

LONGMONT ASTRONOMICAL SOCIETY

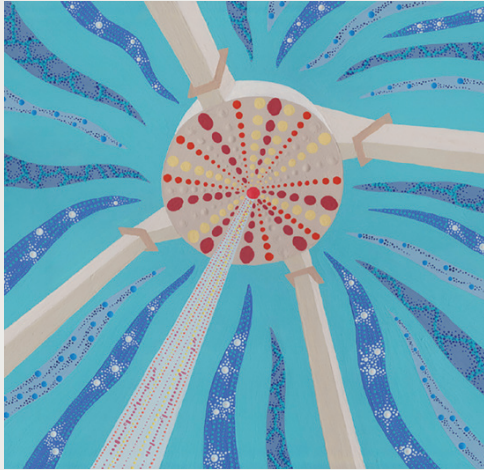


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LAS Meeting June 17 from 7 to 9 pm

“Radio Astronomy: Past and Future” by Dayton Jones



Credit: John Ramer

The radio astronomy community was dealt a blow last December when the iconic Arecibo radio telescope collapsed. I will discuss how this happened and what options may exist for a replacement. Looking ahead, large arrays of small telescopes will provide more capabilities than any single-aperture telescope could. The international astronomy community is developing the Square Kilometre Array (SKA), a massive project to construct several hundred dish antennas in South Africa to observe at medium radio frequencies, and hundreds of thousands of dipole antennas in western Australia to observe at low radio frequencies. In parallel, the US National Radio Astronomy Observatory is proposing a next-generation Very Large Array (ngVLA) to observe at higher frequencies with an array of dish antenna in the southwestern US. I will briefly describe the plans for these future facilities and some of the primary science goals that have motivated their design.

Biography: Dayton Jones

Dayton Jones grew up in Philadelphia and attended Carleton College (BS in Physics, 1974), University of California at Santa Barbara (MS in Scientific Instrumentation, 1976) and Cornell University (MS in Astronomy, 1979, and PhD in Astronomy, 1981). Following graduate school he was a postdoc with the VLBI radio astronomy group at Caltech, then a National Research Council postdoc at the Jet Propulsion Laboratory in Pasadena. He joined the JPL staff in 1986 and worked there until 2015 when he



joined the Space Science Institute in Boulder, retiring from JPL as a Principal Scientist. He is currently working part-time as a Senior Research Scientist at SSI and living near Lyons. His research interests center on high resolution radio imaging and astrometry using interferometry. He is an author on more than 100 refereed papers in scientific journals. His other interests include amateur radio, hiking, skiing, and reading.

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.



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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2021 LAS Officers and Board Members

- | | |
|---|---|
| <ul style="list-style-type: none"> • Stephen Garretson, President • M. J. Post, Vice President • Sven Schmidt, Secretary • Bruce Lamoreaux, Treasurer | <p>Board Members:</p> <ul style="list-style-type: none"> David Elmore, Mike Hotka, Gary Garzone, Brian Kimball, Vern Raben |
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Appointed Positions 2021

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

Solar System Highlights for June 2021

F



Third Quarter: June 2 at 1:26 am

New Moon: June 10 at 4:54 am

First Quarter: June 17 at 9:55 pm

Full Moon: June 24 at 12:41 pm

Image Credit: Brian Kimball

Mercury

Mercury is not visible this month by naked eye.

Venus

Venus in constellation Taurus as the month begins. It moves to Gemini on the 3rd and then to Cancer on the 25th. It is magnitude -3.9 in brightness and its disk is 11 arc sec across.

Mars

Mars begins the month in constellation Gemini and then moves into Cancer on the 8th. It decreases in brightness from 1.7 magnitude to 1.8. The disk decreases in apparent size this month from 4.2 arc sec across to 3.8 arc sec.

Jupiter

Jupiter is constellation Aquarius. Its disk increases in apparent size from 41 to 45 arc sec across this month. The brightness increases from -2.5 to -2.7 in magnitude. The Great Red Spot is more than 20° above the horizon and dark enough to be viewed during mid transit at the following times the month:

- June 2 at 5:03 am altitude 36°
- June 7 at 4:11 am altitude 33°
- June 12 at 3:19 am altitude 29°
- June 14 at 4:57 am altitude 39°
- June 17 at 2:27 am altitude 24°
- June 19 at 4:05 am altitude 36°
- June 24 at 3:13 am altitude 33°
- June 26 at 4:51 am altitude 40°
- June 29 at 2:21 am altitude 30°

Saturn

Saturn is in constellation Capricornus. It increases in brightness from 0.6 to 0.4 magnitude and the disk is 18 arc sec across.

Uranus

Uranus in constellation Aries. It is +5.8 magnitude in brightness and the disk is 3.4 arc sec across.

Neptune

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

Early Evening Star Party Targets for June 18

On Fri. June 18, sunset is at 8:32 pm; it is reasonably dark by 9:15 pm.

Moon is at lunation 8

- Plato - watch long shadows from rising sun cast shadows across the crater floor
- Eratosthenes - complex crater with terraced walls and central peaks
- Don't miss the straight wall (Rupes Recta) which looks like a sword with a hilt
- Clavius at sunrise is marvelous sight to see

Galaxies

- M64, "Black Eyed Galaxy" in Coma Berenices mag 8.4
- M63 SunFlower in Canes Venatici mag 8.5
- M51 Whirlpool Galaxy in Canes Venatici mag 7.9
- M81 and M82 Bodes Galaxy in Ursa Major mag 6.7

Globular Clusters

- M13 in Hercules mag 5.8
- M5 in Serpens mag 5.7
- M92 in Hercules mag 6.4
- M3 in Canes Venatici mag 6.

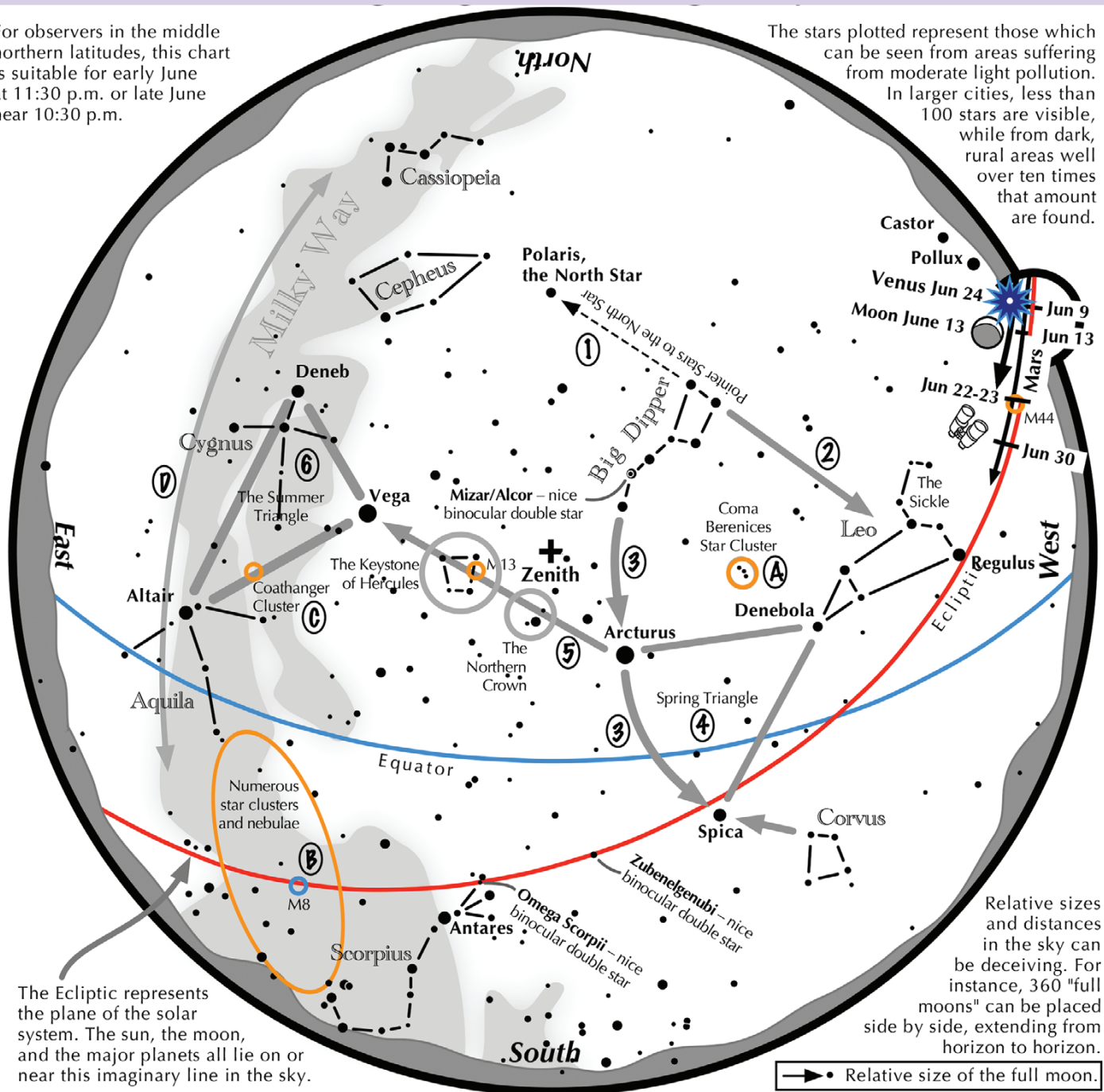
Nebulas

- M97 in Ursa Major mag 9.8
- M57 Ring Nebula in Lyra mag 9.8
- NGC6210 in Hercules mag 8.8

Navigating the mid June Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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 June 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 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 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.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

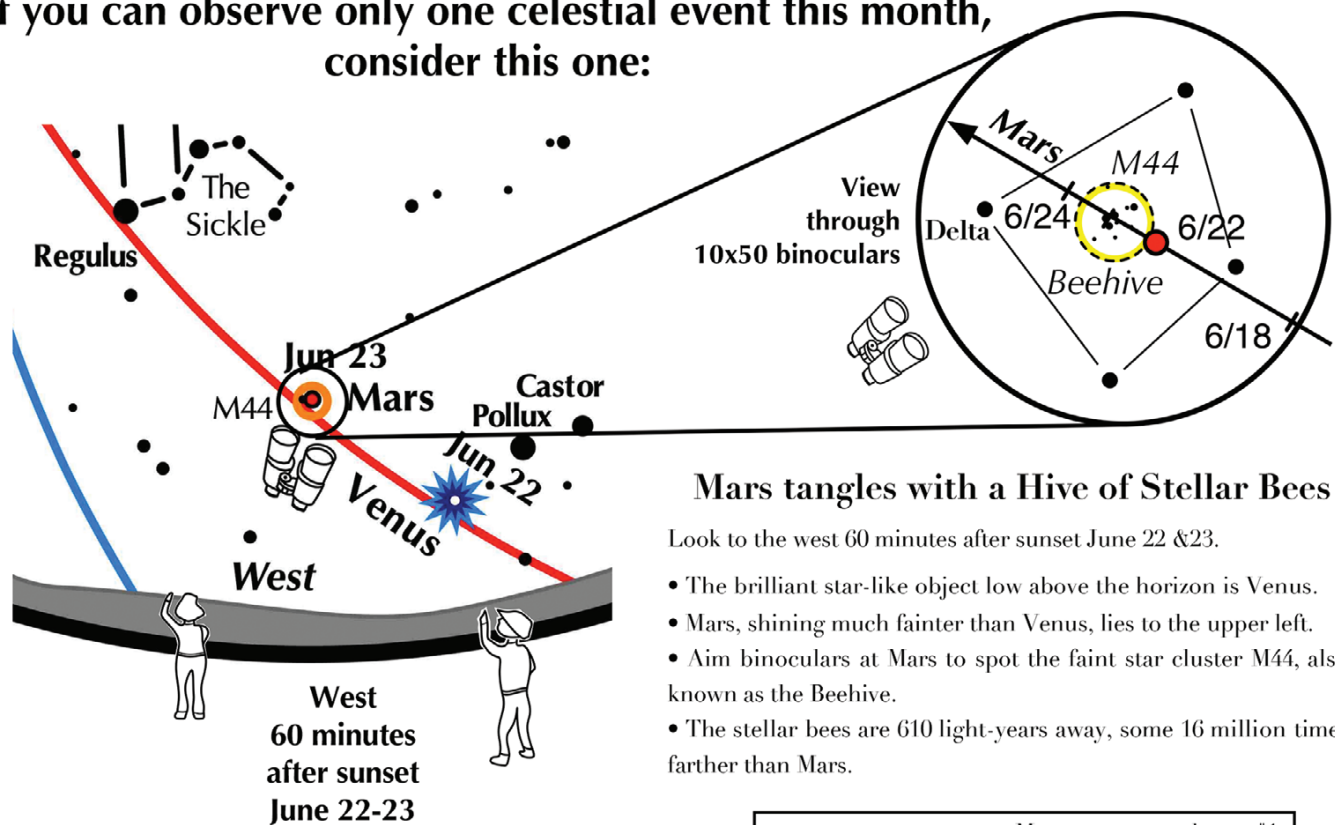
Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of 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.



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

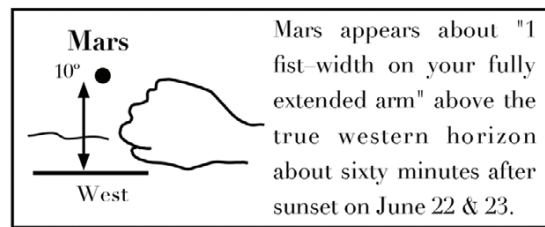
If you can observe only one celestial event this month, consider this one:



Mars tangles with a Hive of Stellar Bees

Look to the west 60 minutes after sunset June 22 & 23.

- The brilliant star-like object low above the horizon is Venus.
- Mars, shining much fainter than Venus, lies to the upper left.
- Aim binoculars at Mars to spot the faint star cluster M44, also known as the Beehive.
- The stellar bees are 610 light-years away, some 16 million times farther than Mars.



Mars appears about "1 fist-width on your fully extended arm" above the true western horizon about sixty minutes after sunset on June 22 & 23.



Newsletter Archives

10 Years Ago - June 2011



Our speaker is Randy Cunningham of AstroSystems. He will demonstrate short f-ratio truss telescope components.

These components require greater accuracy of collimation and optical support with new materials and engineering design changes. The all sky camera failed on Mar 14 but it was not possible to retrieve it until early this month due to snow. Camera, computer, etc. were ok; the video frame capture card failed.

20 Years Ago - June 2001



The featured speaker was Bill Beach representing Edge of Space Sciences which is an organization that works with amateur radio clubs, schools,

and government agency in flying small equipment attached to balloons to high altitudes. He showed videos taken at 132,000 ft. which showed curvature of the earth. He talked about launching, tracking, and recovering these flights. He challenged us to come up with astronomy related high altitude experiments. See www.eoss.org

30 Years Ago - June 1991

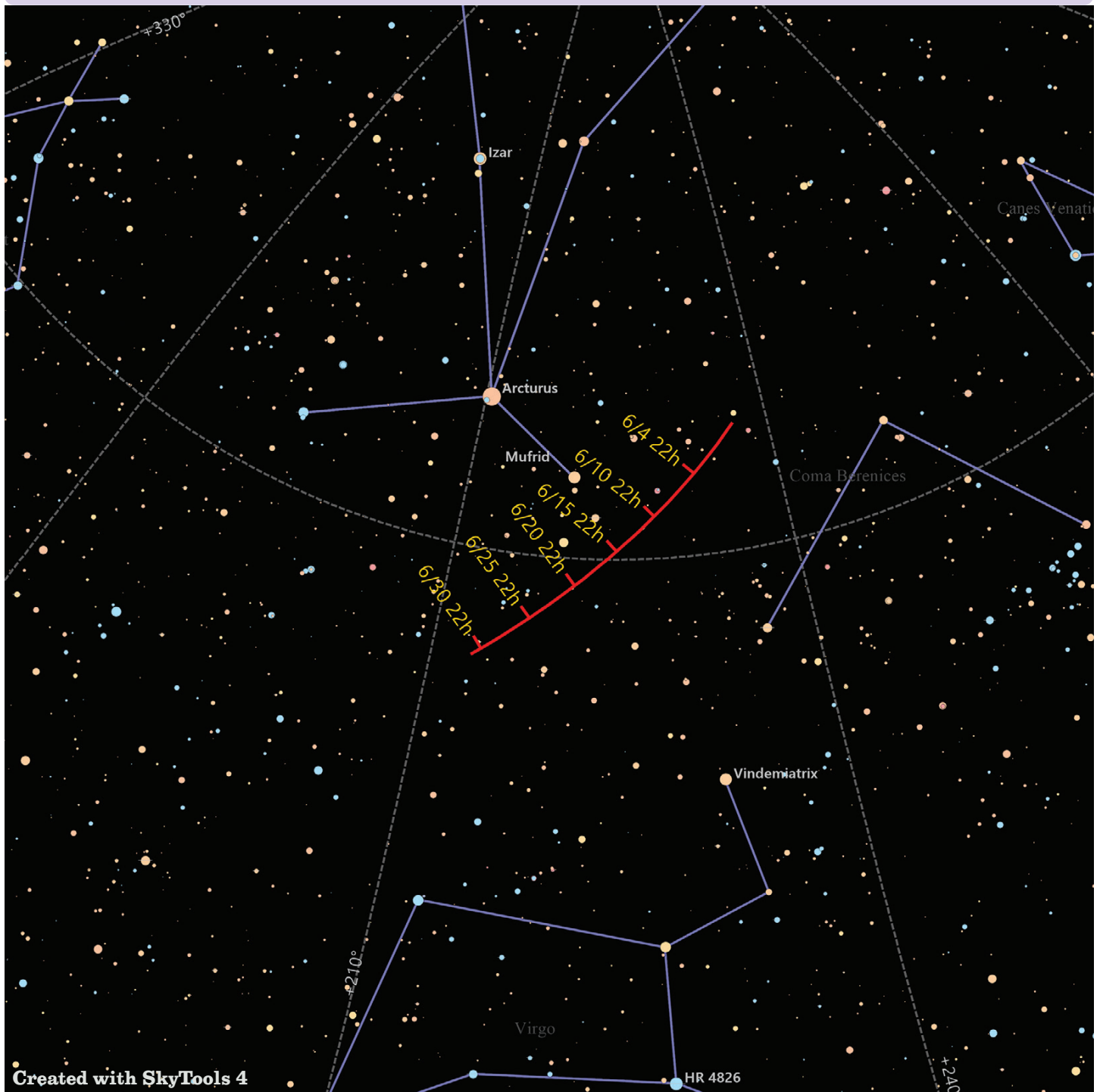


LAS president Randy Cunningham talked about his back-to-back trips to the Texas Star Party and the Riverside

Telescope Makers Convention in Big Bear Lake, California. About 600 people were in attendance at Prude Ranch in the Davis Mountains in Texas. Weather was superb with clear skies from dusk to dawn. Attendance at Riverside conference was down 40% from 2500 the previous year; the talks were superb.

Comets in June

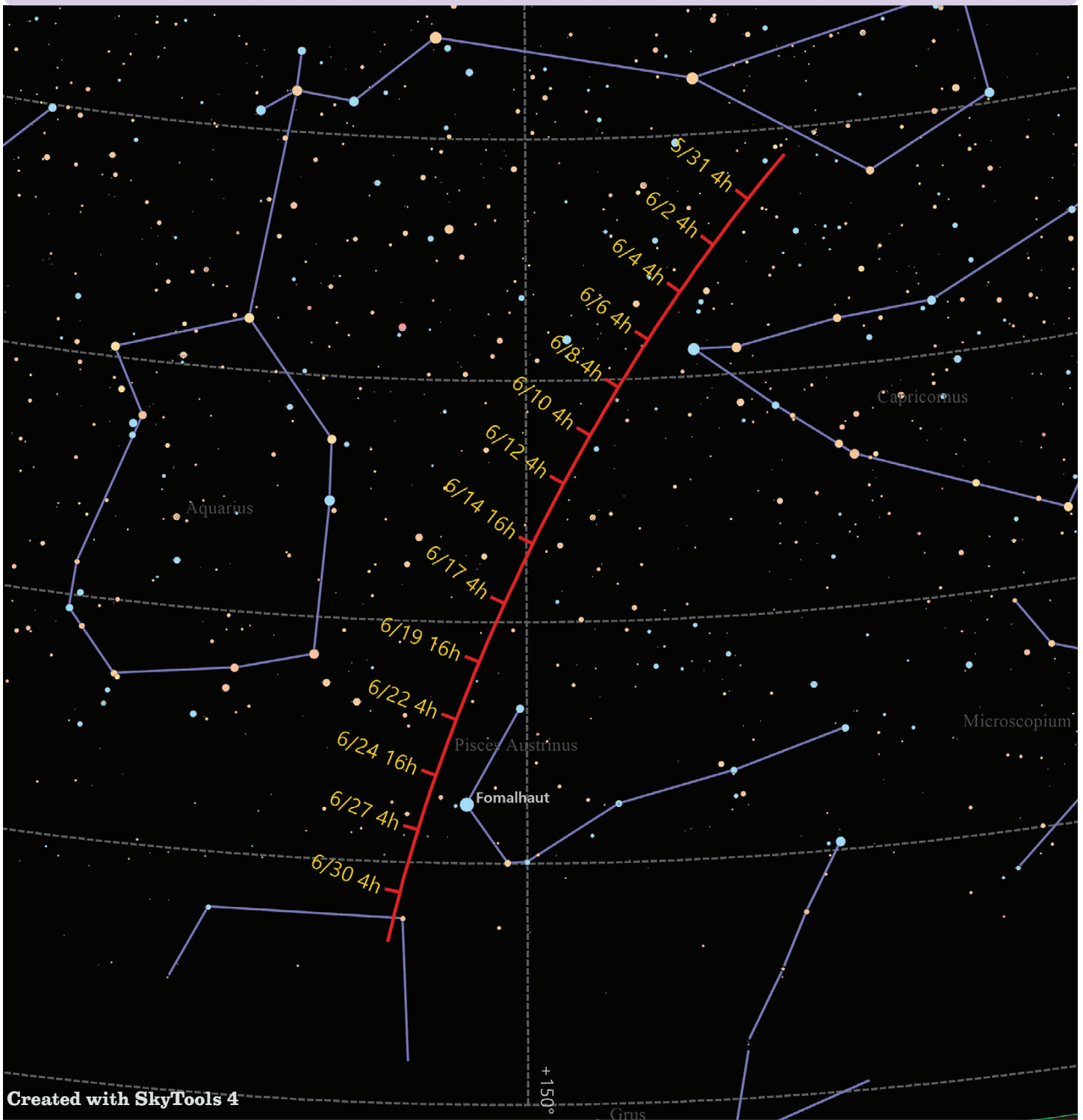
C/2020 T2 (Palomar)



Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
June 1	10:26 pm	13h37m19.8s	+22°34'46"	Bootes	10.5	5.6
June 8	10:27 pm	13h38m48.5s	+19°41'42"	Bootes	10.5	5.5
June 15	10:28 pm	13h41m38.4s	+16°39'06"	Bootes	10.5	5.4
June 22	10:26 pm	13h45m45.7s	+13°30'21"	Bootes	10.6	5.3
June 30	10:24 pm	13h51m56.0s	+09°50'49"	Bootes	10.6	5.1

7P/Pons-Winnecke



Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
June 1	03:51 am	21h39m00.0s	-12°16'08"	Capricornus	11.8	20
June 8	03:50 am	22h06m24.1s	-17°06'06"	Aquarius	11.8	20
June 15	03:51 am	22h32m29.3s	-22°02'04"	Aquarius	11.9	20
June 22	03:56 am	22h56m33.0s	-26°51'42"	Pisces Austinus	12.0	20
June 30	04:01 am	23h20m43.5s	-32°02'44"	Sculptoris	12.2	19

LAS Executive Meeting Thursday May 13, 2021

I. Call to Order

Stephen calls the Zoom meeting to order at 7:00 PM. Officers present: Stephen Garretson (President), M.J. Post (Vice President), Bruce Lamoreaux (Treasurer), Sven Schmidt (Secretary). Board Members Present: Brian Kimball, Gary Garzone, Vern Raben

II. Main Business

Star parties

- Should we resume in-person star parties?
- What COVID procedures to adopt?
- Should we do video-transmission as well
- Restrictions on number of people via required registration on Boulder county website
- Stephen to contact Deborah Price with Boulder County Parks & Open Space to discuss in-person star party and date

In-Person Monthly Meetings

- Resume in July at the earliest
- Brian Kimball to contact IHOP on Ken-Pratt for possible meeting location; also will check internet speed
- Stephen to contact library in Lyons as alternative meeting location

Wild Apricot Price Increase

- Current price is \$40/month
- With a 1-year subscription agreement, we'd get a 10% discount, which saves the club \$48 over a year
- With a 2-year agreement, we'd get a 15% discount instead, \$72 savings per year
- It was agreed to opt for the 2-year license agreement

Astronomical League Donation Request

- AL reached out to LAS to ask for a donation to sponsor door prizes for the AL virtual convention (August 19 - 21)
- This turned into a discussion of whether LAS should stay affiliated with AL or sever ties due to questionable AL practices in the past
- Decision was to remain affiliated for now, but not to donate any money

III. Adjournment

LAS May Business Meeting Thursday May 20, 2021

I. Call to Order

Stephen calls the Zoom meeting 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.

II. New Members and Visitors

No members and no visitors.

III. Astronomical History by Stephen Garretson

Today, 30 years ago, the HST (Hubble Space Telescope) had first light. Target was the area around 8.2m double-star HD96755 in open cluster NGC3532, near Eta Carinae.

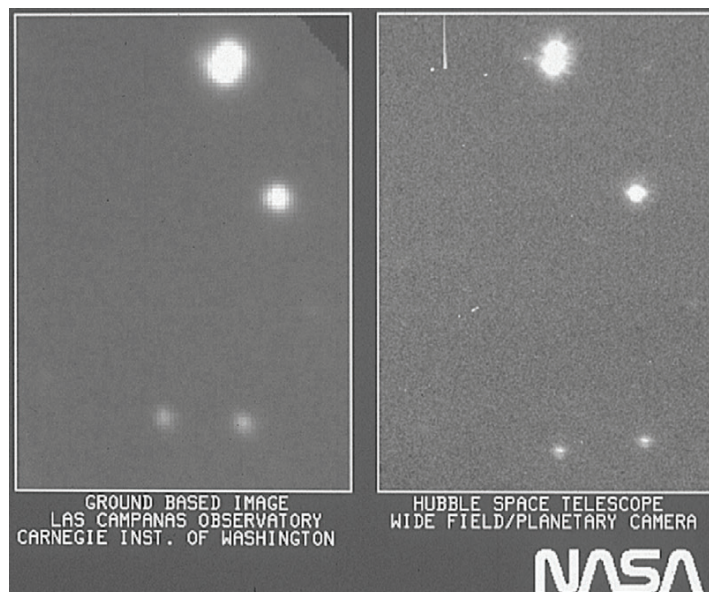


Figure 1: Credits: Left: E. Persson (Las Campanas Observatory, Chile)/Observatories of the Carnegie Institution of Washington; Right: NASA, ESA and STScI
Original STScI release from 1990

IV. Main Presentation

Dr. Frances Bagenal, Juno update at Jupiter: What's happening to the Great Red Spot?



V. Financial Report – Bruce Lamoreaux

Main Checking Account - \$7,600
2-Year Savings Account - \$8,100
Telescope Fund - \$1,100
Petty Cash - \$50.18
Total Assets - \$16,800

VI. Old Business

None

VII. New Business

- Star party July 16th at Rabbit Mountain
- We haven't found a new in-person meeting location yet, Bran Kimball seems to think IHOP on Ken-Pratt might be permanently closed
- Michelle Blom noted that they appear to have changed business hours; she will get in touch and verify
- Some members raised concerns about scheduling problems with IHOP in the past; Michelle to discuss this with the (new?) management
- Michelle also to check out new place, Blue Algave, as a possible meeting location
- Michelle also to check out Aunt Alices's Kitchen
- In-person meetings to resume in July at the earliest

VIII. Adjournment

Meeting adjourned at 8:42pm.
Sven Schmidt, Secretary

LAS Member Images submitted during May 2021



Front Cover:

Messier 13 by Eddie Hunnell posted on May 1. Equipment used was OSC, 11" Edge SCT, CGX mount, CLS filter. These were 39 subs of 90 seconds each at -5C. Bias and Darks used (did not have time to take flats). You can see NGC-6207 in the top right, and about halfway between and a little down, is little IC 4617 - IC4617 is 496m - 540 light years away (see different distances from different sources). That galaxy is moving away from us at 3.6% the speed of light. Always interesting to see the data on these little background galaxies.



Back Cover:

NGC 4236 by M. J. Post; submitted on May 9. He acquired 3 hours of one-shot-color data on NGC 4236 in Draco. It is part of the M81 and M82 group of galaxies that are about 12 million light years from us. In this image north is to the left and east is down. (Cover is rotated for portrait layout, north is up and east is to left). Taken with the gear at DSNM. Field of view is about 0.5 x 0.33 deg.

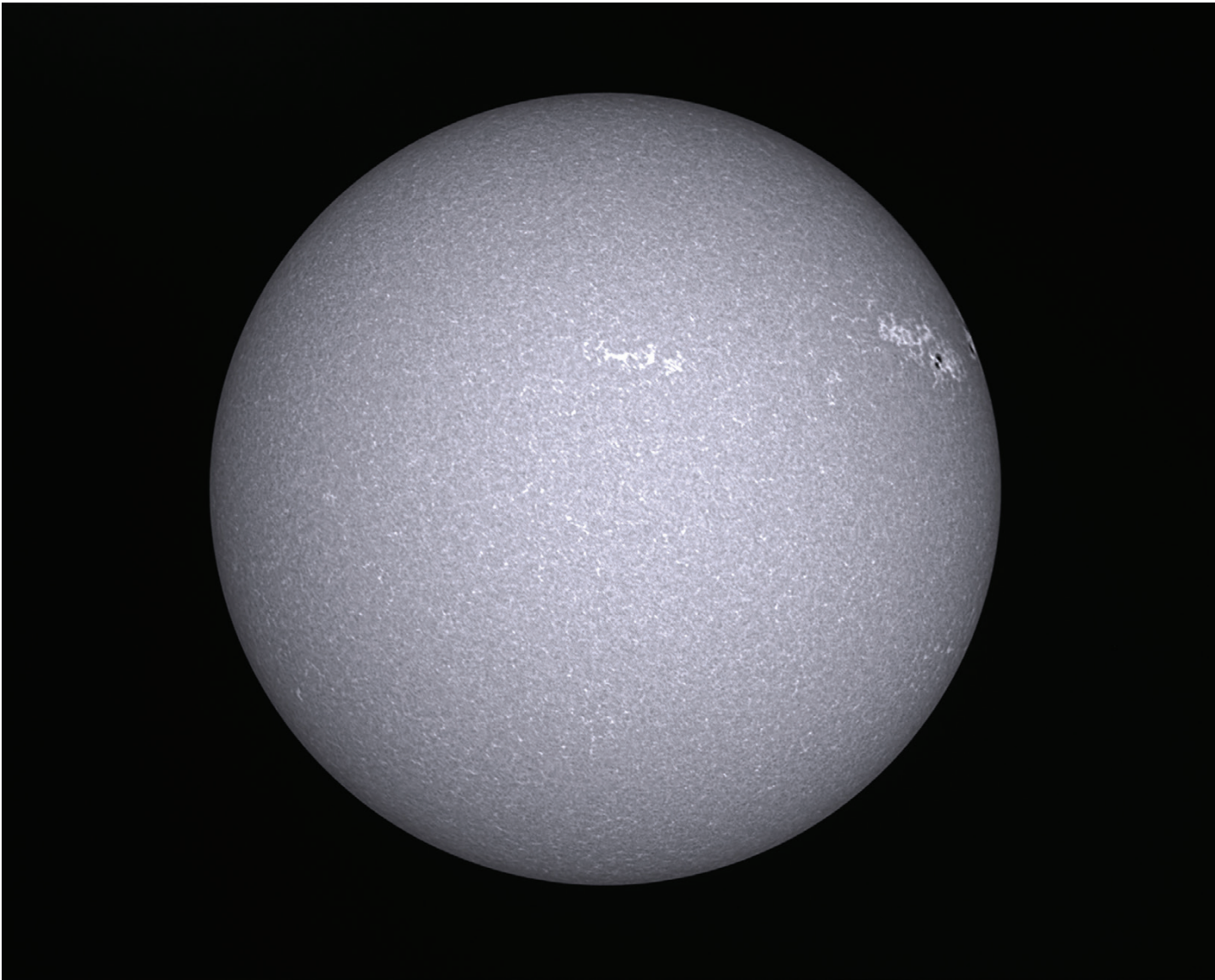


Image of the Sun in calcium K by Brian Kimball, submitted on May 28.



North America Nebula by David Elmore submitted on May 19. Equipment was Borg 55FL astro-graph, 200mm focal length, F/3.6. ZWO ASI2400MC Pro, IDAS NBZ dual band H-alpha and Oxygen III filter. 18 exposures of 10 minutes each. Dark corrected, flat corrected, stacked, defects removed, background removed (not much) in AstroPixelProcessor. Recorded 16 May from Dark Sky New Mexico. Corrected sky quality measurement 21.87.

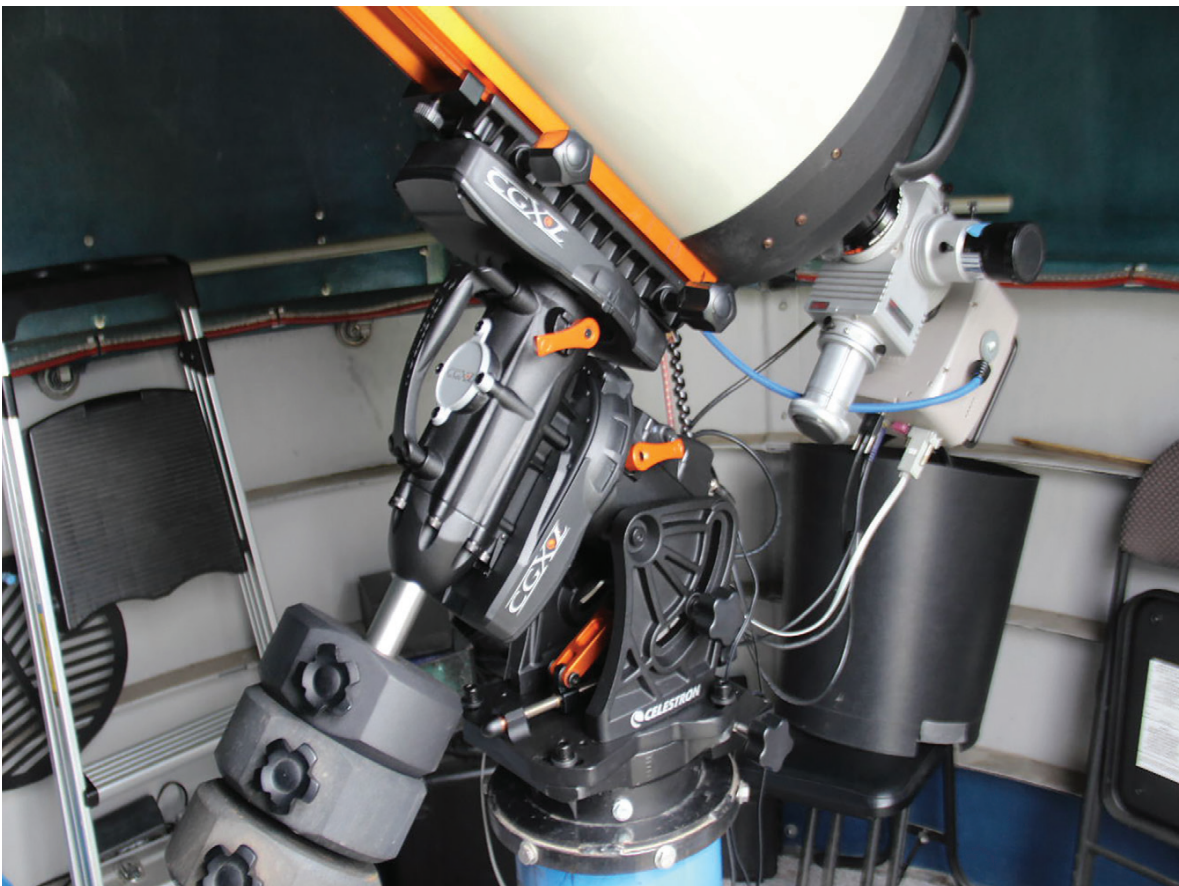


NGC 4517 by M. J. Post; submitted on May 15. A pair of galaxies in Virgo, the lower edge-on being NGC 4517. The upper face-on seems to be a forgotten child. As if it had been forgotten by the NGC folks, it shows up there as NGC 4517A. The edge-on galaxy is 40 million light years away; the face-on 57 million. So they are not gravitationally related. The field of view is about 36 x 24 arc min. Two hours integration on a OSC camera at DSNM.



M 104

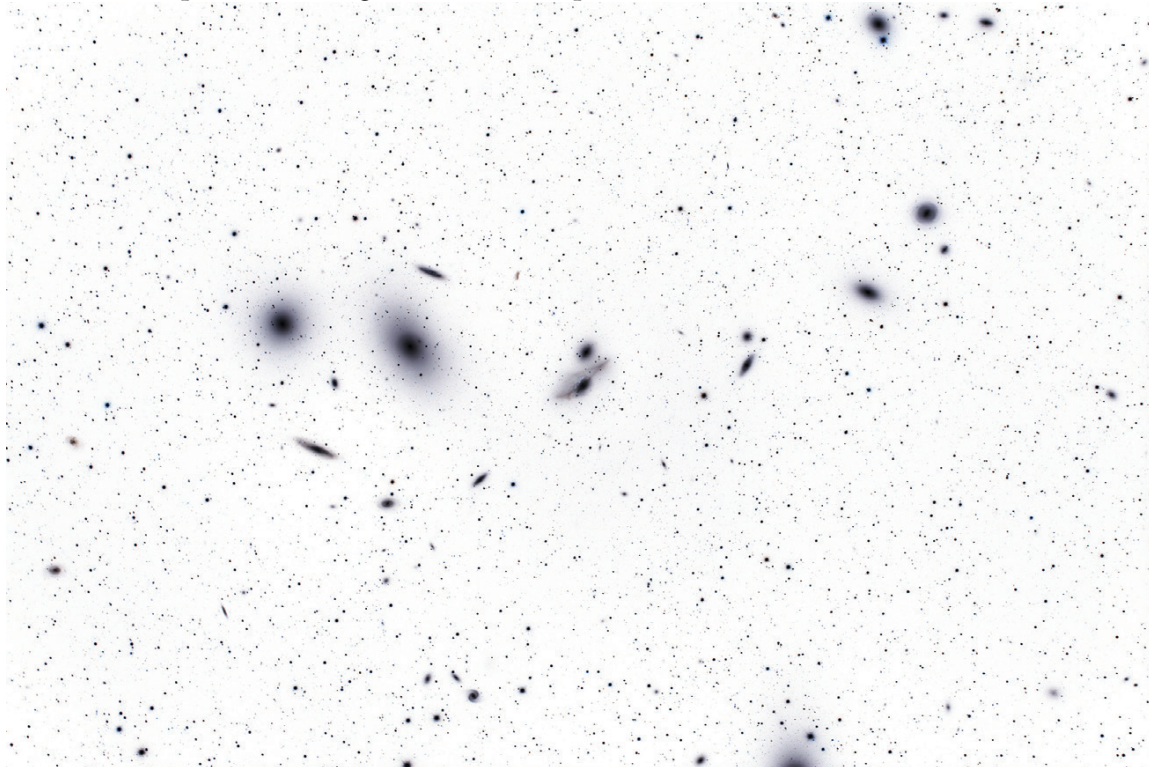
M104 by Gary Garzone, submitted on May 30. C 14 scope, F 7.7 STL 11000 CCD camera, ccd stack2, photo shop.



Gary finally got delivery of his new mount, a Celestron CGX-L. Base fit exactly on old pier round mount that he had custom made, super strong steel, inch thick drilled and tapped. So far he has performed rough polar alignment and he'll spend a few nights of fine tuning.



Makarian chain from Arches National Park, UT by Jim Pollock; submitted on May 12. Here's the Markarian chain with no cropping from his 11" EdgeHD with HyperStar at f/2 on the ZWO 2600mc one-shot-color. No filters since the sky was so clear and dark! The inverted image (below) perhaps gives a better feel for the number of galaxies in the image. Equipment used was a 11" EdgeHD at f/2 with Hyperstar; ZWO 2600mc one-shot-color camera ; No filters; 60 frames, 120sec each = 2 hours of exposure; Pixinsight and Photoshop





M109 by Martin Butley, submitted on May 4. These were taken with a Takahashi FSQ 130 from his backyard just outside of Longmont.

Astrophotography Profile and Bio

Marty Butley
Longmont CO

Amateur Astronomer
Since 1956

Astrophotographer
since 2017



Equipment Shed and Pier



C11 Edge



North American Nebula
Taken with the Takahashi FSQ 130



Takahashi FSQ 130

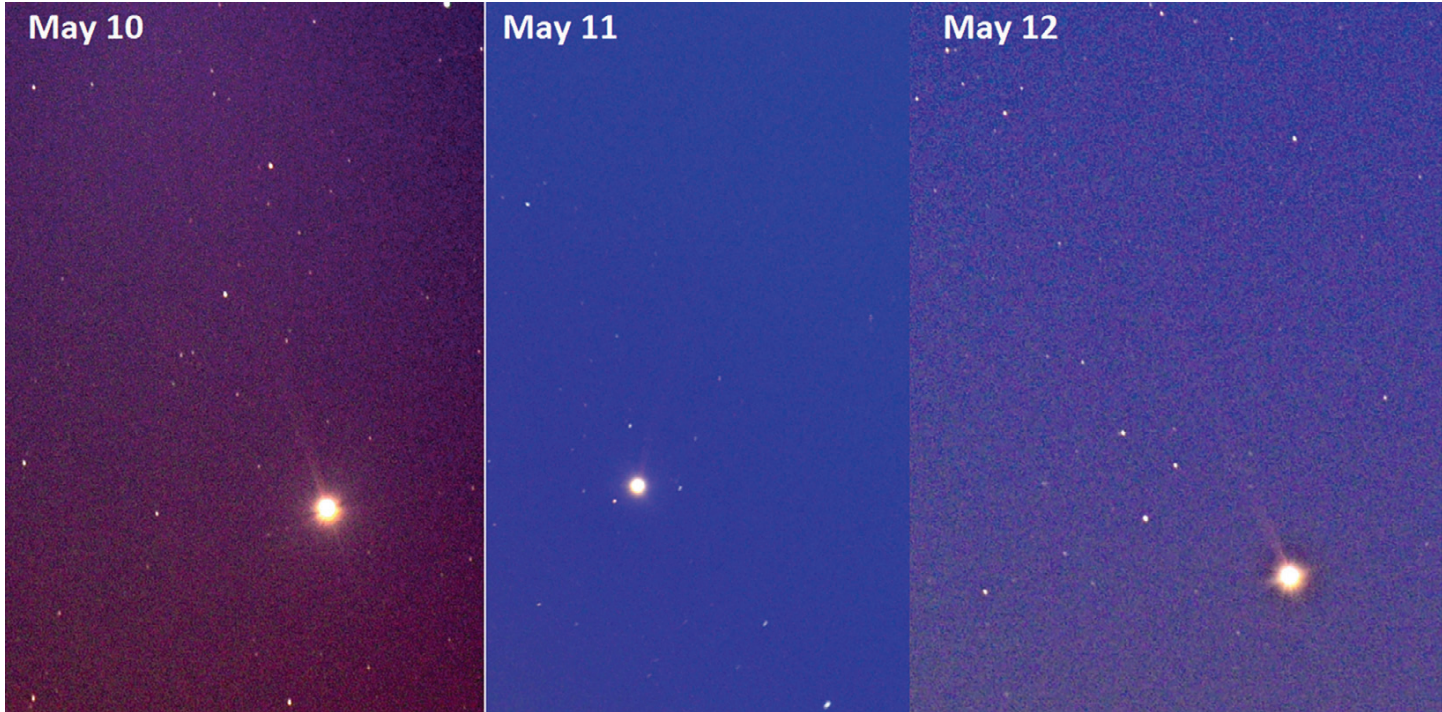


NGC 4395 by M. J Post; submitted on May 16. This galaxy in Canes Venatici is a bit peculiar. It is relatively close (14 million light years) but faint and large (15 arc minutes). It's supermassive black hole is small (an oxymoron?) - one sixth the mass of the Milky Way's. Seyfert galaxies account for about 10% of all those out there. Like quasars, they display strong UV spectra thought to arise from matter in the accretion disc that is being swallowed by black holes in the galactic core.

Field of view here is about 45 x 30 arc minutes. Images were acquired at DSNM, 2 hours in duration on a OSC camera.



Mercury's sodium tail by Paul Robinson; submitted on May 15. Lately on Spaceweather.com, there have been photos by people of the sodium tail of Mercury, requiring a sodium filter to photograph. Apparently such a filter is NOT needed, as I have succeeded in photographing the tail without one. On 3 nights (in Flagstaff, AZ) I used a Nikon D750 with 300mm f/4.5 lens, ISO 3200 to take 30-sec exposures near the end of twilight. I could see the tail on the camera screen after the shots in some cases. I noted that there were sometimes lens spikes emanating from Mercury on the first night, so on the 2nd and 3rd I varied the orientation of the camera and placed it in different locations to see if the tail changed, and it did not seem to.



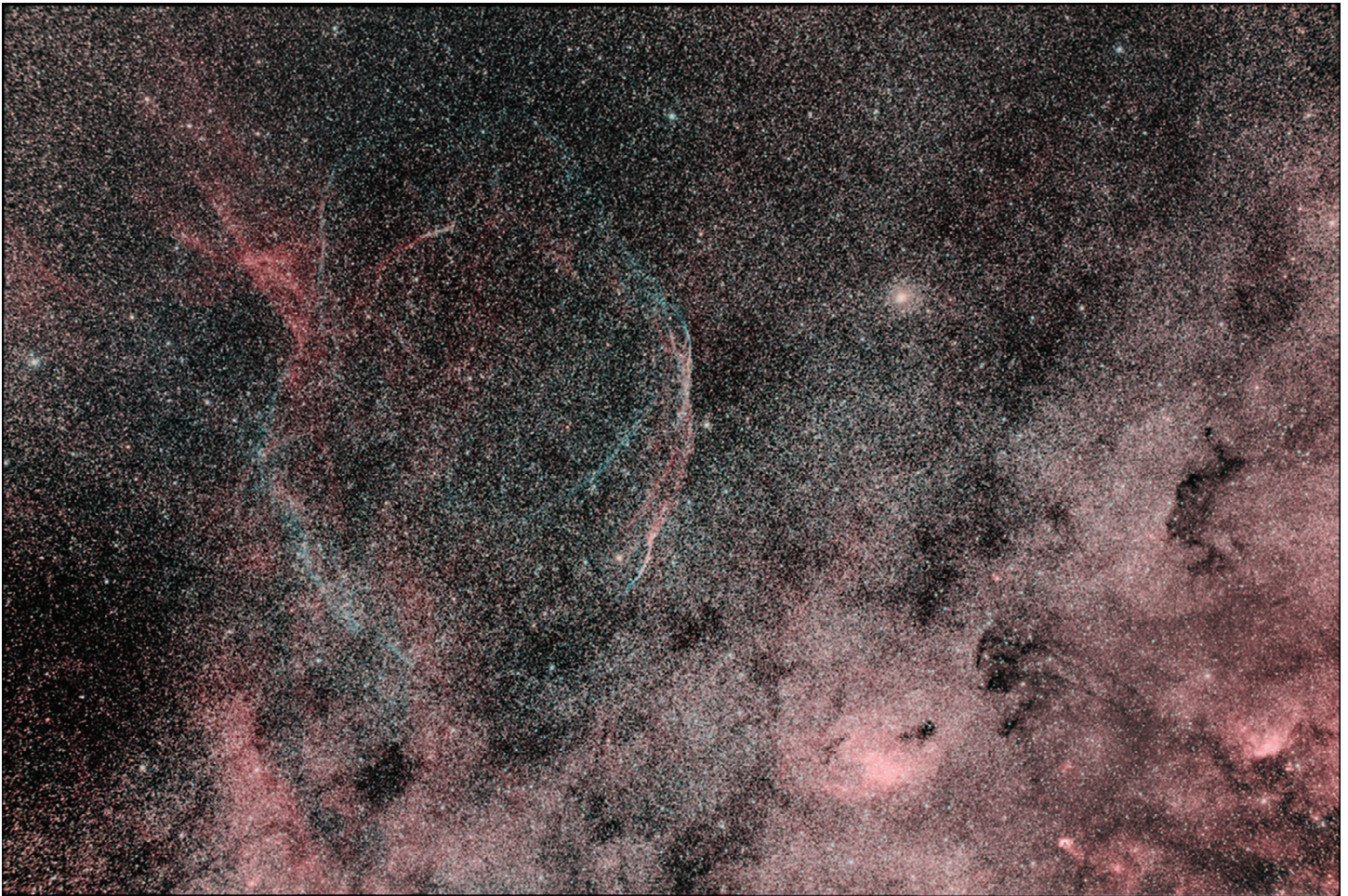


Crescent to Butterfly in HOO by Stephen Garretson; submitted on May 26. This FOV spans from NGC 6888 to that part of IC 1318 that is sometimes referred to as the Butterfly, not to be confused with the planetary nebula called the Butterfly.

[24] 300s guided Ha subs
[24] 300s guided OIII subs
4 hours total

William Optics RedCat f/4.9 Petzval Astrograph
ASI 2600MM cooled
Chroma 3nm Ha filter, Baader 3.5nm Ha filter, Chroma 3nm OIII filter

William Optics UniGuide scope
ASI 290M Mini guide camera
Paramount MX+
from the Beevo Dome



Sharpless 2-91 by David Elmore; submitted on May 10.

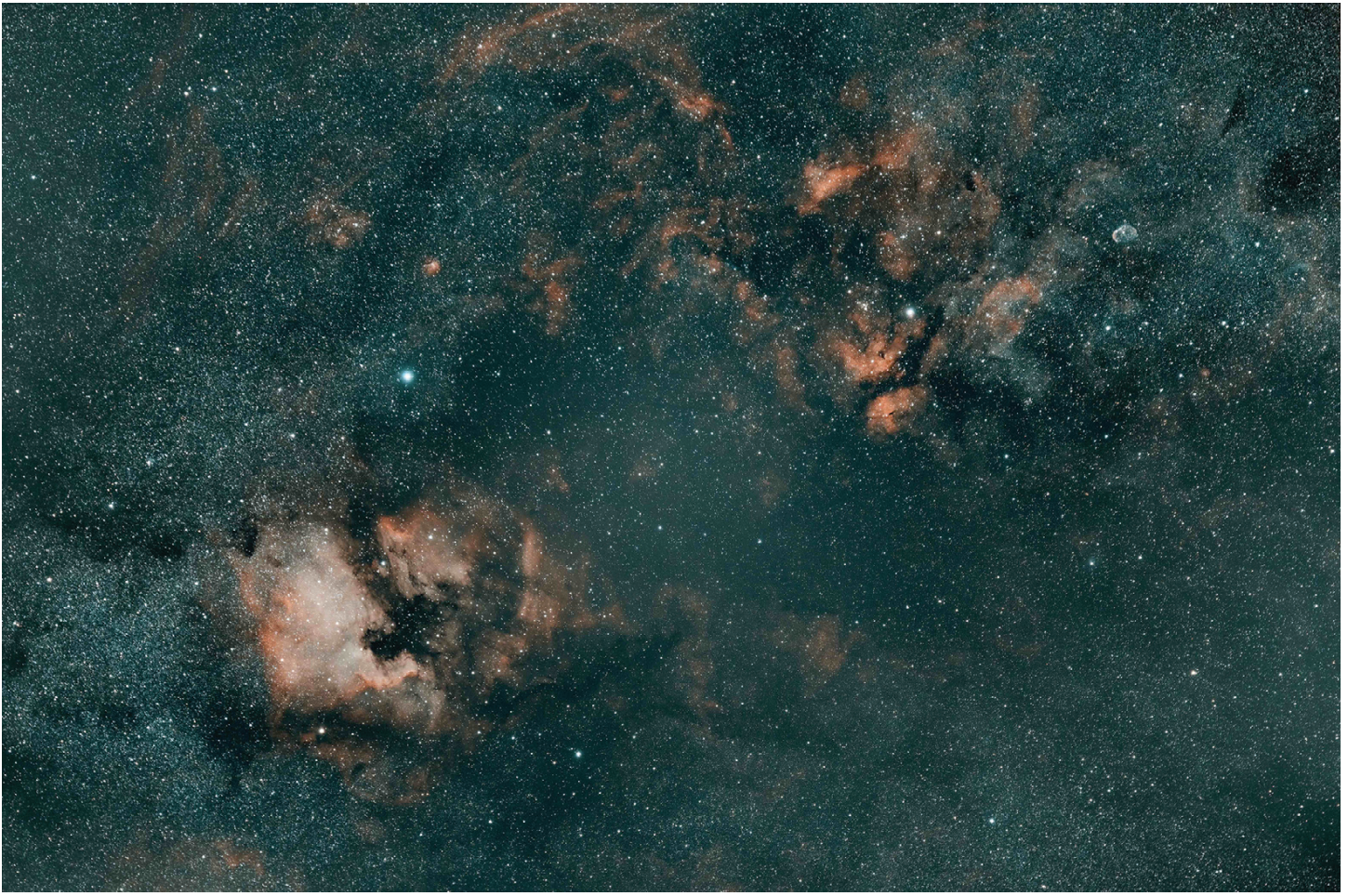
Besides the Veil Nebula, there is another supernova remnant in the constellation Cygnus near the star Albirio, Sharpless2-091. Estimates of its age vary but it is likely the result of a star that exploded approximately 30,000 years ago. Sh2-91 may refer only to the brightest portion on the south side (to the right in this photo).

This image was taken the night of 8/9 May from Dark Sky New Mexico using a Borg 55FL 200mm focal length, F/3.6, astro-graph, ZWO ASI 2400MC Pro camera and IDAS NBZ dual-band filter. Twenty-six ten-minute exposures were calibrated in AstroPixelProcessor, the red Hydrogen-alpha (H), and blue-green Oxygen (O) channels processed separately then recombined with Red-Green-Blue as HOO.

In the original image, the nebula is nearly completely lost against stars of the Milky Way. I ran the image through Star-net++ to remove the stars, then recombined 1/3 of the rich field of Milky Way stars to the starless version in order to bring out the nebula in the recombined image.



M51 by Eddie Hunnell submitted on May 3. He took only 5 subs of 5 min of M51 from Longmont using Celestron 11" Edge and CLS filter.



NGC 7000 to IC 318 by Stephen Garretson; submitted May 6. Sigma 85mm Art lens, f/1.4 run at f/3.2

Camera: ASI 2600MM

Filters: Baader 3.5nm Ha filter, Baader 8.5 OIII filter; William Optics 50x200 guide scope and ASI 290M Mini guide camera

Mount: Paramount MX+ from the Beevo Dome

[12] 300s Ha guided subs

[12] 300s OIII guided subs

TheSkyX, SGP, PHD2

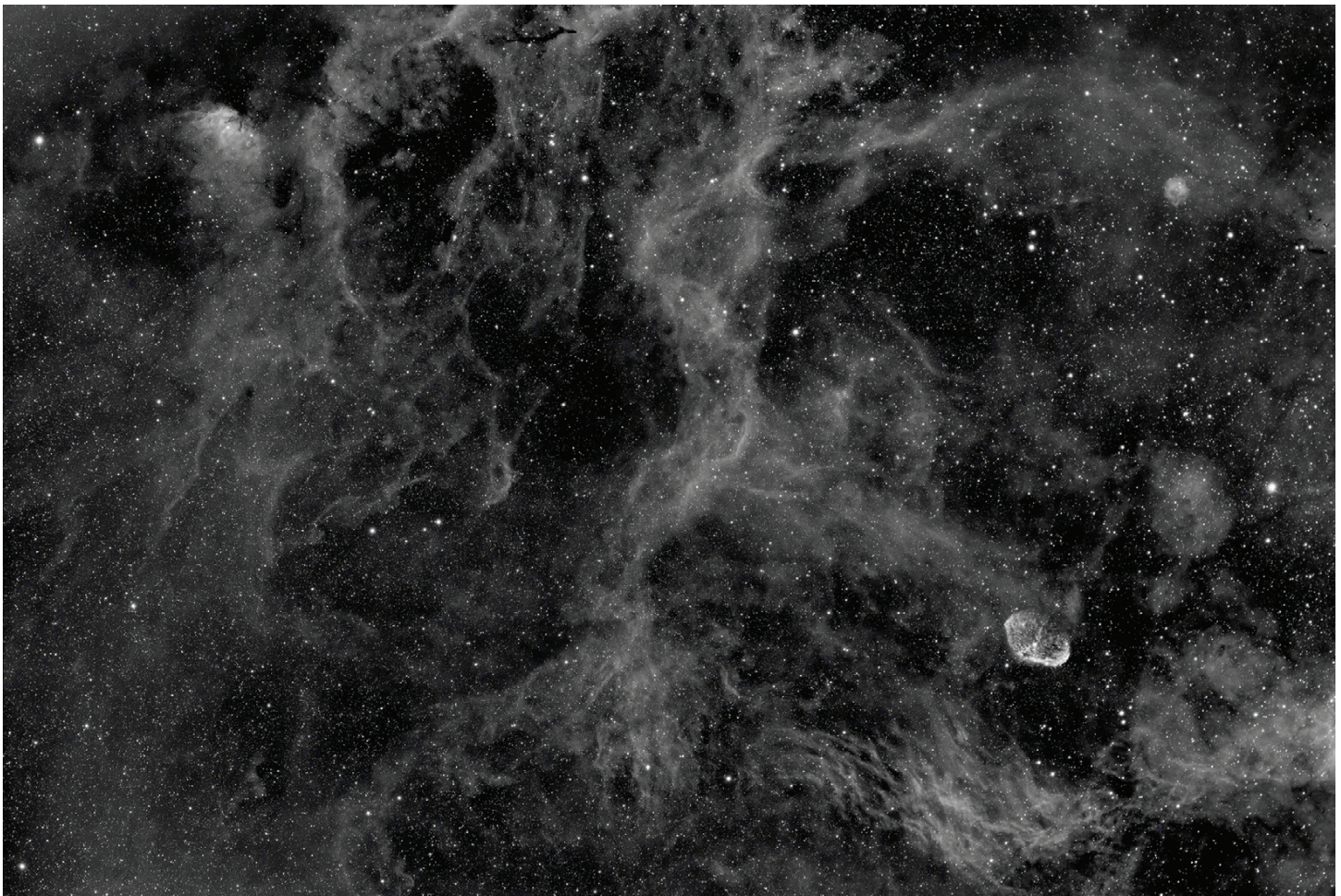
PixInsight, Topaz DeNoise AI, Mac OS Photo, Preview



“The Leo Triplet + One” by Jim Pollock; submitted on May 13. The Leo Triplet (M65, M66, NGC3628) otherwise known as the Hamburger (3628) and Fries (65/66). :-). Images taken at Arches National Park on May 11, 2021 with 11” EdgeHD w/Hyperstar at $f/2$; ZWO 2600mc one-shot-color; No filters; 46 frames at 120sec: 92 minutes.



NGC 4725 by Marty Butley on May 4. Images taken with a Takahashi FSQ 130 from his backyard just outside of Longmont.



Crescent to Tulip by Stephen Garrizon; submitted on May 25. Here is a 2 hour integration using my RedCat and ASI 2600MM with a Chroma 3nm Ha filter. Shot last night with a 98% Moon, fortunately on the other side of the sky.

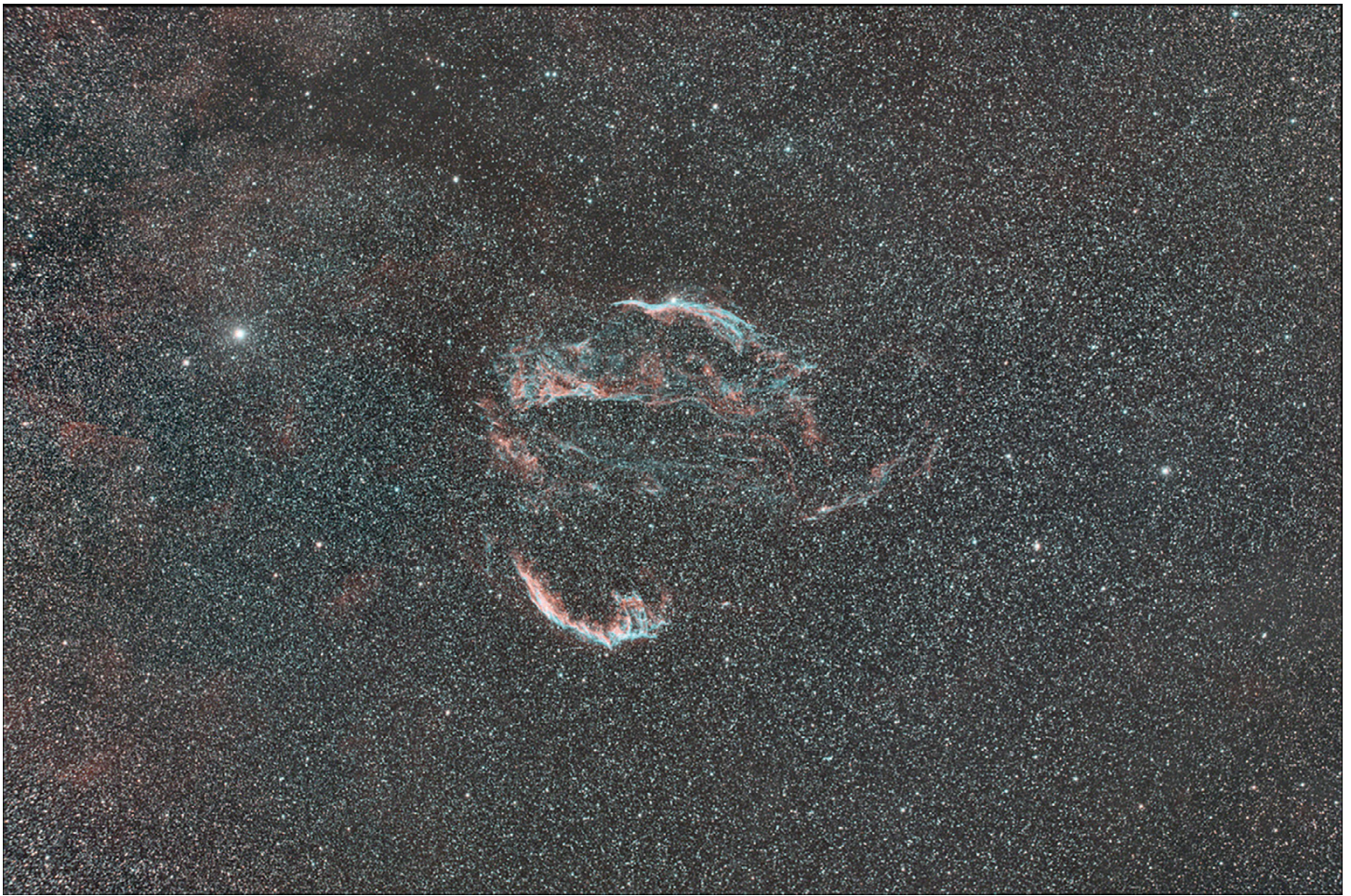
[25] 300s guided subs
2 hours, 5 minutes total integration

William Optics RedCat Petzval Astrograph
ASI 2600MM cooled
Chroma 3nm Ha filter

William Uniguide scope
ASI 290 M Mini guide camera

Paramount MX+

SkyX, SGP, PHD2
PixInsight, Topaz DeNoise AI, Mac OS Photos, Preview



“Sharpless 2-103” by David Elmore; submitted on May 13. The Veil Nebula rises before dawn and will rise earlier and earlier as we go through the summer. This super nova remnant in Cygnus has spatial glory at a range of scales, this one giving context of the entire nebula that spans about 3° in the sky. An on-line search revealed an estimate of 10,000 to 20,000 years since this star exploded.

Borg 55FL astro-graph, 200mm focal length, F/3.6. ZWO ASI2400MC Pro, IDAS NBZ dual band H-alpha and Oxygen III filter. 11 exposures of 10 minutes each.

Dark corrected, flat corrected, stacked, defects removed, background removed (not much) in AstroPixelProcessor. Recorded 13 May from Dark Sky New Mexico. Corrected sky quality measurement of 21.8 to 21.9.



“Comet C/2020 R4 (ATLAS)” by Jim Pollock; posted May 13. While at Arches National Park, he setup his scope with the Hyperstar for a wide field, very fast $f/2$ imaging. He took single frame images with no corrections for Neo-live views for 3 or 4 families that were camping near them.

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