Longmont Astronomical Society

March 2025

Sh 2-284
by Stephen Garretson

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Next LAS Meeting Thursday March 20

Lucy Mission by Dr. Marc Buie, South West Research Institute in Boulder

The next Longmont Astronomical Society's club meeting will be on Thursday, March 20, 2025, starting at 7:00 pm. Dr. Marc Buie, SWRI in Boulder will give a presentation about the Lucy Mission. The Lucy mission is a NASA space probe launched on October 16, 2021, designed to explore a group of asteroids known as the Trojan asteroids, which share Jupiter's orbit around the Sun. Over its planned 12-year mission, Lucy will conduct flybys of several asteroids to gather data about the early solar system and the formation of planets.

Marc William Buie is an American astronomer and prolific discoverer of minor planets who works at the Southwest Research Institute in Boulder, Colorado in the Space Science Department. Formerly he worked at the Lowell Observatory in Flagstaff, Arizona, and was the Sentinel Space Telescope Mission Scientist for the B612 Foundation, which is dedicated to protecting Earth from asteroid impact events.

The meeting will be at the First Evangelical Lutheran Church, 803 Third Avenue, Longmont, CO 80501. If you cannot attend the in-person meeting, it will be available on Zoom. Marc will present in person. Video of the meeting will be available on the LAS member portal website https://members.longmontastro.org a couple days after the presentation.

Front Cover
Sh 2-284 by Stephen Garretson

SH 2-284 is one of the series of Sharpless HII nebulae that string out from the "bottom" of the Rosette; 284 is the last significant one and the other large one, the first being 280.

Inside the giant HII regions is an open star cluster whose light energises the hydrogen gases. Stellar winds from star cluster are clearing out the center giving it a spherical shape.

Back Cover
CED 30 by M. J. Post

CED 30 is in the Taurus dust cloud. It is also known as LBN 782, and the dark clouds surrounding it are designated Barnard 10. There are no blue stars in this dusty scene, but they must exist somewhere to provide the blue reflections!

From DSNM, 2.5 hours exposure on OSC camera through the CDK14 scope. FOV is about 36x24 arc minutes.

About LAS

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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.

Contents

Planets in March

Mercury

Mercury is visible until about mid month low in the West for about an hour and a half after sunset. It dims from magnitude -0.9 on the 1st to 1.3 on the 14th. It's disk is about 7 arc sec across.

Venus

Venus is very low in the west; it disappears into the evening glare about the 15th. It re-appears in the eastern morning sky about 10 days later. It begins the month at magnitude -4.6 and dims to magnitude -4.3 on the 31st. Its disk increases from 50 arc sec across to 57 arc sec.

Mars

Mars is high overhead in constellation Gemini in the early evening sky. It is rapidly moving farther away from us and dims from -0.3 magnitude to +0.5 magnitude in brightness. The disk shrinks in apparent size from 11 arc sec to 8.3 arc sec across.

Jupiter

Best time to view Jupiter is in the early evening while it is high overhead. It is in constellation Taurus and is about -2.3 magnitude in brightness; the disk is 39 arc sec across as the month begins and 36 arc sec at month end. Best times to view the Great Red Spot as it crosses the middle of the planet this month are:

- Mar 1 at 6:30 pm alt 72°
- Mar 3 at 8:09 pm alt 58°
- Mar 8 at 7:19 pm alt 63°
- Mar 10 at 9:58 pm alt 44°
- Mar 12 at 11:37 pm alt 24°
- Mar 13 at 7:29 pm alt 68°
- Mar 15 at 9:08 pm alt 51°
- Mar 17 at 10:47 pm alt 30°
- Mar 20 at 8:18 pm alt 57°
- Mar 22 at 9:57 pm alt 37°
- Mar 27 at 9:07 pm alt 43°
- Mar 29 at 10:47 pm alt 23°

Saturn

Saturn is not visible this month. It will re-appear in the morning sky in early May.

Uranus

Uranus is visible in the early evening western sky in constellation Aries until Mar 3 when it moves into constellation Taurus. It is magnitude 5.8 in brightness and the disk is 3.5 arc sec across.

Neptune

Neptune is not visible this month. It re-appears in the morning sky in early June.

Lunar Phases in March

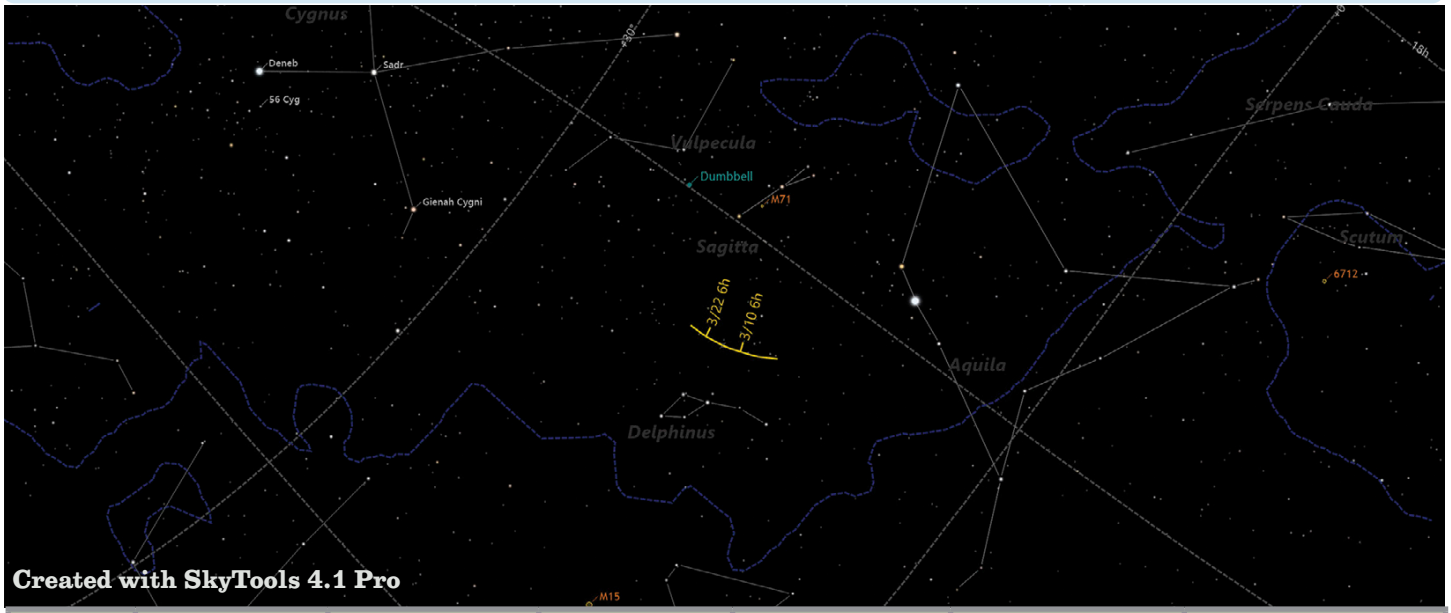
- First Quarter Mar 6 at 9:33 am
- Full Moon Mar 14 at 12:56 am
- Third Quarter Moon on Mar 22 at 5:31 am
- New Moon on Mar 29 at 4:59 am

Total lunar eclipse about 1 am on March 14! See details on page 7.

Showpiece Objects in March

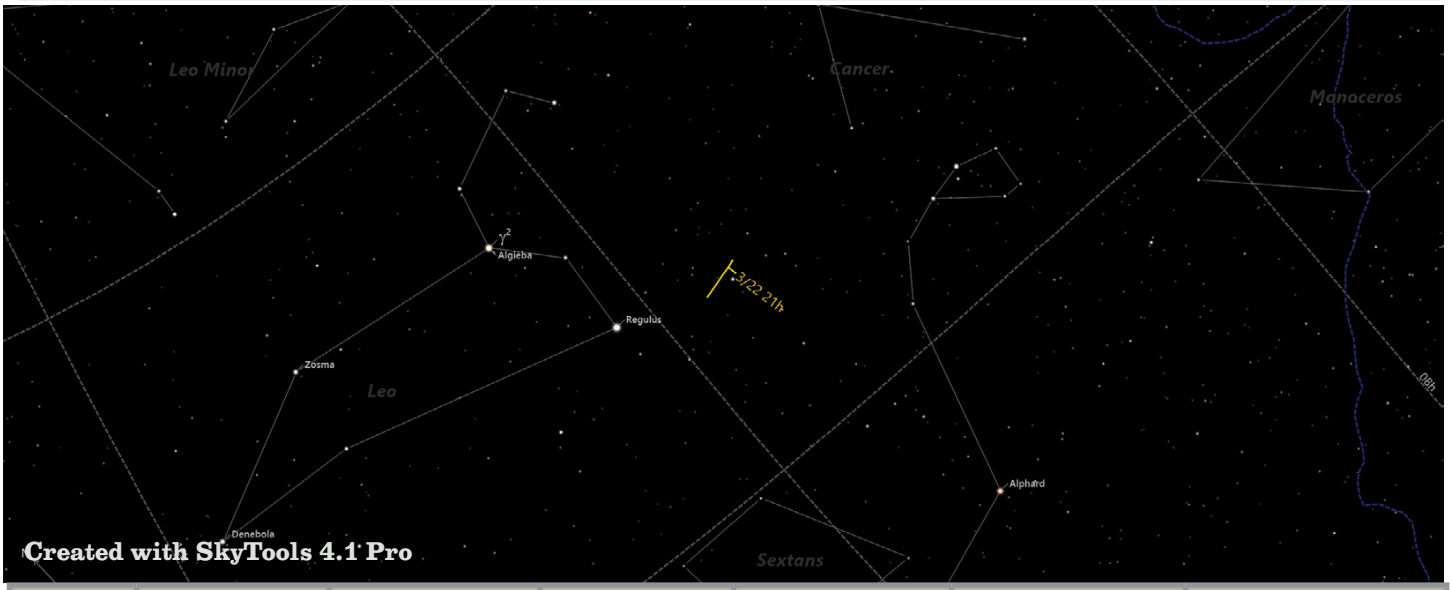
- Abel 31 planetary Nebula in Cnc, mag 12.2
- M44, "Beehive" open cluster in Cnc, mag 3.4
- M81 "Bode's Galaxy" galaxy in UMa, mag 7.8
- M82 "Cigar Galaxy" galaxy in UMa, mag 9.0
- NGC 2264 "Cone Nebula" nebula in Mon
- M1 "Crab Nebula" nebula in Tai, mag 8.4
- NGC 2371 "Gemini Nebula" planetary nebula in Gem, mag 11.2
- G2024.1+04.7 planetary nebula in Mon, mag 12.5
- M35 open cluster in Gem, mag 5.2
- M37 open cluster in Aur, mag 5.9
- M38 open cluster in Aur, mag 5.9
- M47 open cluster in Pup, mag 4.4
- M48 open cluster in Hya, mag 5.3
- M109 galaxy in UMa, mag 10.5
- Abel 21 "Medusa Nebula" planetary nebula in Gemini, mag 11.3
- NGC 2403 galaxy in Cam mag 11.3
- NGC 2904 galaxy in Leo
- M42 "Orion Nebula" nebula in Orion, mag 4
- M97 "Owl Nebula" planetary nebula in UMa, mag 9.7
- M45 "Pleiades" open cluster in Tau, mag 1.2
- NGC 2237 "Rosette Nebula" nebula in Mon, mag 9.0
- NGC 3115 "Spindle Galaxy" galaxy in Sex, mag 10.0
- NGC 2359 "Thor's Helmet" nebula in CMa
- NGC 2683 "UFO Galaxy" galaxy in Lyn, mag 10

Comet C/2023 A3 (Tsuchinshan-ATLAS)



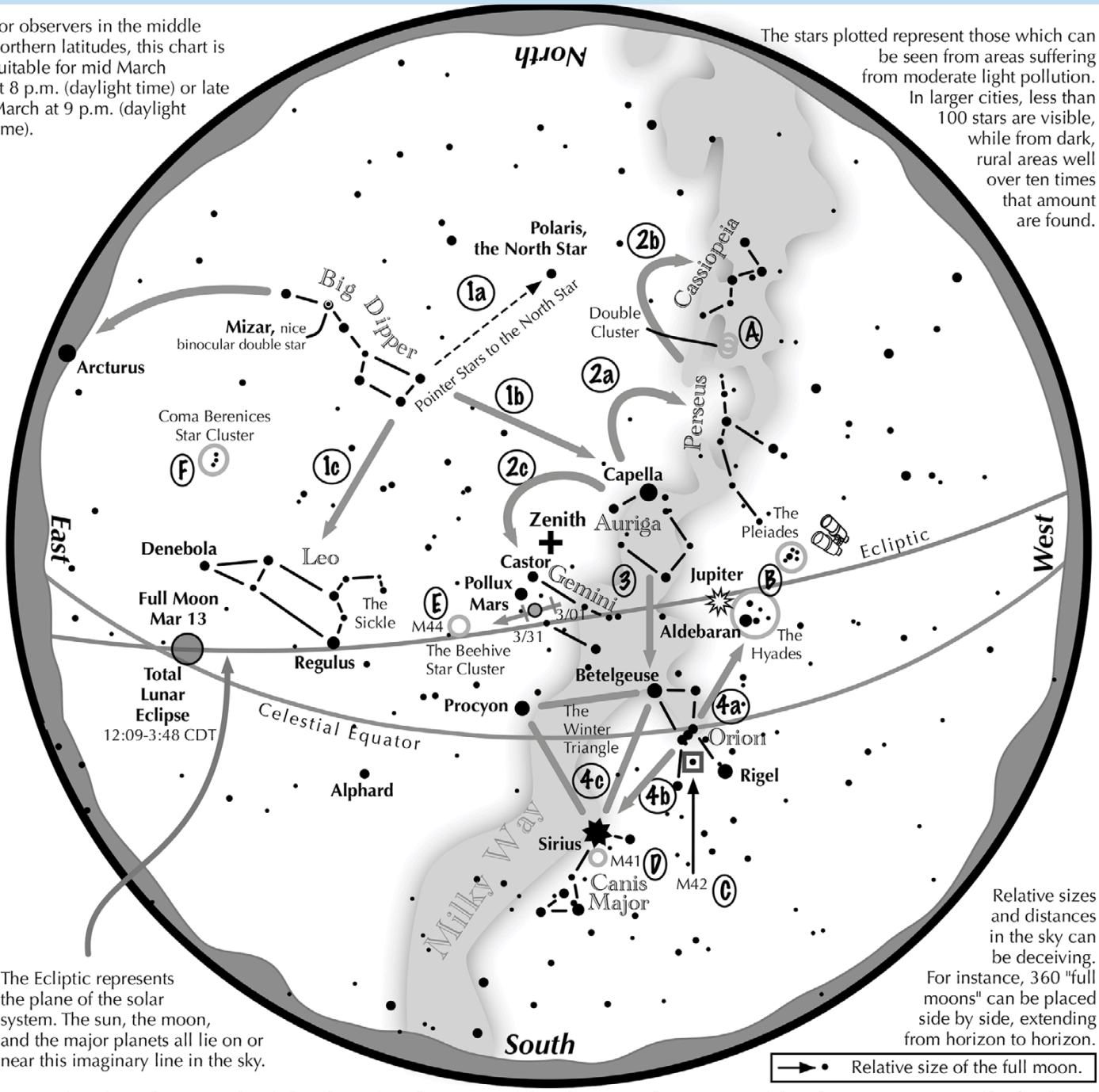
Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	5:15 am	20h22m35.4s	+13°43'17"	Delphinus	Note: SkyTools predicts magnitude 6.3 and a 1.3 arc min coma. This is probably a glitch as other websites predict magnitude 12 including the SkyTools website SkyHound.com!	
Mar 8	6:03 am	20h24m45.3s	+14°50'18"	Delphinus		
Mar 15	5:52 am	20h26m15.4s	+15°59'53"	Delphinus		
Mar 22	5:39 am	20h27m02.4s	+17°11'42"	Delphinus		
Mar 31	5:21 am	20h26m52.9s	+18°46'35"	Delphinus	6.5	1.3

Comet 29P/Schwassmann-Wachmann



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	11:08 pm	09h49m11.6s	+09°57'49"	Leo	11.5	3.6
Mar 8	10:29 pm	09h46m19.1s	+10°09'10"	Leo	11.5	3.6
Mar 15	8:47 pm	09h43m45.8s	+10°19'19"	Leo	11.5	3.5
Mar 22	10:38 pm	09h41m30.3s	+10°28'18"	Leo	11.5	3.5
Mar 31	10:01 pm	09h39m16.1s	+10°37'07"	Leo	11.6	3.4

Navigating the mid-March Night Sky by John Goss



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

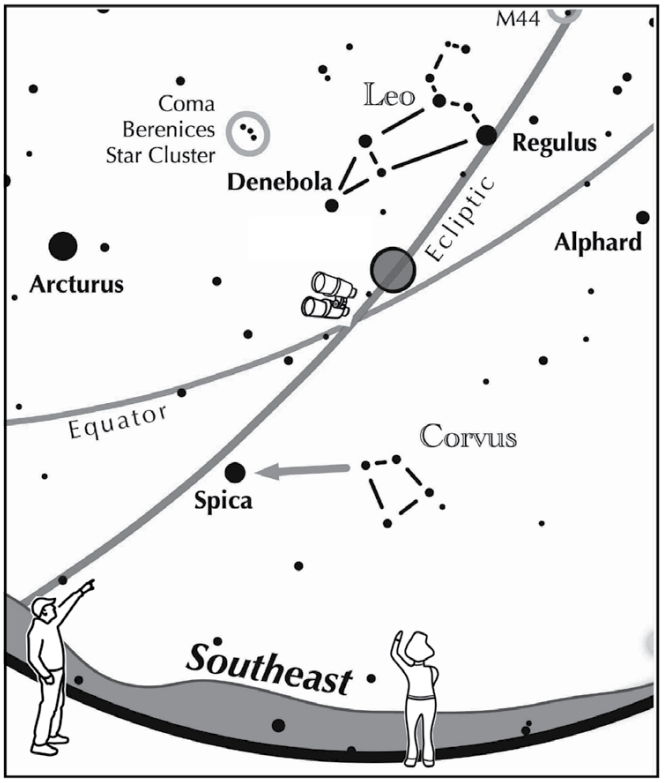
1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star. Its top bowl stars point west to Capella in Auriga, nearly overhead. Leo reclines below the Dipper's bowl.
2. From Capella jump northwestward along the Milky Way to Perseus, then to 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

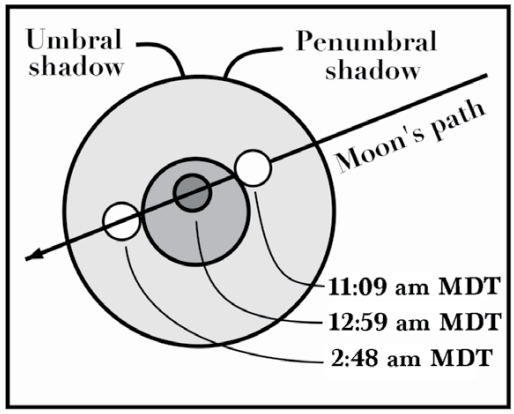
A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** M42 in Orion is a star forming nebula. **D:** Look south of Sirius for the star cluster M41. **E:** M44, a star cluster barely visible to the 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; duplication is allowed and encouraged for all free distribution.*

If you can observe only one celestial event in the evening this March, see this one.



View to the southeast on March 14 at 12:00 am MDT

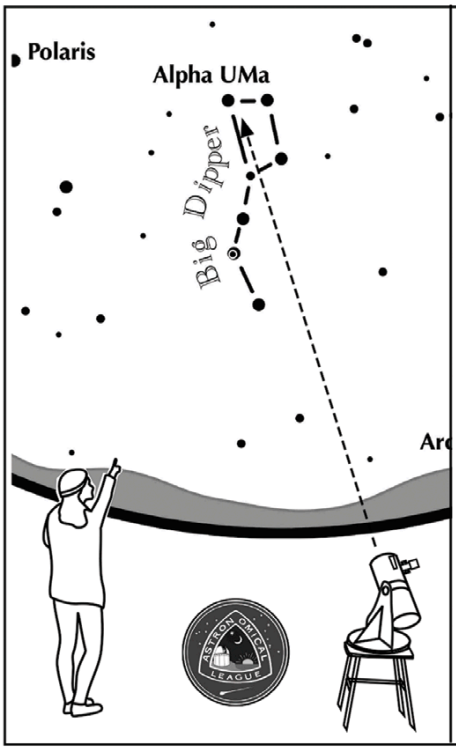


The Moon slides through a total eclipse

In the hours just after midnight on March 14, the brilliant full moon slides into Earth's shadow.

- Even though the partial umbral eclipse begins at 11:09 am MDT darkening might not be noticed for another 5 minutes.
- When totality is reached, the full moon's brilliance is gone, allowing the stars to appear. Can you see that the moon lies mid-way between Regulus to the upper right and Spica to the lower left?
- At mid eclipse, what color is the moon? How red is it?
- During the partial phases, can you notice that the shadow's edge is not straight, but curved?

ASTRONOMICAL LEAGUE Double Star Activity



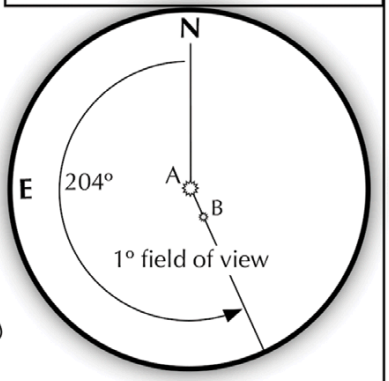
Other Suns: Alpha Ursae Majoris

How to find Alpha Ursae Majoris on a March evening

Face northeast. Look for the Big Dipper standing upright on its handle. Alpha is the star on the upper left corner of the bowl.

Suggested magnification: >20x
Suggested aperture: >3 inches

Alpha UMa
A-B separation: 381 sec
A magnitude: 2.0
B magnitude: 7.0
Position Angle: 204°
Colors:
orange
dark orange



Try binoculars!

LAS Meeting Notes for Feb 20 by Eileen Hall-McKim

I. Introduction

The February LAS monthly meeting was held in-person and by zoom on February 20th at the Longmont Lutheran Church, 803 Third Ave. President Vern Raben began the meeting with self-introduction of members. Nineteen members attended in person, 16 attended on-line.

II. Main Presentation

Our presentation speaker for the evening was long-time LAS member Mike Hotka. Over the years, Mike has completed nearly all of the 70 observing programs offered by the Astronomical League, a national organization of amateur astronomers, and has reached the highest levels of astronomical observing, as a Platinum Master Observer. In other words, 'He has seen a lot of faint little fuzzies'. Mike is also the author of "Globular Clusters: A Guide to the Globular Cluster Observing Program" (2020) soon to be published in its second edition.

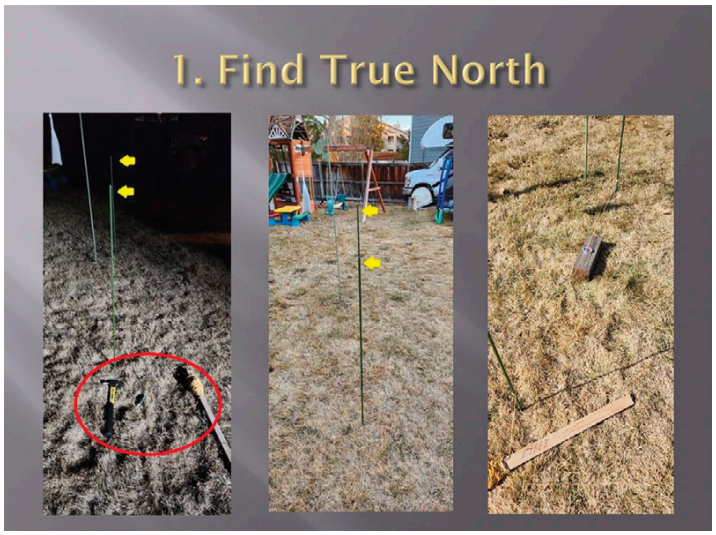
Astronomy Before The Telescope
By Mike Hotka

The Astronomical League, is an umbrella organization of all local amateur astronomy societies. All members of LAS are automatically a member. The Astronomical League offers a large selection of observing programs that can be accessed on the website to help learn the sky and get started with observing. It consists of about 70 different programs; look for Messier objects, galaxies, open clusters, globular clusters, and much more and when completed earn certificate and pin. These are great simultaneous to help get you out there and observing. There are also lots of imaging programs now for those interested in astrophotography.

The Astronomical League program Mike is going to talk about tonight is "Astronomy Before the Telescope" a program he completed December 2024. As the name implies, he built and used instruments that astronomers and cultures used before the use of the telescope to make astronomical observations in 1609.

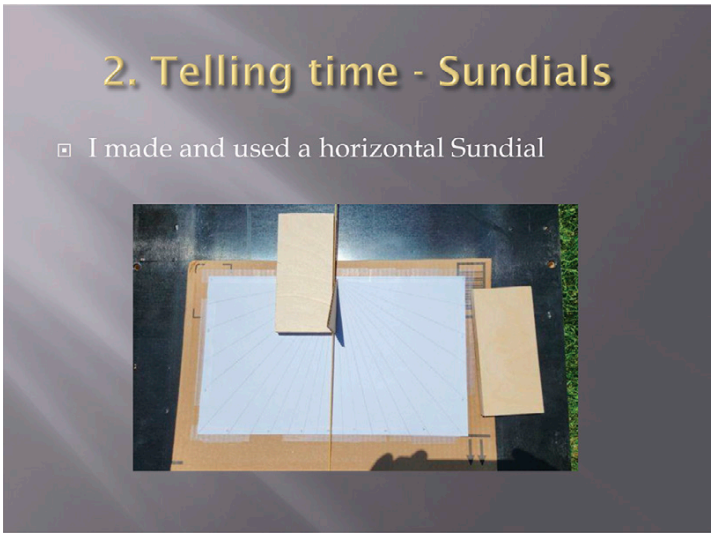
There are 14 task activities to be completed in this program, he will expand upon some of his favorites of these. There were also three optional exercises at the end. Of these he chose the Viking Sun Stone activity. The tasks of this AL program include:

1. Directions – Find true north without a compass
2. Telling time – Sundials
3. Directions – Align a telescope during the daytime
4. Time – Equation of time
5. Telling time – Nocturnal
6. Yearly Calendar Predictor
7. Measuring – Astrolabe
8. Measuring – Astronomical Quadrant
9. Measuring – Cross-staff or Jacob's Staff
10. Measuring – Use Astrolabe, Quadrant, Staff
11. Measuring – Solstices
12. Measuring – 30 Navigational Stars
13. Star Chart/Planisphere
14. Location – Measure your local longitude
15. (Optional) Viking Sun Stone



1. Directions Find true north – the first activity had all kind of ways to find north by looking at the stars and doing other activities. One was to find celestial north; different from magnetic north, but where the direction of Polaris is.

- Put in stake and used plumb bob to align stake with Polaris, then set second stake, stretched a string between them, then could line up any device he needed to be pointing at celestial north; one exercise was to align a compass on this line
- Object was to find the difference between celestial north and magnetic north, determined he was 14° west of magnetic north in his backyard in Broomfield



2. Telling time – Sundials – Exercise was to make sundials, Mike made and used three different sundials; to be effective they had to be aligned on celestial north.

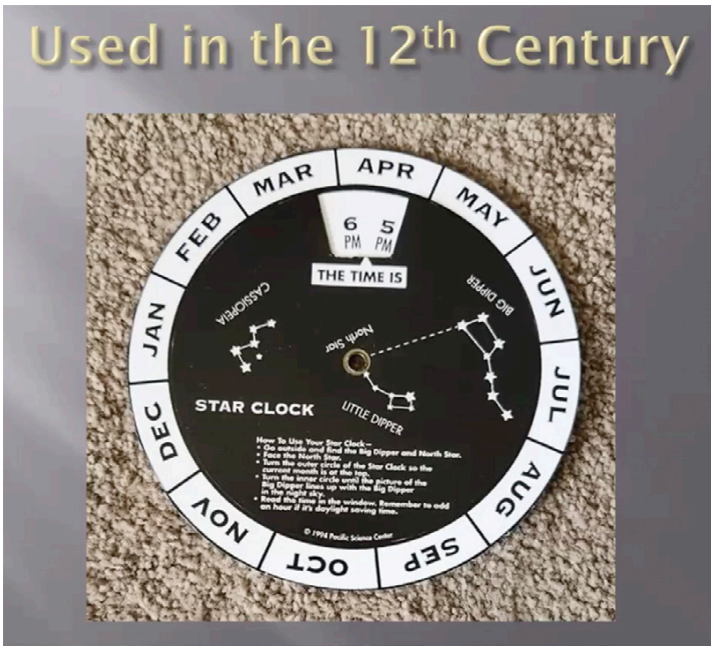
- A Horizontal Sundial – Line up string with proper hour. Put board out, leveled, stretched a string between two poles that marked celestial north, lined up the horizontal sundial that he had made, line up string with 12:00 o'clock hour- is now properly aligned to tell the time *To get actual time using a sundial there is an adjustmentto make called 'Equation of Time' the Sun moves through sky quicker or slower depending on the time of the year so there is an adjustment– had to subtract 1 minute from what sundial read; end comparison results; was very close in accuracy.

- An Equatorial Sundial- Tilting at his latitude and pointing up to Polaris, crease in cardboard parallel to the side of cardboard where the 12:00 noon hour is, so stretched string properly aligned with celestial north; for this date subtract 2 minutes, so again very close in time

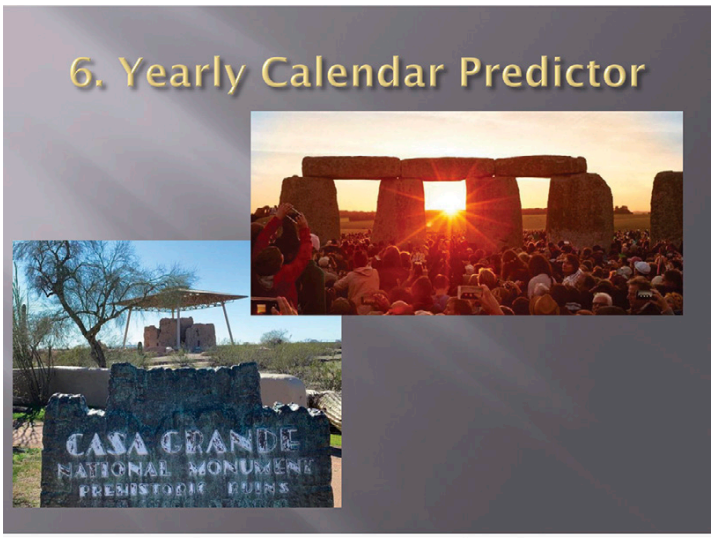
- A Diptych Sundial – called a portable sundial, found a description on Internet, use compass and protractor and straight edge to measure, cut boards to 5.5' made sure at right angle, used fishing line aligned bottom face, used compass to align in the daylight, hole drilled based on latitude of 40° used tape on back side to hold line in place

  Used once December 14, 2024
  – I aligned the Diptych Sundial with celestial north and level
  – The sundial read 11:22
  – The EOT adjustment for this date is about +2 minutes
  – The actual time of the reading is 11:04
  – With the EOT adjustment and DST adjustment, the sundial's local time is 11:24
  – The sundial is 20 minutes ahead of the actual time

Mike uses table leveled with blocks for different thicknesses for use in his projects, portable sundial and quadrant, compass left aligned to celestial north for other projects

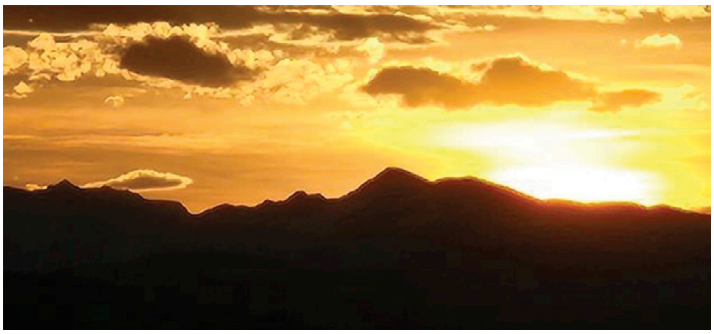


5. Telling time – Nocturnal – The next device he built was a little device called the star clock. He printed this off the web page of the AL on card stock. Put grommet in middle, the way to use it is; knowing what month it is, align month to the top, rotate until constellations match what you see in the sky, read the time off this dial. A pretty accurate little device for as simple as it is!



6. Yearly Calendar Finder - Find a Stonehenge or Casa Grande in Broomfield

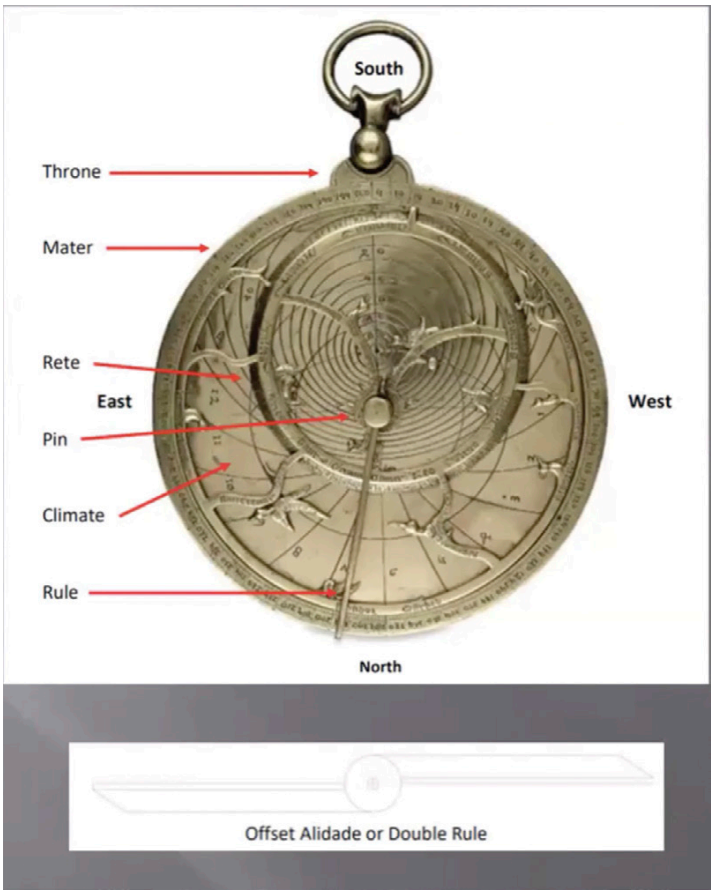
- Thought he would use mountain horizon for sunset – potential problems with likely cloudiness evenings in May; on way to work noticed morning skies much clearer than evening skies, decided to use house with sunrise behind it, had vent to mark viewing point
- A mile further on he found Iglesia Grande, a Broomfield church with steeple, fire hydrant on 136th street mark place to view the church, rising sun next to steeple worked perfect on Spring Equinox, in addition got the evening setting sun on horizon



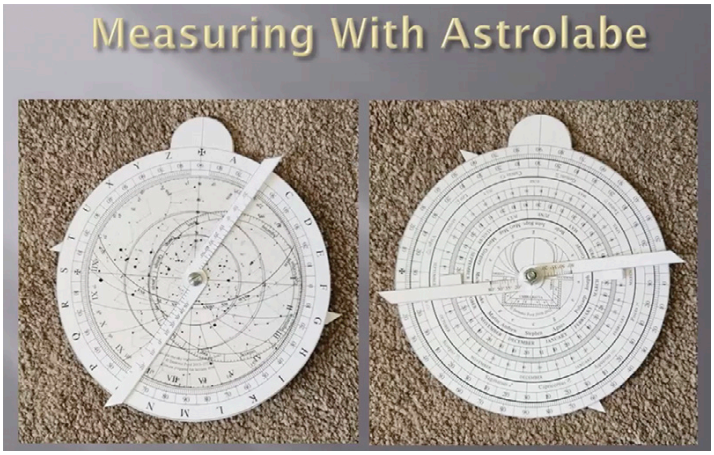
Mountain Sunset – Mikes yearly calendar June 21, 2023 from his viewpoint

7. Measuring – Astrolabe; Task is to Build and Use An Astrolabe

- Building an Astrolabe; has unique terms but most important Climate and Rete
- Climates are interchangeable on a device like this; navigators would have their own climate, churches also have their own climate; Rete points to stars and zodiac signs
- On website place to print out all parts according to latitude, printed out on card stock material; circles are altitude, this can calculate the azimuth of something rising

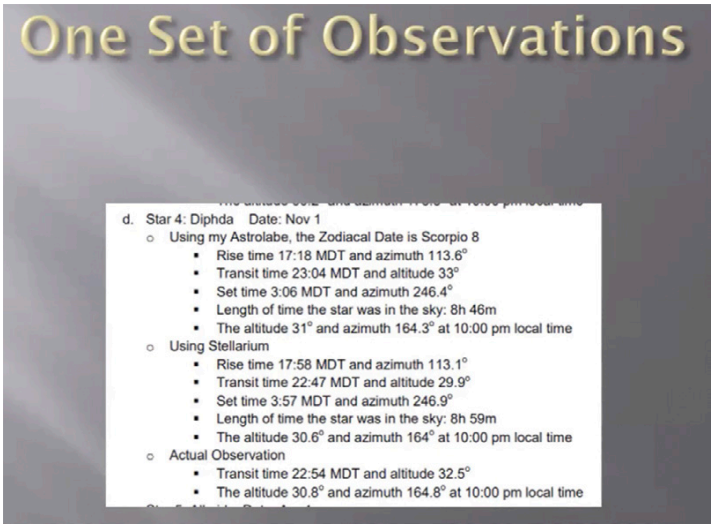


- Mother board back; two dates outer circle epic date of 1394, the one Mikes used 1974
- Rete printed out on clear plastic paper, shows all the stars to be used to make calculation; used paper board from cereal box, used locking nut on front and back of Mother Board, object to have tension without falling down, used locking washer
- Has to hang vertically in order to get real accurate measurement, add paper clip with a nut



Measuring with Astrolabe – So how do you use this?

- Set it up for a specific date – pick a star and a date either current or future. Align the alidade (rotating bar attached to the back) with the date (inner scale) follow down edge of alidade and find the corresponding (30 days) zodiac date that it points to
- On back of astrolabe align the rule with the zodiac date line on the rete
- Put rule on the date chosen, rotate rule and rete together as a unit; put star on eastern horizon (ex. Betelgeuse) and where the rule is pointing can determine the azimuth it is going to rise and can read the time off the edge
- Put star on meridian to find the altitude and time it is going to be there
- Position star on western horizon and then can read the azimuth and time it will set
- And so much more can be determined from this really amazing instrument!



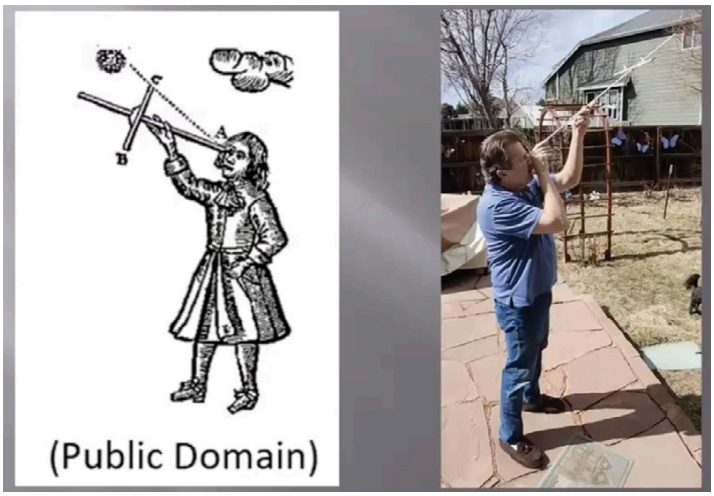
One Set of Observations – Did measurements, used Stellarium for comparison, again very close

8. Measuring – Astronomical Quadrant

- Found instructions on Internet how to build a quadrant – (some of steps in slide photos)
- Aluminum expensive, used altitude scales, used template to build brackets
- Little piece of wire to help read fine numbers of the azimuth scale
- Used ½"pcp pipe as a site tube, worked out well
- Carefully aligned scale, site tube horizontal and glued face at 0°, wingnut to move easily
- Used quadrant to take measurements

Using Quadrant and Jacob's staff to site Polaris at night

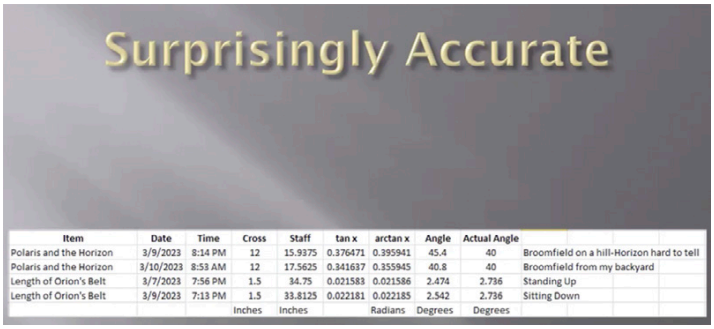
Using Quadrant in the daytime



Observer from days gone by

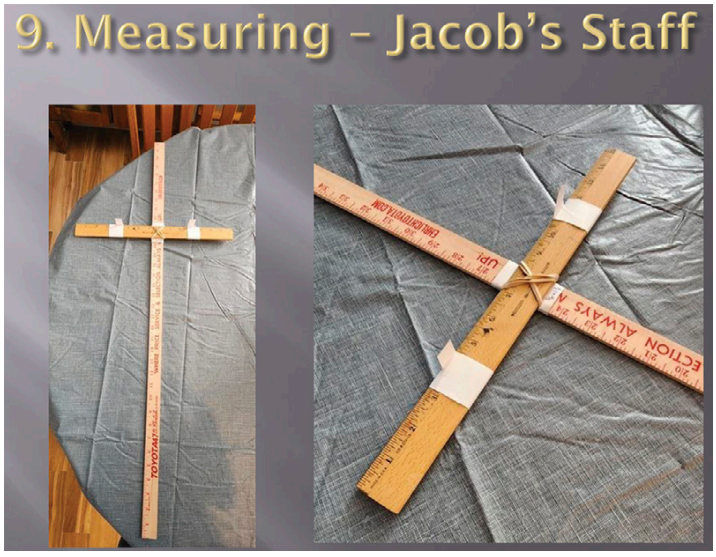
Mike Hotka using Jacob's Staff

- Put up to eye, sight with the little markers tabs, adjust distance on staff
- Calculates distance between two objects using trigonometry

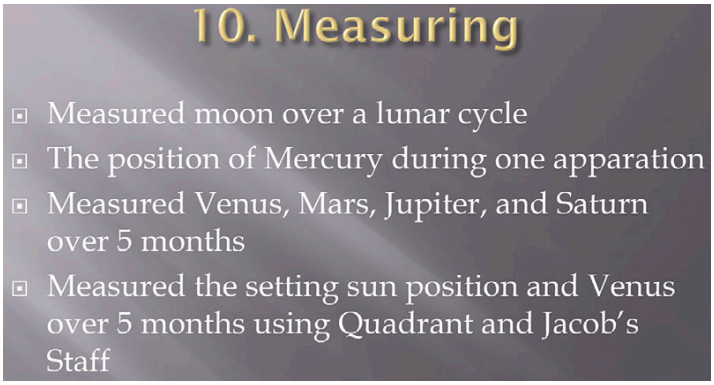


Item	Date	Time	Cross	Staff	tan x	arctan x	Angle	Actual Angle	
Polaris and the Horizon	3/9/2023	8:14 PM	12	15.9375	0.376471	0.395941	45.4	40	Broomfield on a hill-Horizon hard to tell
Polaris and the Horizon	3/10/2023	8:53 AM	12	17.5625	0.341637	0.355945	40.8	40	Broomfield from my backyard
Length of Orion's Belt	3/7/2023	7:56 PM	1.5	34.75	0.021583	0.021586	2.474	2.736	Standing Up
Length of Orion's Belt	3/9/2023	7:13 PM	1.5	33.8125	0.022181	0.022185	2.542	2.736	Sitting Down
			Inches	Inches		Radians	Degrees	Degrees	

Spreadsheet shows surprising accuracy, example Length of Orion's Belt



9. Measuring – Jacob's Staff == Cross Staff – Device to measure the angle between things; made to be easy to slide cross up and down to get a reading, site using paper tabs; measure to get the angle. Good for measuring things that are really definite and can get between. How to use this?



10. Measuring – Use all devices together to compare accuracy

- Measured moon over a lunar cycle
- The position of Mercury during one apparition
- Measured Venus, Mars, Jupiter & Saturn over 5 months – readings showed even caught retrograde motion of Saturn
- Measured the setting Sun position and Venus over 5 months using Quadrant and Jacob's Staff

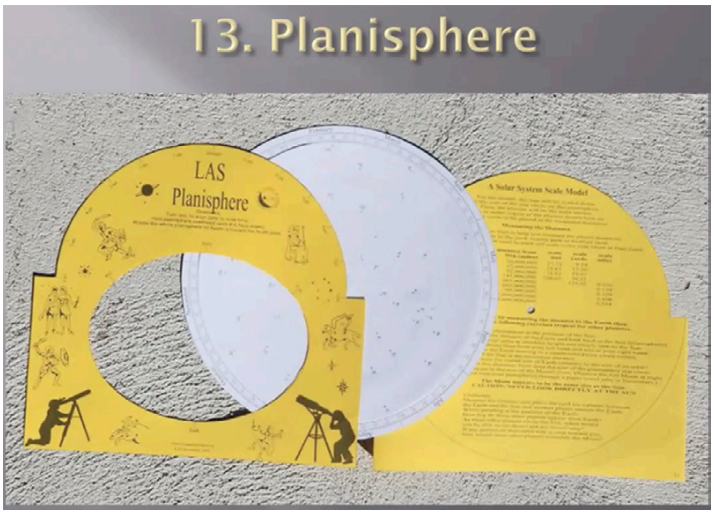
Item	Date	Time	Cross	Staff	tan x	arctan x	Angle	Actual Angle	
Betelgeuse and Rigel	3/7/2023	8:07 PM	8	24.4375	0.163683	0.165169	18.9	18.5	
Betelgeuse and Rigel	3/9/2023	7:05 PM	7	21.40625	0.163504	0.164984	18.9	18.5	Sitting Down
Castor and Pollux	3/7/2023	7:50 PM	1.5	22.125	0.033898	0.033911	3.9	4.3	
Castor and Pollux	3/9/2023	7:19 PM	2	27.875	0.035874	0.03589	4.1	4.3	Sitting Down
3 Stars of Summer Triangle									
Deneb and Vega	3/13/2023	4:48 AM	9	21.6875	0.207493	0.21055	24.13	24	
Deneb and Altair	3/13/2023	4:54 AM	12	17	0.352941	0.368799	42.26	38	
Vega and Altair	3/13/2023	5:02 AM	12	18.1875	0.329897	0.342713	39.27	34	
Two Planets at Conjunction									
Venus and Jupiter	3/5/2023	6:11 PM	2	31.5	0.031746	0.031757	3.64		
			Inches	Inches		Radians	Degrees	Degrees	

			Quadrant Measurement						
	Date	Time	Azimuth1	Altitude1	Azimuth2	Altitude2	Angle	Actual	
ngth of Orion's Belt	1/30/2024	7:51 PM	156	44.8	158	47.1	3.05	2.74	
easure Angles Between These Stars									
telgeuse and Rigel	1/30/2024	7:02 PM	127.6	46	150	38.4	23.65	18.50	
stor and Pollux	1/30/2024	6:49 PM	79.5	39.8	82	35.5	4.97	4.30	
Stars of Summer Triangle									
neb and Vega	6/5/2024	9:49 PM	47.9	22.5	67	36.2	23.51	24	
neb and Altair	6/5/2024	10:54 PM	53.8	27.1	94	17.5	41.33	38	
ga and Altair	6/5/2024	11:00 PM	74	43.9	95.5	19.5	32.52	34	
gasus Square Diagnols									
pheratz-Markab	7/3/2024	3:28 AM	92	52.9	95.9	32.5	20.77		
genib-Scheat	8/16/2024	9:53 PM	81.1	14.7	80.8	35.4	20.70		Astrolabe
laris and the Horizon	1/28/2024	6:46 PM	0	39.9				39.9	39.9

Mikes spreadsheet showing remarkable accuracy!

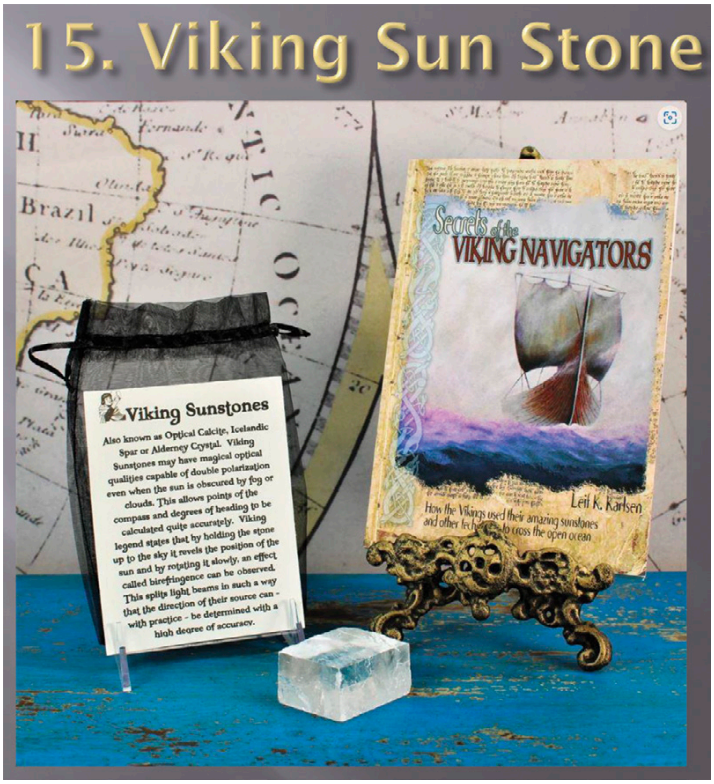
12. Measuring Navigator Stars

- Use your astrolabe and/or quadrant to measure the position of at least 30 of the 57 navigation stars visible from your location
- https://en.wikipedia.org/wiki/List_of_stars_for_navigation
- Measured 49 Navigation Stars – Logged onto spreadsheet – Index number off Wikipedia, local time of observation, quadrant reading, astrolabe reading, tried Jacob's Staff- not good readings, 15 stars were to be captured while transiting (azimuth reading on quadrant=180°) reading are all very, very close
- Used Stellarium to put in azimuth and altitude readings and date and time and it would give right ascension and declination and that were needed for next activity



13. Planisphere

- Vern had found templates years ago for making planispheres during Astronomy Day at Longmont Twin Peaks Mall – Mike still had the file for it on his computer
- Printed out – used graph paper, each star has the index number of the navigational stars from Wikipedia page, turned out to be pretty close, so this would be pretty accurate device to use to find those navigational stars



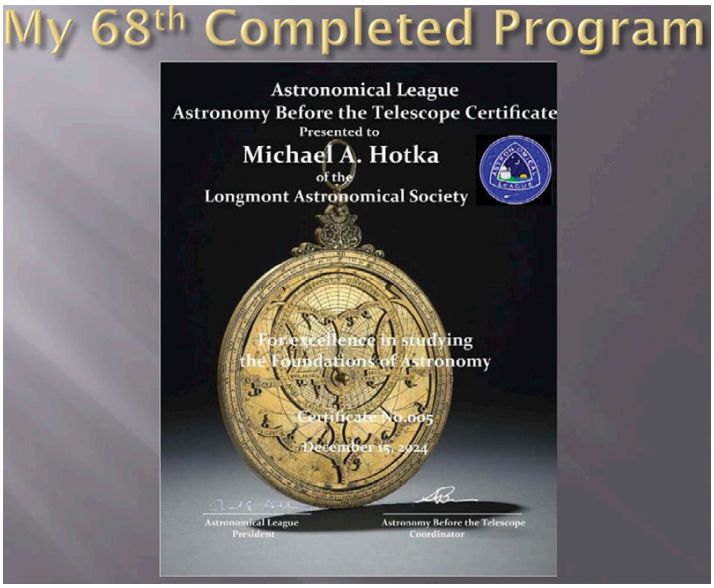
15. Mikes Optional Task: Viking Sun Stone or Calcite Crystal or Iceland Spar

Using the stone, Calcite crystal, the crystal structure is such that, set up right you can find the azimuth of the sun on a cloudy or foggy day.

- Vikings used the transparent calcite crystal, to fix the true bearing the sun. The Sun Stone acted as a compass so that they wouldn't get lost at sea. Also they would use it in twilight and cloudy conditions to figure out their sense of direction
- Bought off Amazon, place dot on end facing sun, looking through the back
- 'Birefringence' interference pattern of the crystal structure causes image – sweep back and forth, get this azimuth reading of the sun

"Viking Sun Stone may have magical optical qualities capable of double polarization even when the sun is obscured by fog or clouds. This allows points of the compass and degrees of heading to be calculation quite accurately. Viking legend states that by holding the stone up to the sky it reveals the position of the sun and by rotating it slowly, and an effect called birefringence can be observed. This splits light beams in such a way that the direction of their source can – with practice – be determined with a high degree of accuracy."

Viking Sun Stone or Iceland Spar finding sun over Mike's house – red arrow, he is sweeping the sun stone back and forth over the sun area. Saw a faint black smudge, not the clearer teardrop but he is convinced he saw a darkened effect from the stone. Comparison of more expensive, more clarity, high quality calcite crystal vs the one from Amazon, possible faces not parallel, rounded edges in lesser quality one, more opaque, to see the full pattern.



This is Mikes's 68th program he has completed! He received his certificate and cool pin.
"What really amazed me about this program was that the instruments I built were so accurate. I learned so much."

III. Business Meeting

Library Telescope Program – Bruce Lamoreaux
Bruce has been working on and supports our Library Telescope Program which we started about 10 years ago, a program that donates and maintains telescopes to local region libraries. We have received a request from High Plains Library if we would be interested in donating a couple new library scopes.

- High Point Scientific is now going to manufacture a library telescope, incorporating some of the things people across the United States, Australia, and the U.K. who have donated the telescopes have used; such as the zoom eyepiece
- Bruce has purchased two of these from High Point Scientific, still need to finish the kits; headlamps, books, totes, moon map

LAS Website Update - Mike Hotka, LAS webmaster and Vern have updated the LAS website. We have been using Square Space for the last couple years and our renewal was coming up, so decided to do an update, save some money and move it over WordPress.

Upcoming Events

- Star party for Boulder County Parks and Recreation; Friday, March 7th, starting at 6 pm at Ron Steward Preserve at Rabbit Mountain, near Lyons. If you want to help out with a telescope please contact LAS Outreach Coordinator, Aref Namari.
- Our next meeting will be Thursday, March 20th at 7:00pm at the Longmont Lutheran Church, 803 Third Ave.

Longmont
Astronomical Society

P.O. Box 806
Longmont, CO 80502-0806

LAS Treasurer's Report - Bruce Lamoreaux **2/20/2025**

Main Checking Account (xxx-1587)

Begin Balance:	$ 8,840.00	**1/6/2025**
Deposits:	$ 310.00	Membership, Calendars
Expenses:	$ (1,515.00)	Bank Charges, Meeting Room, Calendars
Current Balance:	**$ 7,635.00**	**1/6/2025**

2-Year Savings Account (xxx-1478) (matures 10/23/23)

Past Balance:	$ 8,245.00	**9/30/2024**
Interest:	$ 15.00	
Balance:	**$ 8,260.00**	**12/31/2024**

Telescope Fund (xxx-0165)

Past Balance:	$ 1,100.00	**12/30/2024**
Deposits:	$ -	
Expenses:	$ -	
Balance	**$ 1,100.00**	**1/30/2025**

Petty Cash

Past Balance:	$ 50.00
Deposits:	$ -
Expenses:	$ -
Balance	**$ 50.00**

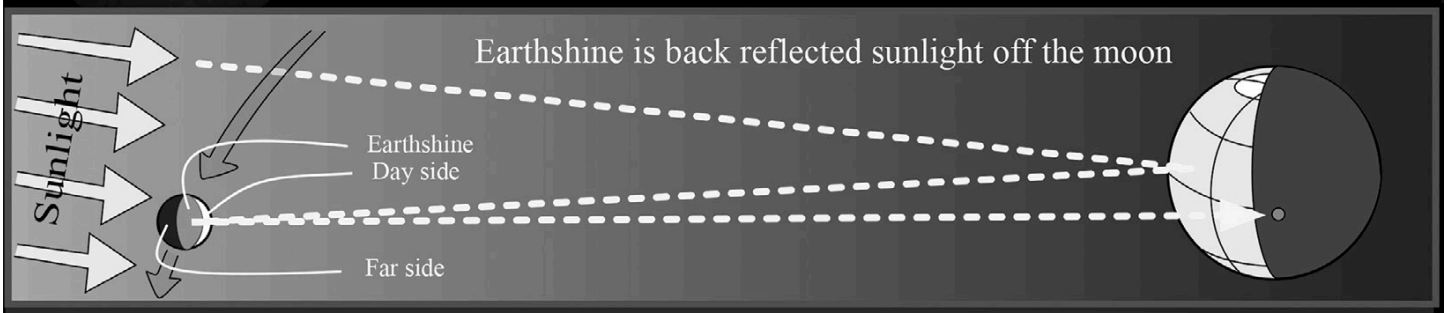
Total Assets **$ 17,045.00** $ (1,220.00) Down from January

Active Membership:	**94**	Active
Student Membership:	**2**	
Total	**96**	

Evening Earthshine

aka "The old moon in the new moon's arms"

In a very strange sense, Earthshine is the reflection of Earth on the moon.



Older than 4 day-old moon:
Distinguishing Earthshine with the unaided becomes harder with each passing evening. However, the moon's night side can still be seen through a telescope for a few more nights.

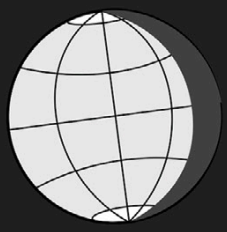
4 day-old moon:
- Sets up to 5 hours after sunset.
- The glare from its brightly lit day side begins to make seeing Earthshine slightly more difficult.

3 day-old moon:
- Sets up to 3.5 hours after sunset.
- Earthshine is very prominent.

2 day-old moon:
- Sets up to 2 hours after sunset.
- The bright twilight mutes the diaphanous glow of the Earthshine.

1 day-old moon:
- Typically sets 60 minutes or less after sunset.
- Earthshine appears very subdued because of the moon's placement in the bright twilight, and the thinness and relative dimness of the crescent.
- Binoculars help pick up the very thin lunar crescent in the twilight just above the horizon.

New Moon, 0 day-old moon:
- Sets with the sun.

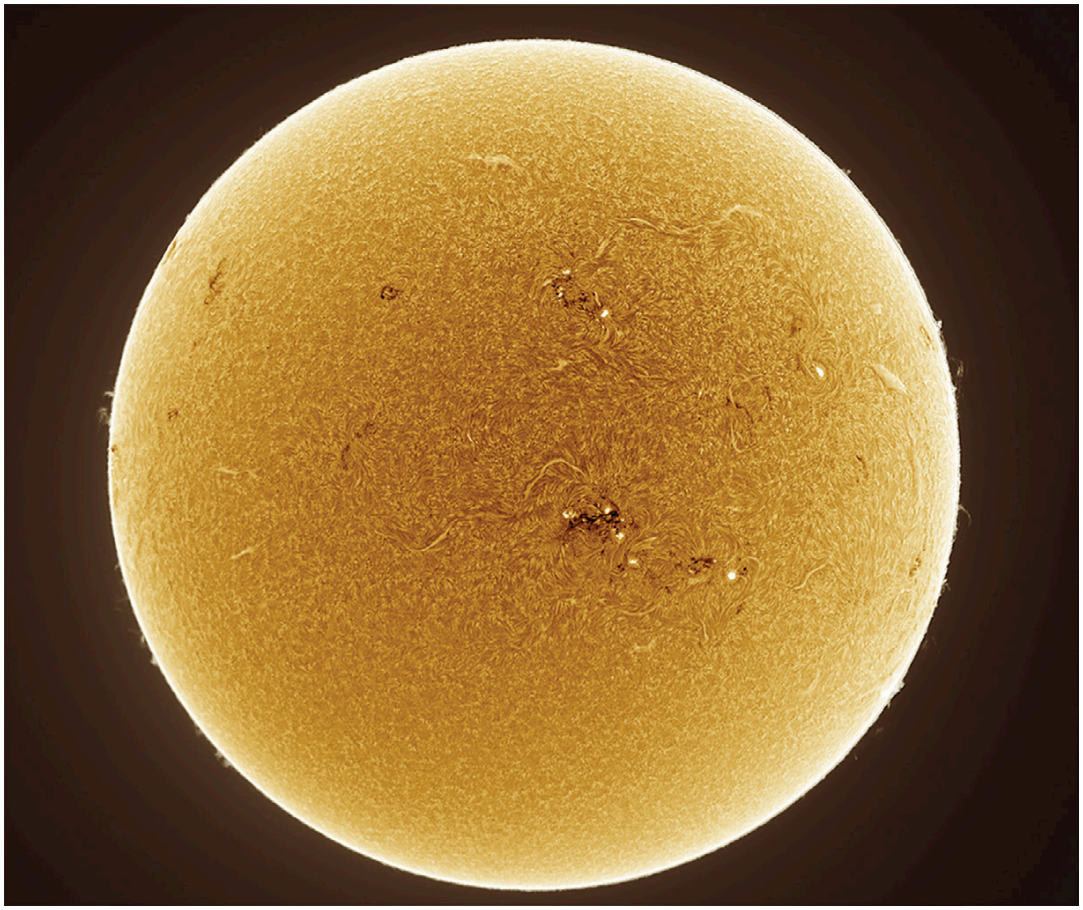


A very bright Earth

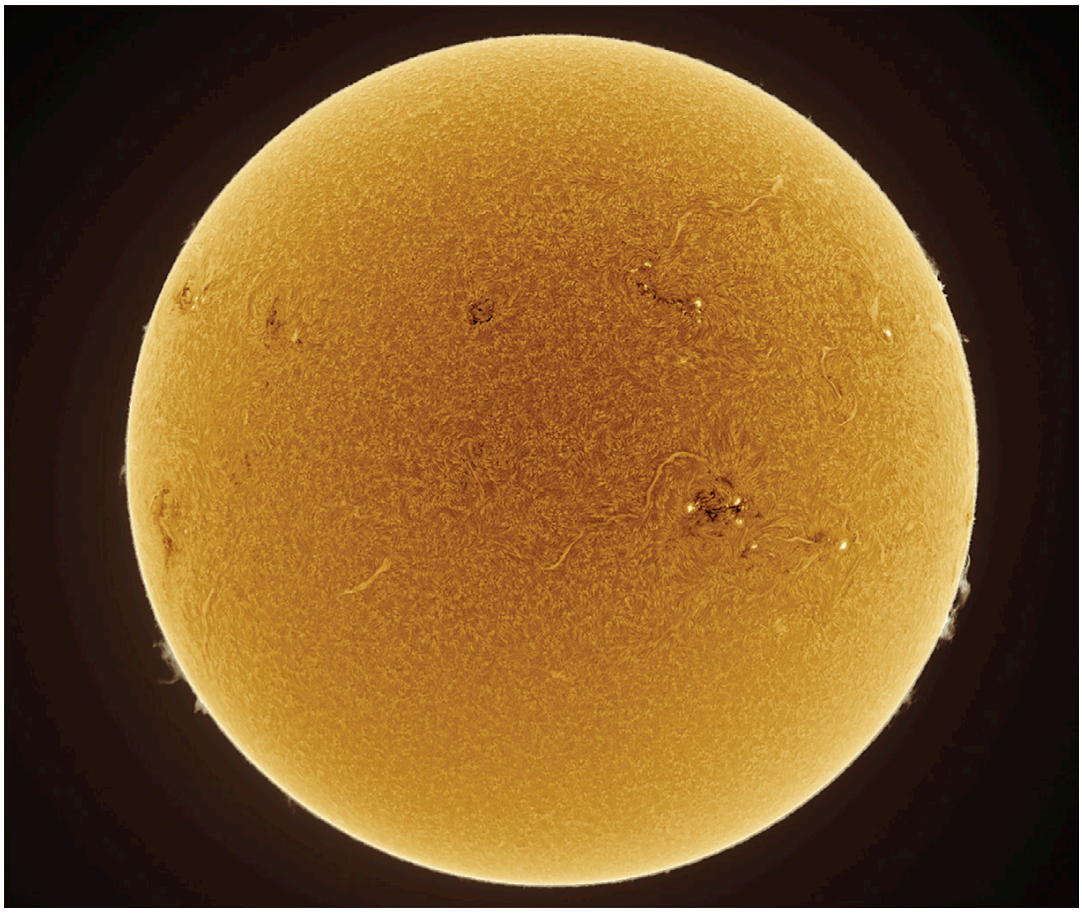
- When the moon shows a thin crescent phase in Earth's sky, the Earth shows a thick gibbous phase in the lunar sky.
- A thick gibbous Earth covers 16 times the sky than the full moon from Earth does – and it reflects 4 times more light. This means that the near full Earth in the lunar sky is nearly 64 times brighter than the full moon is in our sky.
- For an observer on the unlit near side of the moon, the lunar landscape is illuminated by bright Earthlight.

2502

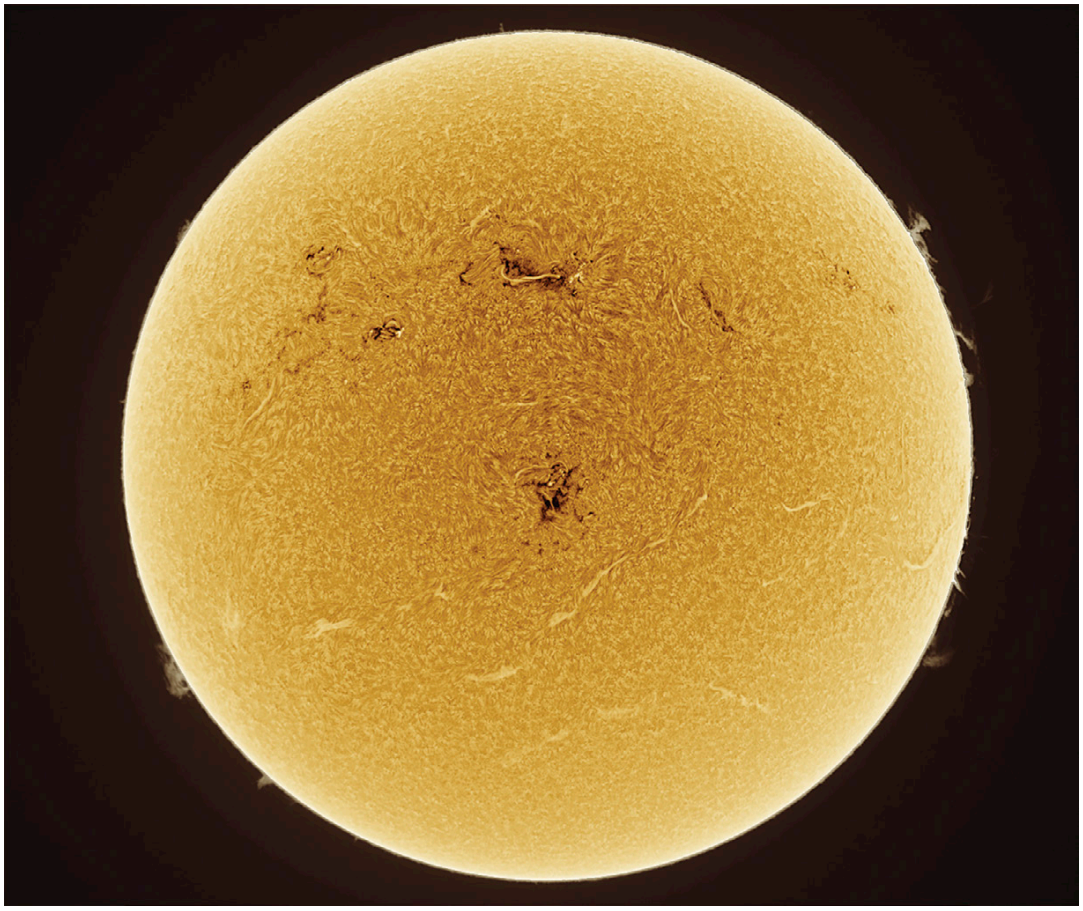
Photos taken at Kitt Peak by Allen Jeter.



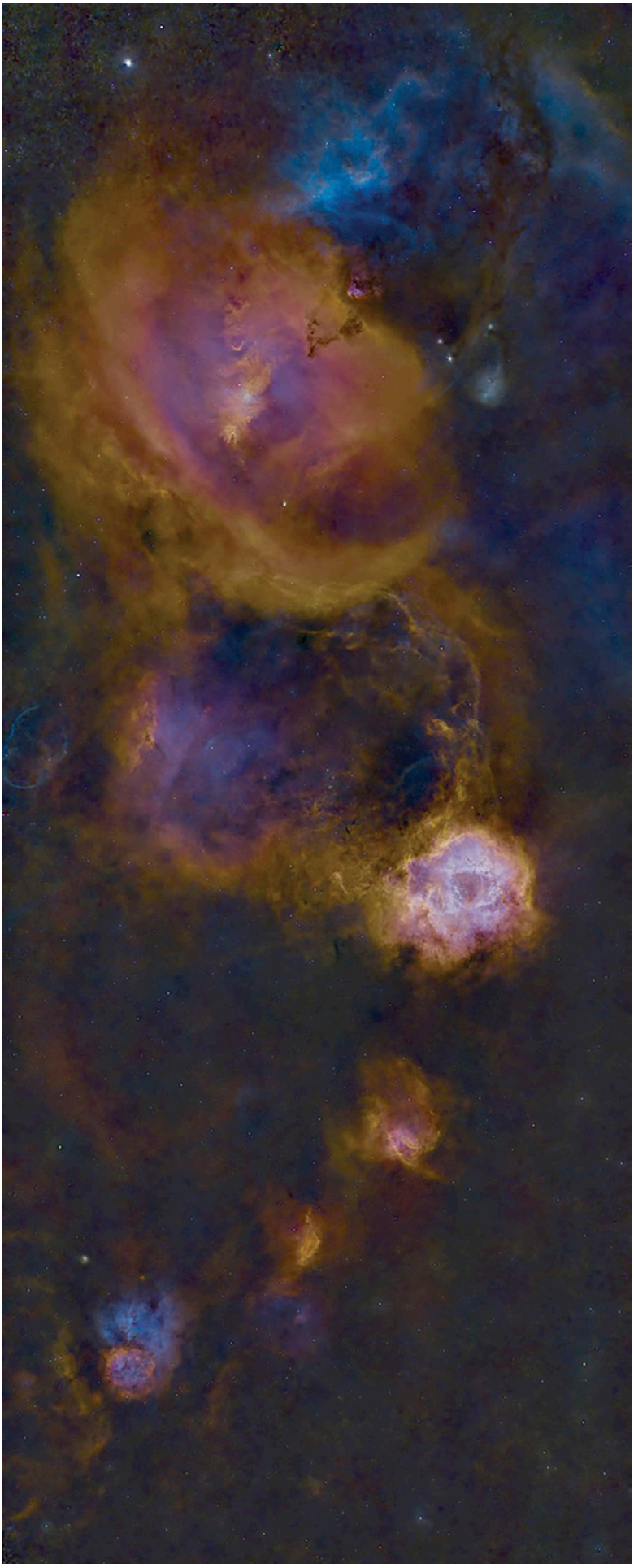
Solar image of the Sun in H-Alpha by Brian Kimball on Feb. 22 average seeing



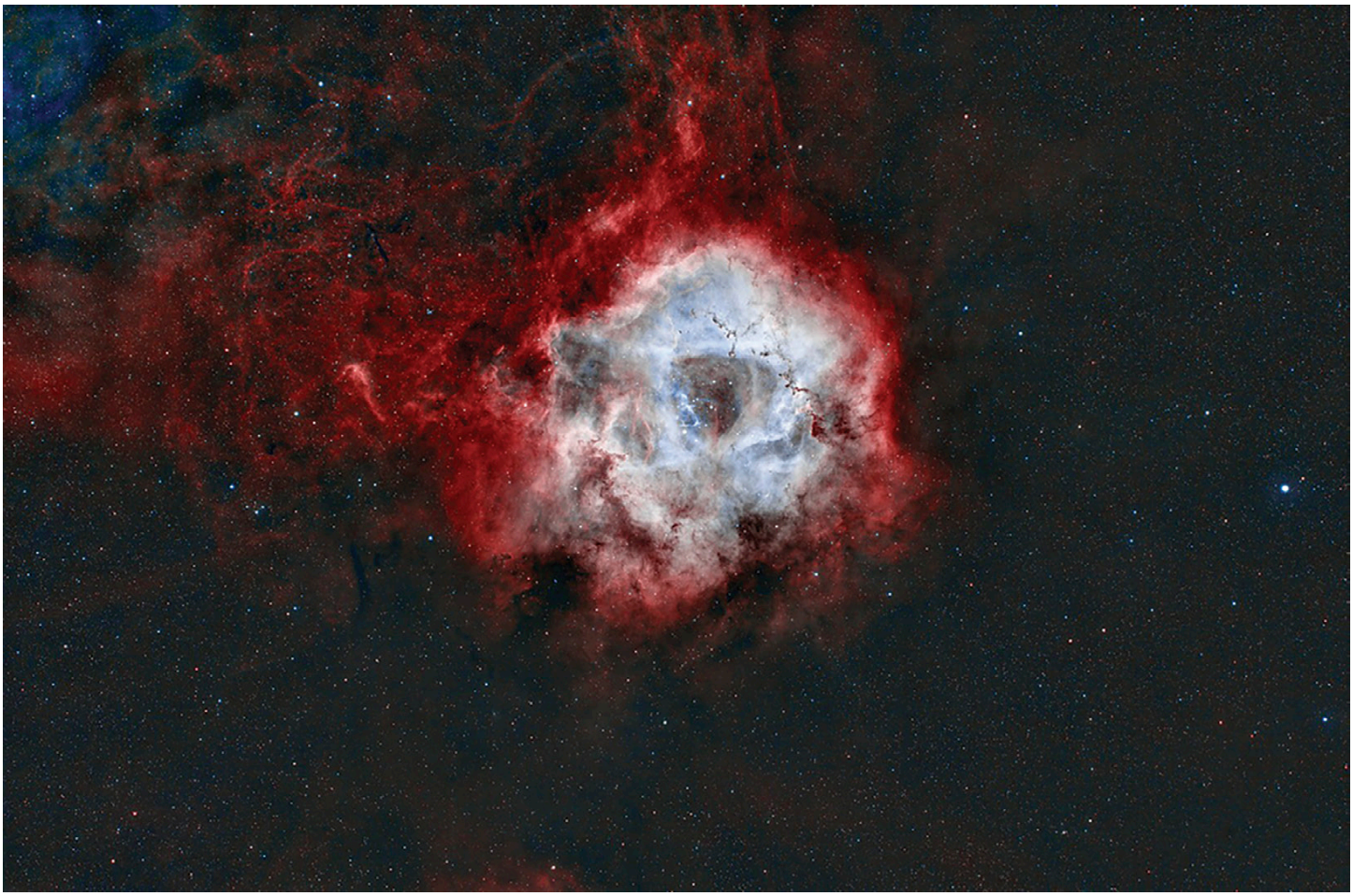
Solar image of the Sun in H-Alpha by Brian Kimball on Feb. 23 average seeing



Solar image of the Sun in H-Alpha take by Brian Kimball on Feb. 28 below average seeing



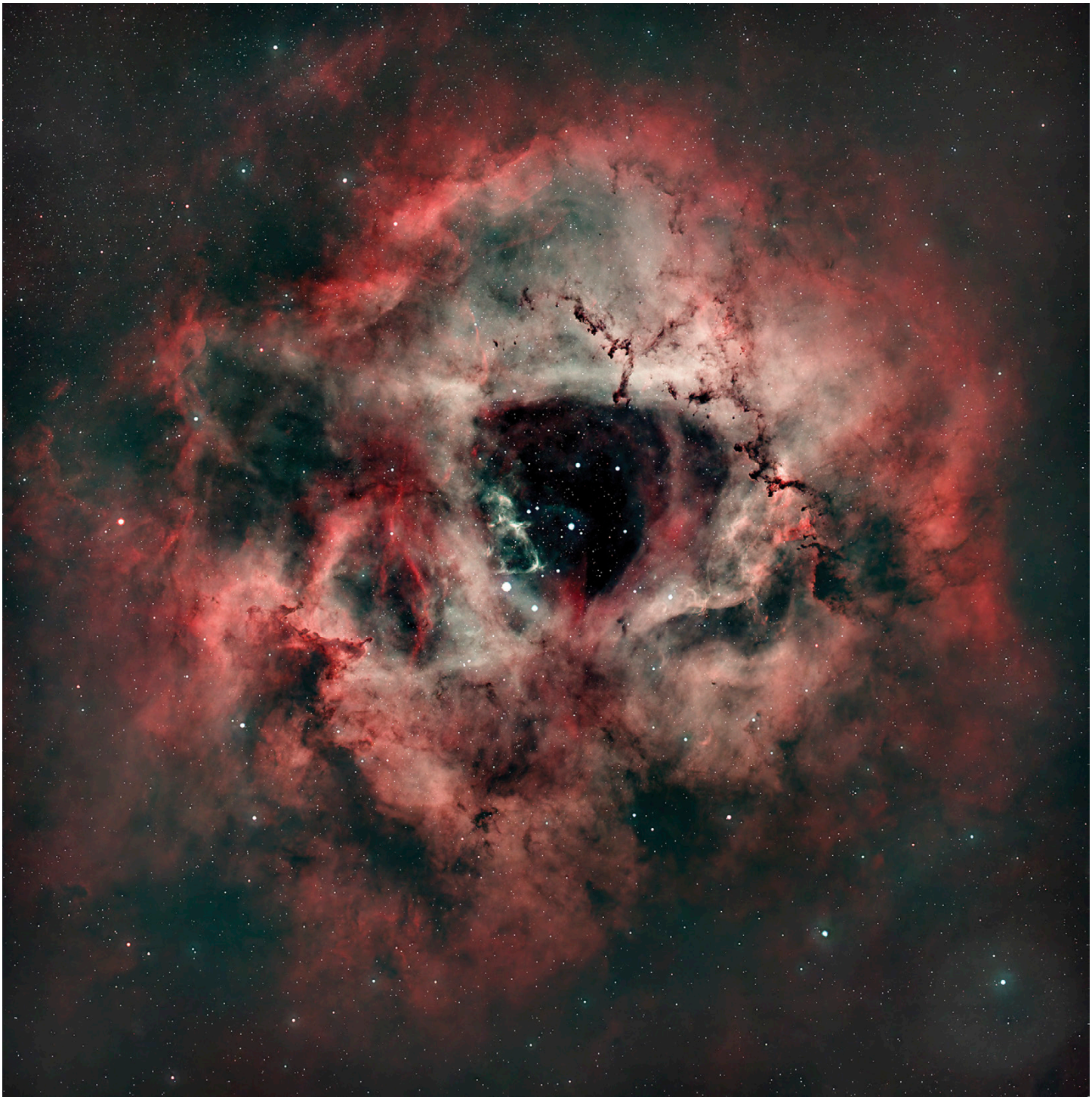
The Cone - Rosette Mosaic
by David Elmore



The Rosette Nebula by David Elmore

The Rosette, about 4900 light-years distant in the Milky Way, is 100 light-years in diameter. As MJ mentioned that is about the size of a 3x3 array of full moons. It's part of the Giant Monoceros R2 Molecular Cloud, a star-forming region. Stellar winds and photon pressure from young stars blew out the nebula's center and shaped dark gas clouds. UV radiation from these hot stars ionizes Hydrogen, Oxygen, and Sulfur, which emit radiation as electrons are re-captured. I've colored the nebula: Sulfur as pure red, Hydrogen as red with green and blue, and Oxygen as blue and green. This color table highlights the Hydrogen stream towards the Cone Nebula. Included is a wide-field image of the Monoceros Molecular Cloud to see where the Rosette resides in the larger molecular cloud.

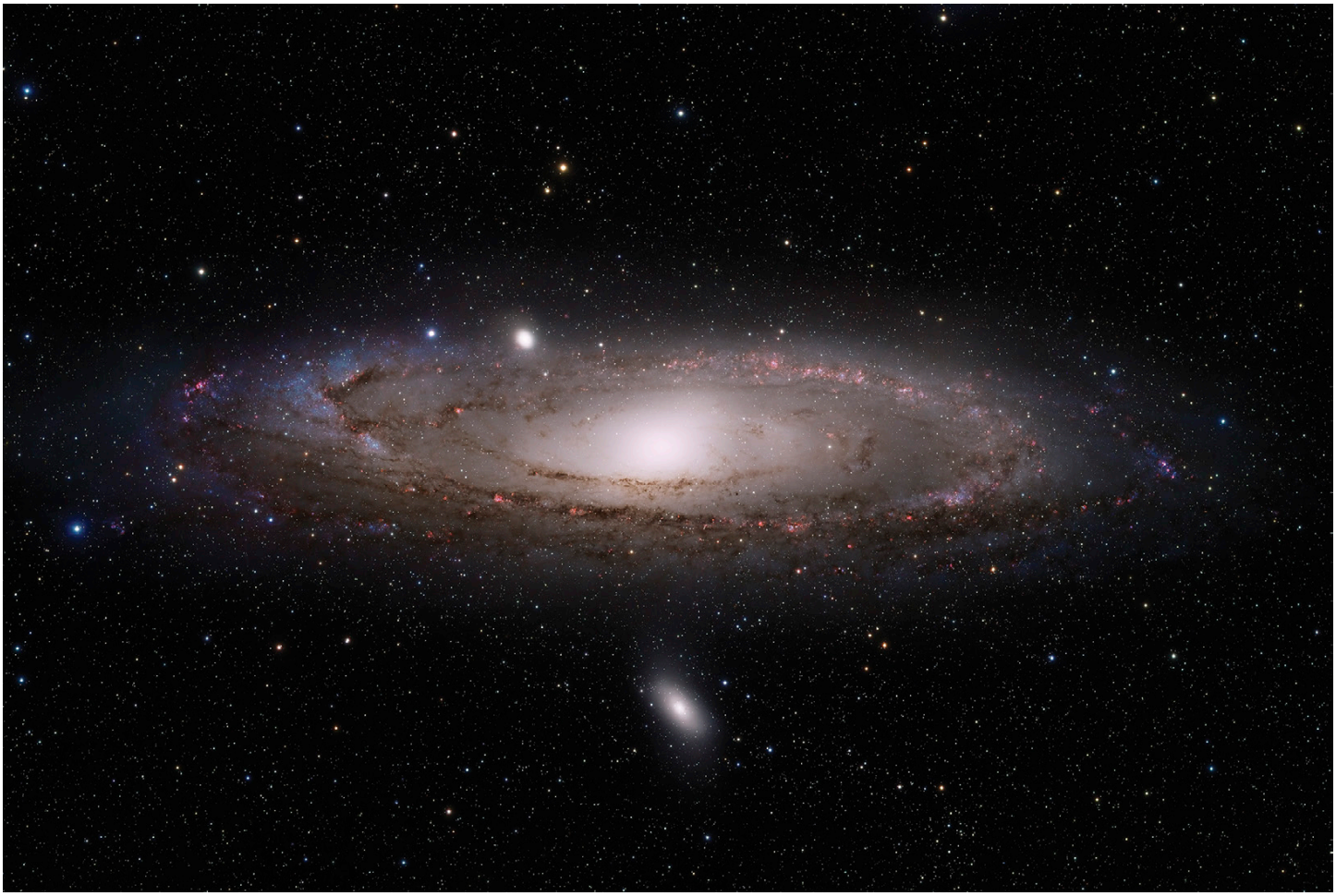
Borg107FL F/3.9 refractor, ASI6200MM Pro camera, Chroma filters, iOptron CEM70G mount, from my remote observatory at Dark Sky New Mexico. A mere (by current practice) 3-1/2 hour total integration.



Rosette Nebula by Jim Polock

Shot the Rosette from my driveway last night. Still among my first shots with the new 9.25" Edge on a ZWO AM5n mount. Great night last night!! I got 0.4 arc seconds tracking for 3 hours of 3-min exposures. I've got an Ethernet running out of the garage to the scope, so images update in about a second after each frame. Sweet!

This is 62 frames of 3-minutes each (3 hours) with my 9.25" EdgeHD at f/2 with Hyperstar on the ZWO 2600mc DUO color camera and an L-Enhance filter (moon wasn't an issue, so used the multi-narrowband Enhanced filter).

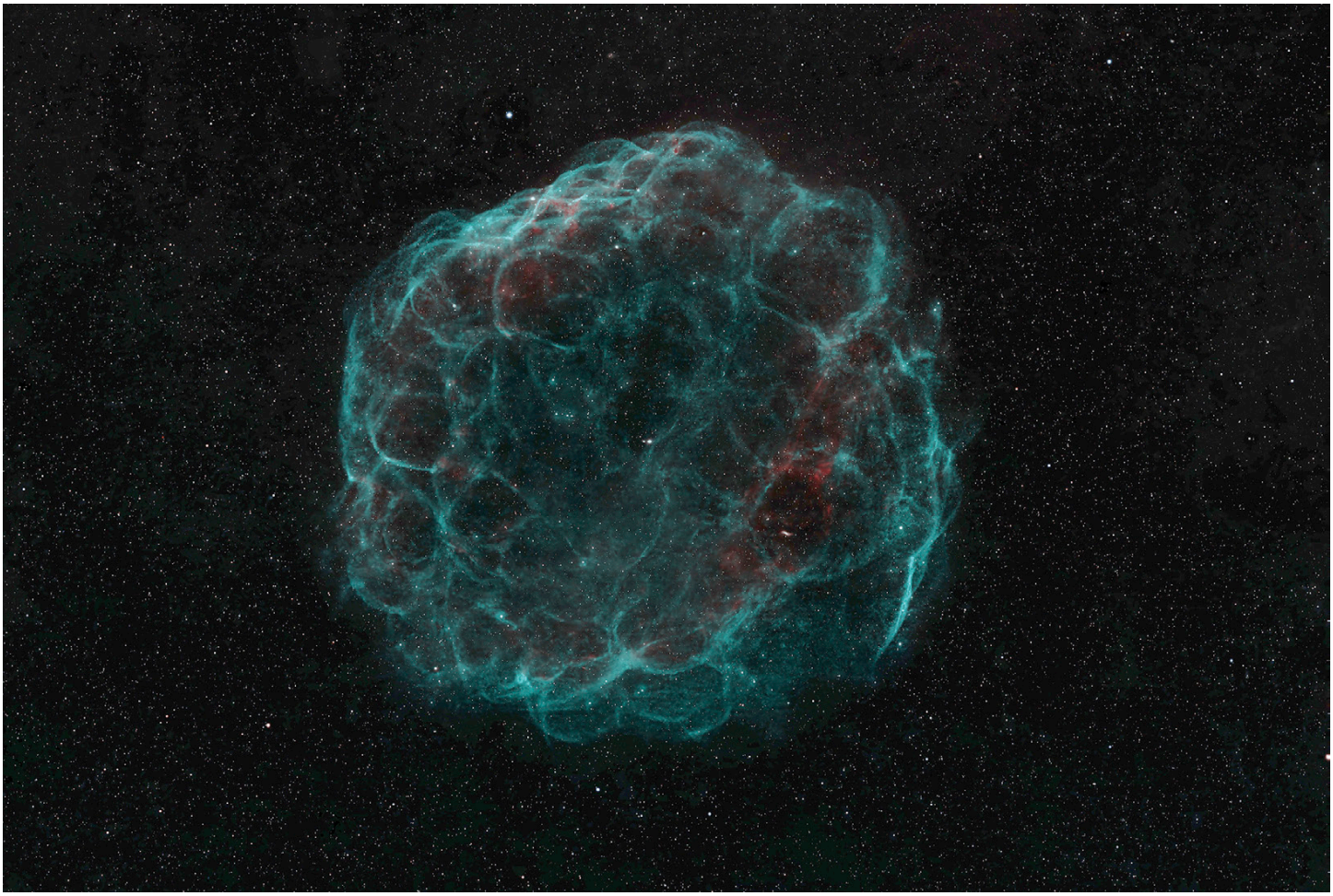


M31, Andromeda Galaxy by Martin Butley

Reprocessed an old favorite taken at OkieTex. 5 minute subs: R x 48, G x 19, B x 25, Ha x 37; Total Integration 11 hrs
Takahashi 130 FSQ on an Astrophysics 1100 mount with a ZWO ASI 6200 camera

Falcon 9 rocket launch by Eddie Hunnell on Feb 4

Falcon 9 rocket launch from my neighborhood in Holly Springs, NC. It was awesome to see it go by. I could even see contrails from its mostly vertical phase of launch.



SNR G179.0+0.26 by M. J. Post

Super Nova Remnant G179.0+0.26 lies in Auriga between open cluster M37 and the Spaghetti Nebula. It's about 11,000 light year away and spans 200 light years. That makes it about one degree wide as seen from planet Earth (a group of four full moons).

Here's my result using 11" RASA and 4 hours of exposures through each of the standard narrowband filters: H-alpha, SII, and OIII. H-alpha and SII signals are nearly non-existent except in a few "hot spots." Unfortunately, on the nights I imaged this target, seeing was terrible - consistently 4-7 arc minutes FWHM. Each pixel in my setup spans 1.26 arc seconds in the sky, so why not reduce noise by binning the master sub frames 2x2? I did.

NGC 2149 Reflection Nebula by M. J. Post

This small object is rarely photographed, probably because it is not that interesting and because it is embedded in an amorphous cloud of dust and gas. It is the central object here, while the smaller and dimmer blue reflection nebula on its right side is vdB 66. These objects are in Monoceros the Unicorn, just below the celestial equator; they are about 1300 light years away.

From DSNM, 2.5 hours total exposure time on OSC camera, CDK14 scope. FOV is about 18 x 12 arc min.

NGC 2403 by M. J. Post

I finished the OSC image of this galaxy about 1 month ago, awaiting an opportunity to add H-alpha data to it to show the HII regions better. That finally happened tonight, so here's the result of combining 3 hours of luminance data (CDK scope) with 1 hour of H-alpha data (RASA scope) from DSNM. FOV is about 45 x 30 arc minutes.

Also known as Caldwell 7, this galaxy is remarkably similar to M33 . It is 8 M.l.y. from earth and lies in Camelopardalis, whereas M33 is 3 M.l.y. away and lies in Triangulum. It appears smaller than M33 but is actually slightly larger.

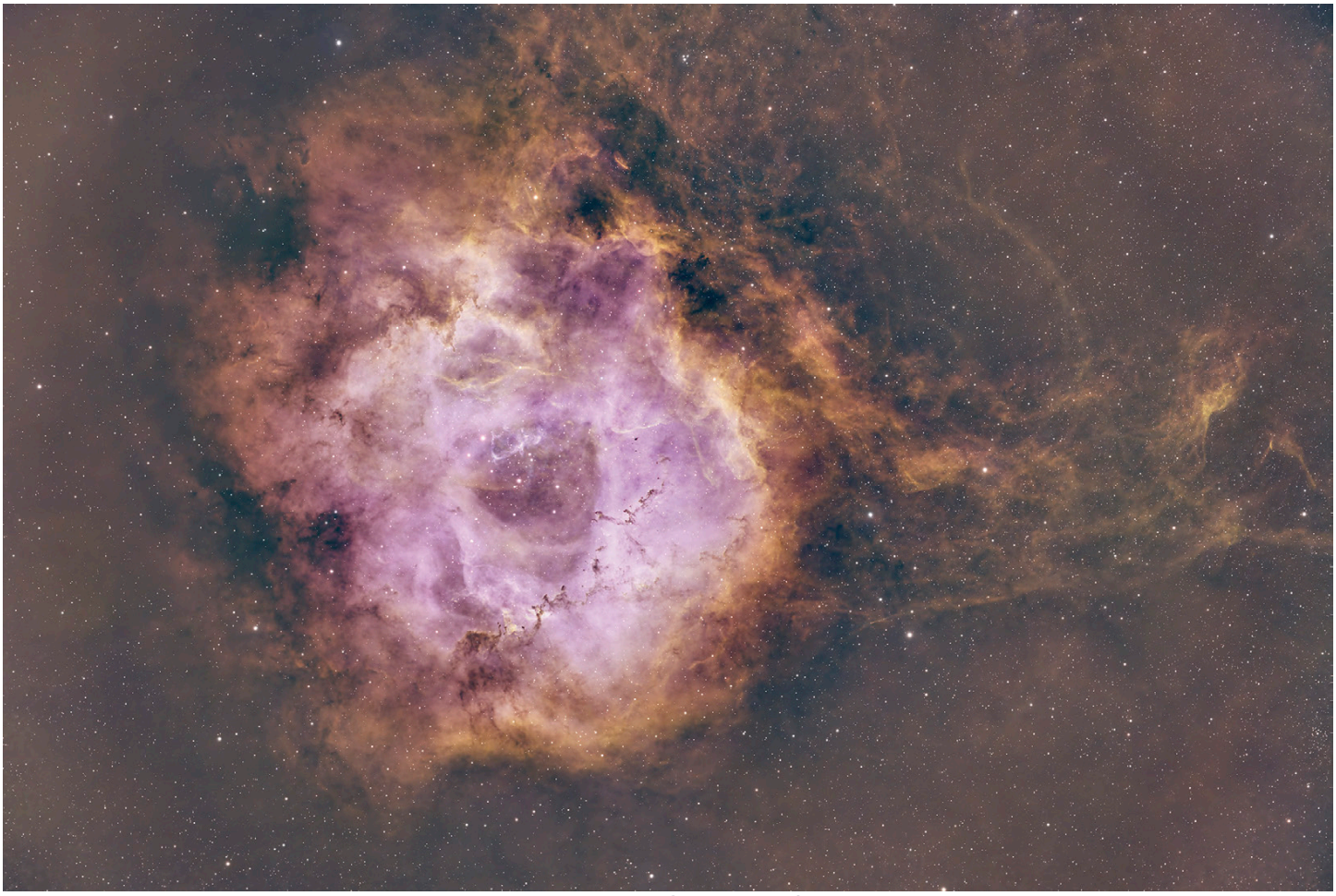
UGC 5829 by M. J. Post

UCG 5829 is in Leo Minor, about 27 M.l.y. distant. It has acquired the nickname of Spider Galaxy. FOV is about 21 x 14 arc minutes. From DSNM with CDK14 scope, ASI 6200MC camera, and luminance filter. 3.5 hours on target. UGC stands for Uppsala General Catalogue (of galaxies)

Abel 31 (below) is a large, ancient planetary nebula in Cancer. It is about 2000 light years away and weighs in at Mag 15.5. It is 10 light years in diameter and therefore subtends about 1/3 of a degree in the sky (nearly the size of a full moon). That makes it one of the largest planetary nebulae that we can observe from planet Earth.

Two hours each H-alpha, OIII, and SII taken through an 11" RASA scope. Surprisingly, SII signals were equal in strength to the H-alpha signal, and different in structure. That is very uncharacteristic for planetary nebulae that often have no SII at all!

Abel 31 by M. J. Post



Rosette Nebula by Stephen Garretson

Several of us have recently returned to this amazing object, offering various interpretations; this is mine...at least for now. I have pretty nice data in all 4 of these narrowband wavelengths. I may elect to manipulate the colors again just to see what I get. The intention here was to add H-Beta to the normal triad of Ha, OIII, and SII, as the target is quite rich in H=Beta. Initially I was going to try and map all 4 channels close to their natural colors, but I elected to show SII as yellow to bring it out more distinctly. After all, color selection is really personal choice and artistic bent, usually some combination of science and aesthetics. So this is the result this time.

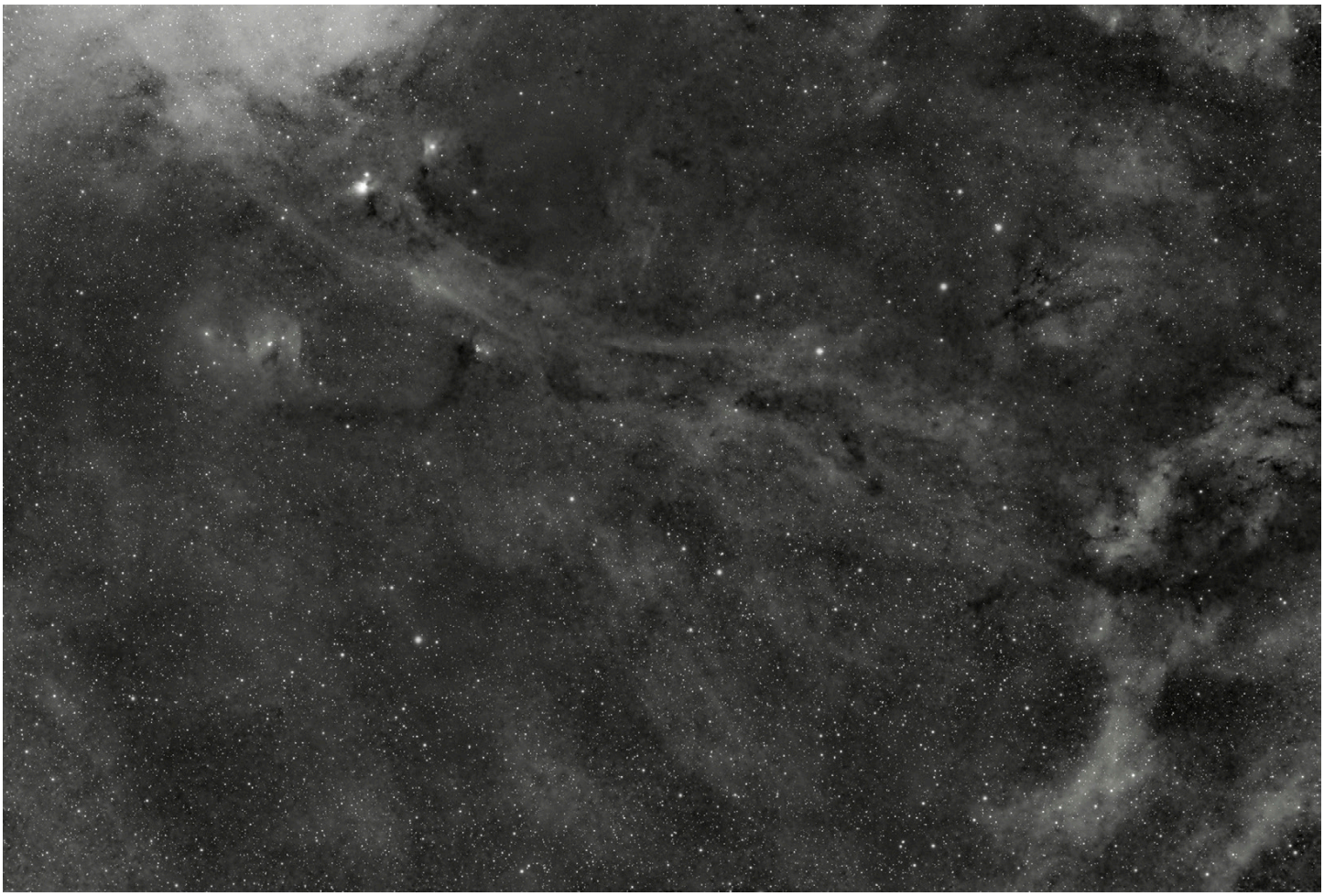
36 x 300s guided Ha subs, 36x300s guided H-Beta subs, 36x300s guided OIII subs, 36x300s guided SII subs
Total integration: 12 hours

Borg FL 107 6 element f/3.9 APO, Primalucelab Esatto Robotic Focuser
ZWO EFW, Chroma 3nm filters, Wanderer Astro. V2 Rotator, WandererBox Lite V3, modified Wanderer Astro Eclipse

William Optics Star 71 Gen II f/4.9 Petzval Astrograph, Optec TCF Leo robotic focuser
ZWO EFW, Chroma 3nm filters, Baader H-Beta filter, Wanderer Astro. V2 Rotator ,WandererBox Lite V3, modified Wanderer Astro Eclipse

Paramount MX+
TheSkyX, SGP, Wanderer Empire, PHD2
PixInsight, Mac OS Photos, Preview

From the Beevo Dome



LBN 903 area by Stephen Garretson

This is just off to the right of the Cone/Fox Fur area. The Moon is too bright to add OIII or SII now, so the image is Ha only. There's a different configuration in the Beevo Dome; the 132s are resting and a Borg 107 FL/William Optics Star 71 f/4.9 Astrograph duo in residence; both run identical filters and cameras. These two scopes with slightly different FOVs, so in processing I align with a Borg sub [smaller FOV] as the reference.

23 x guided 600s subs
Total integration: 3 hours, 50 minutes

Borg FL 107 6 element f/3.9 APO, Primalucelab Esatto Robotic Focuser
ZWO EFW, Chroma 3nm filters, Wanderer Astro. V2 Rotator

William Optics Star 71 Gen II f/4.9 Petzval Astrograph
ZWO EFW, Chroma 3nm filters, Wanderer Astro. V2 Rotator

Paramount MX+

TheSkyX, SGP, Wanderer Empire, PHD2
PixInsight, Mac OS Photos, Preview

from the Beevo Dome

Sh 2-284 by Stephen Garretson

This is one of the series of Sharpless HII nebulae that string out from the "bottom" of the Rosette; 284 is the last significant one and the other large one, the first being 280. I was surprised at the amount of interesting structure that showed up compared to rather uninteresting subs, even at 600s. When our friend the Moon is resting again and not lighting up everything I will get OIII and SII to make a color image.

22 x guided 600s subs
Total integration: 3 hours, 40 minutes

Borg FL 107 6 element f/3.9 APO, Primalucelab Esatto Robotic Focuser
ZWO EFW, Chroma 3nm filters, Wanderer Astro. V2 Rotator

William Optics Star 71 Gen II f/4.9 Petzval Astrograph
ZWO EFW
Chroma 3nm filters
Wanderer Astro. V2 Rotator

Paramount MX+

TheSkyX, SGP, Wanderer Empire, PHD2
PixInsight, Mac OS Photos, Preview

from the Beevo Dome

Newsletter Archives by Eileen Hall-McKim

30 Years Ago March 1995

President, Thorn Peck opened the meeting with general discussion regarding: Star parties for the next 9 months, LAS guest speakers for the next 9 months, 1995 FRASC Star parties. ALCOR Jerry Wilkinson gave out Honorary Messier award to Bob Michael. Bob Michael also received the AL Messier binocular and Deep sky awards.

- Open discussion about observing past and present
- Tom Bisque of Bisque software entertained and informed us all about computerized astronomy. Using Bisque software Tom showed us the tremendous information available, the instructional nature, and research capabilities of Bisque software
- A reminder that the annual spring FRASC meeting will take place on Saturday, April 22nd at the Boettcher Auditorium, University of Denver Campus. Note that FRASC meetings are open to all club members, so if you would like to learn more about astronomy in general and what's going on with amateur astronomy along the Front Range, please attend!

Orbiting about 40,000 light years from the galactic core is the final Messier object with the borders of Canes Venatici. The great M3 globular cluster. This superb object is highly resolvable, 18 min of arc. diameter and worth the visit every night it is visible. Canes Venatici is clear of the Milky Way and provides an excellent window into the extragalactic cosmos. To itemize objects here would be to numerous, but you could review historical LAS newsletter articles by Tom Johnson or Bob Spohn. Once you have explored the numerous fantastic galaxies of Canes Venatici the constellation will never be confusing or escape you again!

20 Years Ago March 2005

Hello dark sky marines, April is coming up fast now for the annual dark sky Sterling Star Party. It's on the 7th, 8th, and 9thof April. All are invited again. For info check our web site for maps and directions.

Astronomy day is also coming up, we will need Volunteers again. Thanks to many it makes it a fun day. Ray Warren loves selling and giving away stuff, we will try to encourage him for he is making the club money, now what to do with it?

During their planning meeting executives agreed to get a weekend star party at CU Mountain Research Station going in joint effort with BASS. We can rent dorms to sleep in, kitchen, and conference rooms to use for short guest speaker topic, then afternoon checking out scopes and buildings, we get a dark sky night at 10, 000 ft. location is pretty good for local short trip. This could be like a field trip and we car pool up there or whatever. BASS, the Boulder club, and LAS money would pay for Kitchen and Conference room and the rest of us pay for rooms, four to a room but two would be better or family could share to keep expenses down. Julie Carmen is working on this for us.

The Home Planet Stellar views have been very good again this last month despite me not getting to dark sky places. Yard views are way better than no views I always say. Saturn on good seeing nights has been some of the best in long time. It's goodbye to Saturn for good views soon, but Jupiter will be ruling the skies again, already up high early now. Galaxies are some of my favorites in large aperture scopes, M104 in Virgo and other, Coma Berenices, NGC 4565, all those small ones, M53,85, 88,91,98,99,100, M64 black-eyed galaxy. You got the picture, lots of those M numbers for your Messier Certificate, right Bob S?

Astro pictures from Brian Kimball are getting way better, he has it all working right now it seems and new camera to boot. We love getting his pictures. Enough of my ramblings, this is what's up, astronomy is a lifelong adventure, see you in the Dark? Bye, Gary

Andrew Plank, quick follow-up on astronomy camp Julie has alluded to. Thanks to LAS and Mike Hotka, 60 cool packets with planispheres and fascinating paraphernalia.

10 Years Ago March 2015

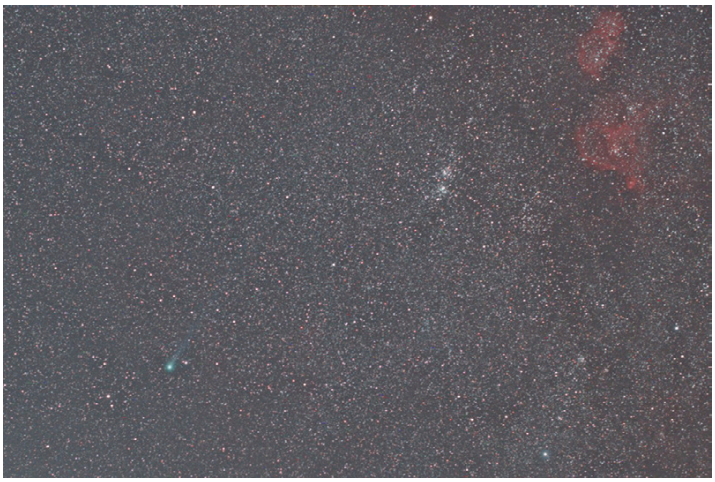
Forty-two people attended the February meeting of the Longmont Astronomical Society. Vern Raben announced the agenda for the meeting and introduced the club board and officers: himself (President), Gary Garzone (Vice President), Michael Fellows (Treasurer/ALCor), Joe Hudson (Secretary), Brian Kimball (Member-at-large), Jim Elkins (Member-at-large), and Tally O'Donnell (Member-at-large). Vern also greeted 5 first time visitors.

The LAS Board has decided to begin work developing a library telescope program which will be somewhat similar, but on a much smaller scale, to what has been done by the New Hampshire Astronomical Society. The New Hampshire club has placed 100 telescopes in participating libraries since 2008. See http://nhastro.com/ltp.php for short summary of their program. The concept is that the telescopes and other items would be purchased, modified by LAS, and then donated to a library. Patrons of the library would check out the telescope kit as they do books and other media. The telescopes would be periodically cleaned, adjusted, and maintained by LAS as needed.

Tools and Techniques – Photoshop actions and scripting by Vern Raben
Like any other hobby, this one requires capabilities with tools and techniques... tonight some of the capabilities of a tool used by many imagers, Photoshop.

Aurora image by Paul Robinson taken in southern Montana (4 miles west of Lodge Grass, MT on March 1st, 2015)

M33, the Triangulum Galaxy by Brian Kimball



Wide field image of comet C/2014 Q2 (Lovejoy), the Double Cluster, and the Heart and Soul by David Elmore from Sunspot, NM

Horsehead and Flame Nebula by Gary Garzone

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CED 30 by M. J. Post