Longmont Astronomical Society

April 2025

Cone Nebula
by Martin Butley

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Next LAS Meeting Thursday April 24

Open Forum

The next Longmont Astronomical Society's club meeting will be on Thursday, April 24, 2025, starting at 7:00 pm. No speaker is scheduled so we'll have open forum member presentations. LAS members are invited to give a 5 to 10 minute presentation on an astronomy related topic.

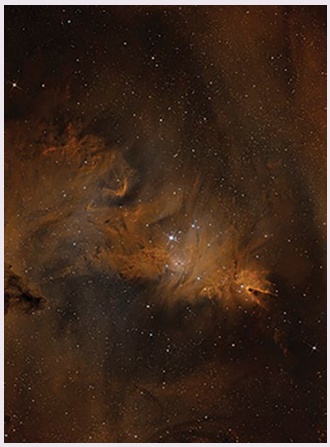
Tell everyone about:

- An observing or imaging project that you are doing
- Good things and bad things about some equipment you have purchased
- Talk about an image you have taken - what is in it, equipment used, how you processed it
- Interesting techniques you have learned about
- Just about anything astronomy related that interests you will probably interest others as well

You may present in-person or via Zoom. Not mandatory but it would be helpful if you email Vern that you are interested in presenting and the topic before the meeting.

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. Video of the meeting will be available on the LAS member portal website https://members.longmontastro.org on Friday after the presentation.

Front Cover
Cone Nebula by Marty Butley



Reprocessed some old narrowband subs (10 min x 21 each Ha, OIII, SII) and added some new RGB stars (45 sec x 25 each R,G,B)
Total integration 11 hours

From my backyard in Hygiene with a Takahashi 130 FSQ refractor on an AP 1100 mount with a ZWO ASI 6200 camera

Back Cover
SNR G206.9+02.3 by Tally O'Donnell

This is the SNR that is just to the east of G205.5+00.5 This is an SHO image with one hour each of Ha and SII and 4 hours of OIII to help bring out the SNR. The nebulosity to the right side of the image is LBN947 and LDN1631.

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 Mike Hotka. 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.

Contents

Planets in April

Mercury

Mercury is not visible this month.

Venus

Venus is visible very low in the East shortly before sunrise. It is very bright at about magnitude -5.5; the apparent disk decreases from 57 arc sec to 37 arc sec across during the month.

Mars

Mars is high in the west after sunset. It is magnitude +0.5 magnitude on the 1st and dims to 1.0 magnitude by the 30th. The disc decreases from 8.1 arc to 6.5 arc sec in apparent size.

Jupiter

Jupiter is getting lower in the west after sunset each day this month. It is -2.1 magnitude in brightness and the disc decreases from 36 to 34 arc sec across this month. Best times to view the Great Red Spot as it crosses the middle of the planet this month are:

- Apr 1 at 8:18 pm at alt 50°
- Apr 3 at 9:57 pm at alt 29°
- Apr 8 at 9:07 pm at alt 36°
- Apr 15 at 9:57 pm at alt 22°
- Apr 20 at 9:07 pm at alt 29°

Saturn

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

Uranus

Uranus is visible low in the WNW until about the 20th when it disappears into the bright twilight after sunset. It is magnitude 5.8 in brightness and is 3.4 arc sec across.

Neptune

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

Lunar Phases in April

- First Quarter April 4 at 8:16 pm
- Full Moon April 12 at 6:23 pm
- Third Quarter on April 20 at 7:37 pm
- New Moon April 27 at 12:35 pm

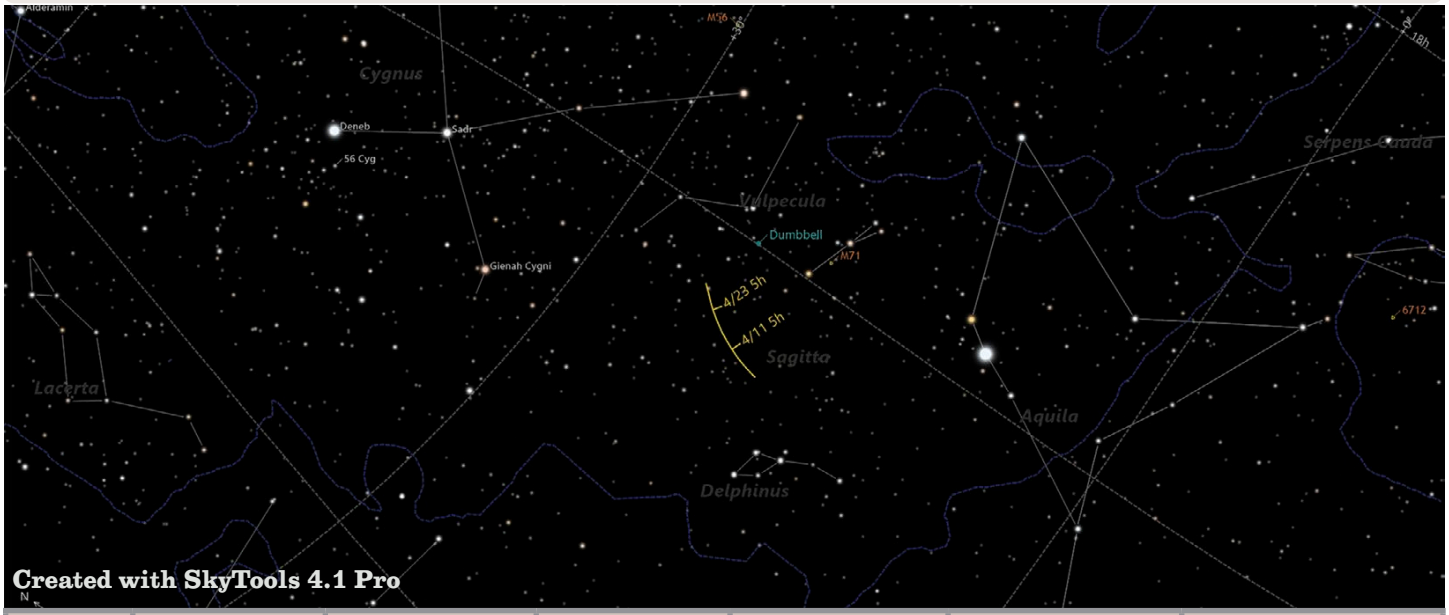
Meteor Showers in April

The Lyrids meteor shower peaks on the night of April 21/22. Expect to see about 18 per hour from a dark location. Moon rise is about 3 am on the 22nd so it won't interfere much. The Lyrids meteor shower has been for over 2700 years according to ancient Chinese records. It is caused by debris from long period comet C/1861 G1 (Thatcher). Comet Thatcher orbits the sun every 415.5 years.

Showpiece Objects in April

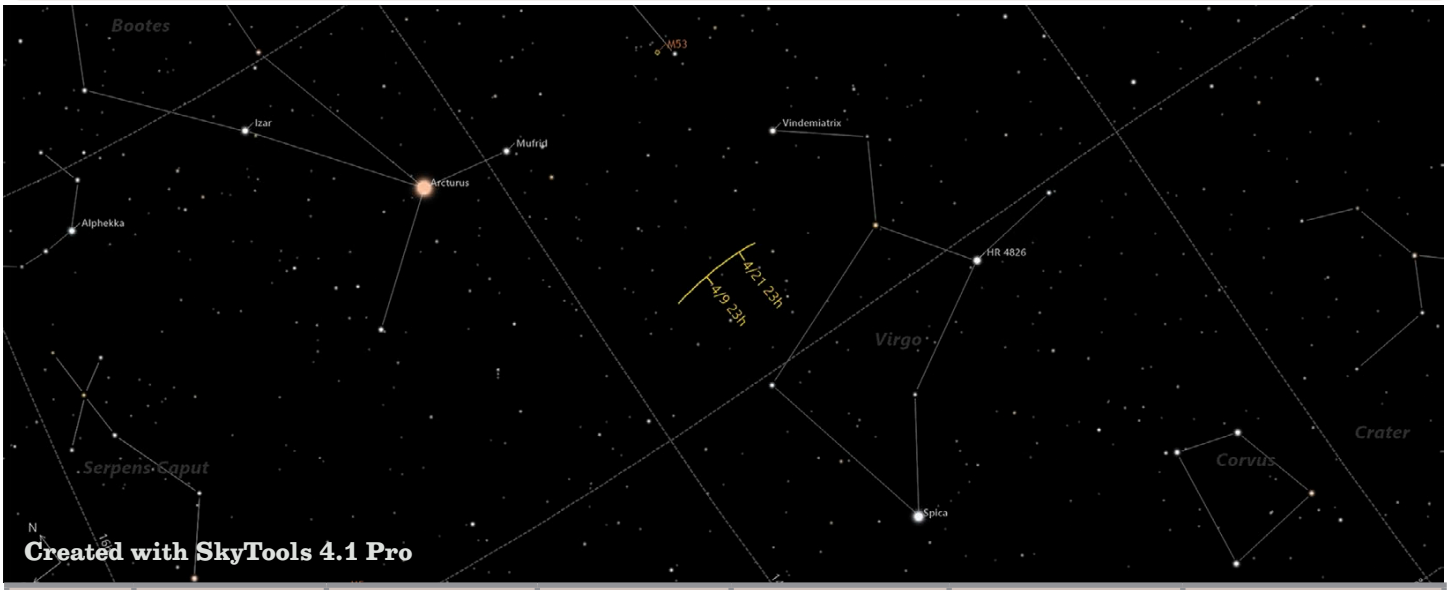
- Abel 31 planetary Nebula in Cnc, mag 12.2
- M 44, "Beehive" open cluster in Cnc, mag 3.4
- M 64, "Black Eye" galaxy in Com, mag 9.8
- M 81, "Bode's Galaxy" galaxy in UMa, mag 7.8
- M 82, "Cigar Galaxy" galaxy in UMa, mag 9.0
- NGC 4490, "Cocoon" galaxy in CVn, mag 9.8
- M 1, "Crab" nebula in Tai, mag 8.4
- NGC 2371 "Gemini" planetary nebula in Gem, mag 11.2
- NGC 4657, "Hockey Stick" galaxy in CVn, mag 9.8
- M 49 galaxy in Vir mag 9.3
- M 66 galaxy in Leo, mag 9.7
- M 86 galaxy in Vir, mag 9.8
- M 88 galaxy in Com, mag 10.2
- M 89 galaxy in Vir, mag 10.7
- M 96 galaxy in Leo, mag 10.1
- M 98 galaxy in Com, mag 10.9
- M 106 galaxy in CVn, mag 9.1
- M 109 galaxy in UMa, mag 10.5
- NGC 2403 galaxy in Cam mag 11.3
- NGC 2904 galaxy in Leo
- NGC 2905 galaxy in Leo, mag 9.5
- NGC 4565 galaxy in Com, mag 10.1
- M 97, "Owl" planetary nebula in UMa, mag 9.7
- M 101, "Pinwheel" galaxy in UMa, mag 8.4
- NGC 4244, "Silver Needle" galaxy Sex, mag 10.0
- NGC 3115 "Spindle Galaxy" galaxy in Sex, mag 10.0
- M 63, "Sunflower" galaxy in CVn, mag 9.3
- NGC 2683, "UFO" galaxy in Lyn, mag 10.0
- NGC 2359 "Thor's Helmet" nebula in CMa
- NGC 2683 "UFO " galaxy in Lyn, mag 10
- NGC 4631, "Whale" galaxy in CVn, mag 9.5
- M 51, "Whirlpool" galaxy in CVn, mag 8.7

Comet C/2023 A3 (Tsuchinshan-ATLAS)



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
April 1	5:12 am	20h26m46.7s	+18°57'12"	Delphinus	12.0	35
April 8	5:02 am	20h25m31.8s	+20°12'17"	Delphinus	12.1	35
April 15	4:47 am	20h23m20.1s	+21°27'22"	Vulpecula	12.1	35
April 22	4:32 am	20h20m08.1s	+22°41'32	Vulpecula	12.2	35
April 30	4:17 am	20h14m27.3s	+24°13'36"	Vulpecula	12.2	36

Comet P/2010 H2 (Vales)

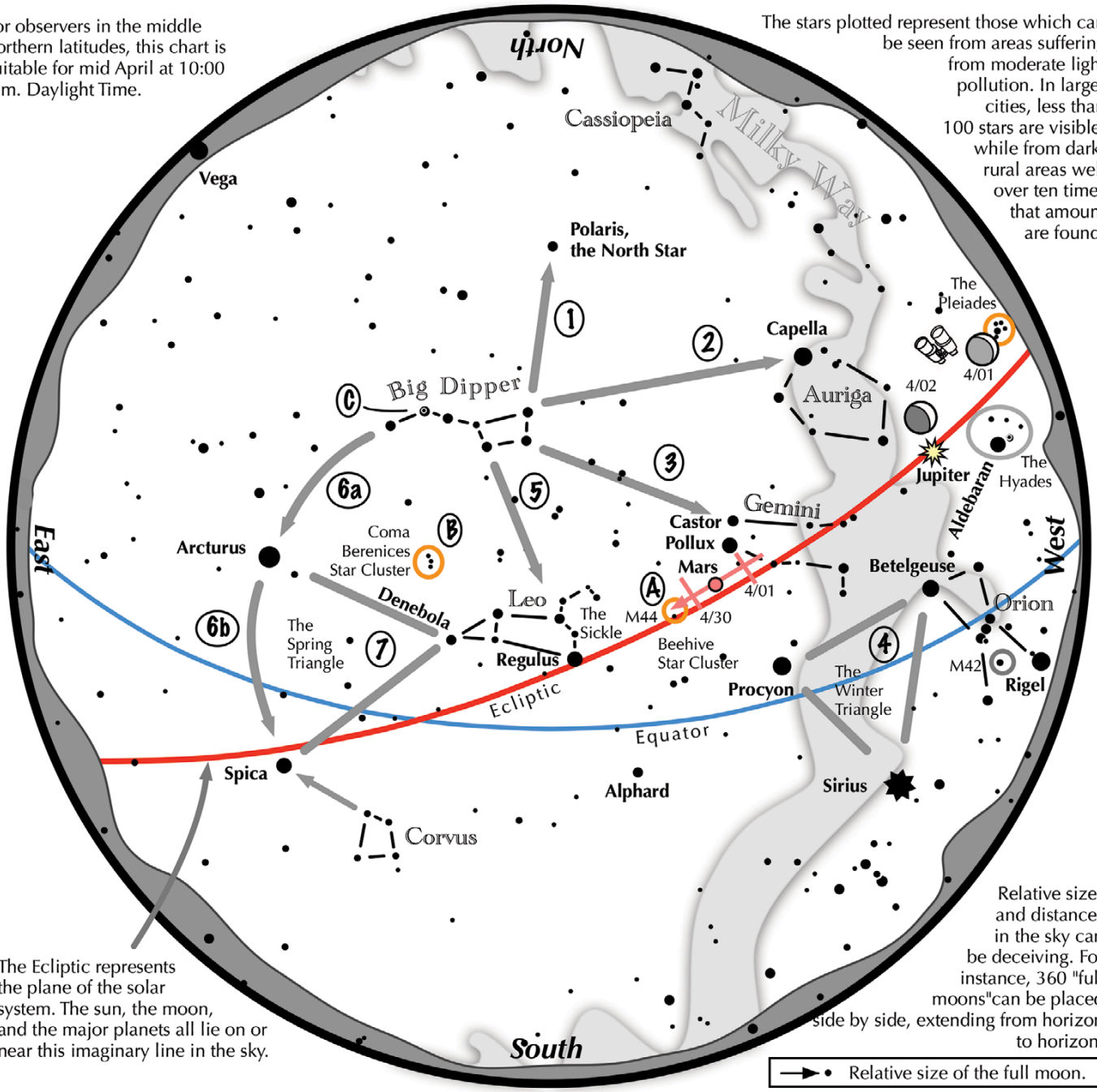


Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
April 1	1:57 am	13h40m00.9s	+06°04'04"	Virgo	14.9	39
April 8	4:51 am	13h34m48.8s	+06°16'06"	Virgo	14.9	39
April 15	10:49 pm	13h29m44.7s	+06°22'06"	Virgo	14.9	39
April 22	12:19 am	13h24m32.8s	+06°21'47"	Virgo	14.9	39
April 30	11:43 pm	13h19m08.2s	+06°12'28"	Virgo	15.0	38

Navigating the mid-April Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 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 April night sky: Simply start with what you know or with what you can easily find.

1. Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
2. Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
3. Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
4. Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
5. Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
6. Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
7. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
B: Look nearly overhead for the loose star cluster of Coma Berenices.
C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.

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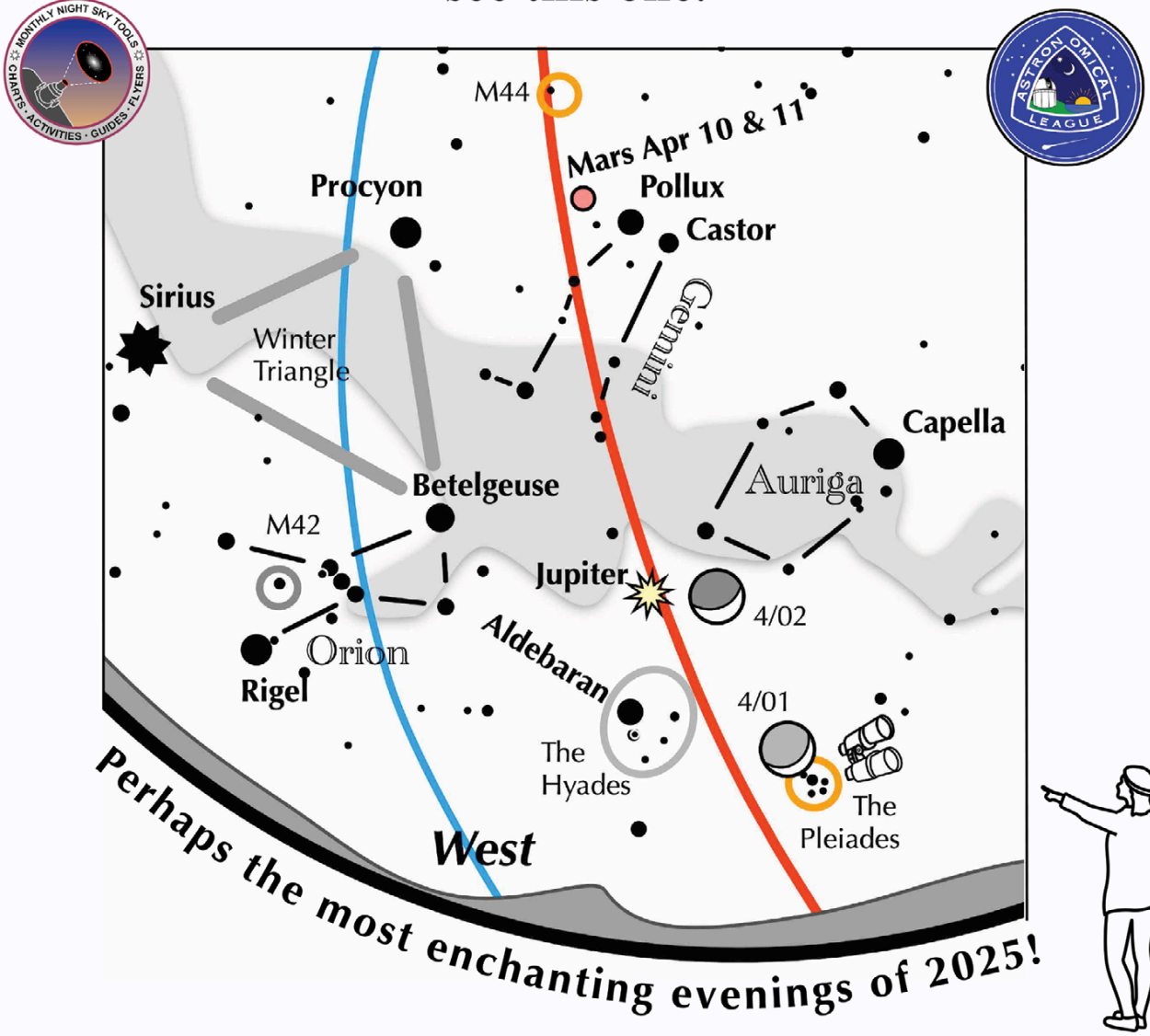
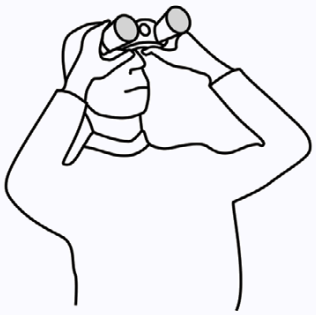
Duplication allowed and encouraged for all free distribution.

If you can see only one celestial event this April, see this one.





Enhance the scene – use binoculars!

On April 1 & 2, look low in the west-northwest 60 minutes after sunset.

• On the first evening, the crescent moon, glowing full with earthshine, floats immediately above the delicate Pleiades star cluster. To its upper left, shine Aldebaran and the intriguing Hyades star cluster. And bright Jupiter lies above that.

• On the second evening, the slightly thicker, but more pronounced crescent moon moves above the Pleiades and next to Jupiter.

• Above it all, red Mars plows through Gemini, reaching alignment with Castor and Pollux on April 10 & 11.

www.astroleague.org

LAS Meeting Notes for March 20 by Eileen Hall-McKim

I. Introduction

The March LAS monthly meeting was held in-person and by Zoom on March 20th at the Longmont Lutheran Church, 803 Third Ave. Twenty members attended in person, 15 attended on-line.

II. Main Presentation

Our guest speaker for the March meeting was Dr. Marc Buie, a senior scientist in the Space Science Department at Southwest Research Institute (SWRI) in Boulder, Colorado. Marc gave a presentation about some of the work being done during 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.

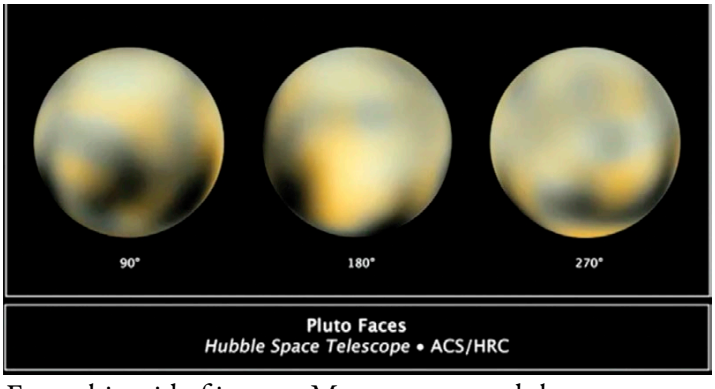
Marc Buie is an American astronomer and prolific discoverer of minor planets. Formerly he worked at the Lowell Observatory in Flagstaff, Arizona, and was the Sentinel Space Telescope Mission Scientist for the B612 Foundation, which is dedicated to protecting Earth from asteroid impact events.

The Lucy Mission: Small-bodies, Occultations, Community Science Goals & Status
By Dr. Marc W. Buie

Marc grew up as crewed space flight was beginning and he was aware of space activities and exploration from a very young age. He went from media reports, newspapers articles, science fiction books, and eventually as student, got to play with some really incredible scopes: at University of Arizona, 61" Kuiper telescope in the Catalina Mountains of Arizona, and 4-meter Cerro Tololo telescope in Chile, while working on his Ph. D in Planetary Sciences with his ongoing long-time interest in Pluto.

New Horizons Launched January 19, 2006 on its way to Pluto – Marc was in the group of people who got together to build the mission. Many years from concept, funding, building community support and actually building the hardware and flying it.

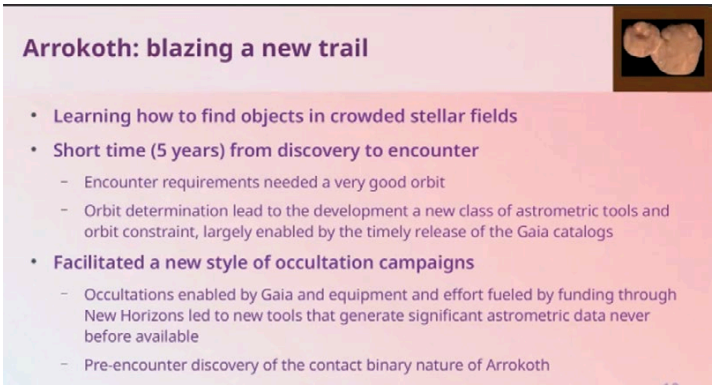
A grid of images of Pluto taken with the Hubble Telescope, each row is one epic. Allows one to reconstruct the high frequency information from the images of Hubble and recover the full diffraction limited quality image of Pluto from the Hubble images that you can't do from a single image, with each photo a different rotation of Pluto.



From this grid of images, Marc constructed these maps of Pluto. Notice bright area in 180° image, compare with

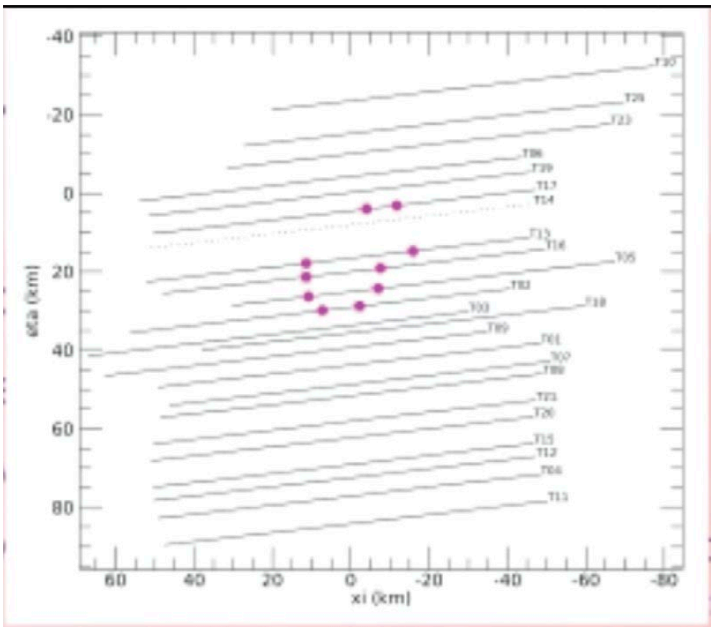
photo of Pluto; when we got there with New Horizons, could only choose one hemisphere to image due to slow rotation and viewing time at flyby, Marc chose this side as area for New Horizons to photograph because of information in these maps.

Image of Pluto at flyby

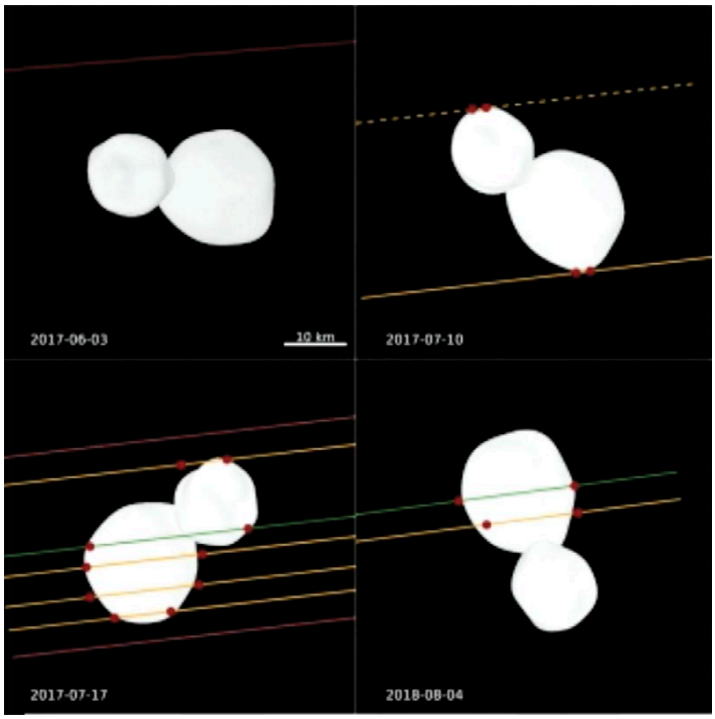


Arrokoth: blazing a new trail in discovering new class of objects we could study up close

- Started search effort in 2004 for objects in crowded field – found 2014 took 10 years
- Facilitated new style of occultation campaigns



- Each line represents where the star cuts across the object as seen by one station, each line represents a different team with a different telescope
- Pink dots represent rim of object, first thought – two balls stuck together – years later, photo of Arrokoth in upper corner, taken by New Horizons, shows what you can do from the Earth with small telescopes even with something out at 40 AU from the Sun!



Shape models from the data from New Horizons, mapped back on all the occultation data, able to refine the data, figured out shape from occultations; next best thing to sending a spacecraft, but way cheaper.

Arrokoth revealed by New Horizons

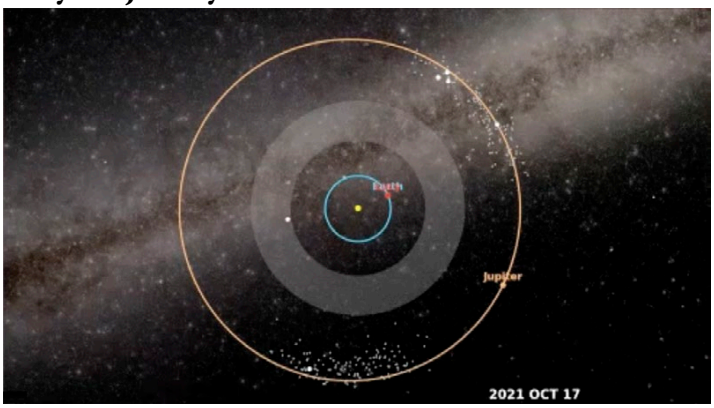
Arrokoth revealed by New Horizons – Marc discovered with Hubble Space Telescope

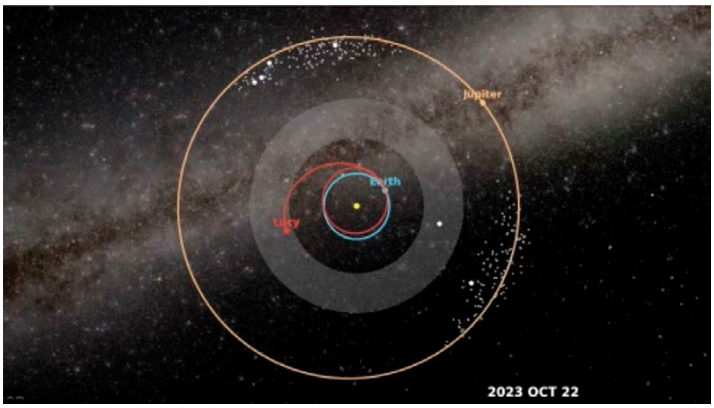
- Figured out its contact binary shape before from occultation
- Wants to do more study of objects out beyond Pluto
- Based on these successes, when Lucy Mission was proposed, Marc was asked by NASA for assistance on upcoming mission

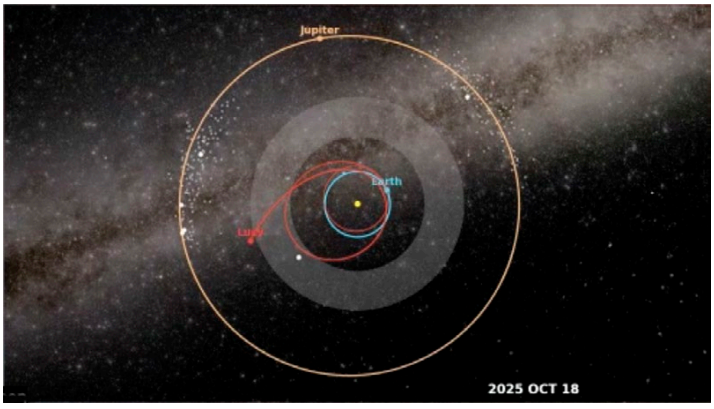
Lucy Mission to the Jupiter Trojan Asteroids

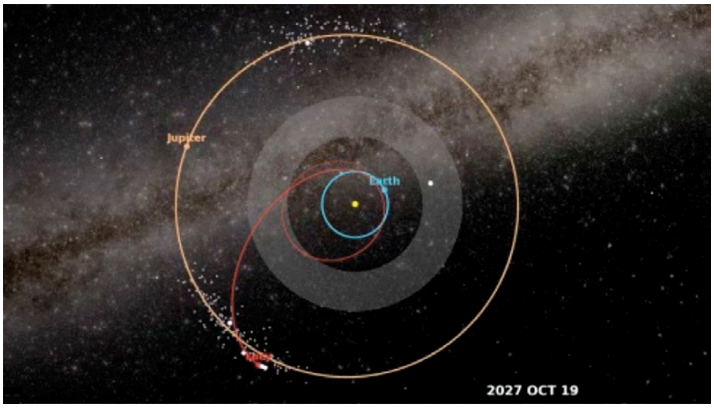
Focus of work now to provide information on the 5 primary bodies Lucy was going to flyby

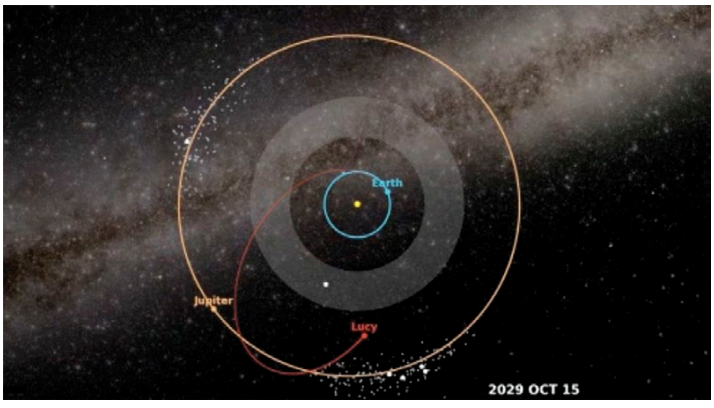
Lucy Trajectory

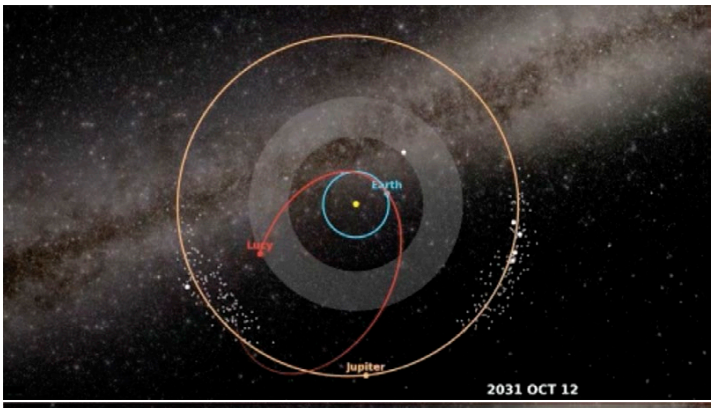


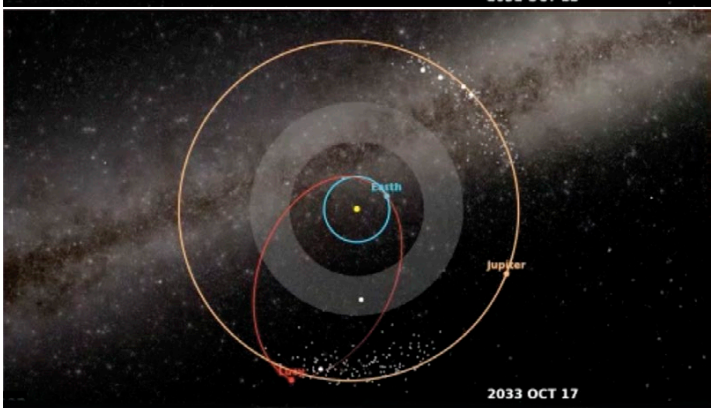








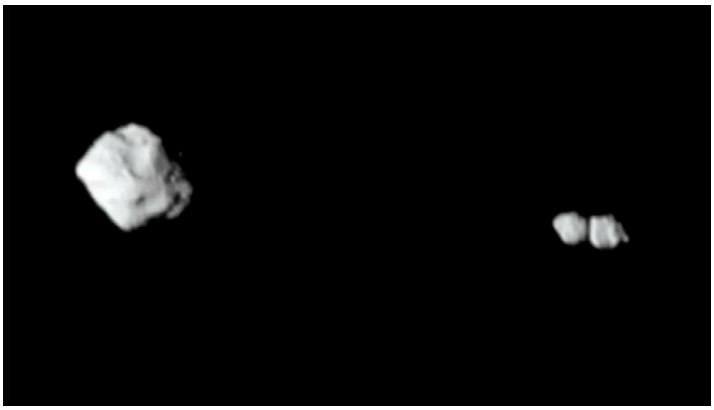




Lucy Mission Timeline

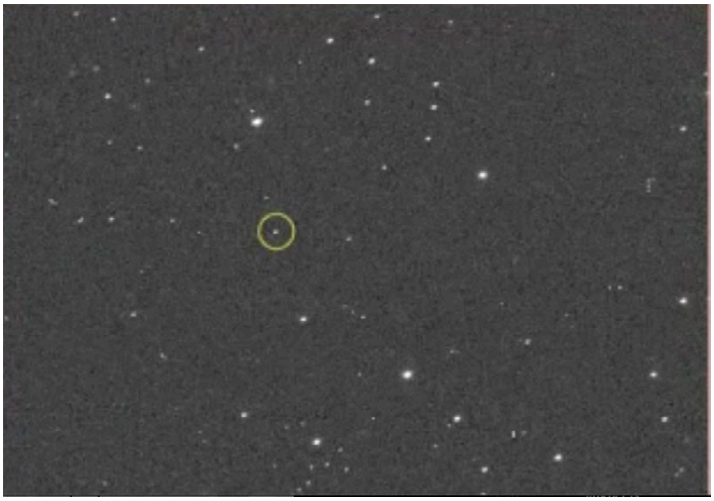
- Launched October 16, 2021
- Dinkenesh flyby, Tuesday, Nov. 2023
- Donaldjohanson flyby, April 2025
- Eurybates, August 2027
- Polymele, September 2027
- Leucus, April 2028
- Orus, November 2028
- Patroclus & Menoetius, March 2033

Lucy's First Target: Dinkinesh



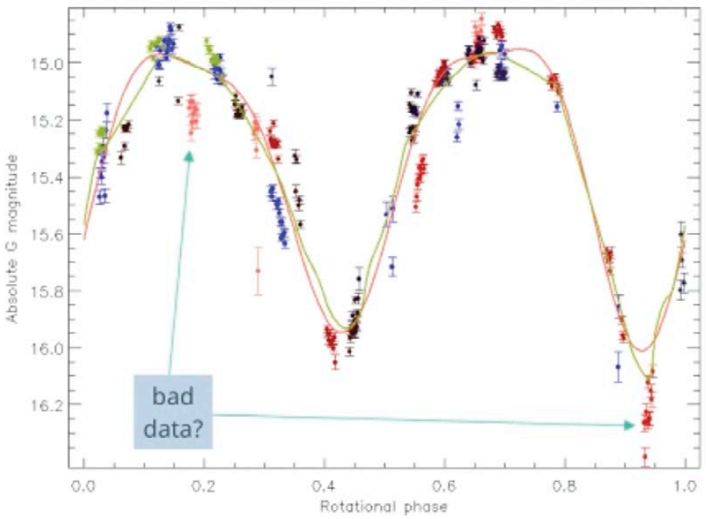
One of first photos seen when coming back from the Dinkinesh encounter, realized it is two objects, and the moon is a contact binary, just like Arrokoth. Structure and shape of object tells us about the origin and evolution of this object, as seen in other small asteroids.

Bennu and Ryugu, both Near-Earth asteroids – shapes look more square, actually top- shaped, rotationally symmetric maybe show stage of evolution; rotational shape likely driven by spin, sheds mass



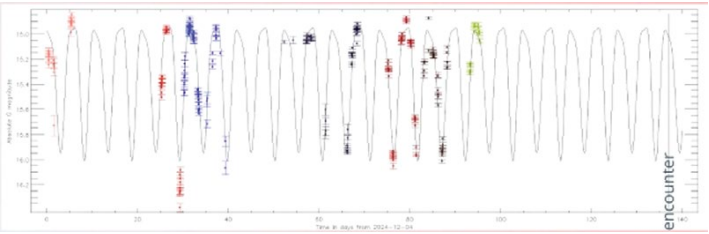
Next target: (52246) Donaldjohanson

- https://whereislucy.space/ to see real-time information
- Donaldjohanson flyby coming up, actually have only about 4 hrs at time of flyby
- April 20, 2025 – close approach
- O2.24.2025 image one of first navigation images – dot in center of circle Dinkinesh



Light curve of Donaldjohanson– monitoring brightness as a function of time

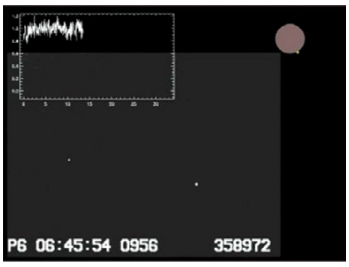
- Varies by more than a magnitude
- High-amplitude light curve implies highly elongated object
- 10 day rotation period, very long, Dinkinesh rotation period about 5 hrs
- Some odd things about data points, low cluster points, can't be explained yet
- Expecting surprised when we get there

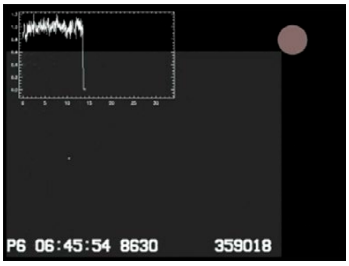


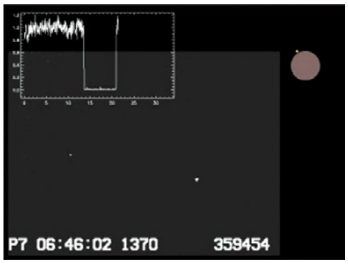
DJ light curve unwrapped – strictly a function of time – when we get there will be broadside from Earth's vantage point, will have a lot of surface for the spaceship to image so should get a pretty good idea of what the shape of this object.

Occultation Reconnaissance
Occultation of Patroclus done at Durango, Colorado

- Upper corner shows transiting asteroid across light of star
- As it approaches it disappears, when it moves off the star, the light comes back
- Putting line of telescopes out, each cut across at a different place, form different line
- Small bodies are not spheres, can tell the shape of bodies from data lines collected
- Type of geology maps using 10-16" telescopes, no need for massive scopes to do science







Mobile Systems design details – Lucy

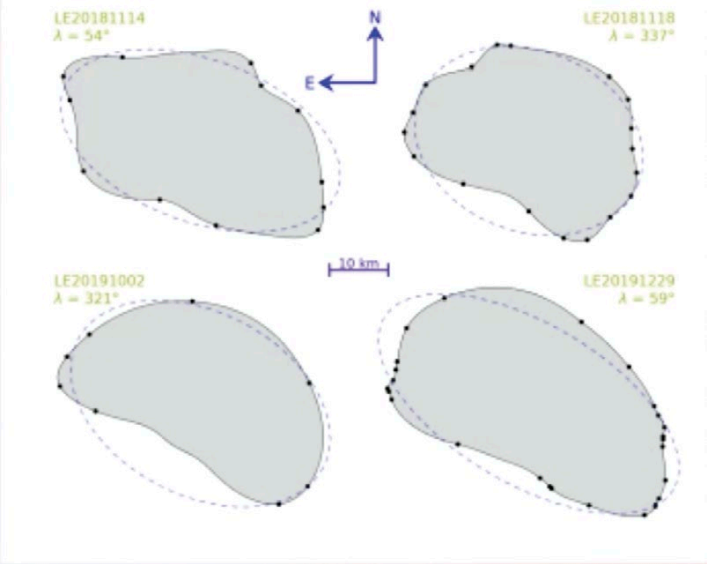
- Ultra mobile systems with international shipping crates
  - All systems use QHY174M-GPS cameras, fast readout sCMOS with integrated GPS for <1 ms timing accuracy
  - CPC1100 telescopes with HyperStars (1 degree FOV)
  - SkyWatcher 16" and 8" telescopes
  - Choice of systems dictated by details of an event noting that larger aperture implies higher deployment costs
- Observers recruited from RECON, IOTA, and referrals
  - Excellent "community science" project that has global reach
- Training and practice built into the deployment plan so that we don't require observers to have prior experience with our equipment
- Strong central control over deployment locations according to the needs of each campaign

Marc's fleet of CPC 1100's telescopes in his warehouse in Mead, CO

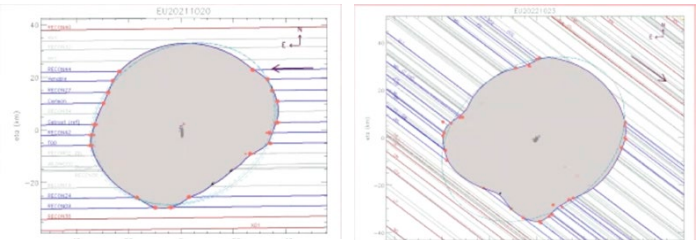
Other projects:

- RECON – Research and Education Collaborative Occultation Network – 40 high schools
- IOTA – International Occultation Timing Association

In observing campaigns local community people participate to learn the skills needed, do not need any prior astronomy experience, have 4-day campaign of training and preparation

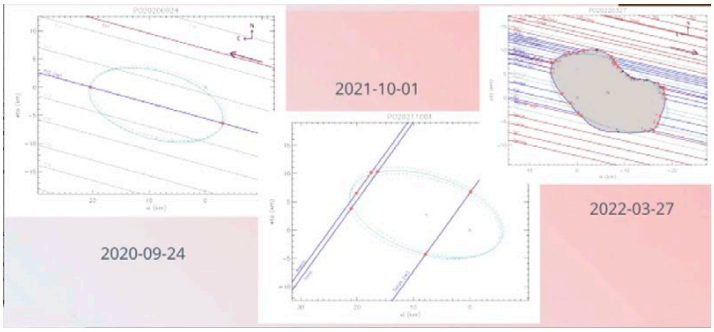


Leucus – First one we worked on, slow rotation period so Lucy is only going to see one side, can combine several looks into 3D model. Will combine high resolution information on the object and the occultation data with the Lucy data in end.



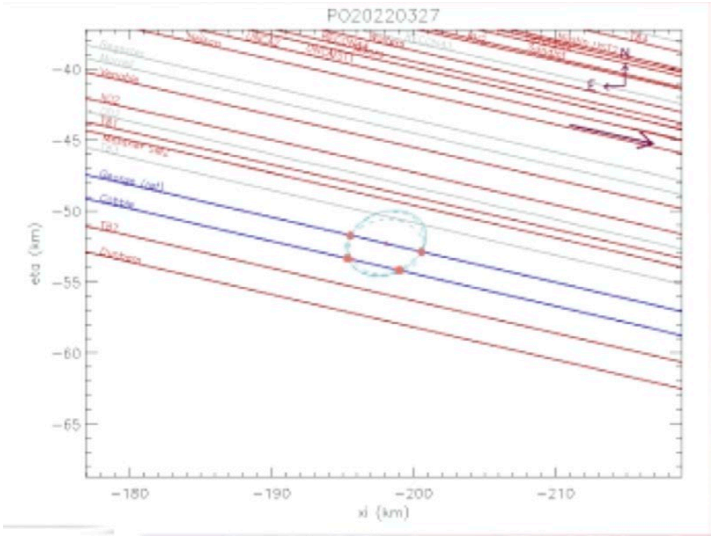
Eurybates – Will be first prime target

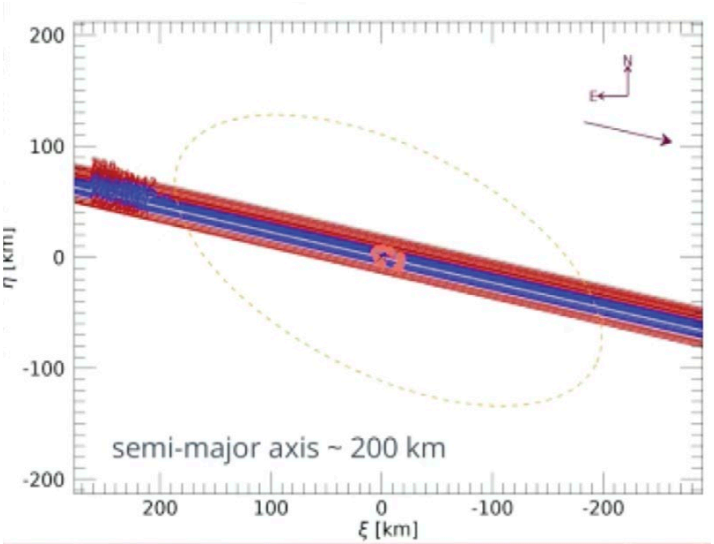
- Each line a different telescope, station on the ground looking at it, collecting data
- Can see there is a lot of topography on Eurybates
- Left side was in Las Vegas, right was year later in Europe with 350 teams out
- Blue with orange dots – observers saw star disappear and then reappear
- Orange line means have data, but did not see disappear
- Gray- team set up but something went wrong, weather, technical problems, no data
- Weather very bad, out of 350 teams, 25 got data, but still got this great profile



Polymele – Smallest of the Lucy prime targets; another highly oblate object

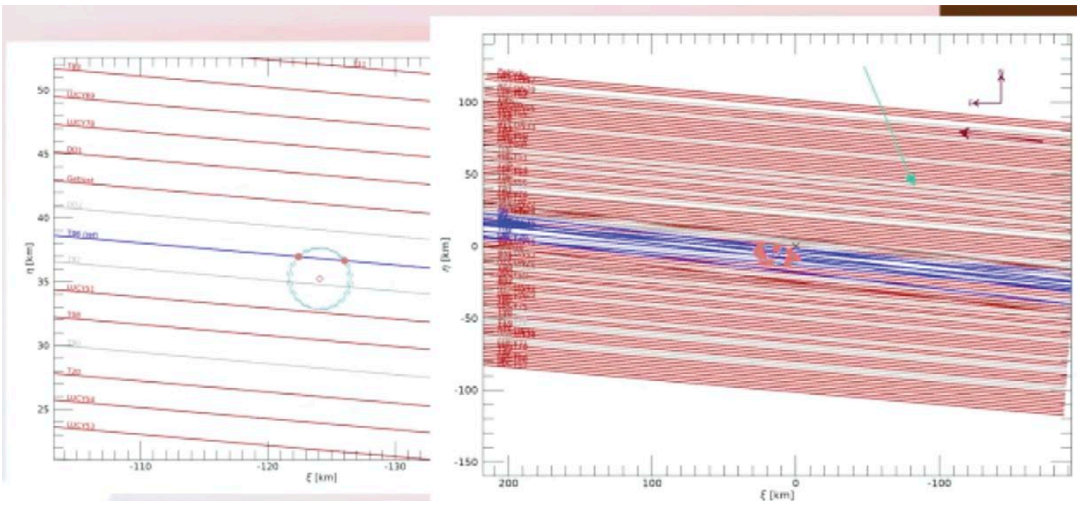
- Another observation campaign in Senegal
- Comparable in size to Arrokoth
- Low-amplitude lightcurve with complicated structure
- Low-obliquity spin pole





Polymele surprise – Senegal observations– discovered a moon with occultation data

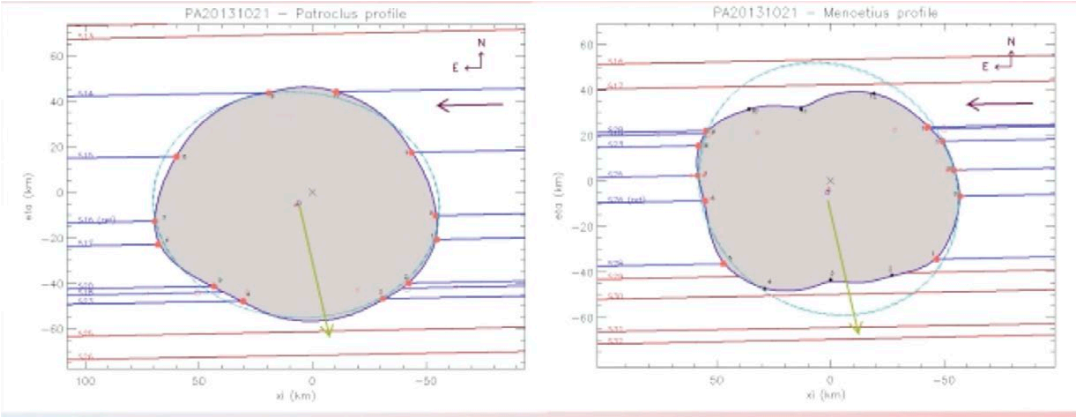
- Second object seen in the system - moon
- 5-6 km diameter, similar in size to small lobe of Arrokoth
- Moon is nicknamed 'Shaun' until it receives official name



Shaun recovered a year later, 2023-02-04

- Out on mission in Kansas, spread out from Wichita to Salina, Kansas
- 150 people, extreme cold weather during event
- 94 telescope teams, evenly spaced every 2km – for 200 km
- Two women volunteers on team recorded the occultation on camera, able to find Shaun; later a third attempt to locate Shaun in Baja, Mexico but clouded out

Dr. Buie showed a movie "Science through Shadows". You may view this video on the LAS member portal (members.longmontastro.org) by viewing the video for the March 20, 2025 meeting starting at time 1:00:10 in the video.



Patroclus-Menoetius – Equal mass binary system

- Patroclus-Menoetius binary is the largest of the Lucy targets
- Large scale topography, will only see one side as Lucy goes by
- Able to measure the mass ratio of the two bodies
- Final target of the mission; we expect to fill in the shape of the non-encounter hemisphere and the winter pole

The Power of Community Science

- More than 700 people have helped collect vital data for New Horizons and Lucy
- Cutting edge science can come from community-base resources
- RECON is continuing with study of other Jupiter Trojans
- We can use this new approach to study the origins of our solar system and impact lives along the way

The team in Argentina for 1st Arrokoth occultation

The Senegal team in Senegal for Arrokoth in 2018

Look around for PBS Nova documentary "Star Chasers of Senegal" to learn more about the project.

Additional resources

- Shadow Chasers - Sky & Telescope, Sept. 2023 issue
- Star chasers of Senegal, NOVA/PBS, first aired in Feb. 2023
- lucy.swri.edu/occultations.html
- tnorecon.net (RECON)
- occsci.substack.com (look for summary of RECON project)
- New book coming out on occultations this year
- Organizing a front-range occultation team

Argentina scope aimed at occultation field for Arrokoth in the galactic center

Marc Buie is organizing a front-range occultation team, for anyone interested experience is not required. Will use resources in the warehouse in Mead to anchor building the first pod of telescopes for working in this particular area and to build a team to help deploy the telescopes when we have an occultation somewhere close. Marc has written an extensive training guide, may organize community work through TinkerMill, Longmont. Hopes to see you all on some future campaign!

Questions and comments followed by members.
Where did the funding come from?

As I understand, just as an example a 20k object would only last about a second, sample rate is only about 4X second, that doesn't seem like much resolution?

As a follow up, does the angular diameter of the star ever cause any inaccuracy in any of what you just talked about?

How do you decide what to look at with only minutes at a flyby?

You mentioned you were looking for people to get involved with this, how would one do that?

III. Business Report by Treasurer Bruce Lamoreaux

Longmont
Astronomical Society

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

LAS Treasurer's Report - Bruce Lamoreaux **3/20/2025**

Main Checking Account (xxx-1587)

Begin Balance:	$ 7,635.00	**2/4/2025**
Deposits:	$ 200.00	Membership
Expenses:	$ (1,065.00)	Bank Charges, Insurance, Library Scopes
Current Balance:	**$ 6,770.00**	**3/4/2025**

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	**1/30/2025**
Deposits:	$ -	
Expenses:	$ -	
Balance	**$ 1,100.00**	**2/27/2025**

Petty Cash

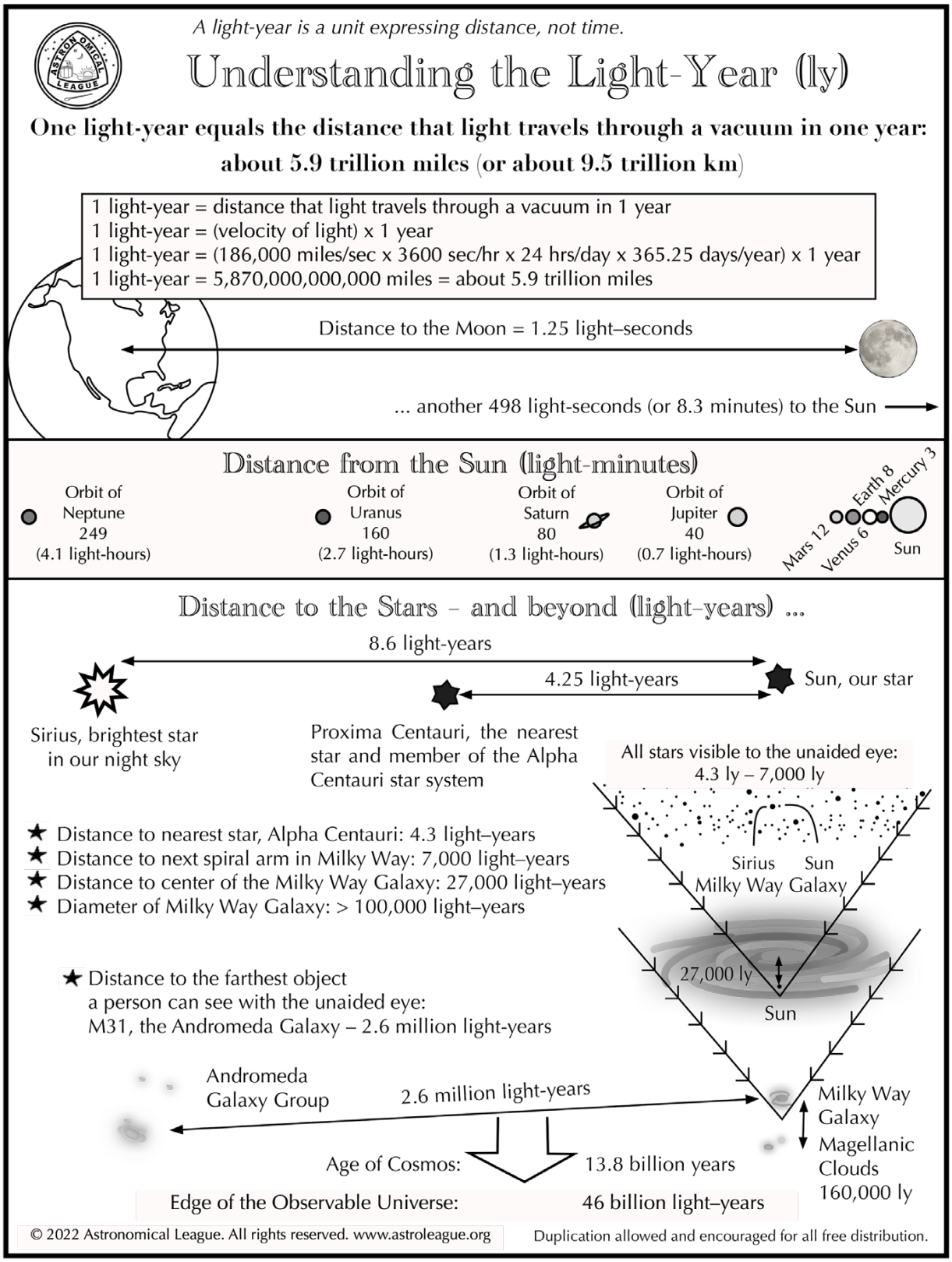
Past Balance:	$ 50.00
Deposits:	$ -
Expenses:	$ -
Balance	**$ 50.00**

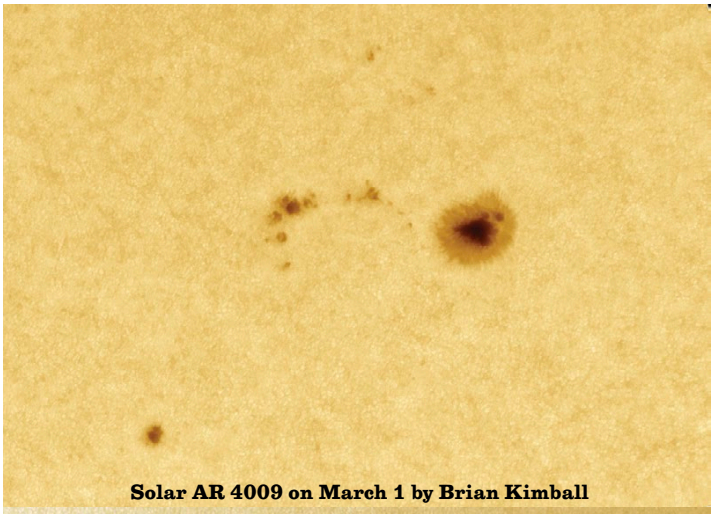
Total Assets	**$ 16,180.00**	$	(865.00) Down from February

Active Membership:	**95**	
Student Membership:	**2**	
Total	**97**	Active

IV. Upcoming Events

- Astronomy Night at Sandstone Ranch on March 29 (Note Hunter Morrison gave his presentation but star party was canceled due to weather)
- Rabbit Mountain Friday, April 18th Star party for Boulder County Parks and Recreation; at Ron Steward Preserve at Rabbit Mountain, near Lyons
- LAS next meeting is not on the usual day, but being held on the 4th Thursday in April 24th due to activities that weekend at the Church where LAS meetings are held

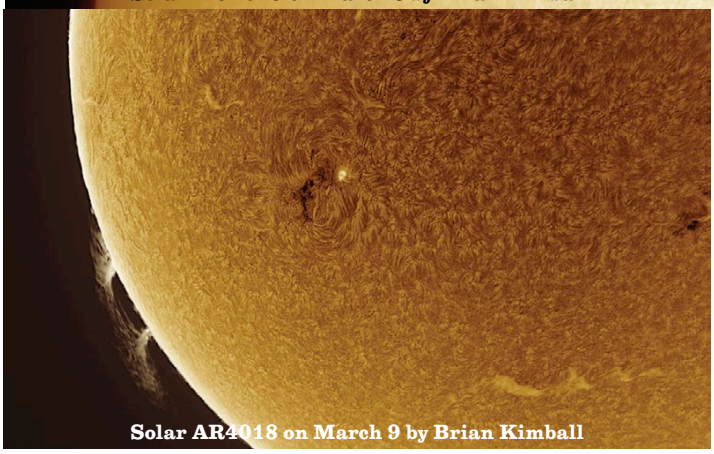




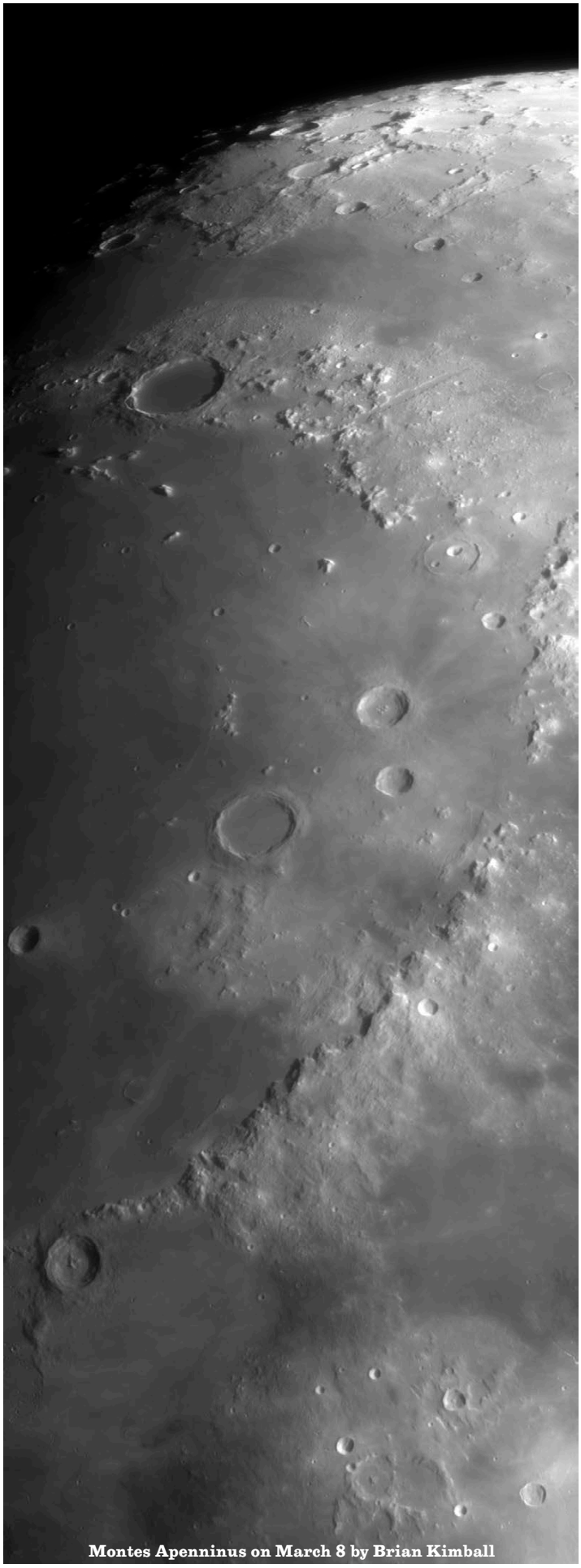
Solar AR 4009 on March 1 by Brian Kimball

Solar AR 4012 on Marcy 8 by Brian Kimball

Solar AR 4019 on March 8 by Brian Kimball

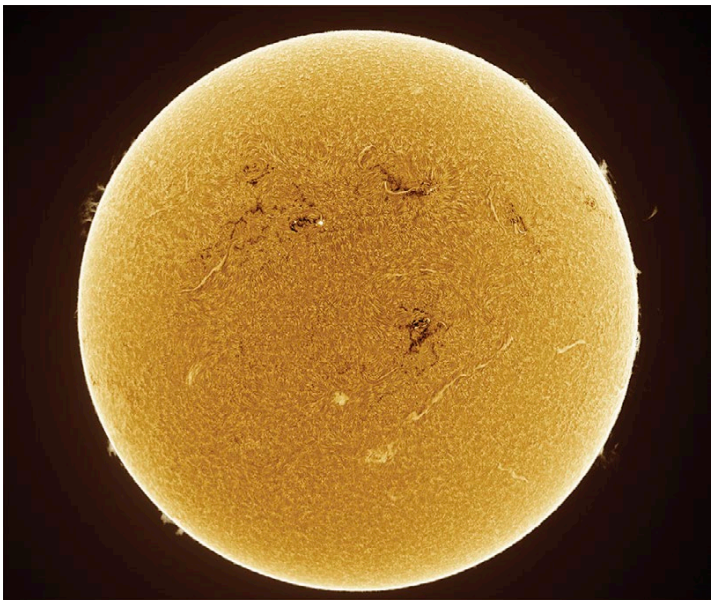


Solar AR4018 on March 9 by Brian Kimball

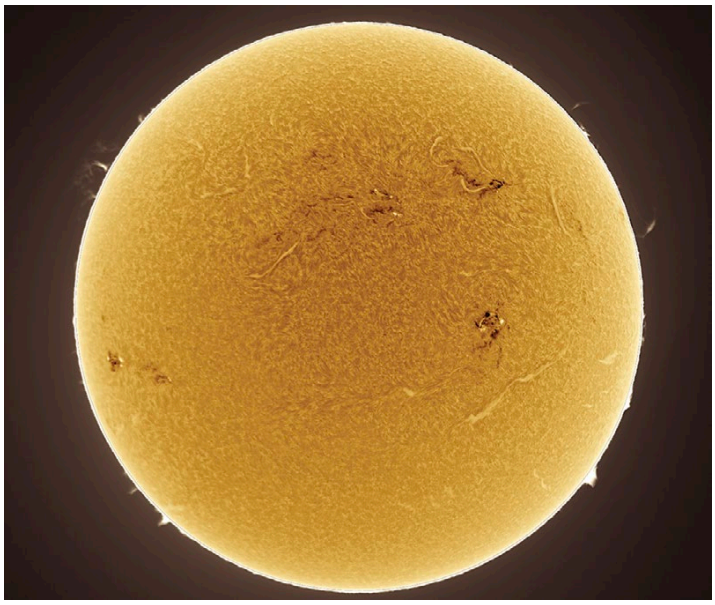


Montes Apenninus on March 8 by Brian Kimball

The Moon's Terminator on March 8 by Brian Kimball_

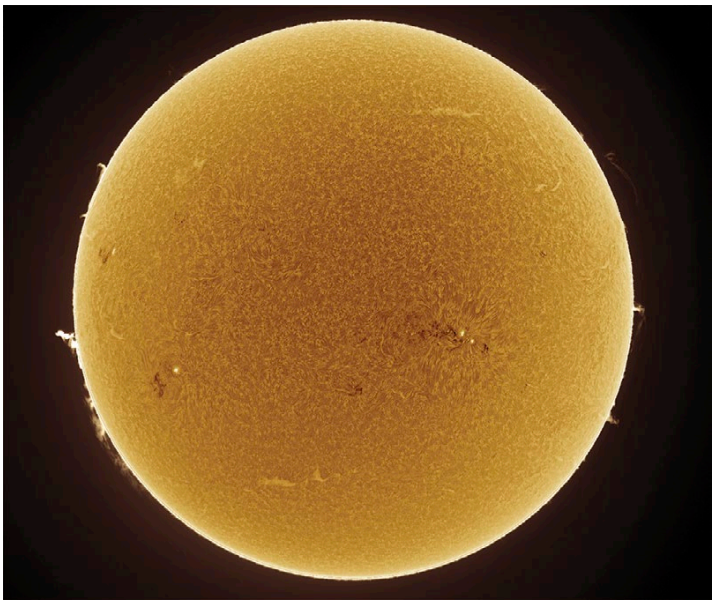


Sun in H-Alpha on March 1 by Brian Kimball



Sun in H-Alpha on March 2 by Brian Kimball

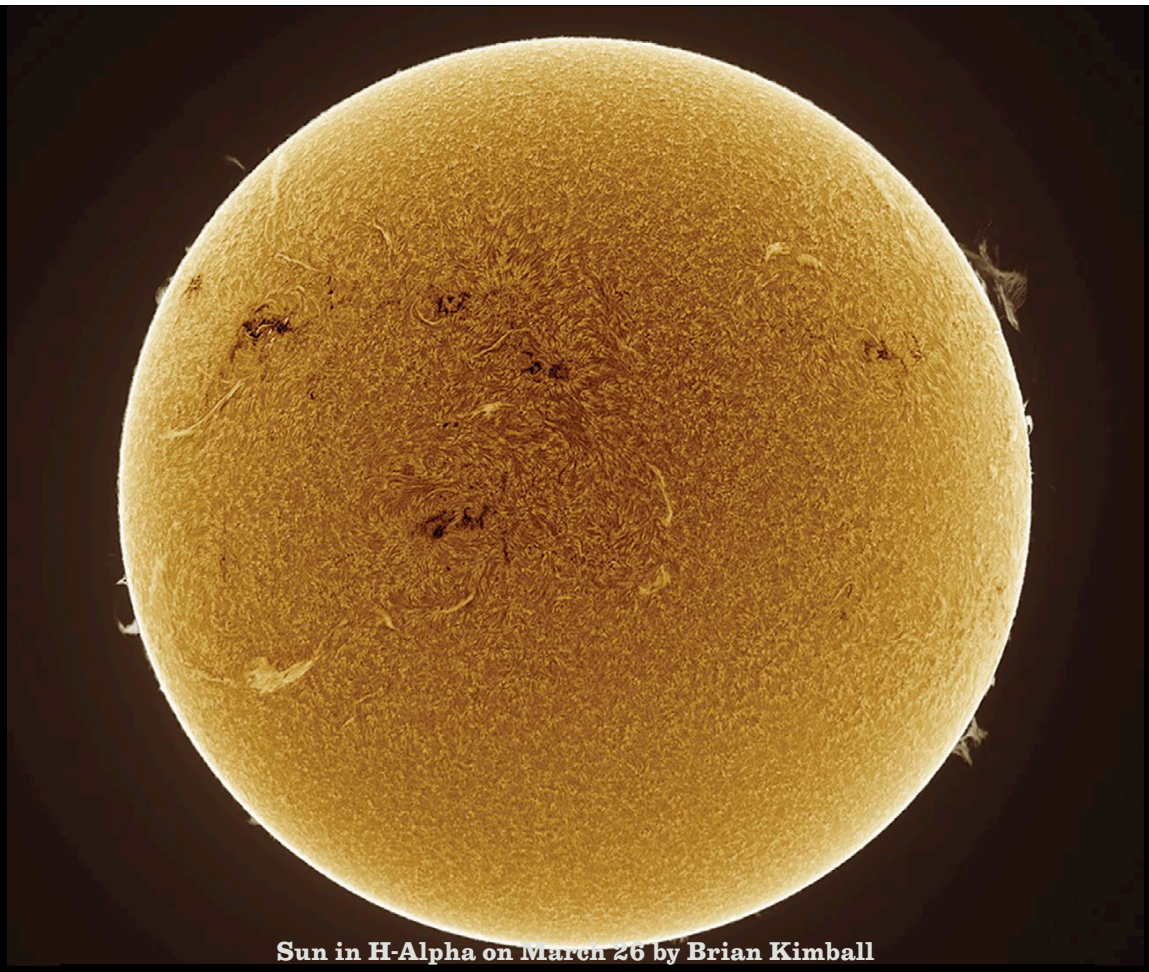
Sun in H-Alpha on March 3 by Brian Kimball



Sun in H-Alpha on March 8 by Brian Kimball

Sun in H-Alpha on March 12 by Brian Kimball

Sun in H-Alpha on March 16 by Brian Kimball



Sun in H-Alpha on March 26 by Brian Kimball

Sun in white light on March 26 by Brian Kimball

Sh 2-304 and Sh 2-308 by David Elmore on Mar 30

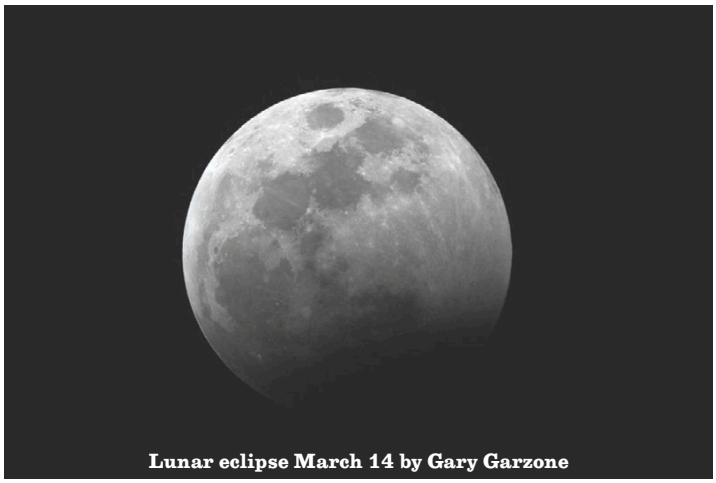
Here is the Dolphin Head Sh2-308 and Sh2-304 on the right.

The Dolphin Head is a cloud of Oxygen rich emission surrounding a Wolf-Rayet star. That star is massive, young and very hot. It has burned through all its Hydrogen and is working on heavier elements having created this teal-colored Oxygen shell about 70,000 years ago. It is on its way to becoming a super-nova.

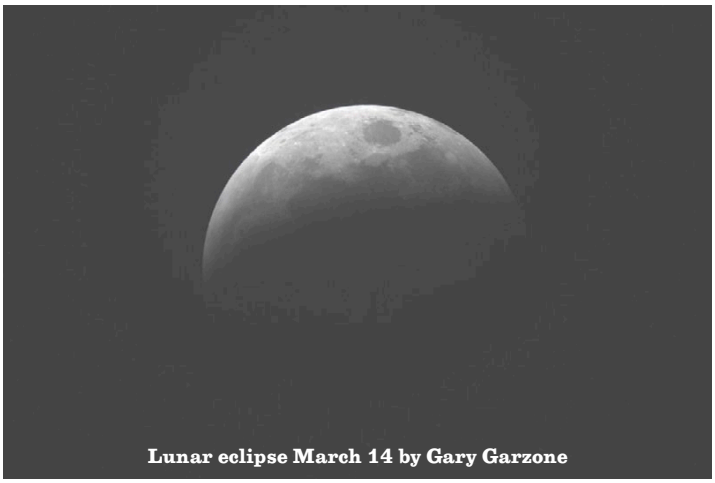
This is from 11 hours 20 minutes total exposure distributed among Hydrogen-alpha (red), Oxygen III (teal), and Sulfur II (yellow). The wide field is about 4.9° x 3.25° near Sirius. The moon is 0.5°.

For the full-sized higher resolution drizzled image go to https://app.astrobin.com/i/64hxu0
That full-sized image is 19086 x 12724 pixels wide and high.

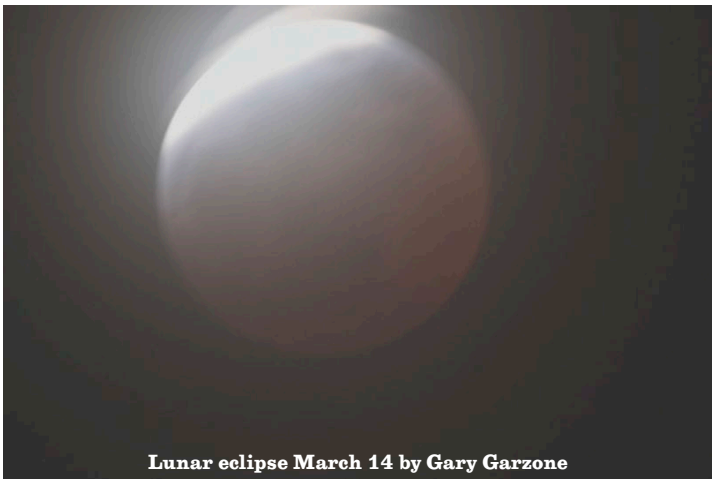
Lunar eclipse March 14 by Gary Garzone



Lunar eclipse March 14 by Gary Garzone



Lunar eclipse March 14 by Gary Garzone



Lunar eclipse March 14 by Gary Garzone

Sky was clear when the moon was rising,10 pm. Started pictures around 11:45 pm. The rest of sky was mostly cloudy but the Moon was shinning thru thin layers,v very hazy.

The clouds totally covered the sky around 12:45 am, so I missed out on getting real good reds.
Meade 8 inch scope without tracking so blurred some when shutter speeds decreased to pull in the light, 10 to 15 seconds were not long enough, should have been done with tracking mount. Fun trying!

M 67 Open Cluster on March 3 by Jim Pollock

I think we all tend to go for those gorgeous swirling zones of nebulosity and details of magnificent galaxies or the grandeur of galaxy chains as well as the true gems of the sky, globular clusters. And in so doing, we forget about lonely open clusters (unless they are embedded in those same swirling nebula). In my slow moving quest to image all the Messier Objects for myself, I occasionally allow myself the pleasure of the open cluster.

For your amusement, above is a shot of M67, aka. The King Cobra Cluster or the Golden Eye Cluster in Cancer. It was discovered by Johan Koehler in 1779 and is estimated to be among the oldest clusters in our Milky Way clocking in at 3.2 to 5 Billion years old. The cluster lies about 2600-2900 light years away.

Wikipedia describes it as a paradigm study object in stellar evolution due to the following criteria:
- It is well-populated
- It has negligible amounts of dust obscuration
- All its stars are at the same distance and age, save for approximately 30 anomalous blue stragglers

This image was shot last Saturday night with my new system: 9.25" EdgeHD on the AM5N mount with Hyperstar (f/2.2) and ASIAIR controlling all. I'm using my ZWO 2600mc DUO (built-in guiding chip). While some of the usual pundits on Cloudy Night say a 9.25" is too big for the AM5... I find it working great. I had 0.55 to 0.65 arc-seconds of guiding accuracy for the evening.

This image is 56 frames of 30 sec each (about 1/2 hour of exposure) with the one-shot color camera. I used a L-Enhance Filter to protect from Longmont Lights (there was no moon).

M 81 and M 82 by Martin Butley on Mar 1

I was able to get down to Starry Meadows (RMSS site) last Monday and Tuesday nights and image M81 and M82.

Only 8 hours total integration with less than 1 hour in Blue, and no Ha - so still a work in progress.

My goal was to capture some of the nebulosity in our own galaxy that also fills the field.

I think David Elmore called this “Galactic Cirrus” ??

Anyway, here is my attempt with my standard set up Takahashi 130 ED FSQ refractor on an Astrophysics 1100 mount with a ZWO ASI 6200 monochrome camera.

All 5 minute subs
- Blue x 10
- Green x 17
- Red x 24
- Lum x 48

Total integration 8 hrs 15 min

Abel 24 by MJ Post on March 24

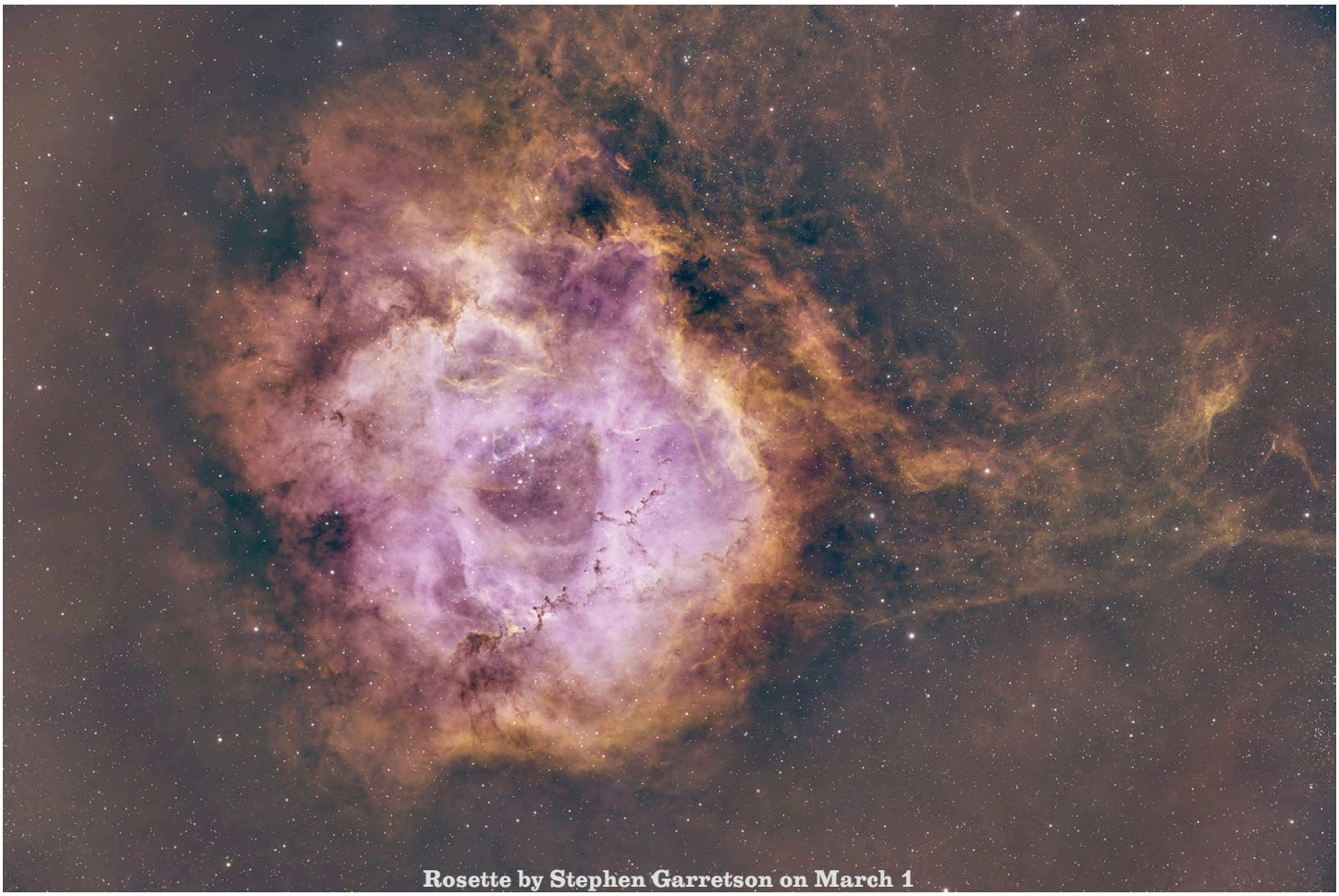
This PN is large and relatively bright for its age of nearly 11,000 years. It's 7 arc min in diameter and lies in Canis Minor about 1700 light years away. It is positioned abnormally far above the galactic plane by about 500 light years. If you zoom in you can find the hot blue-colored white dwarf progenitor star whose surface temperature is 137K Kelvin.

I could not find an understandable designation for the galaxy to the south of Abell 24, except for a label of AGN in Aladin.

From DSNM. 2 hours each of H-alpha and OIII exposures through 11" RASA. HOO rendition with RGB stars from the CDK14 scope.

NGC 1999 by MJ Post on March 28

M 42 by Rolando Garcia on March 1



Rosette by Stephen Garretson on March 1

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.

In addition to the Optec Leo focuser on the Star 71, I now have modified Wanderer Astro Eclipse Dust Covers, removing the solid cover and replacing it with a Bahtinov mask on each scope. Thus, instead of climbing a small ladder to place and then remove a Bahtinov mask whenever I need to check/adjust focus, I simply close the "cover", make any needed adjustments, then open it up to start imaging again. This way I only need to venture into the scope area from the control cube to check the shutter position; i.e., other than required journeys to the kitchen for snacks and tea.
[36] 300s guided Ha subs ; [36] 300s guided H-Beta subs ; [36] 300s guided OIII subs ; [36] 300s 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

Fox Fur Nebula by Stephen Garretson on March 20

This area around the Cone Nebula and the Fox Fur Nebula has always been a draw for me. In particular I like Barnard 39, the "check mark" dark nebula, and LBN 902 which lies just "below" in this image. The treatment is a modified HOS; i.e., Ha: red/orange; OIII: teal/blue; SII: yellow. It's this last element that is not true to color, which is a dark red. But it needs another selection to allow it to stand out better, even if it just promotes a blend with Ha where both species are present.

[13] 600s guided Ha subs; [12] 600s guided OIII subs; [13] 600s guided SII subs
Total integration: 6 hours, 20 minutes

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; Bahtinov mask 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; Bahtinov mask modified Wanderer Astro Eclipse

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 April 1995

The March meeting of the Longmont Astronomical Society began at 7:45 with 30 people attending. Guests were introduced. Joining us tonight were several members from the Northern Colorado Astronomy group and some folks new to the area. WELCOME!

Jim Getson donated to the club 3x5 Messier and NGC finder charts, he also mentioned he has S&T's available for free. Call Jim at Mike's Camera in Boulder.

Gary Emerson gave us a presentation on CCD astronomy. The presentation included slides from his observatory, many CCD images with interpretation, theory and practice information. He followed the presentation with a demonstration of an actual CCD camera linked with a PC. WOW! Thanks to Gary for a fine presentation.

In the January issue of the Journal, it was announced that the LAS had a home page on the www (World Wide Web). Since then there have been inquiries such as "What is the Web? What's the significance of it? How do I get access to the web and the LAS page?"

In This Issue...Tom Johnston takes us on a detailed tour of the Abell galaxy clusters. "I had the pleasure of doing this cluster from our very dark site at Luna Lake, Arizona. About 8,000 ft up into the San Francisco Mts on the AZ-NM border lies a quiet little retreat know only to a few dedicated astronomers – Luna Lake and its observing area known simply as the Meadow! There are no visible light domes of any kind at this location. It is the darkest site I have ever personally been to and the viewing is tremendous."

20 Years Ago April 2005

"We all ventured out to North Sterling Reservoir State Park for our LAS annual Star party. Thursday, I left for Sterling but broke down with Motor Home on I-76 by Wiggins and did not make it to Sterling until Friday morning. I heard from gang it was a great night. Friday the winds blew so hard that most left for home figuring on clouds and wind, but by midnight it all cleared and was beautiful, calm, clear and real dark. Saturday morning the park Ranger Bob Loomis stopped by my motor home to warn us about huge snow storm moving in. We all hit the road before then and good thing with 12 to 30 inches of snow, most major highways were closed down by Sunday morning. Great blizzard and blow out of 2005, will remember this one for awhile." G. Garzone

LAS Execs April 13, 2005

"Astronomy day at Mall was probably the best yet. We had three solar scopes set up by west entrance to Mall. Andrew Planck and Vern Raben had H alpha filters, with very cool views of sun, super treat indeed for most of us. We also had my 8 inch telescope with solar Baader film for sun spots. Crowds were constant all day long. Thanks to many of the LAS members who helped out. Michelle Lavers brought her big Meade scope, which was impressive. Mike Hotka for JPL set up again, Jeff Laux, Mark Propp, Mike Fellows, Ken Tryon, Ray Warren, Nancy Muth, Brian Kimball, Philippe Bridenne, Dick Mallot, Dick Latt, Bob Spohn, Ron Crispe, Michelle, Neal Stangis and his wife Shannon, also Terry Frazier wheeled in to help with crowds and giving away the posters. Wow! Just like at big star party."

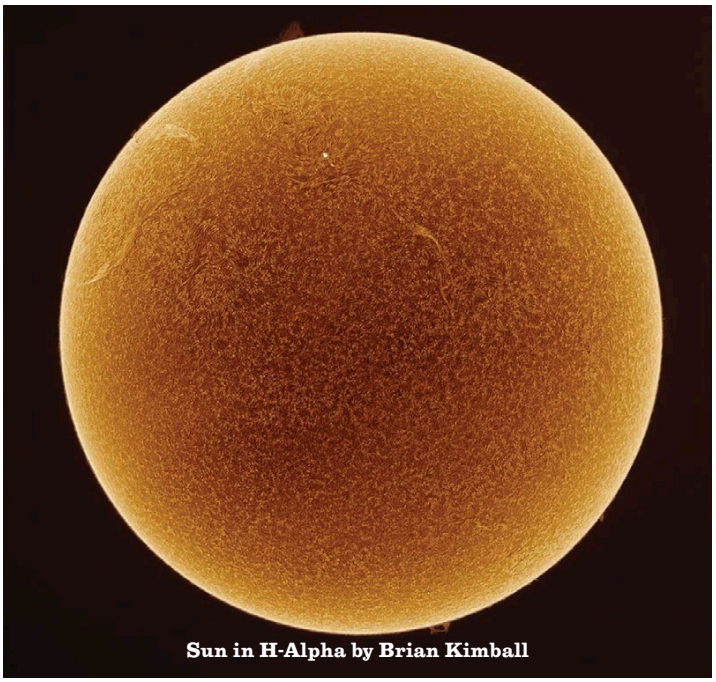
M33 by Brian Kimball

Collaboration with BASS and CU to use CU Mountain Research Station north of Nederland. There is a 12" scope up there, new dormitory, June 10th and 11th. It is 4 days after New Moon. We have to pay for the dorm rooms. Julie Carmen: We will be one of the first groups to use the full facilities, BASS would like to host Friday night and pay for Kitchen that night, and we would host Saturday night. It is a two night event. Perhaps we could have a presentation for Saturday. When snow is down we can map out where to place our scopes.

Western Colorado Astronomy Party in June, Grand Junction. Gary heard it is great. It is located at 10,000 feet on top of a mesa. Rave reviews. Same weekend as the CU Mountain Research party, only 30 miles away. Andrew's party is the weekend prior. Steve Albers, showed off some new links from our web site. Cool stuff, Titan, Mars, Cassini, amusing and entertaining. There is a link to a blog on Cassini, college age guy working as part of imaging team at Univ. of Arizona leaks some stuff before it is available on the JPL web site: "Titan Today". There are some raw images, commentary. Presentation by Dick Mallott: Upon Whose Shoulders We Stand: A History of Astronomy Up to 200 A.D. A great presentation!

10 Years Ago April 2015

LAS Meeting April 16 - Dr. Steve Hartung - Image Differencing. The differencing or subtraction of images is a way of finding all of the photometric changes between two images. This can be used to find or characterize objects that are either variable in nature or are moving. Subtle changes in focus and the position of the field of view on the detector are enough to fill the results with a myriad of false detections. What is needed is a way to match the optical and sampling differences between the two images. Steve will give an overview of how this is done and display some results of high quality subtractions. Steve is the current president of the Boulder Astronomy & Space Society (BASS).



Sun in H-Alpha by Brian Kimball

Spring Skies & Jupiter for City of Boulder Open Space and Boulder County Parks and Open Space. Enjoy the open space in the sky! Dave Sutherland (City of Boulder Open Space) and Deborah Price (Boulder County Parks and Open Space) are teaming up to help you explore the spring constellations and discover fun facts about Jupiter and its moons at a brief program, followed by sky gazing with telescopes provided by the Longmont Astronomical Society. Dress warmly. Location is 0.1 mile south of intersection of Neva Rd and US 36. Head east about 0.3 miles to shelter. Note: weather backup date is April 18.

Running Man and Great Orion Nebula by Tally O'Donnell

Library Telescope Program by Vern Raben
Goal: Consider establishment of a telescope rental program though Longmont Library. Vern reviewed lending model that New Hampshire Astro executes and his conversations with the director. Library management team have met internally, very supportive of the concept.

Longmont Astronomical Society
P. O. Box 806
Longmont, CO 80506

SNR G206.9+02.3 by Tally O'Donnell