance to avoid cloudiness during the event. The weather in Utah should also be ideal in October, though possibly quite hot for some folks, and expect large crowds and traffic issues. Lodging and camping are extremely limited for such large crowds as are expected in this rugged and partially remote area. See maps and chart times for more details of Utah and other areas.

April 8th 2024 In contrast, a total solar eclipse occurs when the new moon passes between Sun & Earth when at its closest point to Earth (perigee), as in the more recent 2017 eclipse, with minutes of totality darkness occurring. The best viewing for this event with cloud cover considered will be Mexico or Texas. Cloud cover for this time of year for Austin, Dallas areas is about 52%, but much higher when going to northeastern locations.

LAS/EXECS Committee has discussed possibility of planning group meetings for these events. Preliminary planning is in process of discussion of feasibility. Vern will be doing more updates on this to see if there is interest in trying to meet as a group as the large LAS group did in Nebraska in 2017. This would most likely be in the Austin, Texas area, still a 14hr drive for us here on the Front Range, so not a trivial event.

Bottom line for attending either of these events is expect large crowds and plan ahead!

IV. Business Meeting

LAS Treasurer's Financial Report by Bruce Lamoreaux 2/16/2023

Main Checking Account	\$10,325.00
2-Year Savings Account	\$8,135.00
Telescope Fund	\$1,100.00
Petty Cash	\$50.00
Total Assets	\$19,610.00 (up \$ 850.00 from last report)
Active Membership:	113
Student Membership:	4
Total	117
(13 Renewals Overdue)	

V. New or Old Business

Website move from Wild Apricot to Squarespace has been an ongoing discussion of LAS executive committee

- Renewal with Wild Apricot is coming up in May about \$1224 for two years
- Wild Apricot store site is terrible
- Interface is extremely limited
- LAS/Execs have ok'd spending the money to set up a Squarespace account as of Feb 16 and work has begun to move off of Wild Apricot to Squarespace

Bruce Lamoreaux (ALCOR) Astronomical League Program Coordinator - in continuing interest of finding suitable meeting sites for LAS Visual Observers, is checking out Horsetooth Reservoir, west of Ft. Collins and Carter Lake, southwest of Loveland, both Larimer County, as possible sites. There is a \$10.00 fee at Horsetooth Reservoir for Larimer County Parks 24hr pass. Also discussed possibility of extending Boulder Open Space Rabbit Mountain Program which currently runs April-October, to earlier March or later November.

Bill Tschumy Outreach Coordinator Updates:

- A couple schools have requested star parties, yet to be scheduled in the future, will keep updated, will need club member telescope volunteers.
- We have received notification from RMNP that they are starting up their monthly star parties at Upper Beaver Meadows - June, July and August- plan to have main night plus back up night, for anyone wanting to participate, Bill will be sending out email on that to get signed up on list.
- Boulder County Open Space Rabbit Mountain Star

Parties will be starting up April 21st continuing monthly through October.





Hunter Morrison will lead a presentation followed by a star party at Sandstone Ranch and Visitor's Center on April 15th. The topic of presentation:

"The Life Cycle of Stars; star birth, life cycle, stellar nucleus synthesis, star death"

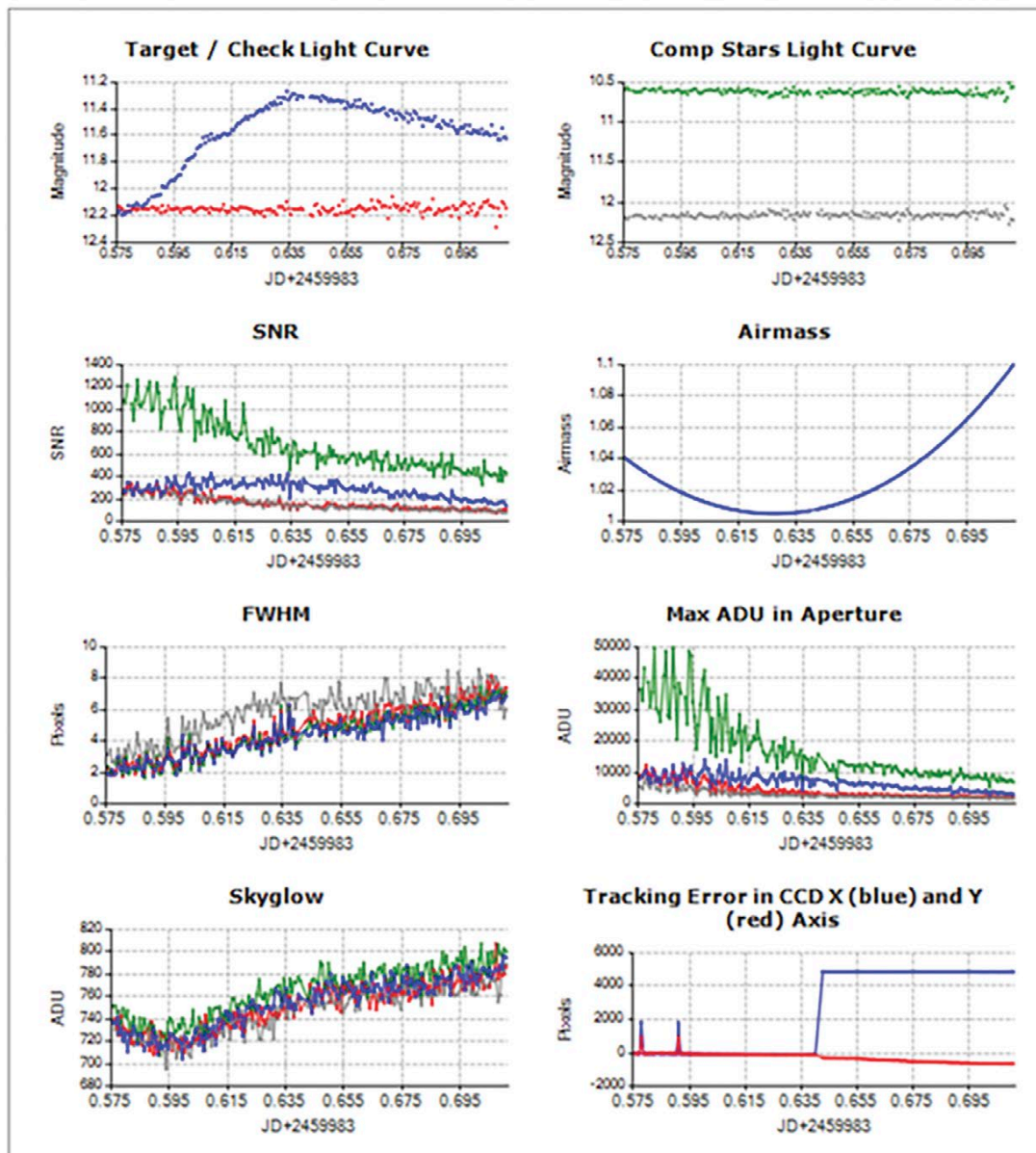
More updates coming for member telescope volunteers for star party viewing.



"Fossil Footprint Nebula by M. J. Post. A bright nebula known as NGC 1491, LBN 704, and/or SH2-206 This target took just 1 hour each through H and O filters using a RASA telescope. Central dust lanes add character.

Bins: 1		Filter(s): V		Stars to plot: ...		Ensemble: ...		Refresh	
		Filter	Average	Min	Max	Std	Avg. SNR		
Targets									
	BH Aur	V	11.568	11.268	12.193	0.245	291		
Check stars									
	121 (12.135)	V	12.147	12.056	12.284	0.029	171		
Comparison stars									
	105 (10.549)	V	10.620	10.507	10.735	0.030	685		
	122 (12.227)	V	12.156	12.041	12.269	0.030	162		

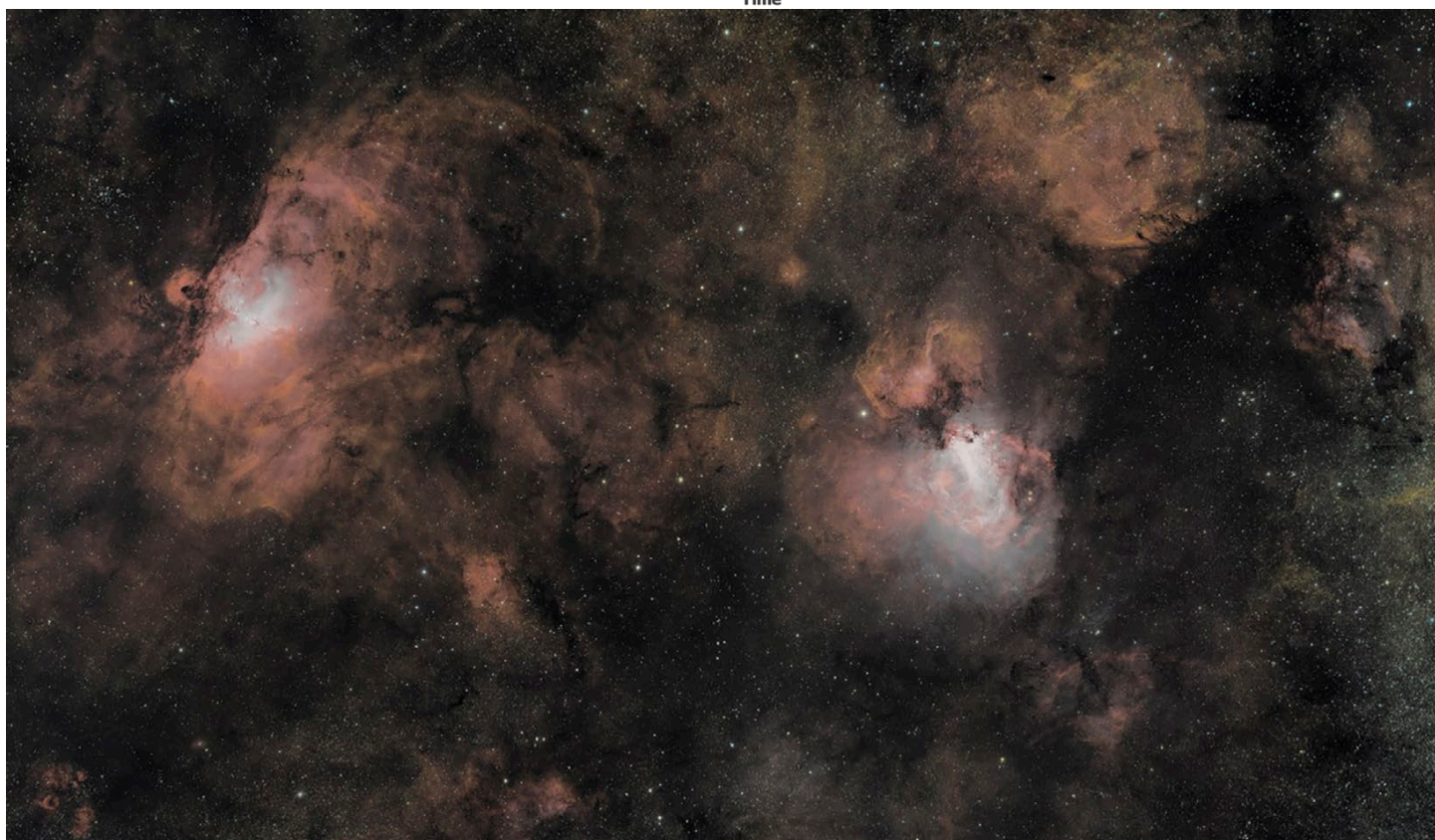
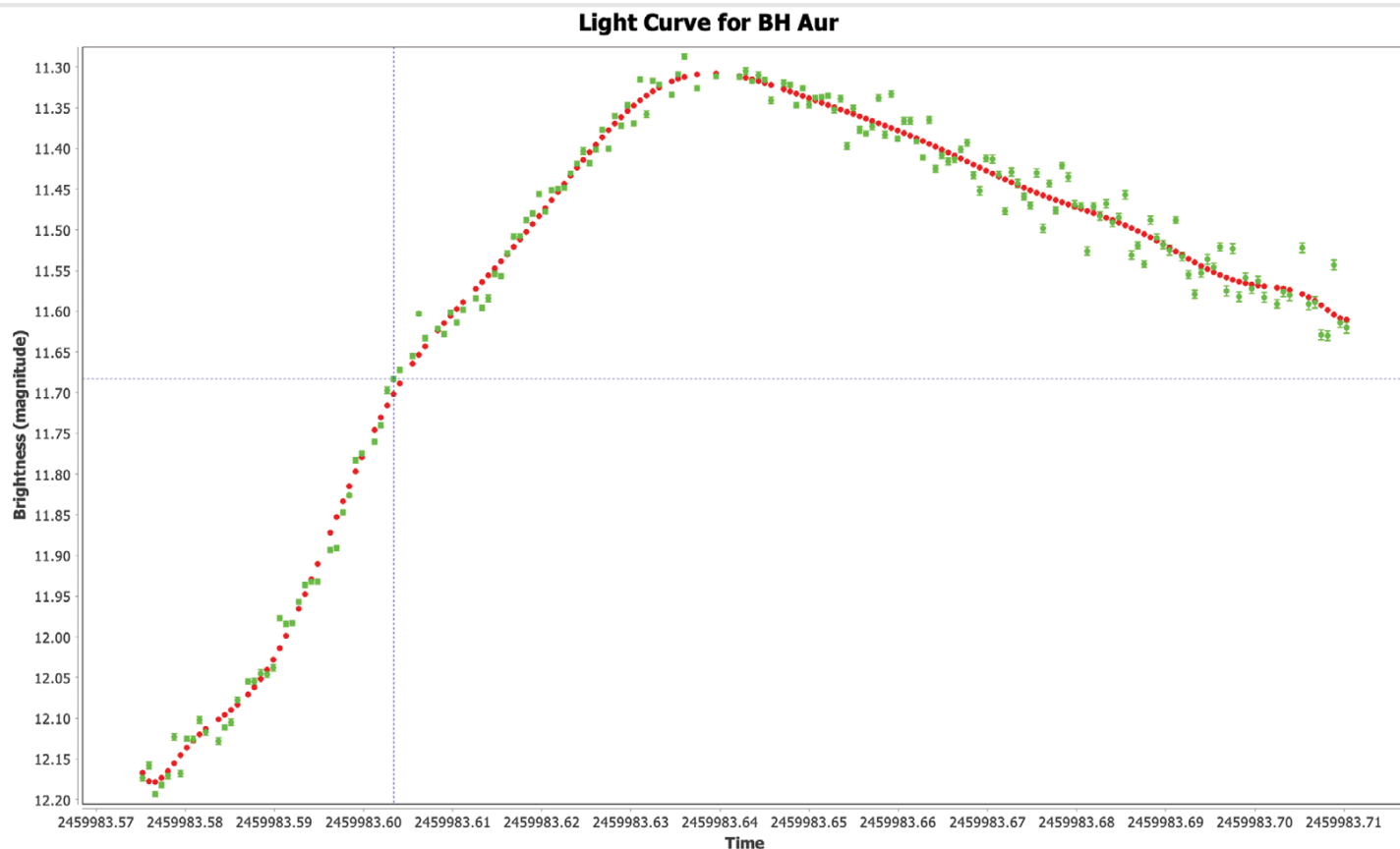
Click charts to view details.



On Feb 7 Bill Tschumy took some measurements on star “BH Aur” for a little over 3 hours taking one 30 sec image per minute. There star were no recent measurements in the AAVSO database and it was predicted to have a peak in the early evening.

This is an RR Lyra type star. RR Lyrae variables have asymmetric light curves (steep ascending branches), periods from 0.3 to 1.0 days, and amplitudes from 0.5 to 2 mag. in V, the photometric green band. BH Aur has a stated range from 11.12 - 12.2 V. As can be seen from the chart below, Bill recorded a minimum magnitude of 12.193 and a max of 11.268 over the 3.1 hour imaging window.

In the charts below, you can see the seeing degrade over the session. His FWHM went from around 2.0 up to 7 at the end. You can also see the rising Moon's affect on the sky glow over the session.



David Elmore reprocessed some images he took last year using Russel Corman's Exterminator processes which cleaned up a number of problems. This is Sh2-45 and Sh2-49, the Eagle and Omega nebulae in narrow band HOO with Sulfur II added as yellow. 6 hours of exposures with a Borg 107FL refractor, Chroma filters, and ASI 6200MM Pro.



Image of Orion by David Elmore from the belt down the sword processed to emphasize nebulae – Flame, Horsehead, Running Man, and Orion. It was re-processed from last year in PixInsight utilizing Russell Corman’s StarXTerminator, NoiseXTerminator, and BlurXTerminator processes. As it is a highly exposed field he used HDRMT. This is narrow-band with H-alpha as red, Oxygen III as teal, and Sulfur II added as a false-color yellow. Borg107FL refractor, Chroma 3nm filters for fast optics, and ASI6200MM Pro. Total exposure time 2-1/2 hours from David’s remote observatory at Dark Sky New Mexico.



Sharpless 301 by David Elmore. The object not far above the southern horizon, close to the brightest star in the sky - Sirius. This image is from DSNM using the RASA scope; it's an HOO rendition. Field of view is about 1.2×0.8 degrees. We're seeing both emissions from hydrogen (red) and reflections from giant O class stars recently born near the middle. Note the central dark dust lanes. From 1.5 hours each through H and O filters on an ASI 6200MM camera.



M 63

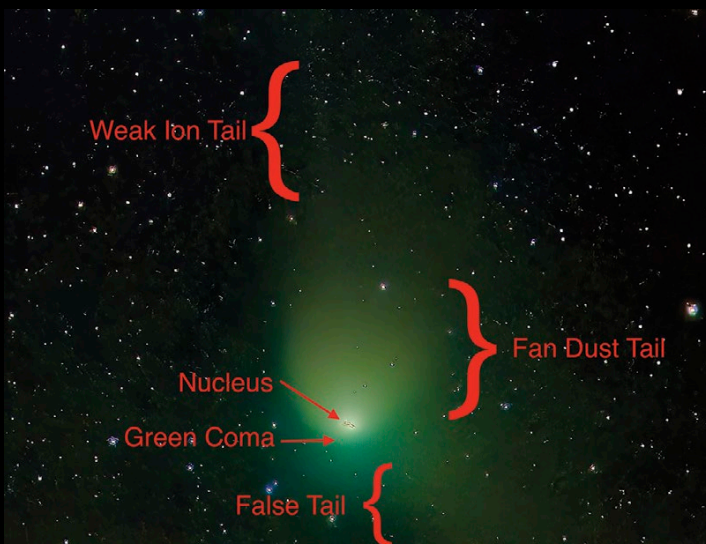
M63 by Gary Garzone on Feb 9 using C 14 Edge at F 7; no filter used.



M3 globular cluster by Gary Garzone on Feb 9 using C 14 Edge at F 7; no filter used.



Comet C/2022 E3 (ZTF) by Jim Elkins. There are three tails to the new “Green Comet”: (1) fan dust tail, (2) ion tail which is 4 degrees long, and (3) the bizarre third anti-tail is made up of the same components as the other tails of the comet but is not a part of it. Rather, it is only an optical illusion caused by Earth as it moves through the orbital plane of comet C/2022 E3 (ZTF). De-noised by Topaz Photo AI, and finally MacOS Photos app. Photo is composed of 29 separate images of 10 seconds with a total exposure of 290 seconds (4.83 minutes) using his Vaonis Vespera smart scope (50 mm, f/4) from last Saturday, Jan. 28, 2023.

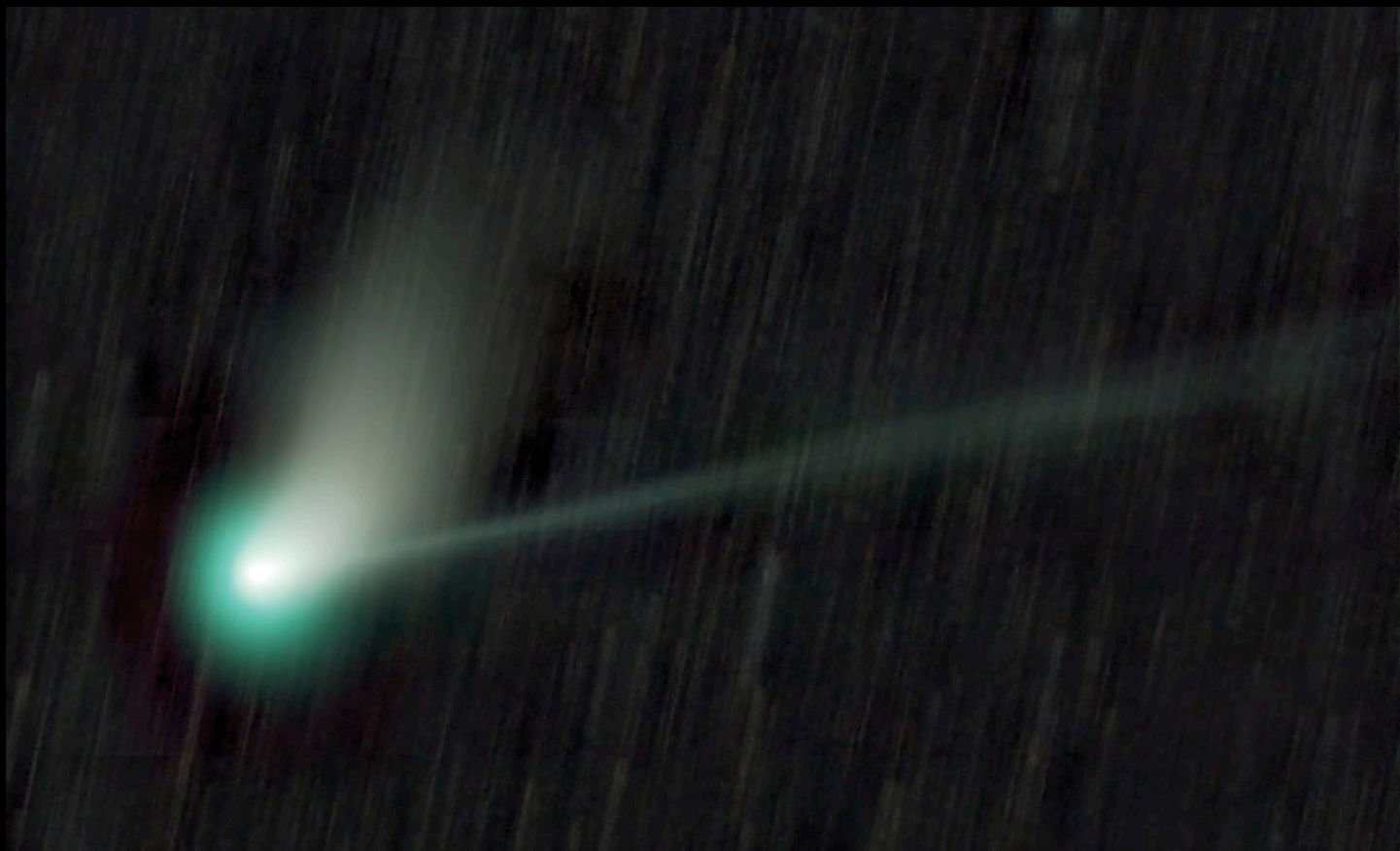




M31 by Jim Elkins. This is the first photo taken with his new Vaonis Vespera smart scope. It has a field of view of $1.6^{\circ} \times 0.9^{\circ}$ but can make mosaics up to 5.8° across. Total exposure was 98 minute with 588 images of FITS and JPEG files. It does the stacking and mosaic automatically with software built into the scope.



The Orion Nebula (M42) by Jim Elkins on Feb. 3. This is a photo stacked with 56 ten second images with a Vaonis Vespera (50 mm APO refractor, f/4) hybrid smart telescope (no eyepiece). Vespera dual band is used for imaging nebula. Affinity Photos 2 with Topaz Photo AI for denoise & sharpening within Brightened with the MacOS Photos App.



Comet C/2022 E3 by Jim Pollock. Image is 41 frames of 120sec each, for use under 1.5 hours of exposure. 14" EdgeHD at f/2 with Hyperstar. L-Pro filter. ZWO 6200mc one-shot-color camera.



M51 by Jim Pollock. This is 21 images of 5 minutes each (just over 1.5 hours of exposure with C/14 at F/2. Used the latest toolbar with BlurXTerminator, Spectral Photo Color Calibration, StarXTerminator (with put-back!), and NoiseExterminator.



“M-45, Pleiades” by Jim Pollock. C14 Edge HD with F/2 Hyperstar. L-Pro filter, ZWO 6200mc one-shot-color camera. Total of 87 frame of 5-minutes for 7 hours of data. Reprocessed with BlurXterminator and Spectral Color Calibration in Pixinsight.



Area near NGC 1499 just south of the M42 complex. This is from 110 minutes of exposure on a OSC camera (ASI 6200MC) using a luminance filter and the PlaneWave CDK14 scope at remote at DSNM. It was a bit windy, so some stars are stretched. The variety of natural colors resulting from emissions and reflections from gas and dust in this treasure are impressive. Field of view is about 0.8 x 0.5 degrees. M. J. Post

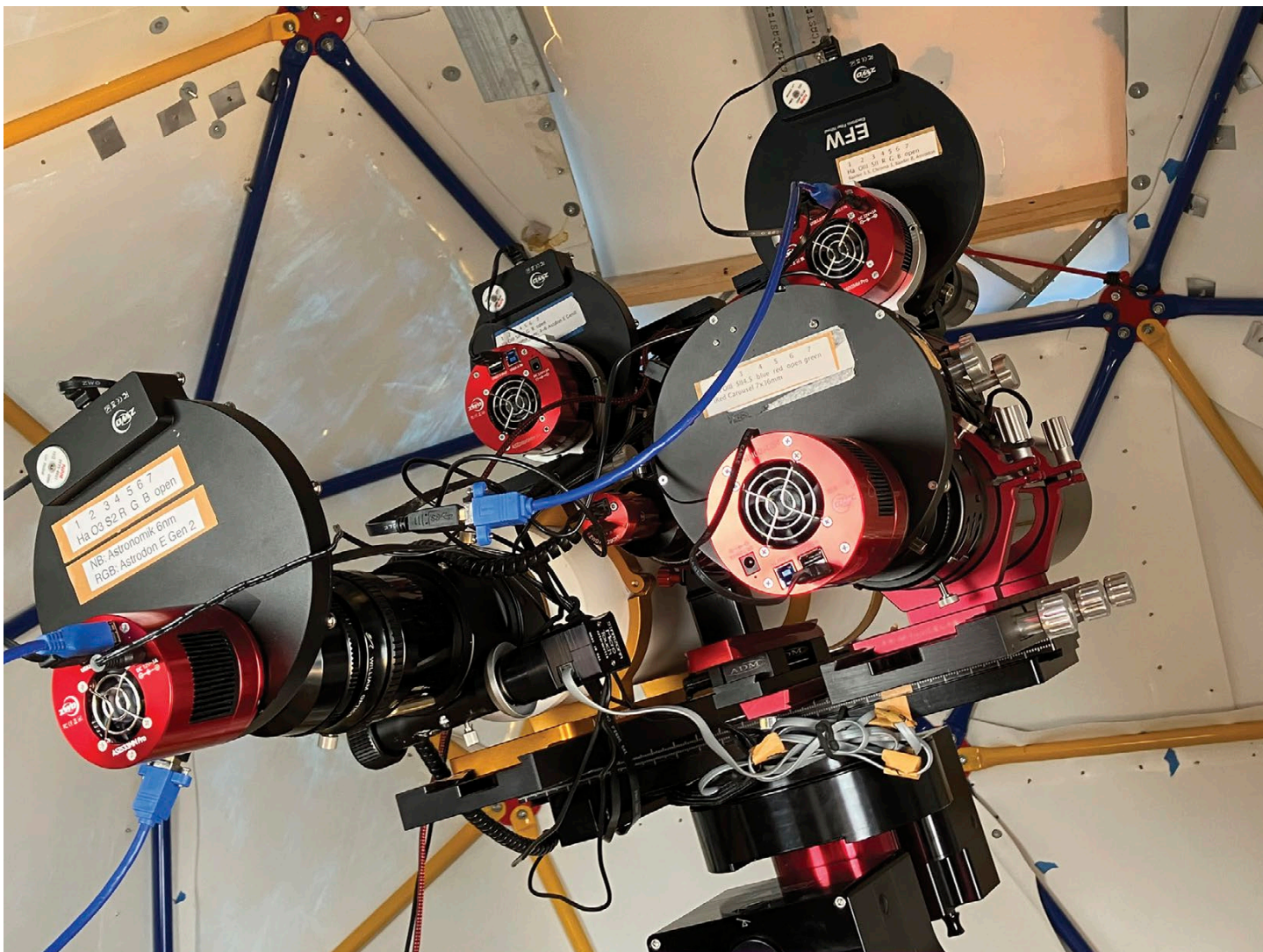


Comet C/2022 E3 (upper, center) was in the same field of view as the planet Mars (lower, right) on Feb. 10. Image by Tally O'Donnell.





**The Christmas Tree cluster on the left (NGC 2264) has the Cone Nebula just below it. The small open cluster top left is NGC2259, but the large cluster bottom center has no designation. The reflection nebula on the right side, starting with the large one and rotating CCW, are IC 2169, NGC 2245, NGC 2247, and IC 446. Image taken with RASA scope and an LRGB combination.
Image taken with RASA scope. 1.5 hours of exposure through each of the four filters using a QHY 600MM camera. Image Credit: M. J. Post**



Stephen Garretson has been re-organizing his equipment with the objective of maximizing imaging time to meet parameters of an imaging project. It's not feasible for him to have a remote setup and he doesn't have open acreage and darker skies. He must make do with his current suburban location. He enjoys his heated control cubby in cold weather. His observatory is literally 5 feet west of his garage so it's a snap to sneak into the house for tea and snacks.

Here are two views of the new arrangement. The view on the page to the right shows a William Optics FLT 132 [$f/7$ reduced 0.8x to run at $f/5.6$]. In the picture above are the ASI 533 MM Pro; MicroTouch focus motor; ZWO EFW with Astronomik 6nm narrow-band filters and Astrodon E Series Gen II RGB filters. Next to the 132 is a Borg 107FL $f/3.9$ 6 APO; Primalucelab Esatto focuser; ASI 2600 MM Pro; Starlight Xpress USB Filter Wheel with a mix of Baader and Chroma narrow-band filters, and Astrodon E Series Gen II RGB filters.

On top are the dual Borg 55FL $f/3.6$ Petzval Astrographs; focus motors...ZWO EAF on B#1, Deep Sky Dad AF3 on B#2; each with an ASI 2600 MM Pro; ZWO EFW with Chroma 3nm narrow-band filters and Astrodon E Series Gen II RGB filters on B#1, ZWO EFW with a mix of Baader and Chroma narrow-band filters, and Astrodon E Series Gen II RGB filters on B#2.

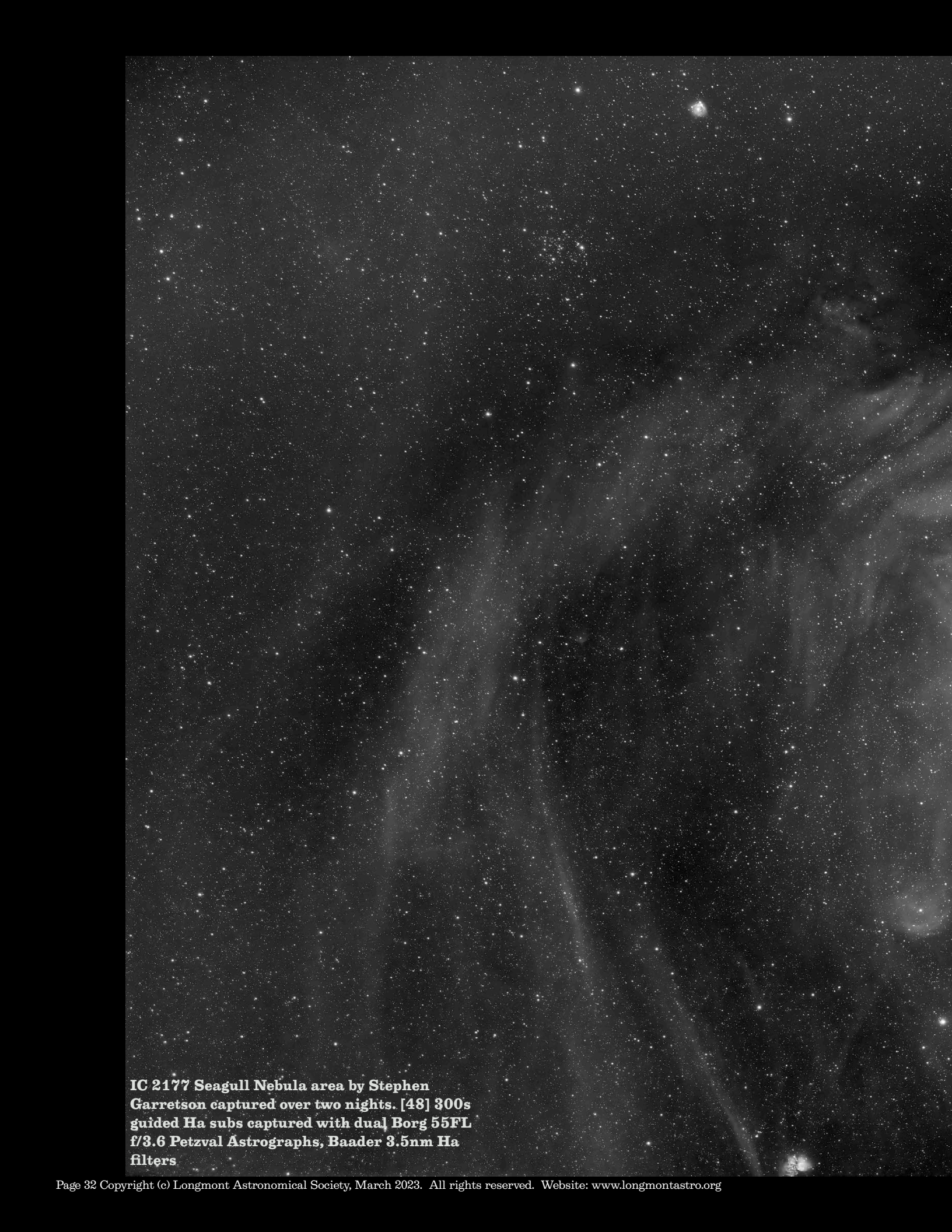
B#2 mounted on an ADM Aimer so he can align the FOVs of the two Borg 55s. William Optics RedCat $f/4.9$ Petzval Astrograph; ASI 290M Mini guide camera. He has employed dual imaging trains before to good advantage [WO Star 71 and RedCat astrographs, and dual 132s]. Since he likes the wider FOVs he elected to double up on the Borg 55s.





Heart, Soul and Double Cluster by Stephen Garretson. A two hour grab of the area using a Sigma Art f/1.8 135 lens stopped to f/3.5 and ASI 2600MM using his new mount configuration.





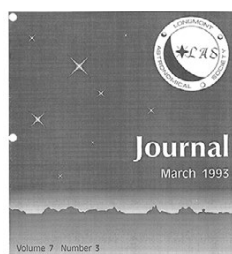
**IC 2177 Seagull Nebula area by Stephen
Garretson captured over two nights. [48] 300s
guided Ha subs captured with dual Borg 55FL
f/3.6 Petzval Astrographs, Baader 3.5nm Ha
filters**





**“IC 434 Horsehead and NGC 2024 Flame Neb-
ulas” by Rolando Garcia. ~2 hours, 3 min subs.
L-enhance filter**

March 1993



President Bob Spohn wrote:

“L.A.S. Messier Observing Program

The weather has been tough on us this winter, but don't fear, March is here. March is the best month for gazing upon M's. This is due to the placement of the Earth, object availability and usually better weather. The March

Messier observing list boasts 10 fabulous galaxies of mixed morphology and 3 excellent globular clusters. Constellations involved this month include Canes Venatici, Leo, Coma Berenices, Virgo and Hydra. Enjoy these gems of the Cosmos. April will zoom in on The Realm of the Galaxies. This area according to Messier includes 14 galaxies in a ten degree area along the borders of Virgo and Coma Berenices. This is truly a treat for ALL.”

FEBRUARY MESSIER OBJECTS

M	NGC	R.A. 2000 DEC.	CONSTELLATION	TYPE
3	5272	13 42.2 +28 23	CANES VENATICI	GLOBULAR CLUSTER
53	5024	13 12.9 +18 10	COMA BERENICES	GLOBULAR CLUSTER
64	4826	12 56.7 +21 41	COMA BERENICES	GALAXY
65	3623	11 18.9 +13 06	LEO	GALAXY
66	3627	11 20.3 +13 00	LEO	GALAXY
95	3351	10 44.0 +11 42	LEO	GALAXY
96	3368	10 46.8 +11 49	LEO	GALAXY
105	3379	10 47.9 +12 35	LEO	GALAXY
49	4472	12 29.8 + 8 00	VIRGO	GALAXY
61	4303	12 21.9 + 4 28	VIRGO	GALAXY
104	4594	12 40.0 -11 37	VIRGO	GALAXY
68	4590	12 39.5 -26 45	HYDRA	GLOBULAR CLUSTER
83	5236	13 37.7 -29 52	HYDRA	GALAXY

day you could really see it, there were over 30 cars in the parking lot. Comet PanStarr, low in the western sky at sunset, ready for viewing or imaging. See some samples on the front cover.

We also had a semi-successful star party of Sandstone last Friday. Sky was marginal, only about 30% of it was somewhat clear to the west. Vern Raben, Mike Fellows, Jim Pollack, Wayne Green and Ken O'Toole brought scopes. Probably 40-50 showed up, in shifts so a long, long, star party.”



Comet PanSTARRS in Feb 2013 by Will Thornburg

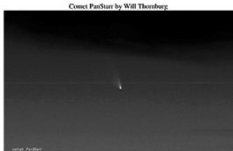


Globular Cluster M3 in Feb 2013 by Gary Garzone

March 2003

No newsletter was published

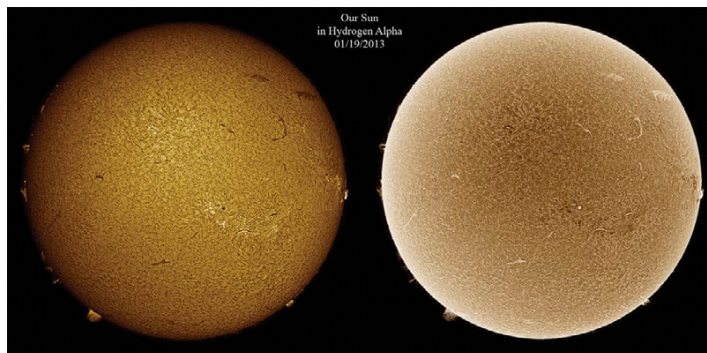
March 2013



President Bill Tschumy wrote:

“Our February meeting was well attended and successful despite being initially locked out of our room. Mike Fellows gave a great Constellation of the Month on Leo and Paul Robinson, our featured speaker, expertly led us through what to expect for the comets C/2011 L4 (PanSTARRS) and C/2012 S1 (ISON) this year.

Speaking of PanSTARRS, we have had some great comet viewing this past week and a half. Our observing site at Sandstone Ranch has gotten lots of use to watch the comet low in the west after sunset. Last week, on the first



Two Suns Views in Feb 2013 by Brian Kimball

LONGMONT ASTRONOMICAL SOCIETY
PO Box 806, LONGMONT, CO
[HTTPS://WWW.LONGMONTASTRO.ORG](https://www.longmontastro.org)

"CALIFORNIA NEBULA" BY JIM ELKINS.

