

LONGMONT ASTRONOMICAL SOCIETY

AUGUST 2021

“NORTH AMERICA NEBULA AND IC5070 AREA”
BY **STEPHEN GARRETSON**

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LAS Meeting August 19 at 7 pm

“Dark Matter and Why We Need It” by Dr. Angela Collier

Abstract:

Some of the most exciting open questions in Astronomy pertain to the origin and properties of dark matter. Dark matter accounts for ~85% of the mass of the Universe but still eludes direct detection. I will discuss in detail the evidence of dark matter and its role in shaping the cosmos. While the importance of dark matter is well understood, its underlying nature is still a mystery. Many cosmologists maintain they are ‘on the verge’ of solving this mystery (though they have been on the ‘verge’ for 30 years now.) I will describe a few of the more interesting theories and experiments. You will not leave this talk with an answer to the question ‘What is dark matter?’ but you will hopefully understand its importance.

Bio:



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.

Our August 19th meeting will be in-person and also available on Zoom. The in-person meeting will be in the “Community Room” at the Lyons Regional Library, 451 4th Ave., Lyons, CO. The Zoom invitation will be sent to members on the LAS email list on Aug. 12 and Aug. 19.

Upcoming Star Partys at Rabbit Mountain

- Saturday August 14
- Friday September 10
- Friday October 15

Masks may be required at telescopes. Registration required at www.BoulderCountyOpenSpace.org/Register

For folks who wish to attend the star party, registration is required, and they register through the BCOS site. The telescope operators don't have to worry about registration.

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.



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



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LAS Officers and Board Members in 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 Thurs. July 15 meeting by Sven Schmidt

I. Call to Order

Stephen calls hybrid meeting (Niwot Inn and Zoom) to order at 7:00 PM.

Officers attending are Stephen Garretson (President), M.J. Post (Vice President), Bruce Lamoreaux (Treasurer), and Sven Schmidt (Secretary).

Board Members-at-large: Mike Hotka, Gary Garzone, Brian Kimball, Tally O'Donnell, Vern Raben.

Note: Since the audio was muffled and speakers were hard to understand via Zoom, the minutes may be incomplete.

II. New Members and Visitors

No members and no visitors.

III. Astronomical History - Stephen Garretson

On July 15th, 1972, Pioneer 10 entered the Asteroid Belt. After that, it got a boost by Jupiter to 82,000 mph heading into outer space.

IV. Open Forum

LAS member David Elmore presented his studies of deep exposures of bright and dark nebulae in the Milky Way using his setup in New Mexico. Dark clouds are partly composed of primordial and partly of recycled star matter (supernovae, planetary nebulae, ...).

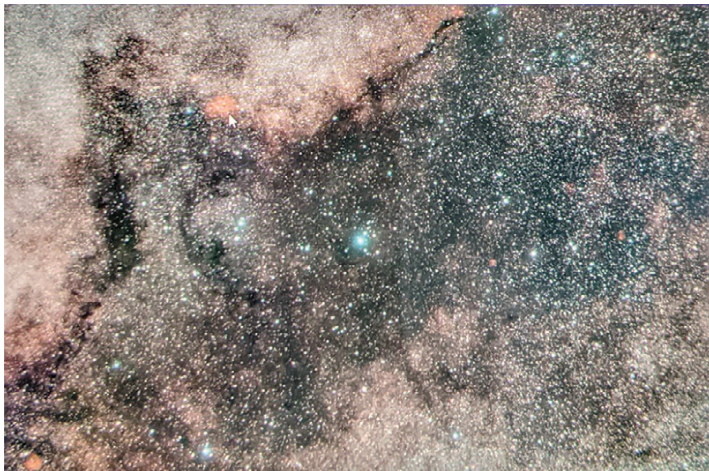


Figure 1: Dark Rift in Sagittarius at the center of the Milky Way, by David Elmore

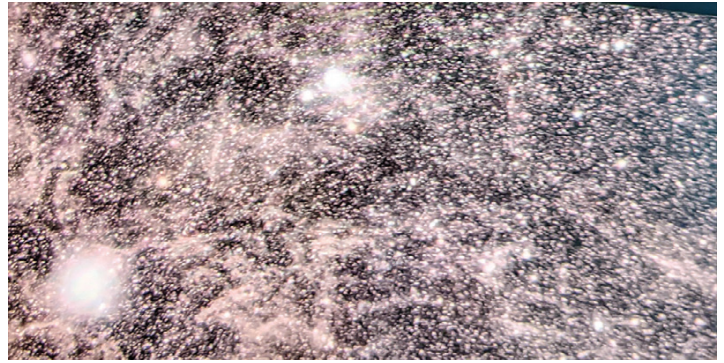


Figure 2: Galactic cirrus illuminated by integrated light of Milky Way stars around Polaris, by David Elmore



Figure 3: M81/M82 appears embedded in galactic cirrus, by David Elmore

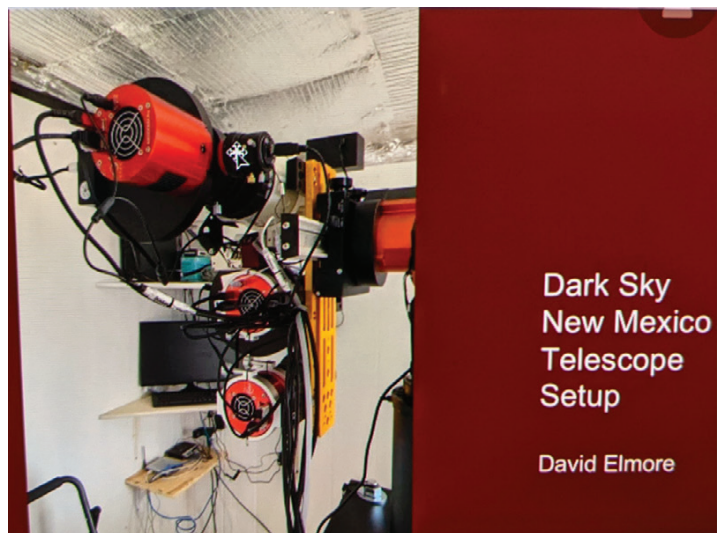


Figure 4: David Elmore's rig in New Mexico, by David Elmore

All images were taken in RGB and thus represent true colors.

Book Presentation by Dr. Jim Elkins: Planetary Astronomy by Christophe Pellier

Jim Elkins and Vern Raben talked about the University of Colorado Alpine Observatory at the Mountain Research Station and the fact that their Meade LX200 is available to club members after receiving training.

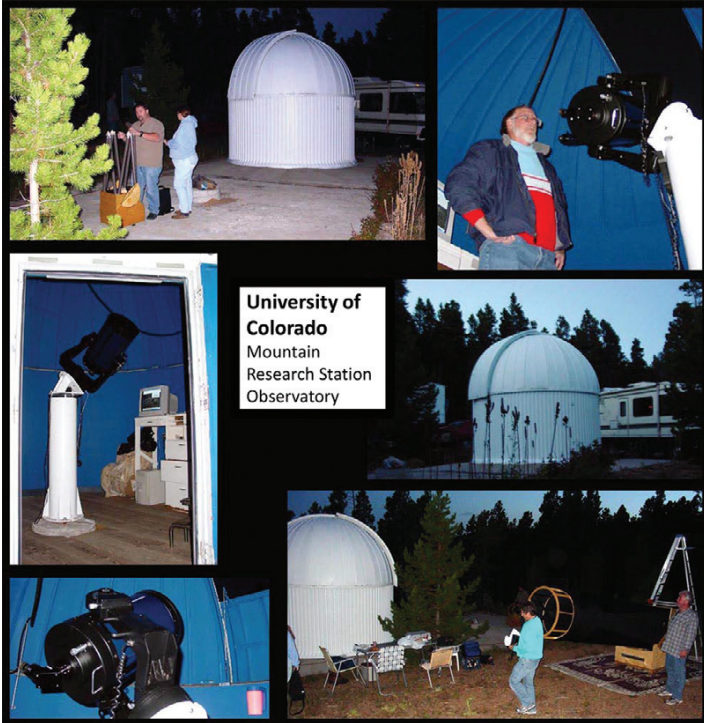


Figure 5. Collage of MRS images by Gary Garzone

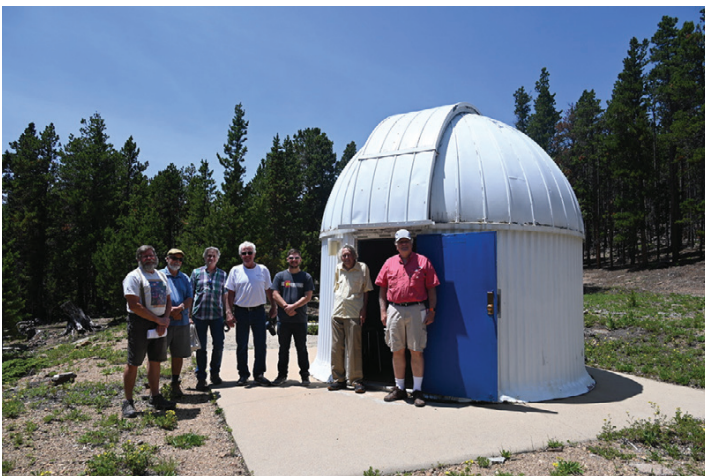


Figure 6. Training attendees outside the Colorado Alpine Observatory by Jim Elkins



Figure 7. Inside the dome s at the Colorado Alpine Observatory by Jim Elkins

V. Treasurer Report by Bruce Lamareaux

Main Checking Account - \$6,400

2-Year Savings Account - \$8,100

Telescope Fund - \$1,100

Petty Cash - \$50

Total Assets - \$16,650

Note: amounts rounded for security purposes.

VI. Old Business

None.

VII. New Business

- Star party July 16th at Rabbit Mountain
- Star party August 14th at Rabbit Mountain
- August 2021 meeting at Lyon's regional library, by Sunset Park
- Stephen Garretson started discussion of what to do with donated telescope donations. Vern Raben suggested to decline them unless they are recent models (parts availability, general condition, ...)
- Stephen Garretson asked whether we should do a brief star party after the August meeting at the Lyon's regional library

VIII. Adjournment

Meeting adjourned at 8:32pm.

Sven Schmidt, Secretary

The Planets in August by Vern Raben

Mercury

Mercury is not visible.

Venus

Venus is visible low in the west after sunset in constellation Leo until the 10th; it is in constellation Virgo for the rest of the month. It is magnitude -4 in brightness and its disk increases from 13 arc to 15 arc sec across.

Mars

Mars is not visible.

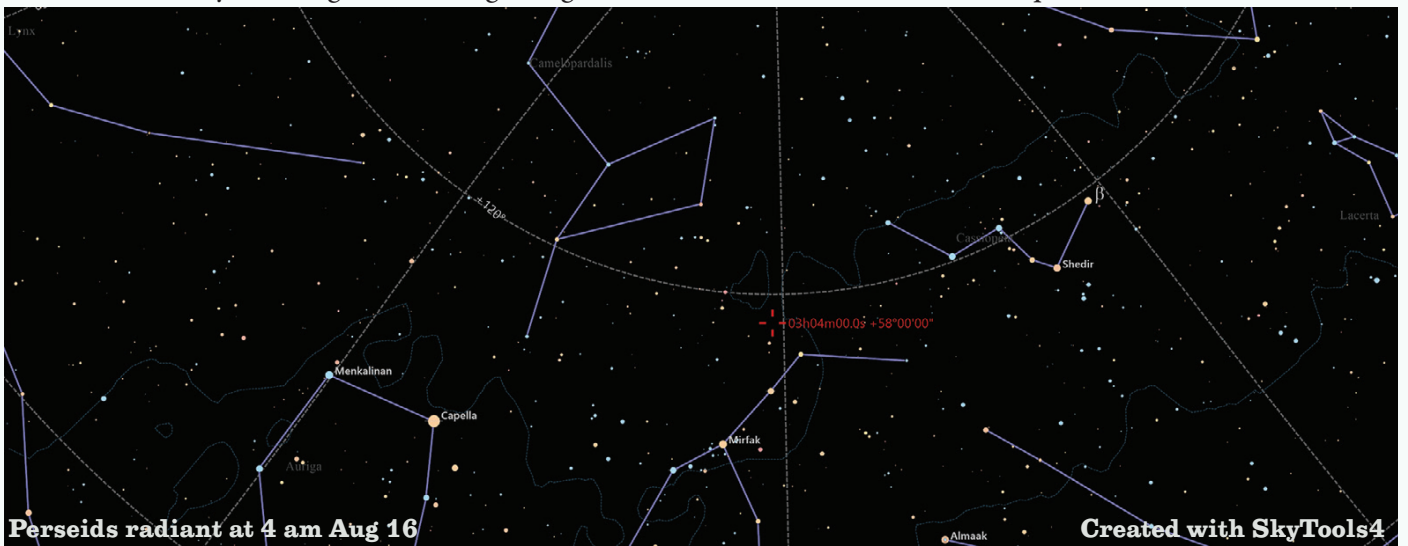
Jupiter

Jupiter will be at opposition this month on August 19th at 6:14 pm. It is 49 arc sec across this month; its brightness is -2.9 magnitude. Good times to view the Great Red Spot crossing the center of the planet this month are:

Aug 2 at 12:22 am at altitude of 32°
Aug 4 at 2:00 am at altitude of 39°
Aug 6 at 3:38 am at altitude of 34°
Aug 6 at 11:29 pm at altitude of 28°
Aug 8 at 5:16 am at altitude of 21°
Aug 9 at 1:07 am at altitude of 37°
Aug 11 at 2:45 am at altitude of 36°
Aug 11 at 10:36 pm at altitude of 23°
Aug 13 at 4:23 am at altitude of 25°
Aug 14 at 12:14 am at altitude of 35°

Meteor Showers

The Perseid meteor shower on Aug. 11-12 is one of the most impressive meteor showers with about 60 or so visible per hour from a dark location. Circumstances are quite good this year as the moon sets at 12:08 am. Perseids are best viewed in the early morning before twilight begins at 4:32 am. Perseids are forecast to peak at 8:17 am.



Aug 16 at 1:52 am at altitude of 38°
Aug 18 at 3:30 am at altitude of 29°
Aug 18 at 11:22 pm at altitude of 32°
Aug 21 at 1:00 am at altitude of 38°
Aug 23 at 2:38 am at altitude of 32°
Aug 23 at 10:29 pm at altitude of 29°
Aug 25 at 4:16 am at altitude of 18°
Aug 26 at 12:07 am at altitude of 37°
Aug 28 at 1:45 am at altitude of 35°
Aug 29 at 9:36 pm at altitude of 25°
Aug 30 at 3:23 am at altitude of 23°
Aug 30 at 11:14 pm at altitude of 36°

Saturn

Saturn is at opposition at 11:59 pm on August 1st. It is in the constellation Capricornus. It is magnitude +0.2 in brightness and it is and the size of its disk is 19 arc sec across.

Uranus

Uranus is in the constellation Aries. It is magnitude 5.8 in brightness and the disk is 3.6 arc sec across.

Neptune

Neptune is visible in the constellation Aquarius. It is magnitude 7.9 in brightness and its disk is 2.3 arc sec across.

Lunar Phases in August



New Moon
Aug 8 at 7:51 am



First Quarter
Aug 15 at 9:21 am



Full Moon
Aug 22 at 6:03 am



Third Quarter
Aug 30 at 1:14 am

Lunar images by NASA Scientific Visualization Studio

Star Party Targets for Aug. 14

On Saturday August 14 sunset is at 7:58 pm; it will be fairly dark by 8:45 pm.

Moon is at Lunation 6.8

List of prominent lunar features near the terminator:

- Vallis Alpes - spectacular valley feature that divides the Montes Alpes range; valley is about 6 miles across at its widest
- Cassini is a flooded crater that has numerous impacts; the larger crater Cassini-A is in the NE and smaller B is in the SW. Cassini is about 35 mi across.
- Manilius - is a 24 mile wide crater with well defined rim
- Hipparchus - eastern half of the crater is visible this evening; it is 150 miles across. Its walls are quite degraded.
- Maurolycis in the southern highlands of the moon is covered with overlapping impact craters

Globular Clusters

- M 3 in Canes Venatici mag 6.2
- M5 in Serpens mag 5.7
- M10 in Ophiuchus mag 6.6
- M13 in Hercules mag 5.8
- M92 in Hercules mag 6.4

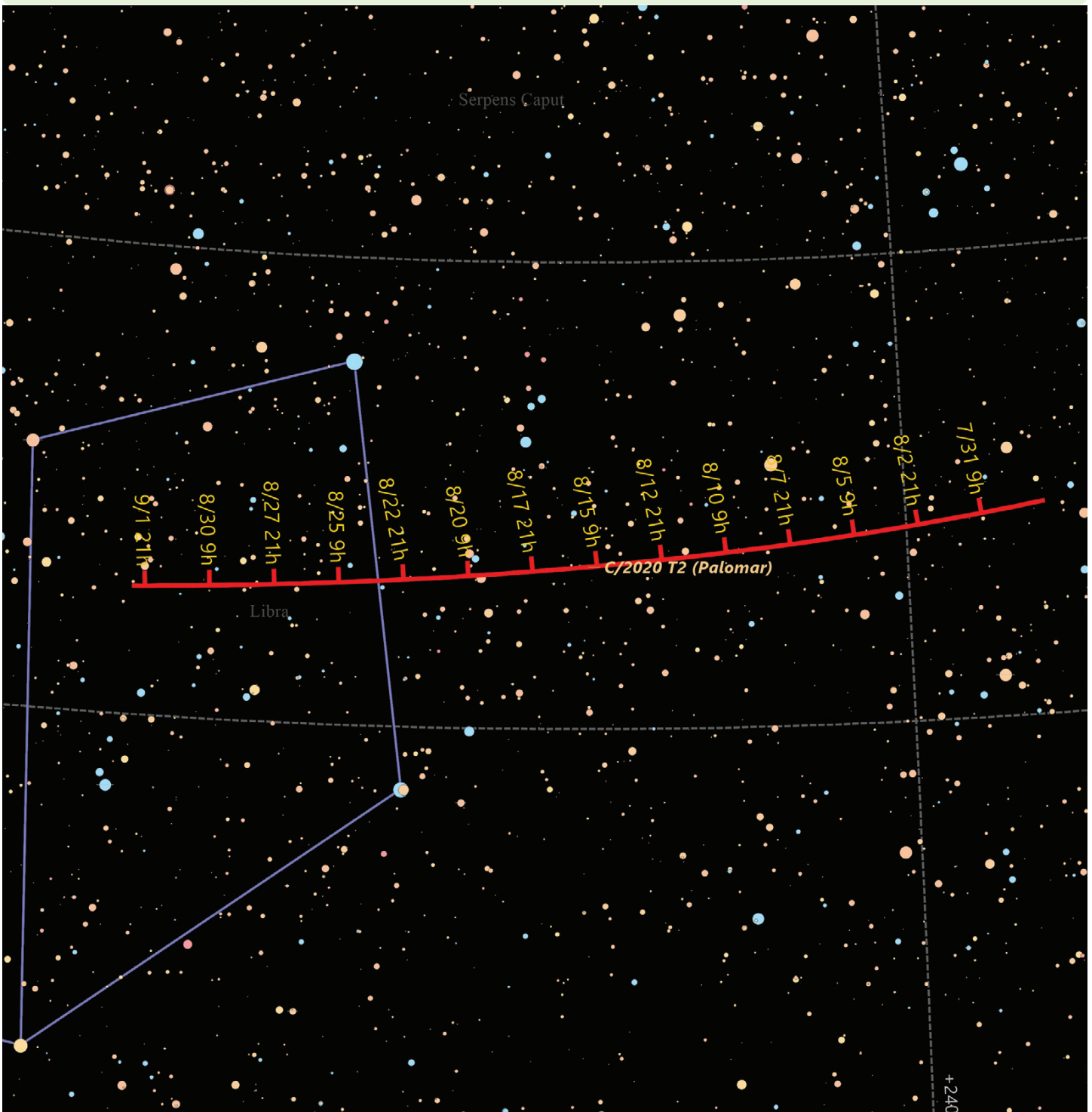
Galaxies

- M101 "Pinwheel Galaxy" in Ursa Major, magnitude 7.9
- M 51 "Whirlpool Galaxy" in Canes Venatici is mag 8.4
- M94 spiral galaxy in Canes Venatici is magnitude 9
- M81 in Ursa Major mag 6.8
- M64 "Black Eye Galaxy" in Coma Berenices mag 8.4
- NGC 6946 "Fireworks Galaxy" in Cygnus mag 8.9

Planetary Nebula

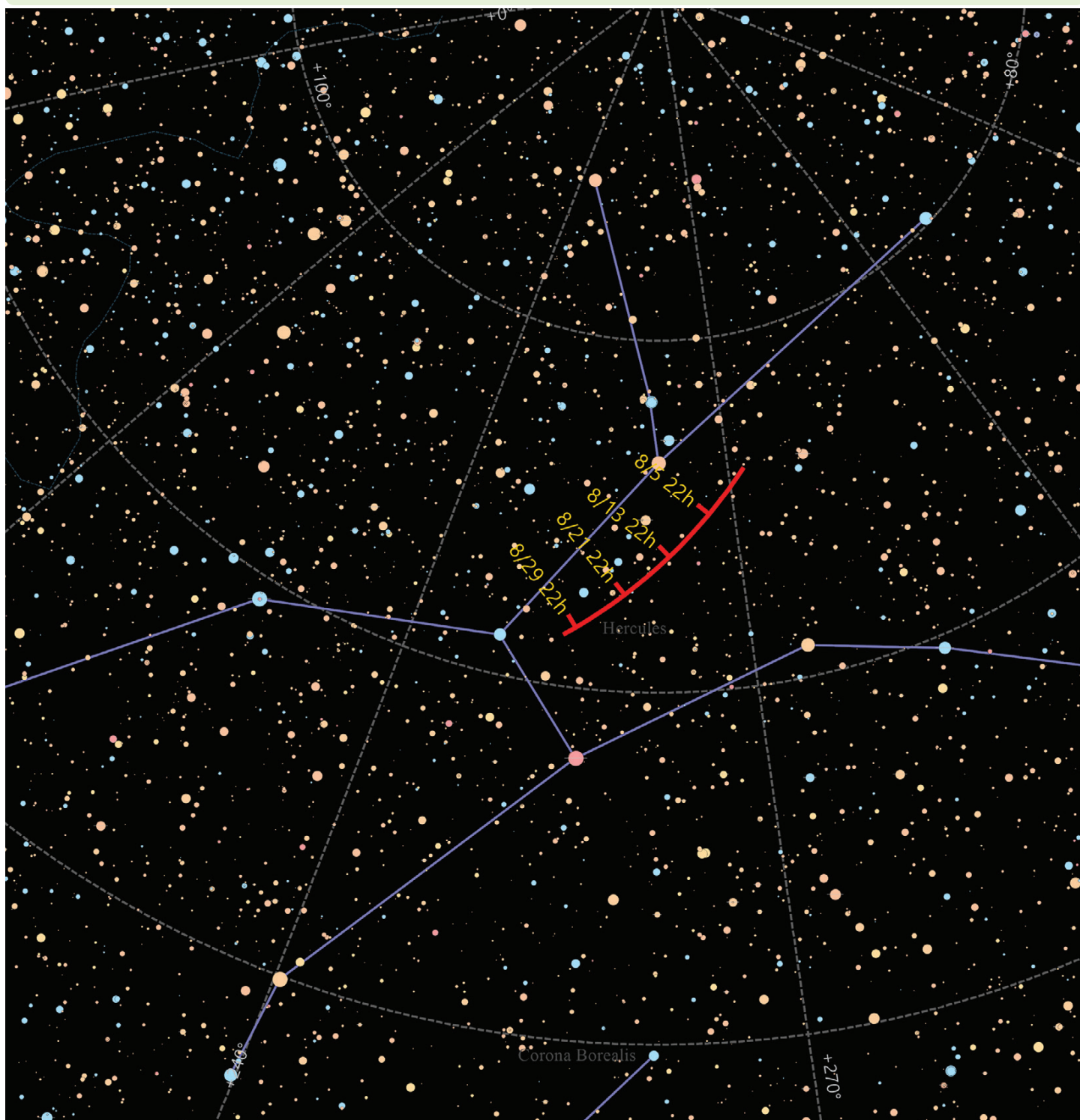
- M27 "Dumbbell Nebula" in Vulpecula
- M57 "Ring Nebula" in Lyra mag 9.8
- NGC 6220 in Hercules mag 8.8
- M8 "Lagoon Nebula" mag 6
- M20 "Trifid Nebula" mag 6.3
- NGC 6543 "Cat's Eye Nebula" in Draco mag 8.1
- NGC 6572 in Ophiuchus mag 8
- NGC 6826 "Blinking planetary" in Cygnus mag 8.9
- NGC 7027 planetary nebula in Cygnus mag 8.5

Comet C/2020 T2 (Palomar) in August 2021



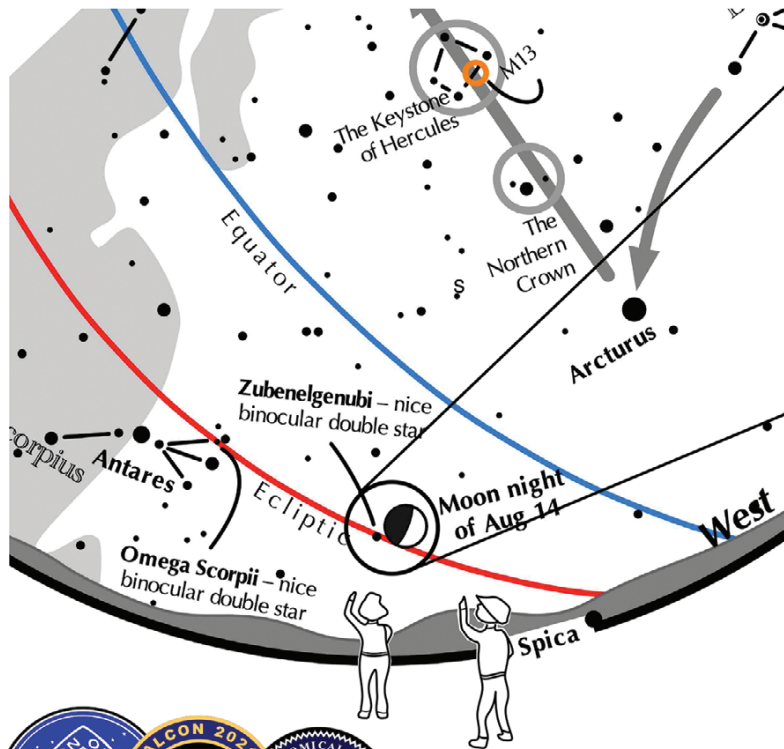
Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Aug 1	9:48 pm	14h29m38.1s	-04°22'23"	Virgo	10.9	3.3
Aug 7	9:38 pm	14h38m37.0s	-06°49'38"	Virgo	11.0	3.2
Aug 13	9:27 pm	14h48m06.3s	-09°11'11"	Libra	11.1	3.1
Aug 19	9:16 pm	14h58m03.9s	-11°26'37"	Libra	11.2	3.0
Aug 25	9:06 pm	15h08m27.6s	-13°35'36"	Libra	11.3	2.9
Aug 31	8:53 pm	15h19m15.7s	-15°37'50"	Libra	11.4	2.8

Comet C/2017 K2 (PANSTARRS) in August 2021



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Aug 1	10:03 pm	17h08m45.6s	+38°22'03"	Hercules	12.9	1.6
Aug 7	9:57 pm	17h05m30.6s	+37°18'26"	Hercules	12.9	1.6
Aug 13	9:47 pm	17h02m48.5s	+36°11'09"	Hercules	12.9	1.6
Aug 19	9:28 pm	17h00m40.1s	35°01'00"	Hercules	12.8	1.6
Aug 25	9:21 pm	16h59m05.0s	+33°48'34"	Hercules	12.8	1.6
Aug 31	9:09 pm	16h58m03.0s	+32°34'37"	Hercules	12.7	1.6

If you can observe only one celestial event this month, consider this one:



View through 10x50 binoculars

The Scene:

First quarter Moon approaches a wide double star

Look to the southwest 75-90 minutes after sunset on August 14.

- The almost first quarter Moon will be found hanging in the darkening twilight.
- People with good eyesight should be able to spot Alpha Librae – Zubenelgenubi – to the Moon's immediate lower left.
- Aim binoculars at the Moon. Zuben will be seen as being a double star with its dimmer component slightly closer to the Moon than the brighter one.

Southwest
75-90 minutes after sunset
on August 14

Zubenelgenubi? Practice saying it:
Zube - en - el - gen - ubi



ASTRONOMICAL LEAGUE



Limited availability!

AL 75th Anniversary Commemorative Pin

A special, LIMITED EDITION lapel pin commemorating the Astronomical League's 75th Anniversary in 2021!

Help proudly celebrate the Astronomical League's "Diamond Anniversary" – established November 15, 1946!

This special pin is 1.25 inches in diameter, a bit larger than most of our Observing Award pins. Be sure to complete your pin collection, or get it started with this unique limited availability pin.

Get one while they last, we will not reorder once these are sold out.

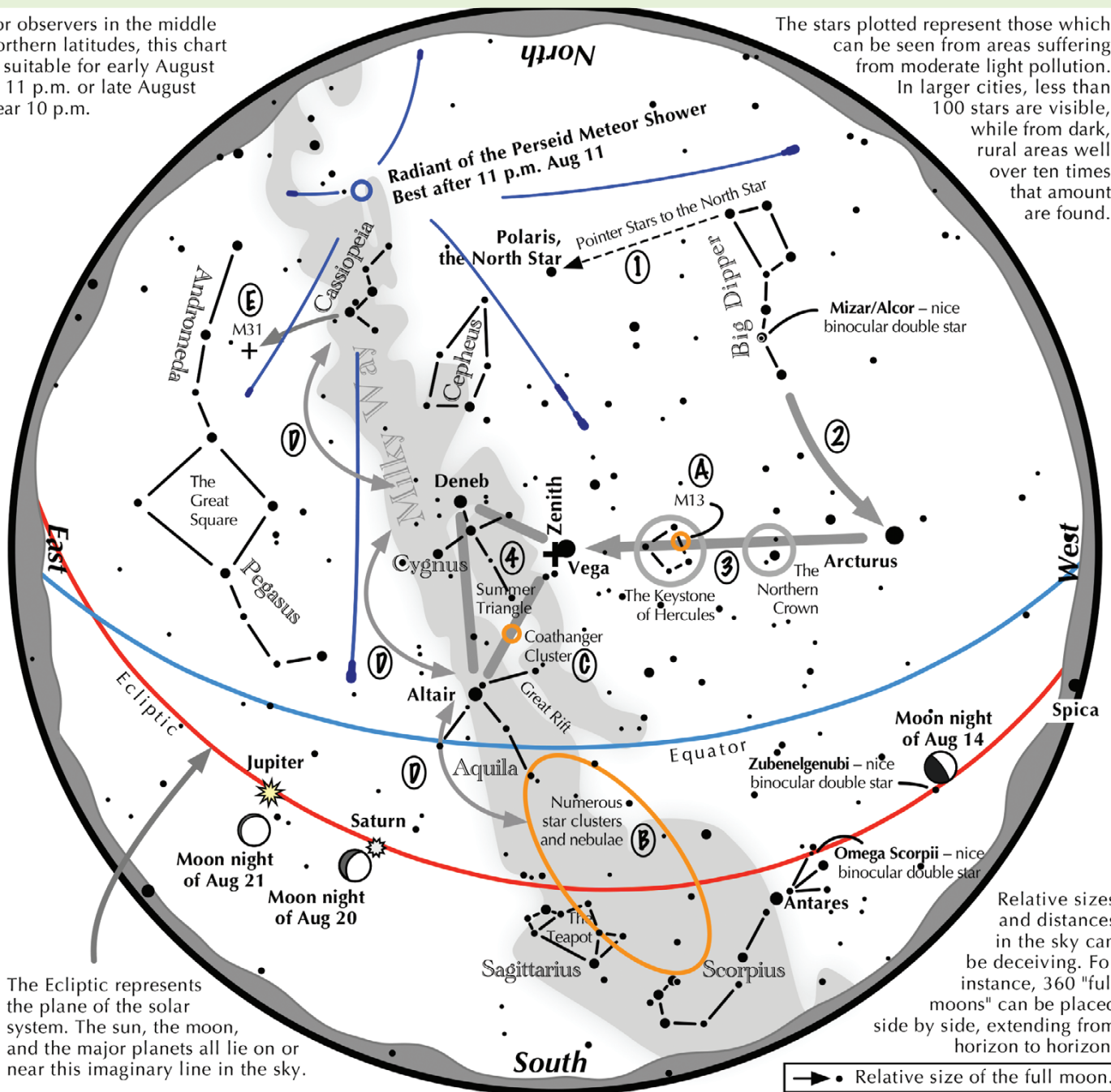
\$6 each through League Sales!

Order a few for your club or group, save a bit! Discounted price for orders of 5 or more: \$5 each.

Navigating the mid August Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 p.m.

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 mid August night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the June evening sky.
- 3 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



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

Join us in celebration of the League's 75th year!

ALCon 2021 Virtual!

ALConVirtual.org

August 19 – 21, 2021



Presented by
Your Astronomical League
Free Registration !!

Door Prizes
valued at more than
\$7500

Grand Prize – Explore Scientific
FirstLight 127mm Mak-Cass Telescope
with Twilight Mount valued at ...
\$750 !

ALCon Speakers and Presentations...

- Dr. Jocelyn Bell Burnell, "The Discovery of Pulsars in Context"
- David Eicher, "Galaxies"
- Dr. Richard Gott, "The Cosmic Web"
- Dr. David Levy, "Poetry in the Heavens"
- Kelly Beatty
- Dr. David Dunham, "Near-Earth Asteroid Occultations"
- Paul Cox, "SLOOH"
- Alan Dyer
- **And more!**

Astronomical League Awards

- Library Telescope Drawing
- Mabel Sterns Newsletter Award
- Webmaster Award
- Peltier Award
- National Young Astronomers
- Horkheimer Youth Awards
- GR Wright Award
- Special Service Awards

Saturday Night:
Global Star Party



Dr. Jocelyn Bell Burnell



David Eicher



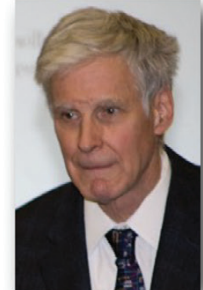
Dr. Richard Gott



Dr. David Levy



Paul Cox



Dr. David Dunham

Alan Dyer

J Kelly Beatty



Virtual Tour of the Very Large Array



Newsletter Archives

10 Years Ago - August 2011

The presentation this month will be about planetary imaging. The planet Jupiter will be at opposition near the end of October and will be more convenient to image in the late evening in the coming weeks. Vern Raben will talk about techniques to obtain images of Jupiter and other planets, collimation, and software to process the images, namely the latest version of image processing software application, Registax 6.1.

The LAS web site was upgraded to latest version of the Drupal content management system. This was a major software upgrade and there were some problems. The new version doesn't support the previous image gallery. It has been replaced with different software. The previous content is being replaced but it will take some time to complete. There are also some problems with the calendar which will be fixed as well. Additional newsletters have been added to the website. We now have all newsletters from March 1987 when the first one was published to the current edition.

Upcoming Star Parties and Events
Beginning Astronomy Class – Friday evening Sept. 30 to Oct. 21.
Telescopes will be needed for Oct. 7th and 21st star parties at Sandstone Ranch.

The Greeley Chamber of Commerce/Visitors Bureau event “Star Gazing on the Prairie” is on Saturday, Oct. 22nd at the Crow Valley Campground near Briggsdale, CO.

20 Years Ago - August 2001

All Mountain Regional Astronomy Society (MARS) members are invited to the Grand Junction Astronomy club's star party on the Grand Mesa on Sept. 14 - 15, 2001.

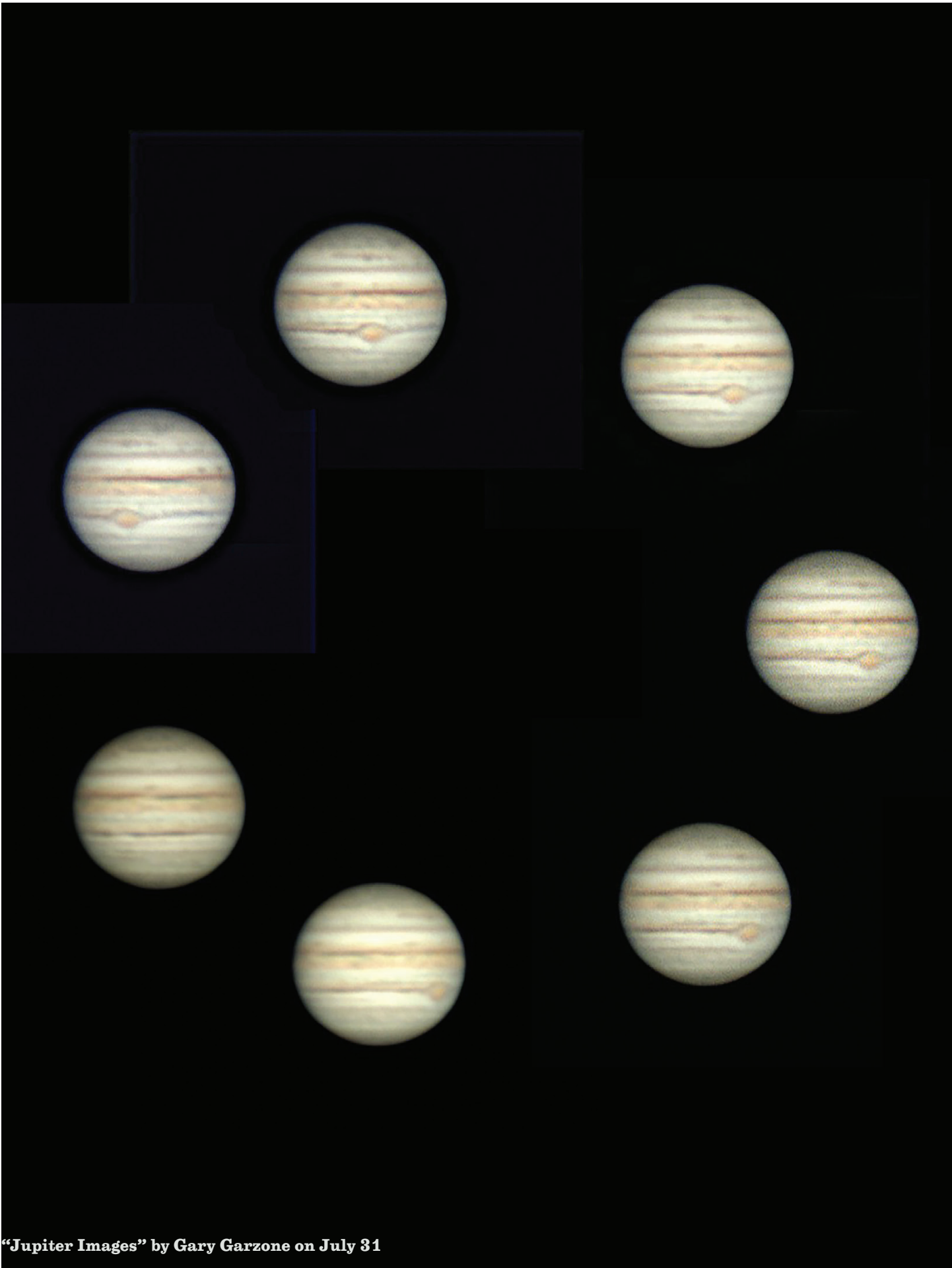
Jim Sapp “Iron Man” reported on the star party at Foxpark, WY on July 18-22. New member Bill Possel was treated to some “real” dark sky. Dan L. from Fort Collins was there as well as Randy and Alan of AstroSystems. Gary and Carol Garzone dragged the 30 in dob later in the afternoon and David Dunn showed up too. They had incredible, steady, clear, dark and wonderfully transparent skies.

Doug Walton reported on star party at Cactus Flats on July 20. He was there with Nate from the Ft. Collins club, Leroy Guatney, and Max Moe and his parents. Mosquitos were in full rampage and they got gaps in clouds now and then so not a great night.

Mike Hotka reported that he had great clear dark skies at Brian Kimball's observatory near Crystal Lakes

30 Years Ago - August 1991

No newsletter published was for August 1991.



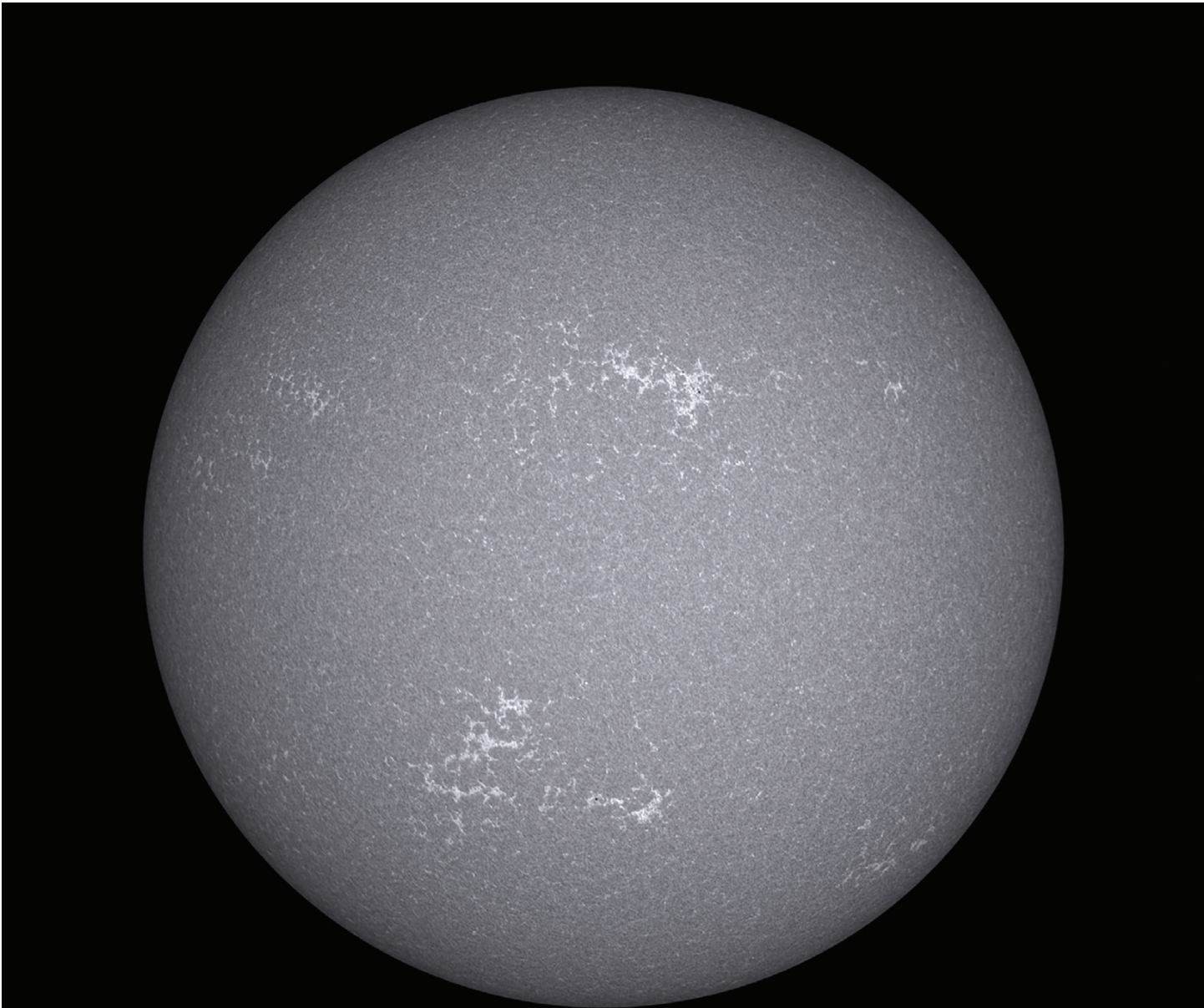
“Jupiter Images” by Gary Garzone on July 31



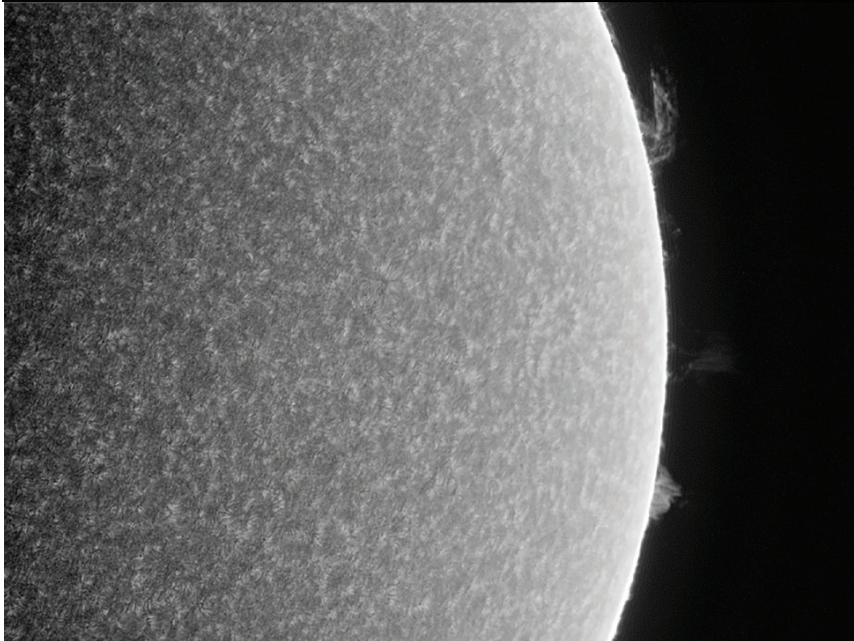
“M20” by Gary Garzone on July 31



“Smoke, sunset, & corpuscular rays” by Gary Garzone on July 13



“Sun in Calcium K on July 26” by Brian Kimball



“Big prominence on July 10” by Brian Kimball



“Moon on July 17” by Brian Kimball



**“Saturn on July 26”
by Gary Garzone**

"Great Rift" by David Elmore on July 9

Wide-field, 6° by 10°, portion of the darkest part of the northern Milky Way between constellations of Serpens and Aquila. Images were recorded July 8 and 9 July at Dark Sky New Mexico. Borg 55FL F/3.6 astro-graph with an ASI2400MC Pro camera. IDAS NGS and IDAS NBZ dual band H-alpha and Oxygen III filter were used. All exposures were 10-min, 18 with NGS1 filter and 34 using the NBZ filter for total of 8 hours 40 min.

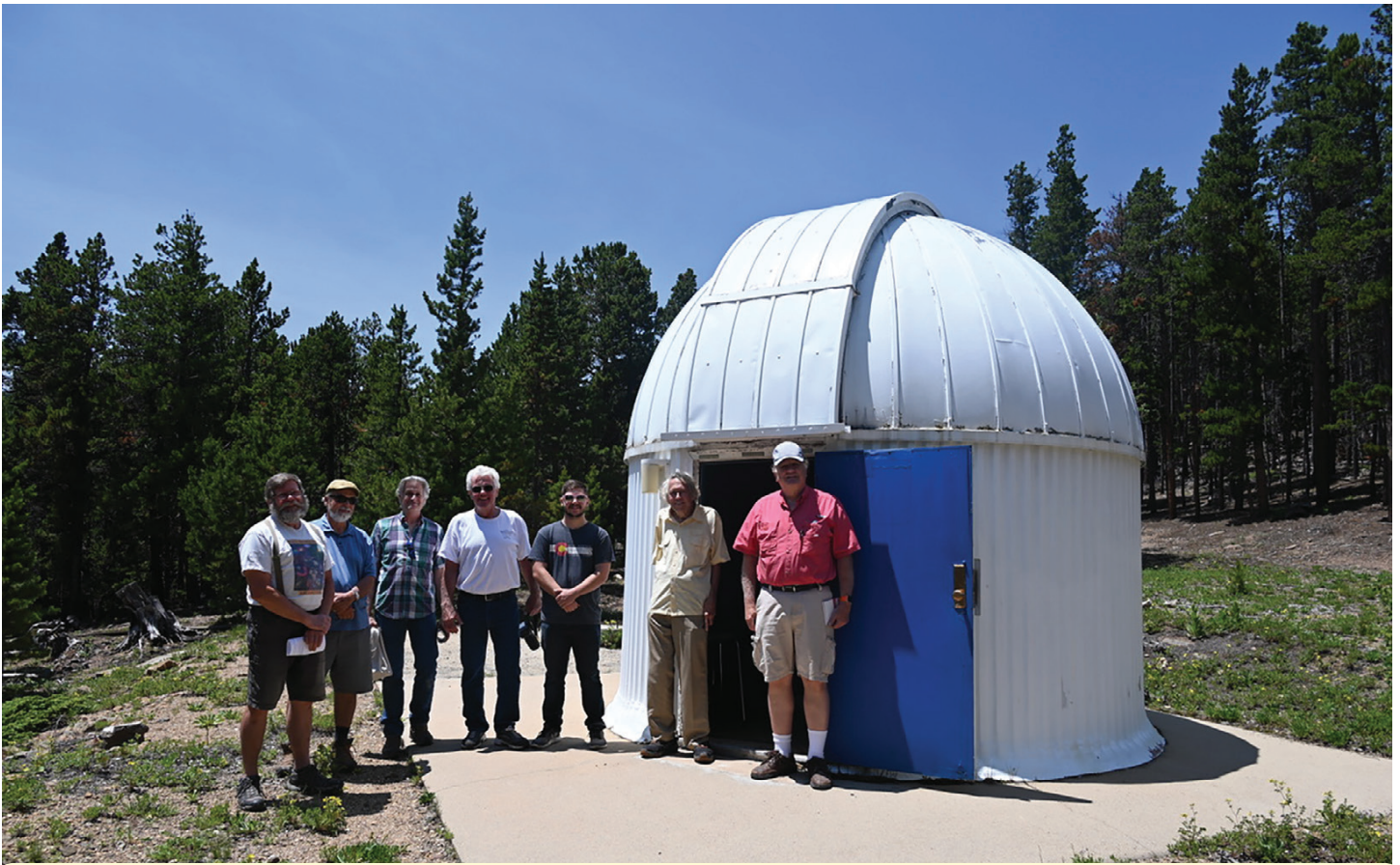




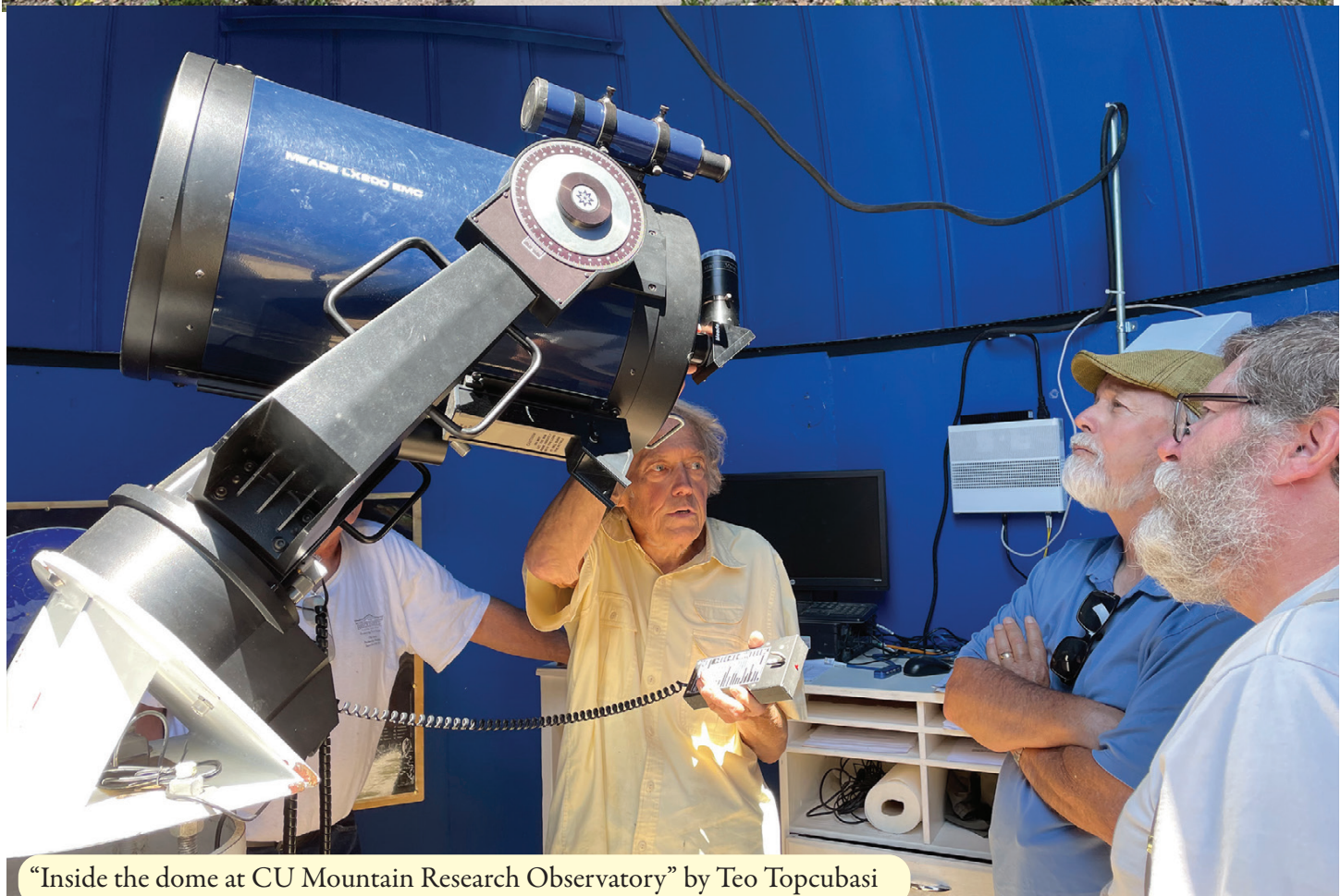
“North America Nebula, NGC7000” by Eddie Hunnell on July 11
22 subs at 60 seconds with a RASA 11” f2.2 and full frame-cooled camera at -5C
Filter - UV/IR cut
Only correction images used were bias
Stacked in DSS and Processed in Pixinsight



"M31" by Eddie Hunnell on July 11
RASA 11" f2.2 and full frame cooled camera at -5C
Filter - UV/IR cut
60 subs of 60 seconds each unguided



Scope training and check out at University of Colorado Mountain Research Observatory” by Jim Elkins on July 10



“Inside the dome at CU Mountain Research Observatory” by Teo Topcubasi



“PacMan to Gamma Cassiopaea”
by Stephen Garretson on July 22
2 hours integration.
Borg 55FL f/3.6 Astrograph
ASI 2600MM
Baader 3.5nm Ha filter
William Optics UniGuide Scope
ASI 290M Mini Guider



“M13” by Rolando Garcia on July 4.



“M20” by Jim Pollock on July 8



“NGC 6888” by Jim Pollock on July 8
Scope: 11” EdgeHD at f/7 on CEM70
Guide: OAG 1970mm w/ ZWO 174mm mini
Image: ZWO 2600mc, gain 100, -20°C
Exposure: 19x 300s = 95 minutes
Filter: Optolong CLS Filter
Process: Pixinsight for alignment, stacking and
PhotoMetric Color calibration

Astronomers confirm there is a third type of supernova explosion



This Hubble image shows the probable electron-capture supernova SN 2018zd (large white dot at right) within the galaxy NGC 2146.



Image of SN 2018zd taken with an 11 inch RASA from Hygiene, CO by Marty Butley.

The theoretical progenitors of electron-capture supernovae are a type of red giant, or aging star, called a super-asymptotic giant branch star, between 8 and 10 solar masses. These progenitors shed much of their mass prior to exploding, puffing away their outer layers into a surrounding cloud.


Astronomers have long suspected that the supernova of A.D. 1054, which created the famous Crab Nebula (M1) and its central pulsar, was an electron-capture supernova. The way its filaments continue to slowly expand over time shows that they are moving through such a cloud of material shed from the progenitor star before the blast.



Crab Nebula taken with a C11 Edge from Hygiene, CO by Marty Butley



“M4 and NGC 6144” by Rolando Garcia on July 6
About 1.5 hours total exposure over two nights. No
filters, 3 minute exposures at ISO 400 on a Nikon
D5600. The scope was an AT92, 500 mm focal length.



LONGMONT ASTRONOMICAL SOCIETY
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[HTTPS://WWW.LONGMONTASTRO.ORG](https://www.longmontastro.org)

“M8”
BY ROLANDO GARCIA