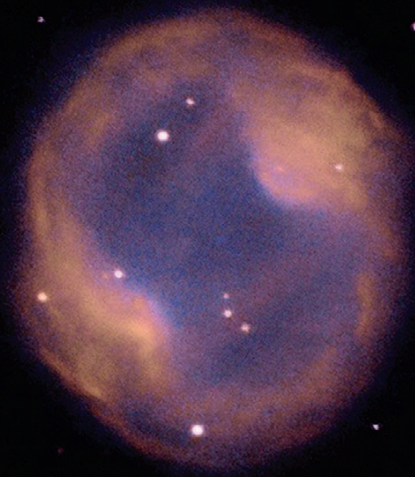


LONGMONT ASTRONOMICAL SOCIETY

APRIL 2021



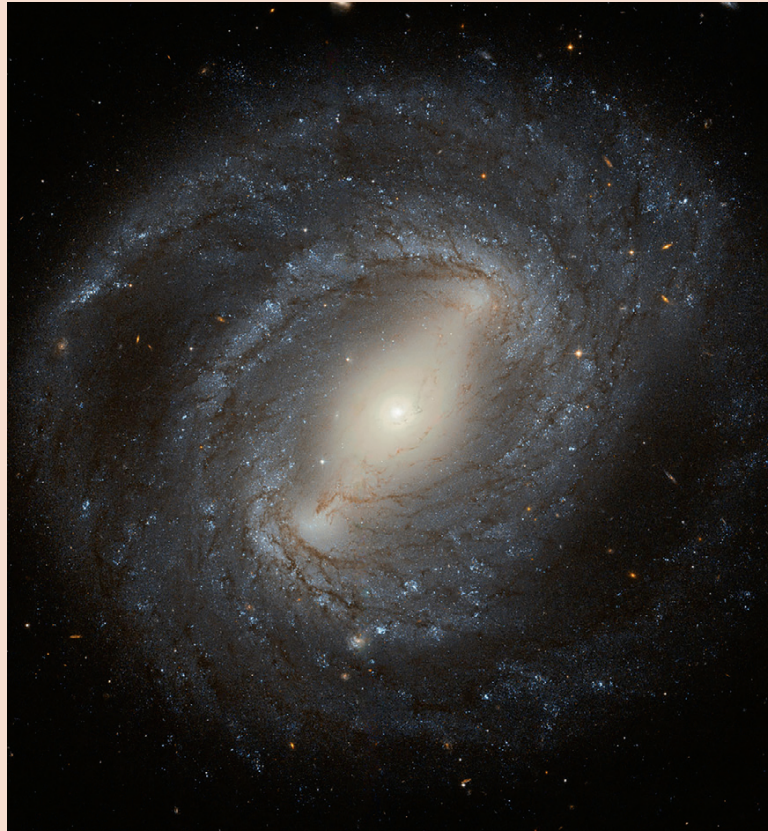
“HEAD PHONES NEBULA”
BY STEPHEN GARRETSON

VOLUME 36, No 4, APR. 2021
ISSN 2641-8886 (WEB)
ISSN 2641-8908 (PRINT)

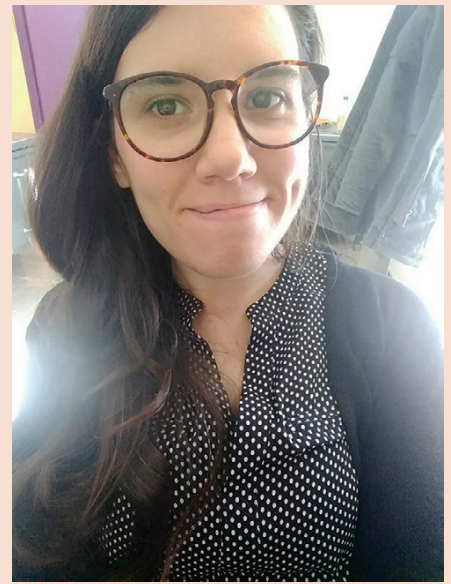
LAS Meeting April 15 at 7 pm

“How do galaxies get their shapes?” by Angela Collier

Astronomers classify galaxies based on their morphology into three categories: Elliptical, spiral and irregular. Each type of galaxy spans a wide range of size, kinematic properties, and chemical makeup. The appearance of galaxies are shaped over billions of years by interactions with other galaxies and internal dynamical processes. While we do not know for sure how galaxies form to take



these different shapes observed today we can find clues in galactic simulations. I will discuss the current state of the field and my own work on dark matter interactions within galaxies.



Angela Collier is a theoretical physicist that explores the role of dark matter interactions in large scale secular dynamics through analytical calculations and numerical simulations. She currently works at JILA and CU Boulder as a research postdoctoral fellow in the Eccentric Dynamics Group. She is originally from Eastern Kentucky.

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>. The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987. Our main goal is to promote local amateur astronomy. This is accomplished through regular monthly meetings, star parties and public observing sessions. Regular meetings are held every month (except December) on the third Thursday.

A broad spectrum of topics are covered at the meetings and include such things as deep sky observing, planetary imaging, narrow band imaging, equipment discussions and demonstrations just to name a few. These subjects are presented by both club members as well as special guests who are professional astronomers or experts in a particular field.



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



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22	“M1” by M. J. Post
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24	“IC 2177, Seagull” by Rolando Garcia
25	“Full Moon” by Sarah Detty
26	“Thor’s Helmet” by Stephen Garretson
27	“Cone Nebula” by Stephen Garretson
Back Cover	“M82” by M. J. Post

LAS Officers and Board Members in 2021



- Stephen Garretson, President
- M. J. Post, Vice President
- Sven Schmidt, Secretary
- Bruce Lamoreaux, Treasurer

- Board Members:
- David Elmore, Gary Garzone,
 - Mike Hotka, Brian Kimball,
 - Vern Raben

Appointed Positions 2021

- Paul Kammermeier, Webmaster
- Bruce Lamoreaux, Library Telescope Coordinator
- Vern Raben, Newsletter Editor

Secretary Notes for March 18 Meeting by Sven Schmidt

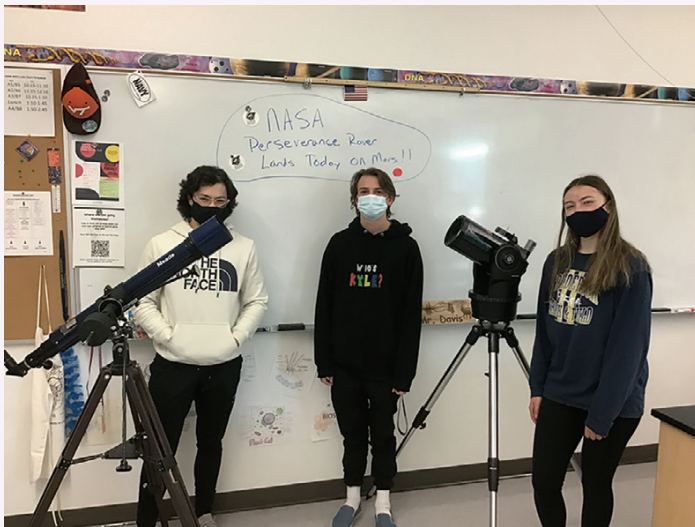
I. Call to Order

Stephen calls the Zoom meeting to order at 6:59 PM. Officers attending are Stephen Garretson (President), M.J. Post (Vice President), Bruce Lamoreaux (Treasurer), Sven Schmidt (Secretary). Board Members-at-large: Mike Hotka, Gary Garzone, Brian Kimball, Tally O'Donnell, and Vern Raben.

II. New Members and Visitors

We have one new member, Joe Summers. No visitors

III. Miscellaneous



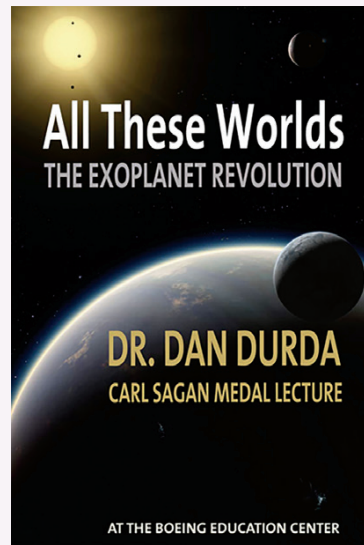
LAS facilitated the donation of two telescopes to the Frederick High School.

Historical Fact



Plutarch, a Greek philosopher, observes a solar eclipse on March 20th, 71 AD.

IV. Main Presentation



[Dr. Dan Durda, Southwest Research Institute, Carl Sagan 2015 medalist](#), “All These Worlds: The Exoplanet Revolution”.

V. Financial Report by Bruce Lamoreaux

Main Checking Account - \$8,800
2-Year Savings Account - \$8,100
Telescope Fund - \$1100
Petty Cash - \$50.18
Total Assets - \$18,000
Paid Membership: 87
Student Membership: 2

VI. Old Business

LAS Virtual Zoom Star Party took place on Monday, Feb. 22, 7:30pm. The team successfully connected 4 scopes. Problems with live streaming to YouTube have been resolved. The plan is to practice one or two more times before we are ready to invite the public.

VII. New Business

Vern Raben asks to be reimbursed \$1093.56 for calendars and newsletters he worked on. Tally moves to approve the reimbursement request, Sven and Gary second. All in favor, motion carries.

Larry Bloom received the Astronomical League's Planetary Nebula observation award. For a list of observation programs, [look here](#).

VIII. Adjournment

Stephen adjourns meeting at 8:37pm.

Solar System Highlights for April 2021



Image Credit: Brian Kimball

Third Quarter: Apr. 4 at 4:04 am

New Moon: Apr. 11 at 8:32 pm

First Quarter: Apr. 20 at 1 am

Full Moon: Apr. 26 at 9:33 am

Planets

Mercury

Mercury is not visible this month.

Venus

Venus is not visible this month.

Mars

Mars is in constellation Taurus until the 24th when moves to Gemini. The disk decreases in apparent size from 5.3 to 4.6 arc sec. Its brightness decreases from 1.6 to 1.3 magnitude.

Jupiter

Jupiter is visible low in the southeast before sunrise in the constellation Capricornus; it moves to constellation Aquarius on the 24th. It increases in brightness from -2.1 to -2.3 magnitude; the disk increases in apparent size from 35 to 38 arc sec across this month.

Saturn

Saturn is also visible low in the southeast before sunrise in the constellation Capricornus. It is magnitude +0.7 in brightness and the disk is about 16 arc sec across this month.

Uranus

Uranus is visible very low in the western sky after sunset. It is magnitude +5.9 in brightness and the disk is 3.4 arc sec across. It disappears into bright evening twilight after the 13th.

Neptune

Neptune becomes visible very low in the eastern morning sky after April 16th. It is magnitude 7.9 in brightness and the disk is 2.2 arc sec across.

Meteor Showers

Lyrid meteor shower peaks on the evening of April 21. Expect to see maybe 10 per hour from a dark site after moonrise (around 4am).

Star Party Targets for Fri. Apr. 16

On Fri. Apr. 16 the sunset is at 7:41 pm; it will fairly dark by 8:30.

Moon - Lunation 5

- Hercules and Atlas craters in north are very prominent
- Rupes Cauchy is a 75 mile long cliff along eastern Mare Tranquillitatis; also the Cauchy domes just south of it
- Crater Taruntius south and east of Mare Crisium is a great example of a floor fractured crater
- Craters Messier A and B splash rays near center of Mare Fecunditatus
- Crater Fracastorius in southwest of Mare Nectaris is example of floor fractured crater due to subsidence

Nebula

- M42 and M43 in Orion are low in the WSW but still great objects to view
- M1, Crab Nebula in Taurus (very near moon though)
- Caldwell 31, Flaming Star Nebula in Auriga (also near moon)

Galaxies

- M64, black eye spiral galaxy in Coma Berenices
- M63 sunflower galaxy in Canes Venatici
- Makarian chain of galaxies in Virgo, M84, M86, NGC 4438, 4388, 4425, and more.
- M51 Whirlpool spiral galaxy in Ursa Major
- M94 spiral galaxy in Canes Venatici
- M101 pinwheel galaxy in Ursa Major

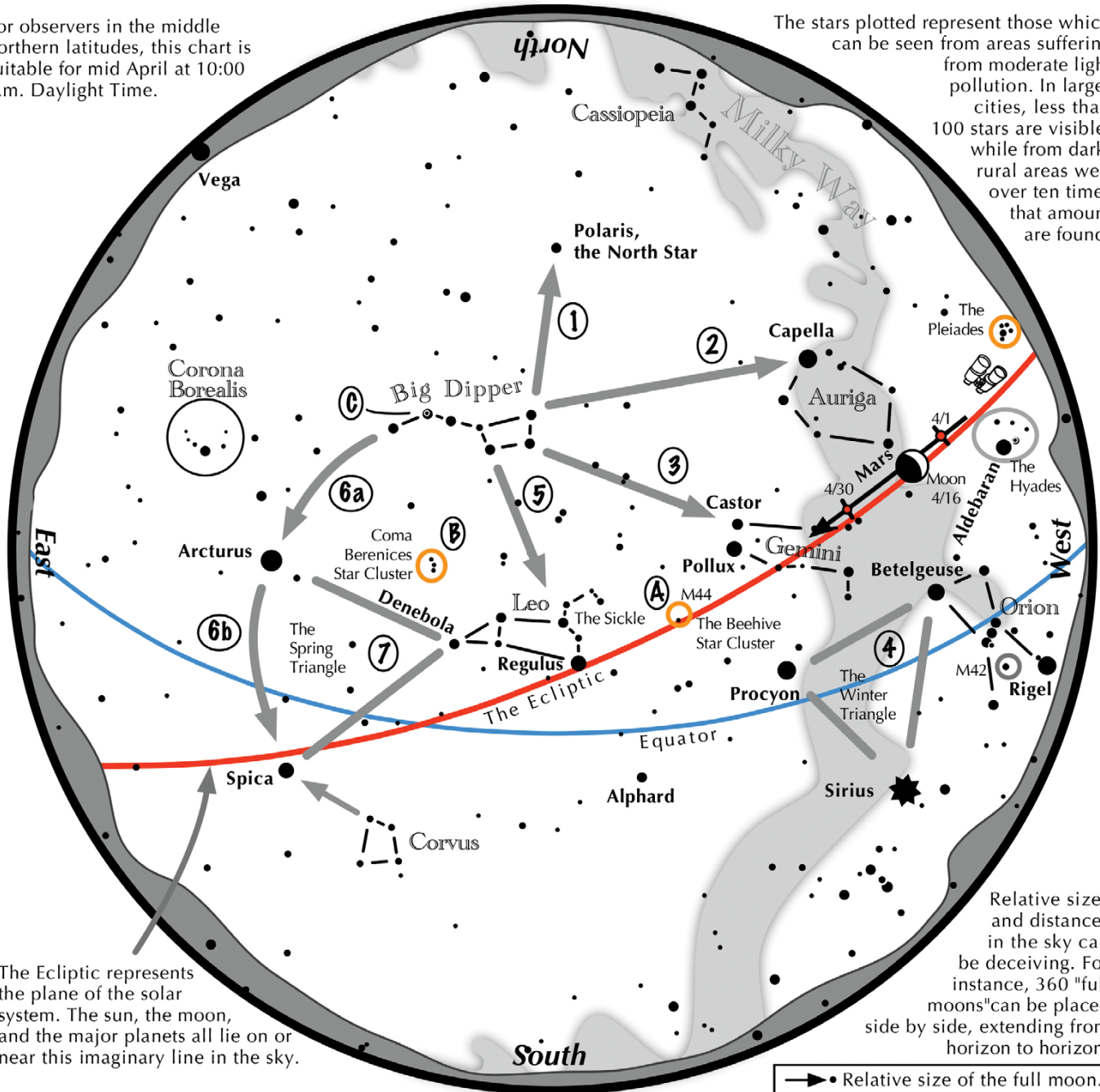
Globular Clusters

- M3 in Canes Venatici
- M53 in Coma Berenices
- M13 fairly low in NE

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

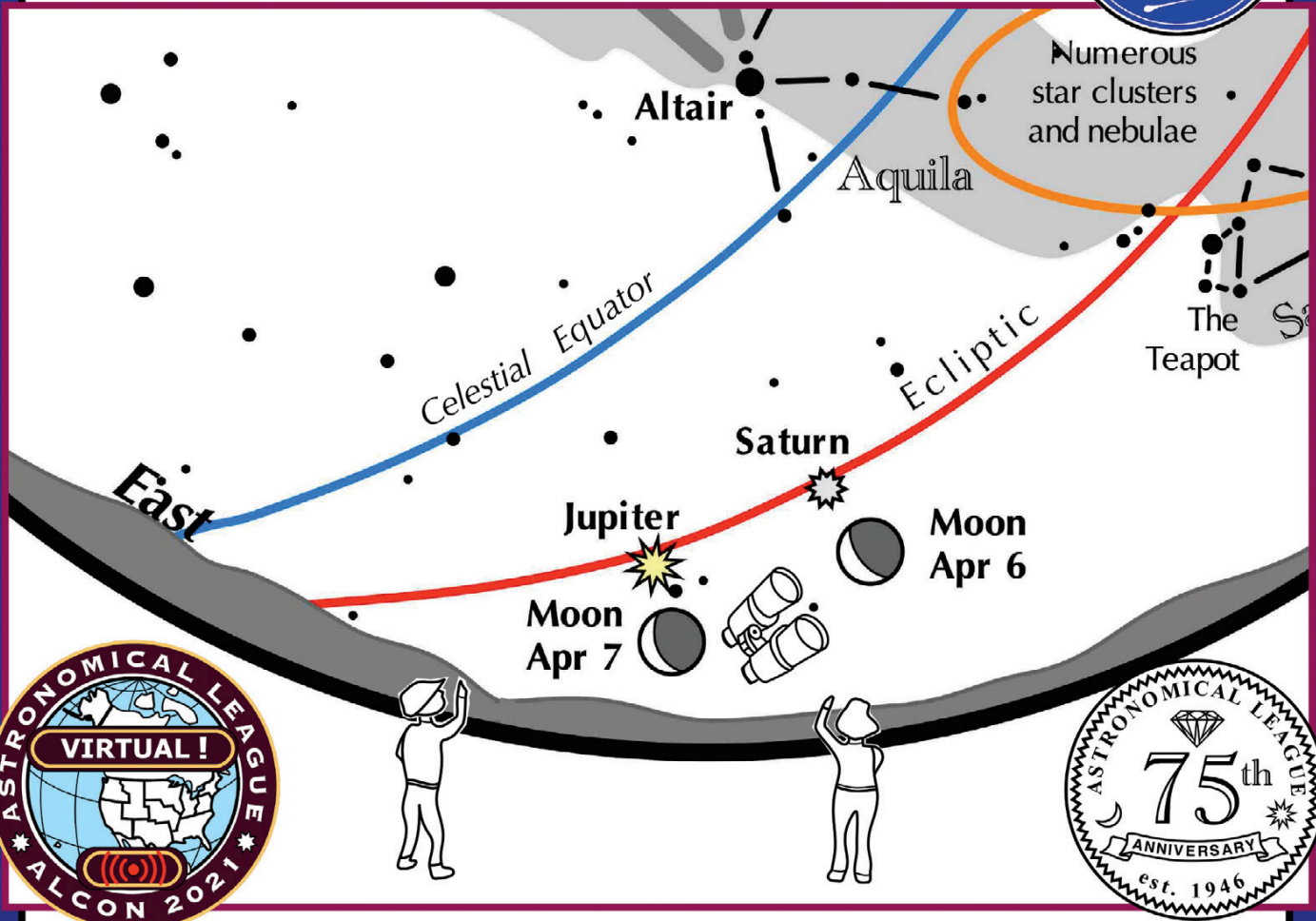
- A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
- B: Look nearly overhead for the loose star cluster of Coma Berenices.
- C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.



Astronomical League
www.astroleague.org/outreach

Duplication allowed and encouraged for all free distribution.

If you can catch only one celestial event in the morning this April, see this one.



Crescent Moon sliding below Saturn and Jupiter on April 6 & 7, respectively.

Look to the southeast 60 minutes before sunrise.

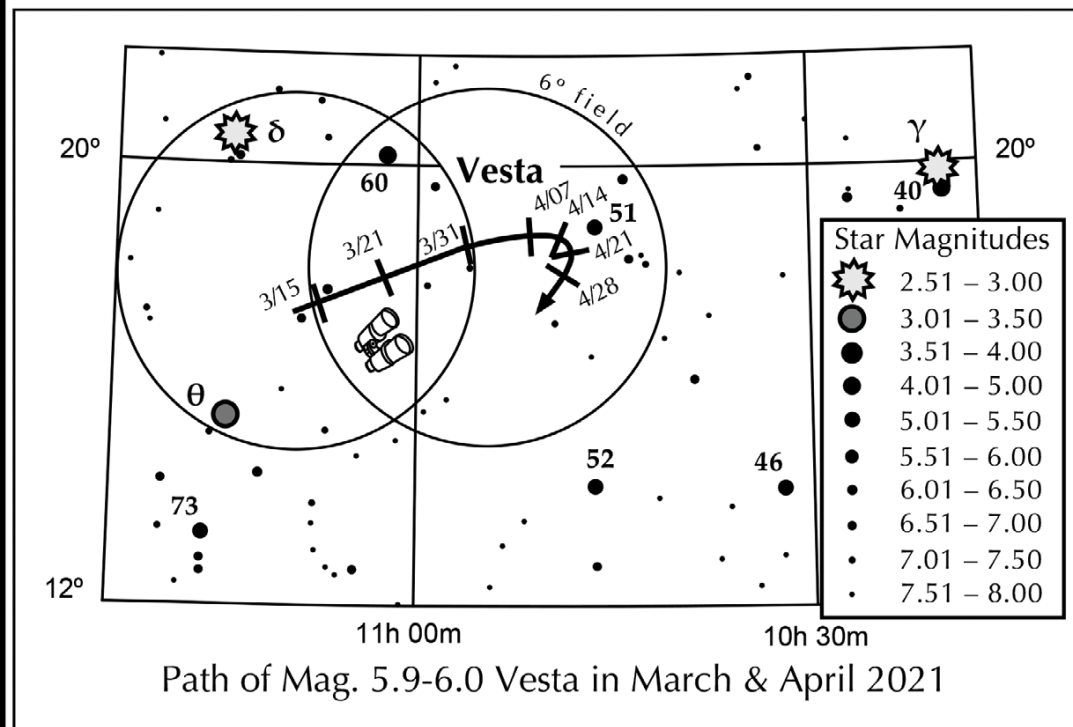
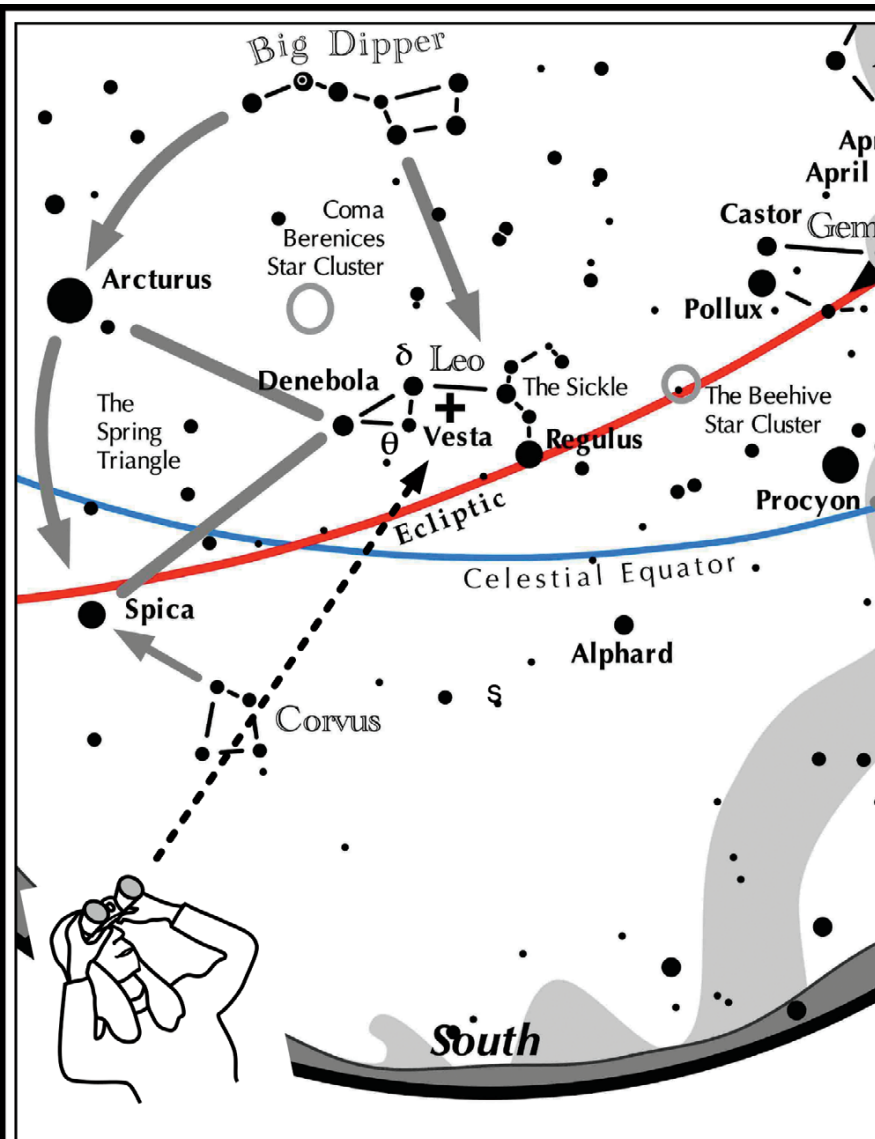
- Look in the southeast 60 minutes before sunrise on April 6 & 7.
- Saturn shines above the Moon on April 6.
- Bright Jupiter brightly shines above the Moon on April 7.
- Use binoculars to marvel at the muted Earthshine lighting the Moon's night region.
- Through binoculars, can you spot Jupiter's four Galilean moons?



Vesta Map A

How to locate Vesta

1. Look for the bright stars Arcturus and Spica in the eastern half of the sky. They belong to the "Spring Triangle" with the third member, Denebola, lying to their west.
2. Denebola is the easternmost star of Leo. Just to its west are two moderately bright stars, Delta (δ) and Theta (θ) Leonis.
3. Vesta lies to their west about 1 binocular field.
4. Triangulate among 60 Leonis, 51 Leonis and Vesta, all easily seen in binoculars.
5. Vesta will be slightly dimmer than 51 Leonis.
6. It will be closest to 51 Leonis on April 17.



Vesta:

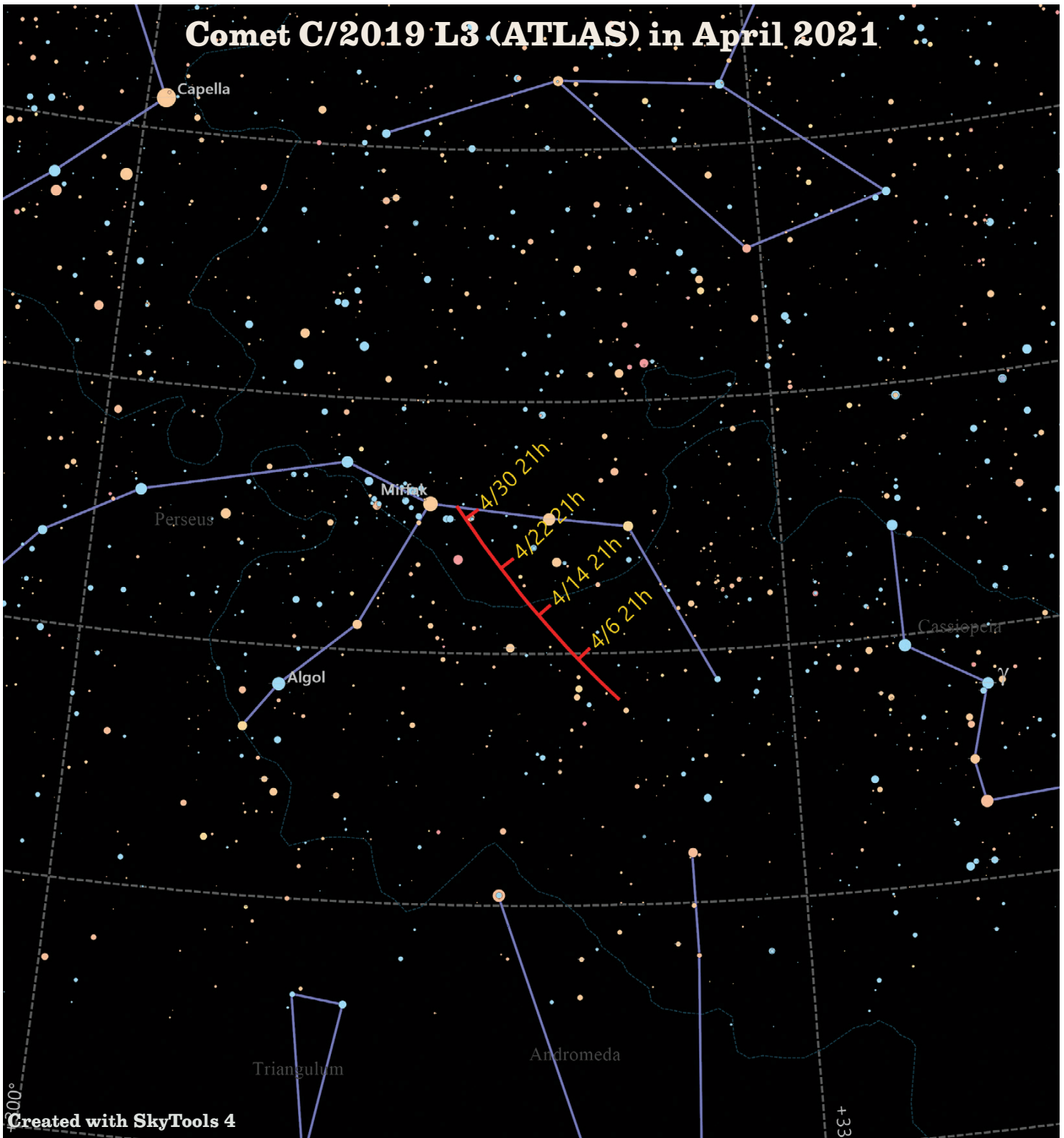
Diameter - 326 miles
(528 km)

Distance from Earth:

- Mar 17 - 127 million miles
(206 million km)
- Apr 1 - 133 million miles
(215 million km)
- Apr 30 - 154 million miles
(250 million km)

Vesta detail Map B

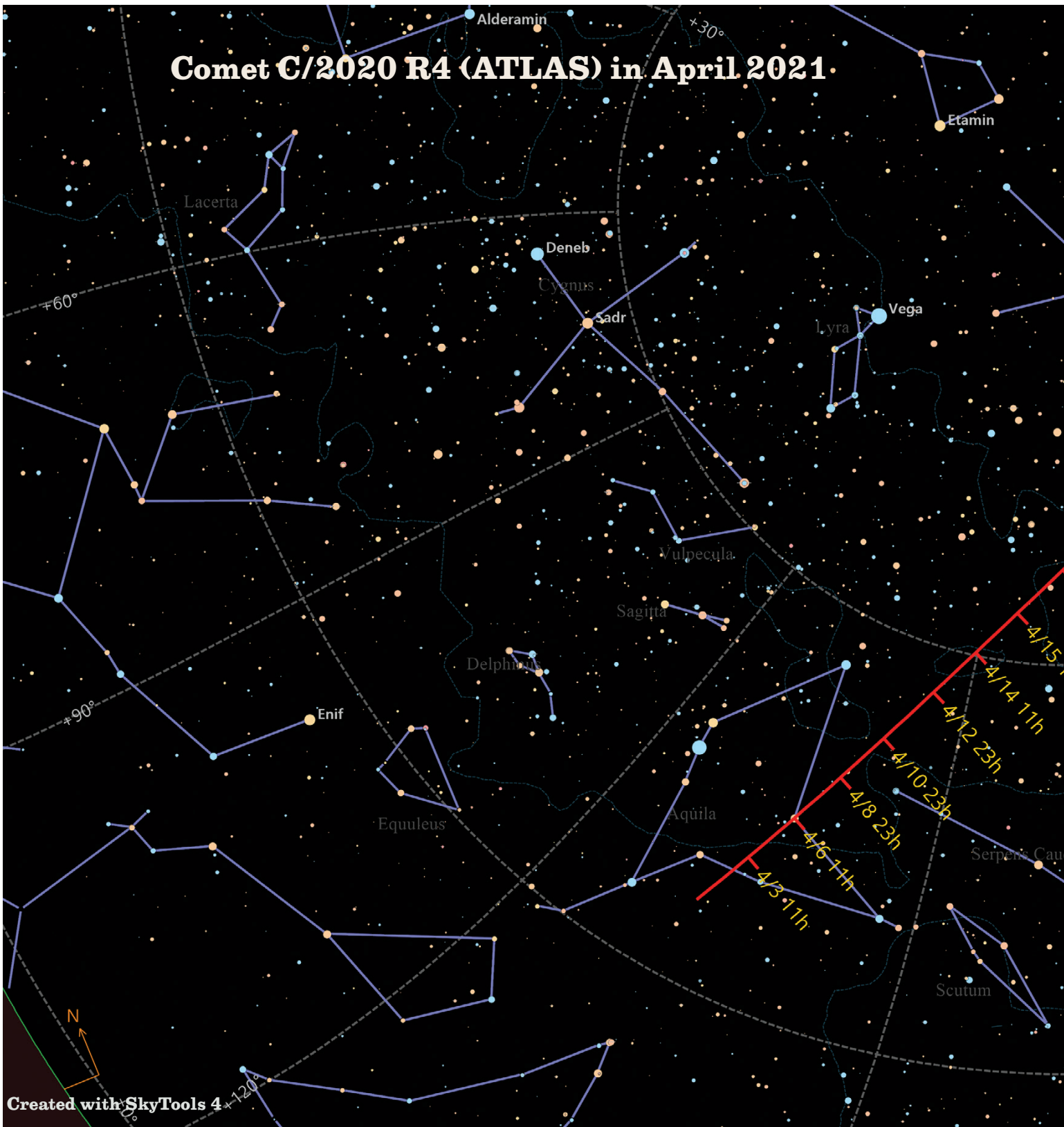
Comet C/2019 L3 (ATLAS) in April 2021



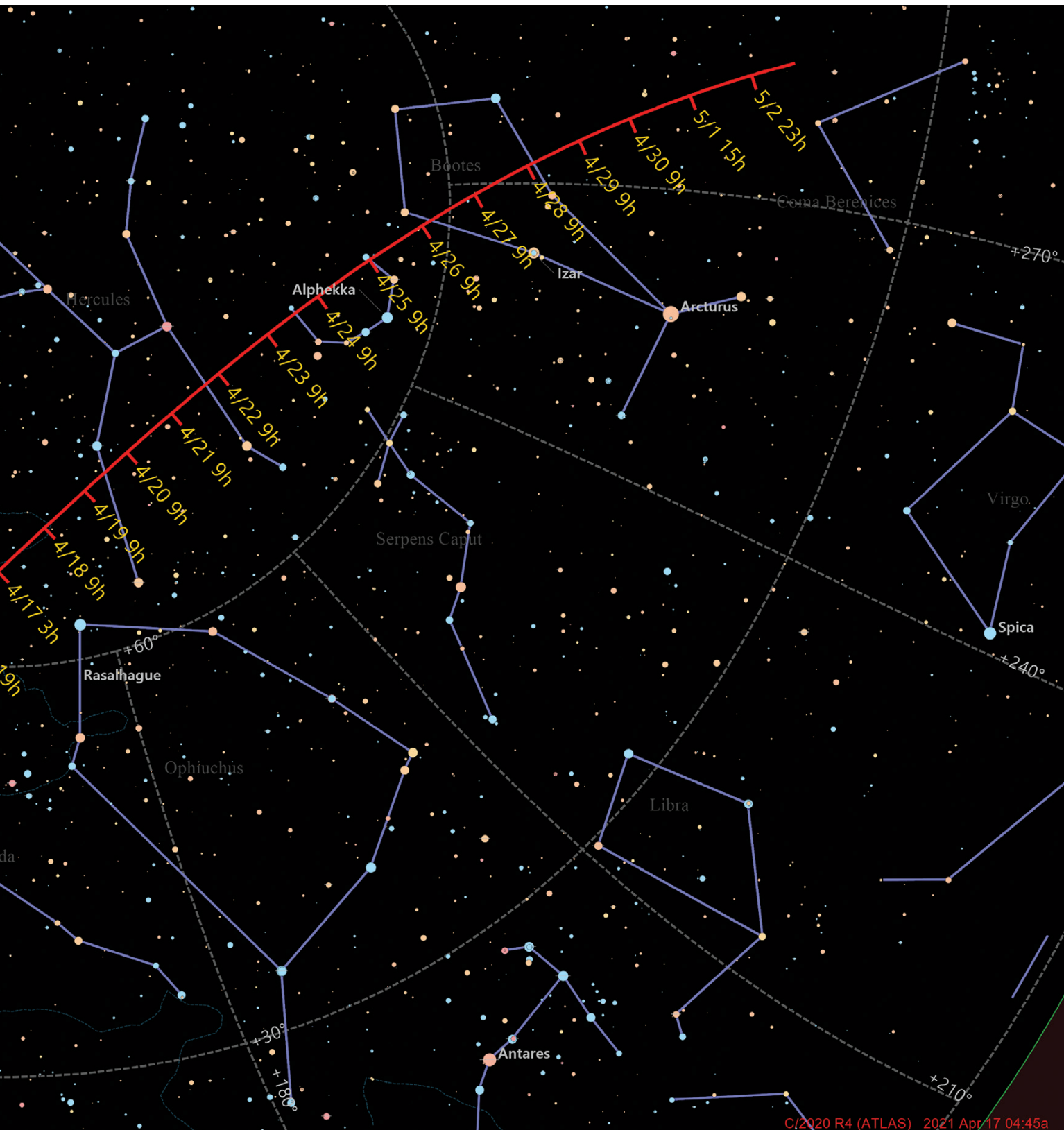
Created with SkyTools 4

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
April 1	08:52 pm	02h23m26.3s	+51°12'30"	11.6	1.5	Perseus
April 7	08:59 pm	02h34m28.1s	+51°06'36"	11.6	1.5	Andromeda
April 13	09:06 pm	02h45m40.1s	+51°01'28"	11.6	1.5	Perseus
April 19	09:13 pm	02h57m01.0s	+50°56'50"	11.6	1.5	Perseus
April 25	09:19 pm	03h08m29.1s	+50°52'24"	11.5	1.5	Perseus
May 1	09:27 pm	03h20m03.8s	+50°47'54"	11.5	1.5	Perseus

Comet C/2020 R4 (ATLAS) in April 2021



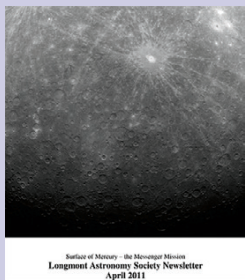
Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
April 1	05:18 am	19h45m02.8s	-00°17'03"	9.0	5.3	Aquila
April 7	05:04 am	19h16m44.7s	+04°56'38"	8.7	5.3	Aquila
April 13	04:50 am	18h29m49.6s	+12°49'57"	8.4	6.6	Hercules



C/2020 R4 (ATLAS) 2021 Apr 17 04:45a

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
April 19	04:17am	17h10m29.2s	+23°21'33"	8.3	7.9	Hercules
April 25	04:32 am	15h16m44.5s	+31°42'18"	8.4	7.9	Bootes
May 1	11:52 pm	13h35m33.3s	+32°54'57"	9.0	6.7	Canes Venatici

10 Years Ago - April 2011



The April 21, 2011 meeting was at the IHop Restaujrant. The speaker was be Mike Hotka and his presentation

“Evolution of My Telescope - A Case Study of 40 Years of Procrastination”.

Mike talked about how the dream of owning his own telescope started in 1971. He showed pictures of the evolution as he and his dad tried various combinations of materials to achieve a stable, RA and Dec motor driven, clock drive telescope. That design evolved into the Dob scope most of you are familiar with that he used for many years.

Following Mike’s talk was a business meeting and discussion of plans for the annual spring astronomy day on Saturday, May 7.



Gary Garzone’s image of the M13 globular cluster from April 2011.

20 Years Ago - April, 2001



Secretary Michael Hota reported that the club’s finances are still in the black and look to being good shape so far this year.

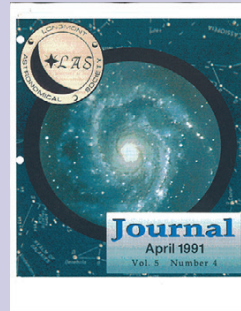
Paul Hale reported that he has received the new Astronomical League catalogue which lists the many publications services, and observing programs available.

Equipment manager Leigh Pierson reported that the needed parts for the mirror grinding machine have been completed and that the machine should be operational in the near future.

It was announced that the April meeting will be held jointly with a tour of the NOAA Space Environment laboratory and the NOAA FSL in Boulder. Steve Albers gave a brief rundown of what to expoect for the tour.

After the break Dave gave a slide show featuring his simple to make all-sky camera made from a hubcap. His slides featured shots of cloud formations and comet Hyautake.

30 Years Ago - April 1991



Randy Cunningham opened the March 21, 1991 meeting at the New Creation Expansion Campus. Jim Getson spoke

on benefits of continuing our membership in the Astronomical League.

Ray Martin of Martins Star Tracker Boulder has been supporting the cover of our newsletter in color (\$20/month). Kevin Brose at Hewlett Packard donated color cartridges making \$200 available to the club’s treasury.

A grazing occultation was viewed by Getson, Albers, McCarthy, and Cunningham, and Poppenhagen about 5 miles west of Ault.

Jerry Wilkins gave a talk about planetary observing. Astromospheric conditions in Colorado are a problem due to turbulence caused by mountains. Best thing is to set up and go out maybe 10 times a night as conditions may change momentarily. East is better. Best times are twilight right after sunset. Hazy conditions are good - may improve during the night. Fall through early spring is a good time to view planets.

Astronomy Day is Saturday April 20, 1991 at the Crossroads Mall in Boulder in conjunction with Boulder Valley Amateur Astronomers. We are featuring telescope clinics for novice amateurs. We also will have a mirror grinding demonstration.



Brian Kimball and Tim Brown collaborated to produce this image of NGC 7331 from a remote 1 meter scope in 2012.

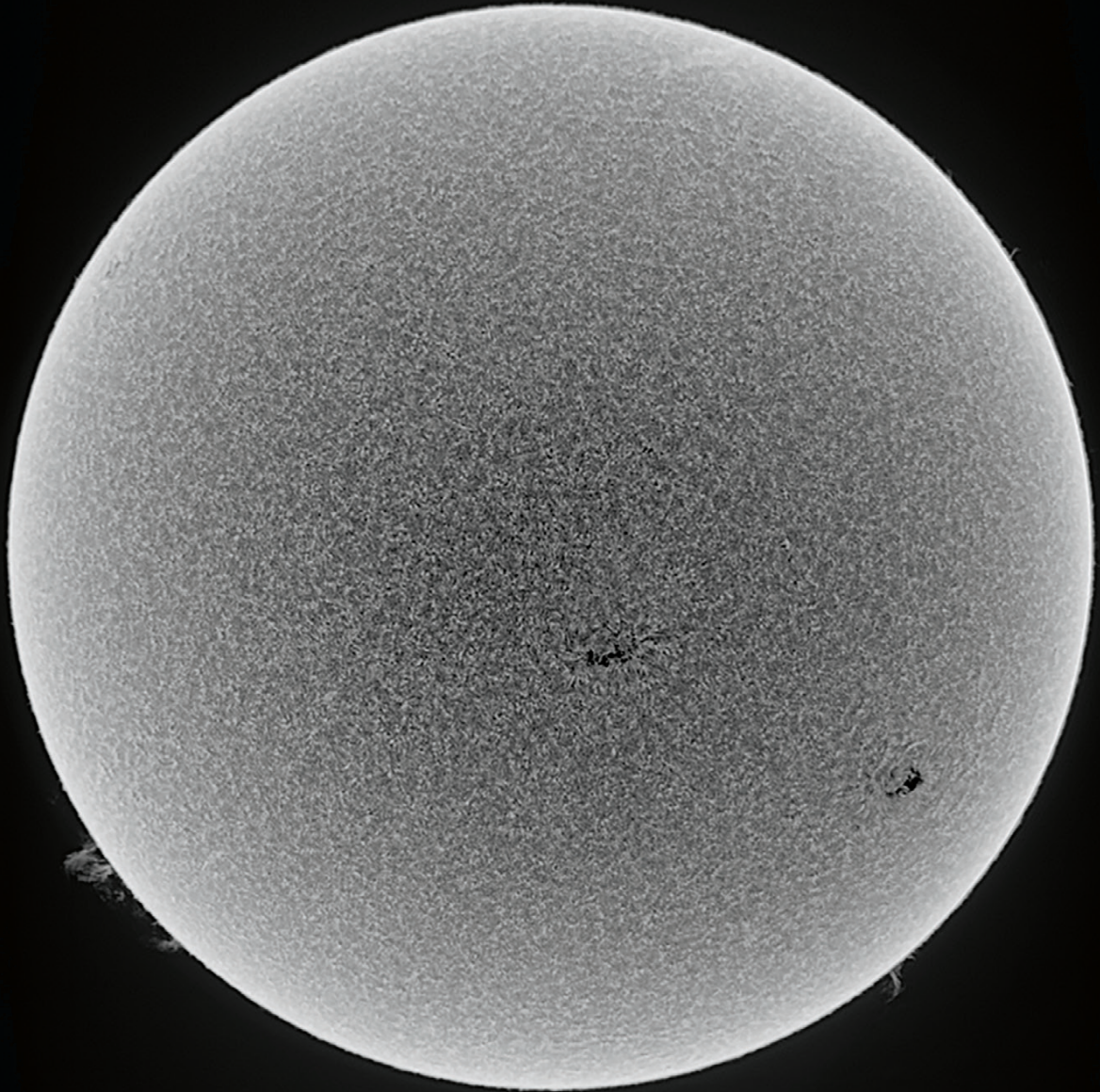


Image of the sun in H-Alpha on March 6 by Brian Kimball

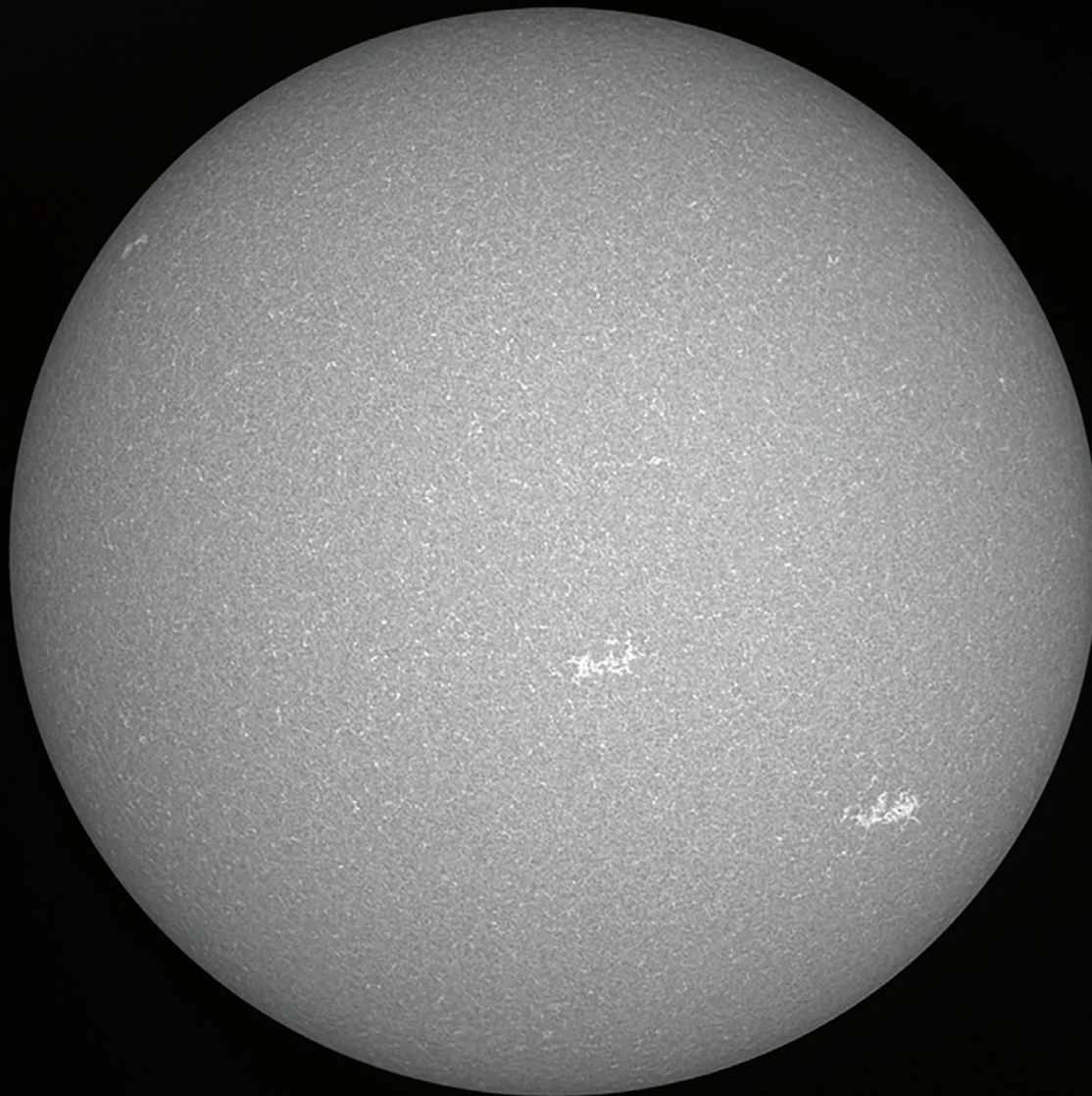


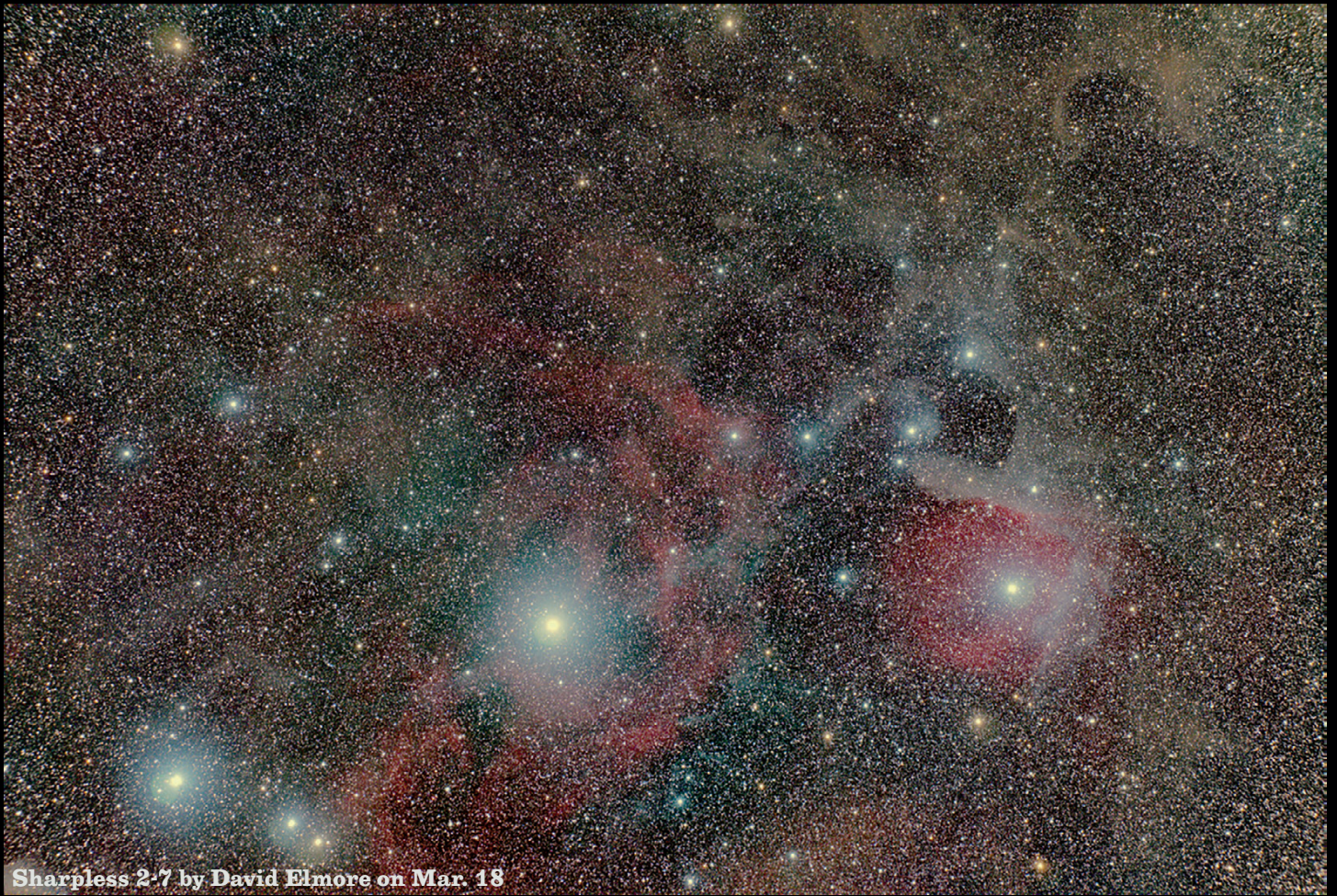
Image of the sun in Calcium K on March 6 by Brian Kimball



Sharpless 2-178 by David Elmore on Mar. 11



Heart & Soul by David Elmore on Mar. 11



Sharpless 2-7 by David Elmore on Mar. 18



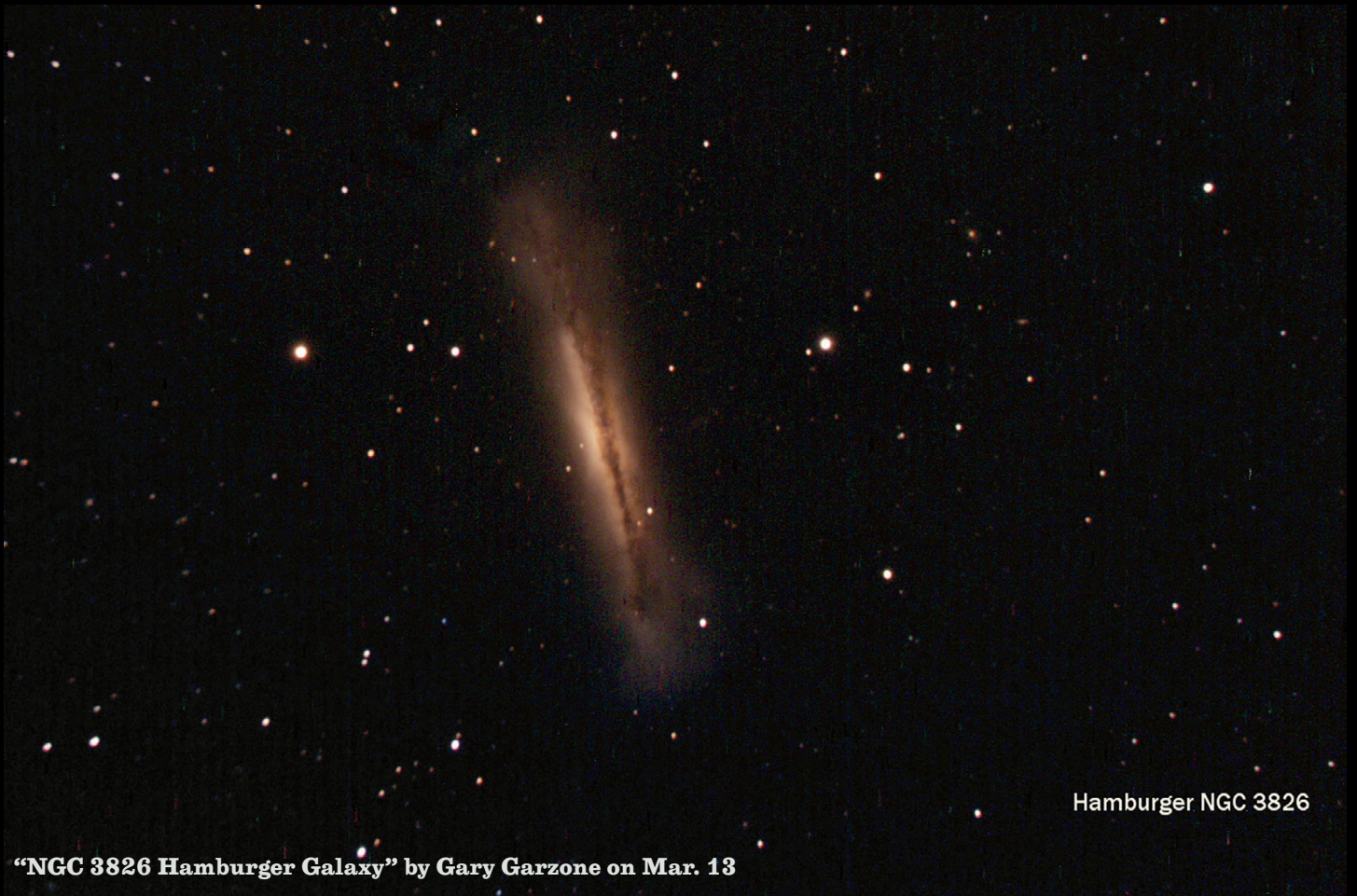
"Blue Horsehead" by David Elmore on Mar. 22



“M51” by Eddie Hunnell on Mar. 21



“M101” by Eddie Hunnell on Mar. 21



Hamburger NGC 3826

“NGC 3826 Hamburger Galaxy” by Gary Garzone on Mar. 13

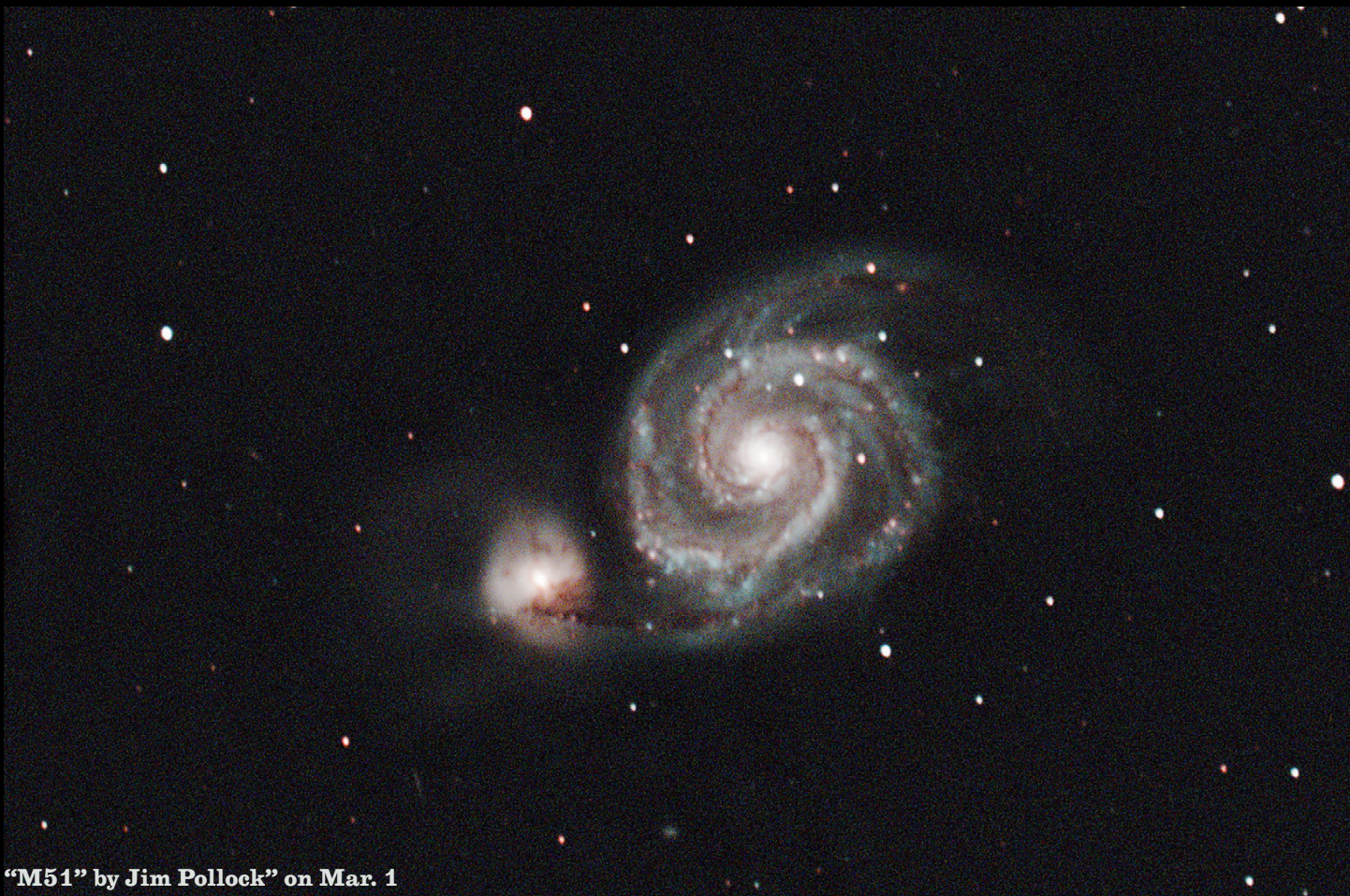


M 42 Orion

“M42, Great Orion Nebula” by Gary Garzone on Mar. 13



“M1” by Jim Pollock on Mar. 1



“M51” by Jim Pollock” on Mar. 1



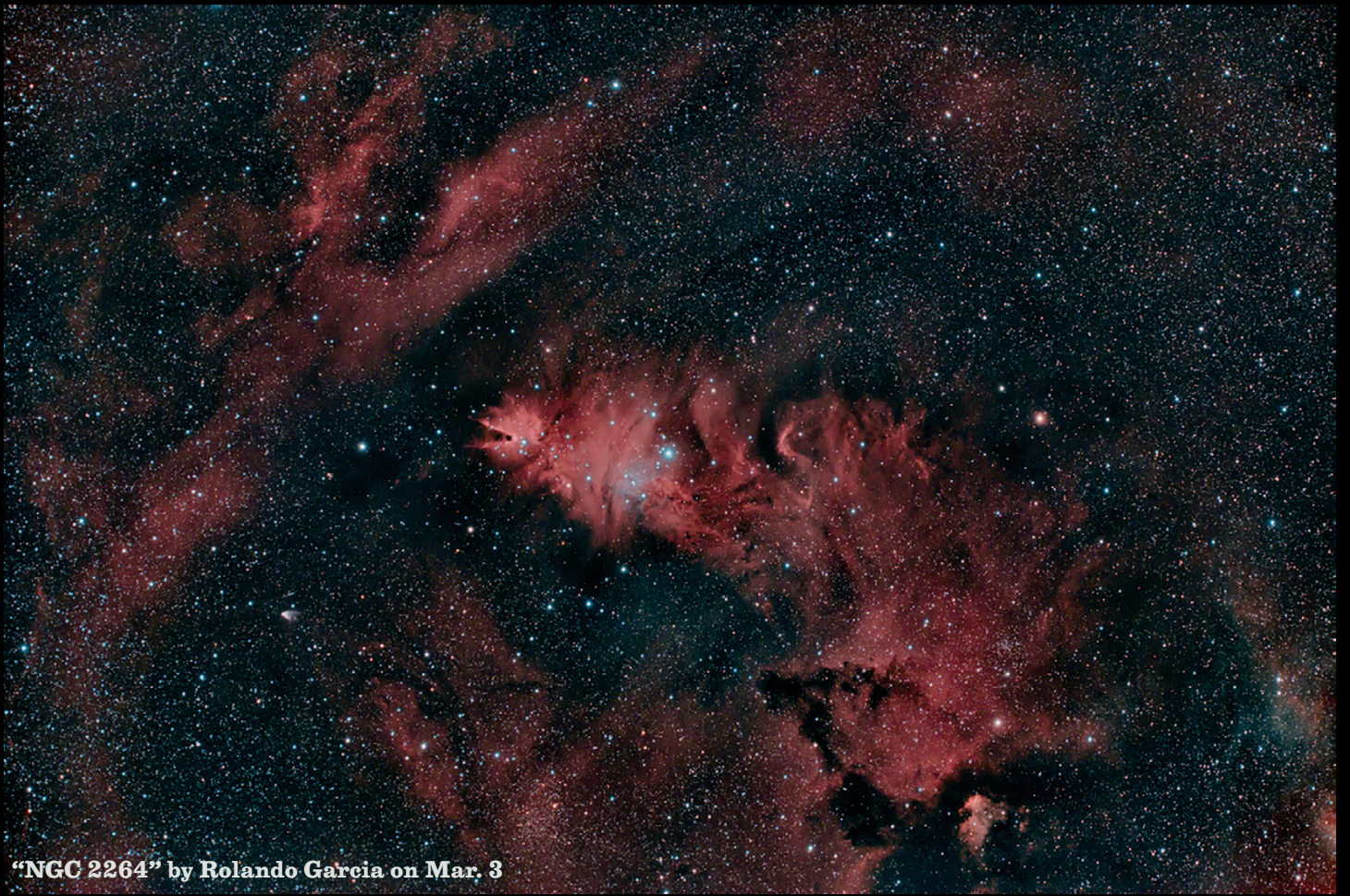
“M63, Sunflower Galaxy” by Jim Pollock on Mar. 3



“M82” by Jim Pollock on Mar. 12



“M1” by M. J. Post on Mar. 19



“NGC 2264” by Rolando Garcia on Mar. 3



“IC 1848” by Stephen Garretson on Mar. 21



“IC 2177 Seagull” by Rolando Garcia on Mar. 11



“Full Moon” by Sarah Detty on Mar. 28

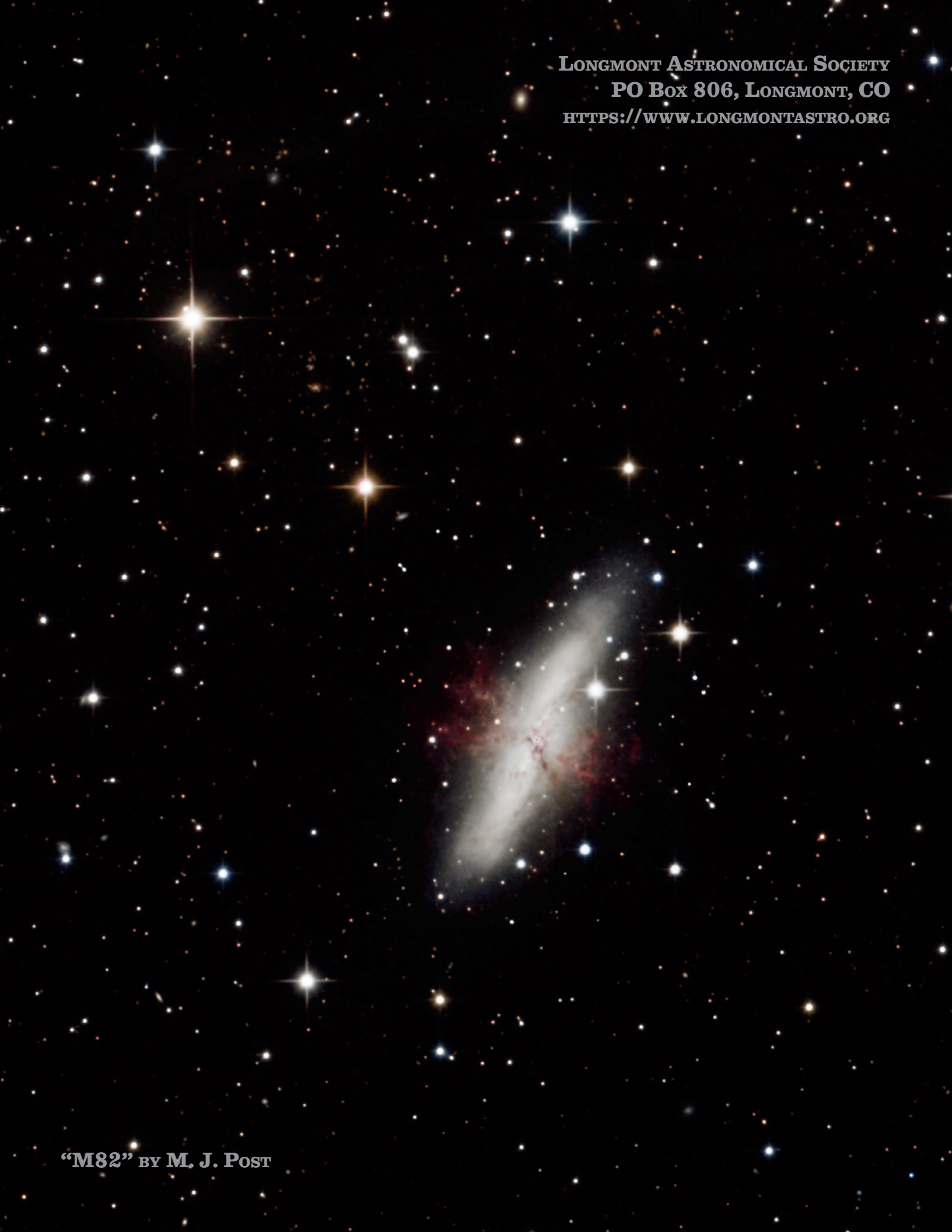


“Thor’s Helmet” by Stephen Garretson on Mar, 28



“Cone Nebula” by Stephen Garretson on Mar. 27

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“M82” BY M. J. POST