

LONGMONT ASTRONOMICAL SOCIETY

JULY 2021

“BUTTERFLY GALAXIES”
BY M. J. POST

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LAS Meeting July 15 at 7 pm Open Forum

Our July meeting will be in-person and also available on Zoom.

In-person will be at the Niwot Inn, which is where we had the last in-person meeting before the pandemic pushed us to Zoom. The Inn is located on 2nd Avenue, third building on the right [north] side after you turn diagonally off of Niwot Road. We'll meet in the main room in front, called the great room.

Vern will send out a Zoom invitation to the membership should you select that option.

Regarding COVID precautions, we will follow what is generally practiced in stores and many businesses. If you are fully vaccinated you need not wear a mask. If you are not fully vaccinated we request that you wear a mask and practice social distancing as much as possible.

Instead of an outside speaker this meeting will host an open forum. Members are invited to share a short astronomy-related talk about something they have been doing, an idea they have, some new equipment they acquired, whatever. Please plan to keep your presentation about 5-10 minutes long. If you are interested in presenting, let me know at least a week in advance so I can plan accordingly.

Stephn Garretson

We're excited to be back in-person, and to be able to offer a Zoom option as well.

...thanks, Stephen

Astronomy: Moon Magic and Sky Viewing

Friday, July 16, 8:15-10:15 p.m.

Location provided to registered participants

Enjoy the moonlight in the dark sky of an open space, and learn some fun facts about the moon at a brief program at the shelter. Sky viewing with telescopes provided by the Longmont Astronomical Society follows the program. 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 <http://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. June 17 meeting by Sven Schmidt

I. Call to Order

Stephen calls the Zoom meeting to order at 7:00 PM. Officers attending are Stephen Garretson (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 new members and no visitors.

III. Astronomical History - Stephen Garretson

The Earth-Sun distance was unknown in the 18th century. Edmund Halley suggested using the June 6th 1761 Venus transit to measure the distance. However, the black drop effect made measuring the entry and exit difficult. The next Venus transit in 1769 resulted in a value within 4% of an AU. Venus transits in 1874 and 1887 helped improve the value within 1% of today's accepted value.

IV. Main Presentation

Dr. Dayton Jones, "Radio Astronomy Past and Future"

Radio Astronomy: Past and Future

1. Demise of the Arecibo Radio Telescope
2. Development of the next generation instruments, SKA and ngVLA

Dayton Jones
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 1984-2015
Space Science Institute, Boulder, CO, 2015-2021

V. Financial Report by Bruce Lamoreaux

Main Checking Account - \$6,800
2-Year Savings Account - \$8,100
Telescope Fund - \$1,100
Petty Cash - \$50.18
Total Assets - \$16,000

VI. Old Business

None.

VII. New Business

- Star party July 16th at Rabbit Mountain
- July 15th meeting is a hybrid, in-person at the Niwot Inn and via Zoom
- August 2021 meeting at Lyon's Library
- Florissant Fossil Beds designated an International Dark Sky Park
- Bill Tschumy mentioned that 35 acres of land are for sale near Pawnee Grasslands. Could be a club dark site location. Turns out that several nearby plots will be developed for residential purposes and thus make this unsuitable for the club.

VIII. Adjournment

Meeting adjourned at 9:04pm.



Arecibo before collapse



Arecibo after collapse

Newsletter Archives

10 Years Ago - July 2011



Asteroid Vesta from the Dawn probe, 28,000 miles
Longmont Astronomy Society Newsletter
July 2011

This month's meeting is on July 21, 2011 at the IHop Restaurant, 2040 Ken Pratt Blvd., Longmont, CO. The general meeting

will begin at 7 pm.

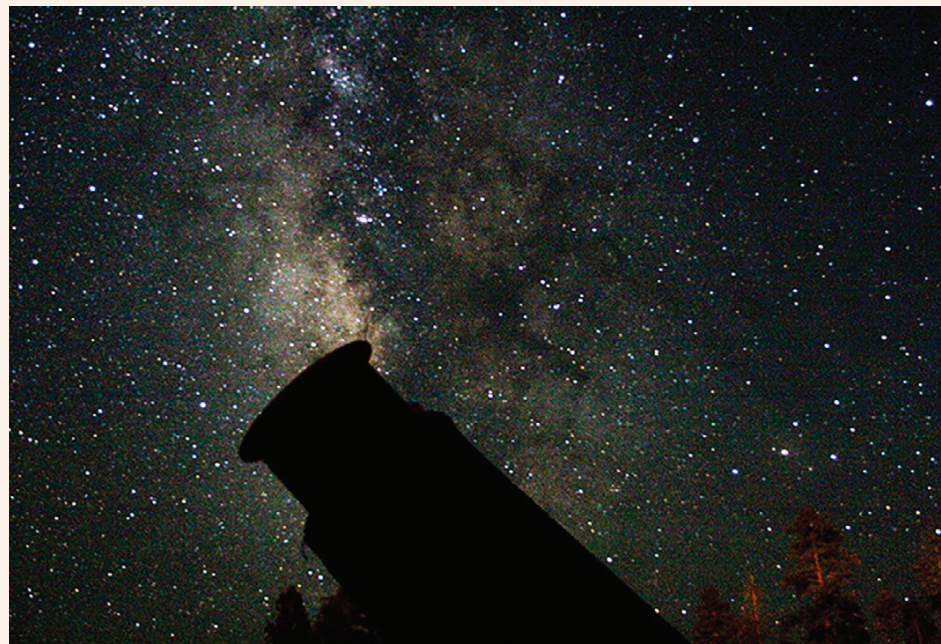
Vern Raben will talk about some of the technologies and equipment available to amateur astronomers such as new digital cameras, intervalometers, low light video cameras, and micro-controllers.

We had some nice weather and clear skies at Astronomical League convention ALCON 2011 in Bryce Canyon about 3 weeks ago. There

were huge crowds at the nightly star parties near the national park headquarters. Nearly 400 amateur astronomers from across the nation attended the event – 10 were from LAS.

Several of us were out at Fairyland Overlook Thursday night and talked for a while with Carolyn Shoemaker. Carolyn was the keynote speaker at the awards banquet Saturday evening.

Friday was the best night during the conference for observing. The view of Saturn through the Salt Lake club's Brandt/Clark refractor (7.9 inch, F16.8) was excellent – seeing was nearly perfect. Later that evening the disk was still totally steady through Gary's 16 inch dob even though it was low to the horizon.



Gary's 16 inch dob silhouetted against the Milky Way at ALCON 2011 in Bryce Canyon, UT. Credit: Gary Garzone

20 Years Ago - July 2001

No newsletter was published for July 2001.

30 Years Ago - July 1991



Thanks to the efforts of Jennifer Getson we are back at Dawson Park for public observing with no sprinklers

or lights.

Dave Street announced that David Levy had discovered another comet (12?). It will pass 1.3 AU from earth and should reach magnitude 7.5. It will pass near M74.

Jim Getson gave a nice physical demonstration of quick, easy, and accurate polar alignment.

Bob Ross and Tom Johnston shared some great slides of their trip to Luna Lake, AZ. Their 6 day trip was filled with "blue skies by day and black skies by night".

Tom Nichel of NOAA gave an informative discussion on solar forecasting. Using the light from H-alpha, Helium, and Iron they compile a solar weather map used by high altitude airliners, ham radio operators and NASA. They can predict flares by monitoring sunspots and their behavior. These flares are directly related to aurora we see occasionally.

The Planets in July by Vern Raben

Mercury

Mercury is a difficult object to view very low in the ENE with binoculars around 4:30 am from about the 11th through the 16th this month. It is -0.4 magnitude in brightness and the disk is about 6.3 arc sec across.

Venus

Venus is visible just above the horizon in the WNW around 8:45 pm. It is magnitude -3.9 magnitude in brightness and its disk is 11 arc sec across.

Mars

Mars is just below Venus in the WNW; it is a challenging object even with binoculars. It disappears into the bright twilight after the 15th.

Jupiter

Jupiter will be at opposition next month on August 19th. It increases in apparent size from 45 to 47 arc sec across this month; its brightness increases from -2.7 to -2.8 magnitude. Good times to view the Great Red Spot crossing the center of the planet this month are:

July 3 at 5:37 am at 37° altitude
July 4 at 1:28 am at 25° altitude
July 6 at 3:07 am at 37° altitude
July 8 at 4:45 am at 39° altitude
July 9 at 12:36 am at 20° altitude

July 11 at 2:14 am at 34° altitude
July 13 at 3:52 am at 39° altitude
July 15 at 5:30 am at 34° altitude
July 16 at 1:22 am at 31° altitude
July 18 at 3:00 am at 39° altitude
July 20 at 4:38 am at 36° altitude
July 21 at 12:29 am at 26° altitude
July 23 at 2:07 am at 37° altitude
July 25 at 3:47 am at 38° altitude
July 25 at 11:36 pm at 22° altitude
July 27 at 5:23 am at 28° altitude
July 28 at 1:14 am at 35° altitude
July 30 at 2:53 am at 39° altitude

Saturn

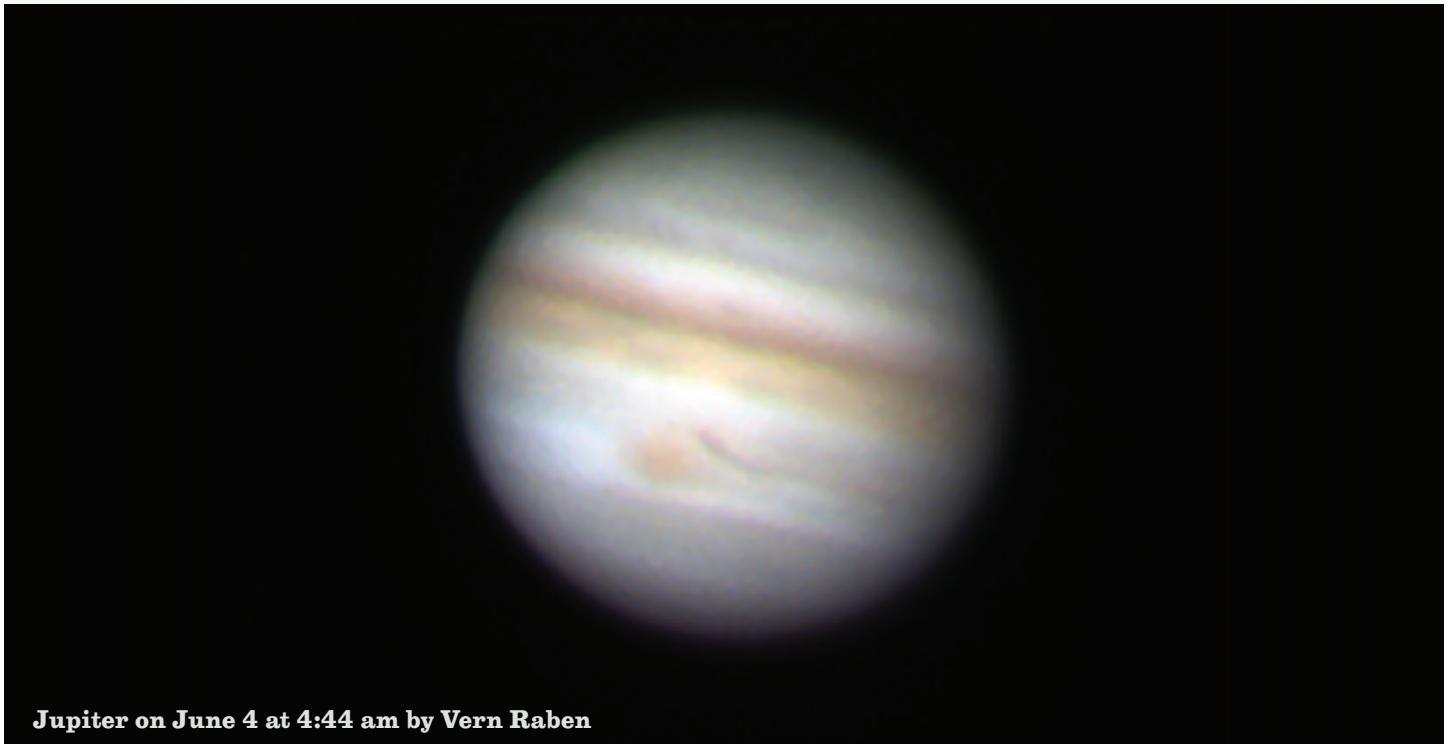
Saturn is in the constellation Capricornus. This month its brightness increases in magnitude from 0.4 to 0.2 and the size of its disk increases from 18 to 19 arc sec across.

Uranus

Uranus is in the constellation Aries. It is magnitude 5.8 in brightness and the disk is 3.5 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.



Jupiter on June 4 at 4:44 am by Vern Raben

Lunar Phases and Star Party Targets for July



Third Quarter
July 1 at 3:12 pm



New Moon
July 9 at 7:18 pm



First Quarter
July 17 at 04:12 am



Full Moon
July 23 at 8:38 pm



Third Quarter
July 31 at 7:17 am

On Fri. July 18 sunset is at 8:26 pm; it will be fairly dark by 9:15 pm.

Moon is at Lunation 9

List of prominent lunar craters near the terminator:

- Plato 101km (63 mi) wide crater in NE of Mare Imbrium
- Copernicus near center in Oceanus Procellarum is 93 km (58 mi) across
- Reinhold is SSW of Copernicus is 48 km across (30 mi)
- Builius is in western part of Mare Nubium; it is 61km (38 mi) across
- Longomontanus is located in the southern lunar highlands; it is 145 km (90 mi) across
- Clavius is located on the southern limb of the moon; it is 231 km (144 mi) across

Globular Clusters

- M 92 globular cluster in Hercules magnitude 6.3
- M13 globular cluster in Hercules mag 5.8
- M53 globular cluster in Coma Berenices, magnitude 8.3
- M5 globular cluster in Serpens, magnitude 5.9
- M12 globular cluster in Ophiuchus, magnitude 7.7
- M56 globular cluster in Lyra, magnitude 8.3

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
- M63 "Sunflower Galaxy" in Canes Venatici mag 9.3

Planetary Nebula

- M97 in Ursa Major mag 9.8
- M57 "Ring Nebula" in Lyra mag 9.8
- M17 "Swan Nebula" mag 6
- M8 "Lagoon Nebula" mag 6
- M20 "Trifid Nebula" mag 6.3

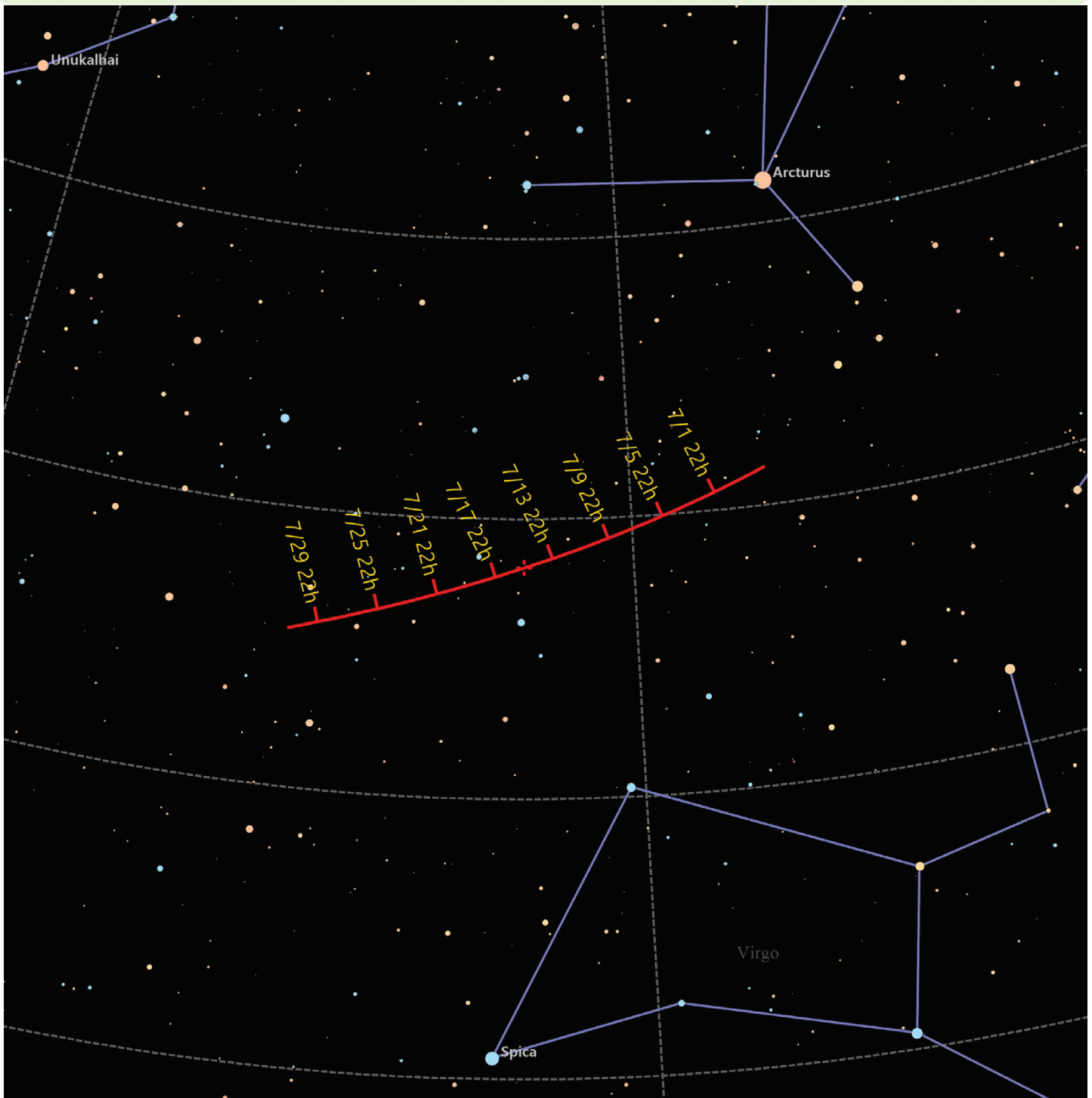
Open Clusters

- M7 "Ptolemy's Cluster" 80 stars apparent mag 3.3
- M6 "Butterfly Cluster" 120 stars, apparent mag 4.2

Comets

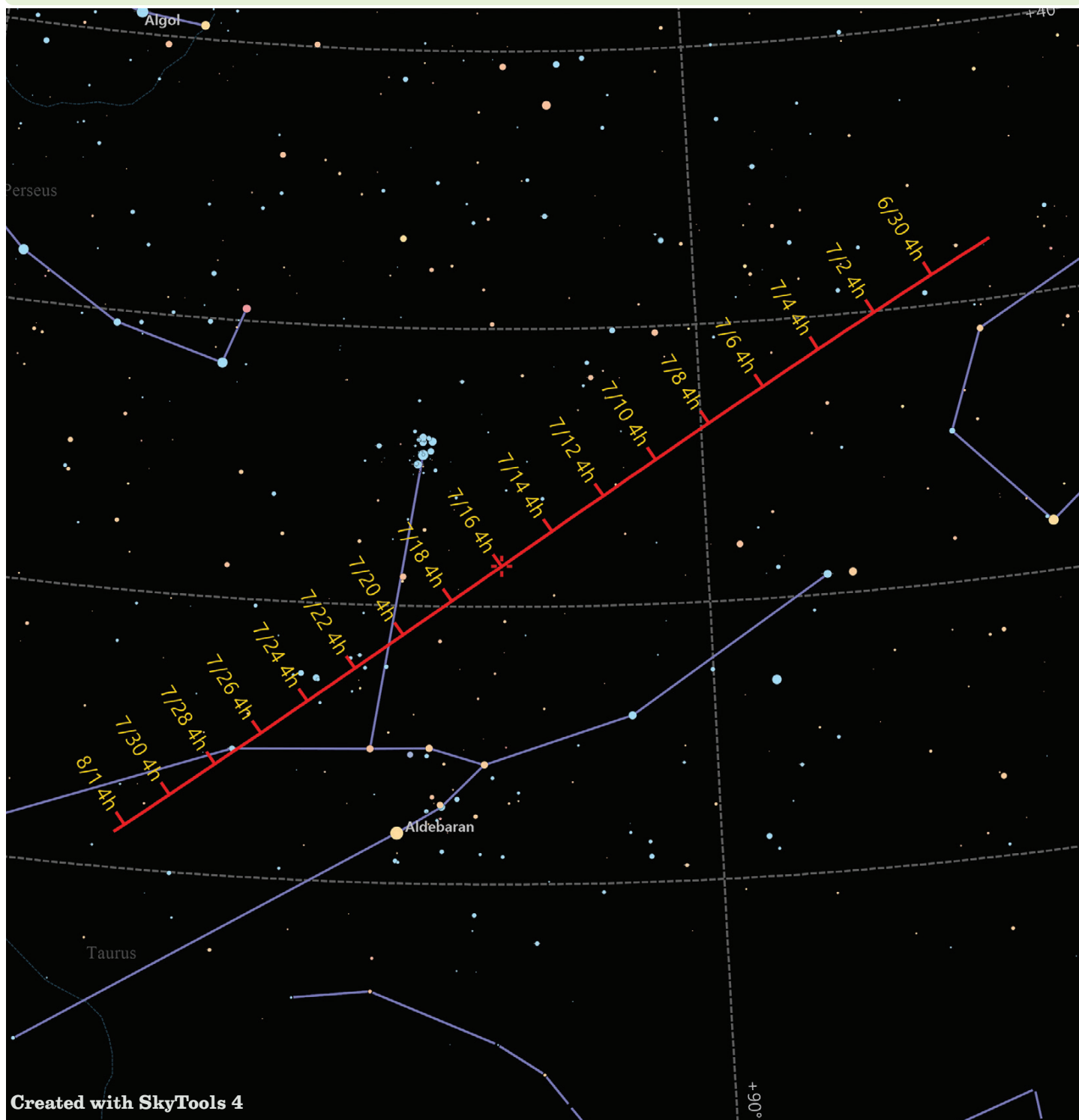
C/2020 T2 (Palomar) mag 10.8 in constellation Virgo

Comet C/2020 T2 (Palomar) in July 2021



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
July 1	10:23 pm	13h52m48.4s	+09°23'16"	Bootes	10.6	5.1
July 7	10:19 pm	13h58m30.4s	+06°38'16"	Virgo	10.7	5.0
July 13	10:13 pm	14h04m57.0s	+03°54'34"	Virgo	10.8	4.8
July 19	10:07 pm	14h12m04.9s	+01°13'25"	Virgo	10.8	4.7
July 25	09:58 pm	14h19m50.7s	-01°24'09"	Virgo	10.9	4.5
July 31	09:49 pm	14h28m11.4s	-03°57'19"	Virgo	11.0	4.4

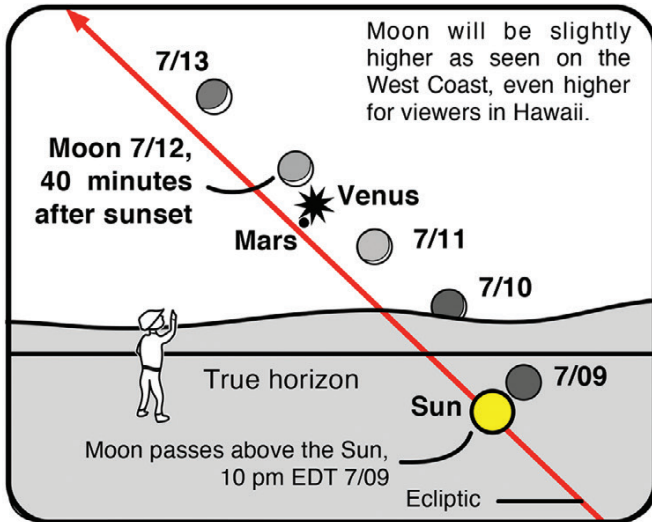
Comet 15P/Finlay in July 2021



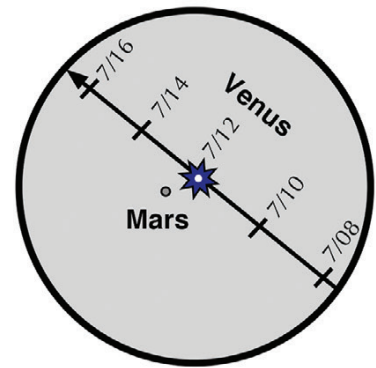
Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
July 1	Not visible					
July 7	04:01 am	03h19m48.3s	+16°22'57"	Aries	10.9	8.7
July 13	04:06 am	03h46m42.8s	+18°47'19"	Taurus	10.9	8.5
July 19	04:10 am	04h13m04.8s	+20°51'05"	Taurus	11.0	8.3
July 25	04:17 am	04h38m46.3s	+22°34'12"	Taurus	11.1	8.2
July 31	04:22 am	05h03m38.7s	+23°57'22"	Taurus	11.3	7.9

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



**View through
10x50 binoculars
in the first half of July**



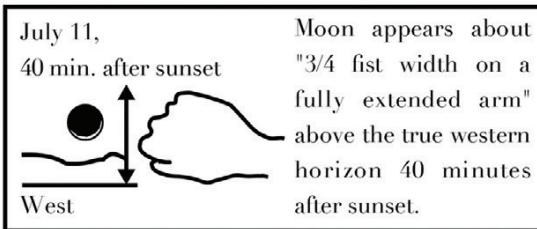
Venus & Mars meet the crescent Moon

During the first half of July, Venus approaches, then passes Mars in the early evening sky. The brilliant planet rises higher each evening while the much dimmer Red Planet drops closer to the horizon. They are at their nearest to each other on July 13, although they shine in the same binocular field from July 8 through July 16.

The very thin crescent Moon adds to the scene on July 11 and 12. (It will be a real challenge to spot just above the true horizon in the bright twilight on July 10.)

- Very clear skies and an unobstructed western horizon are needed.
- Use binoculars. Mars may not be visible to the unaided eye as it lies in the bright twilight, but it will likely be found through 10x50 glasses. Simply locate bright Venus and Mars will be seen to its immediate left.

**July 2021:
Venus and Mars 45 minutes after sunset
very low in the west.**



Register for ALCON '21 Virtual



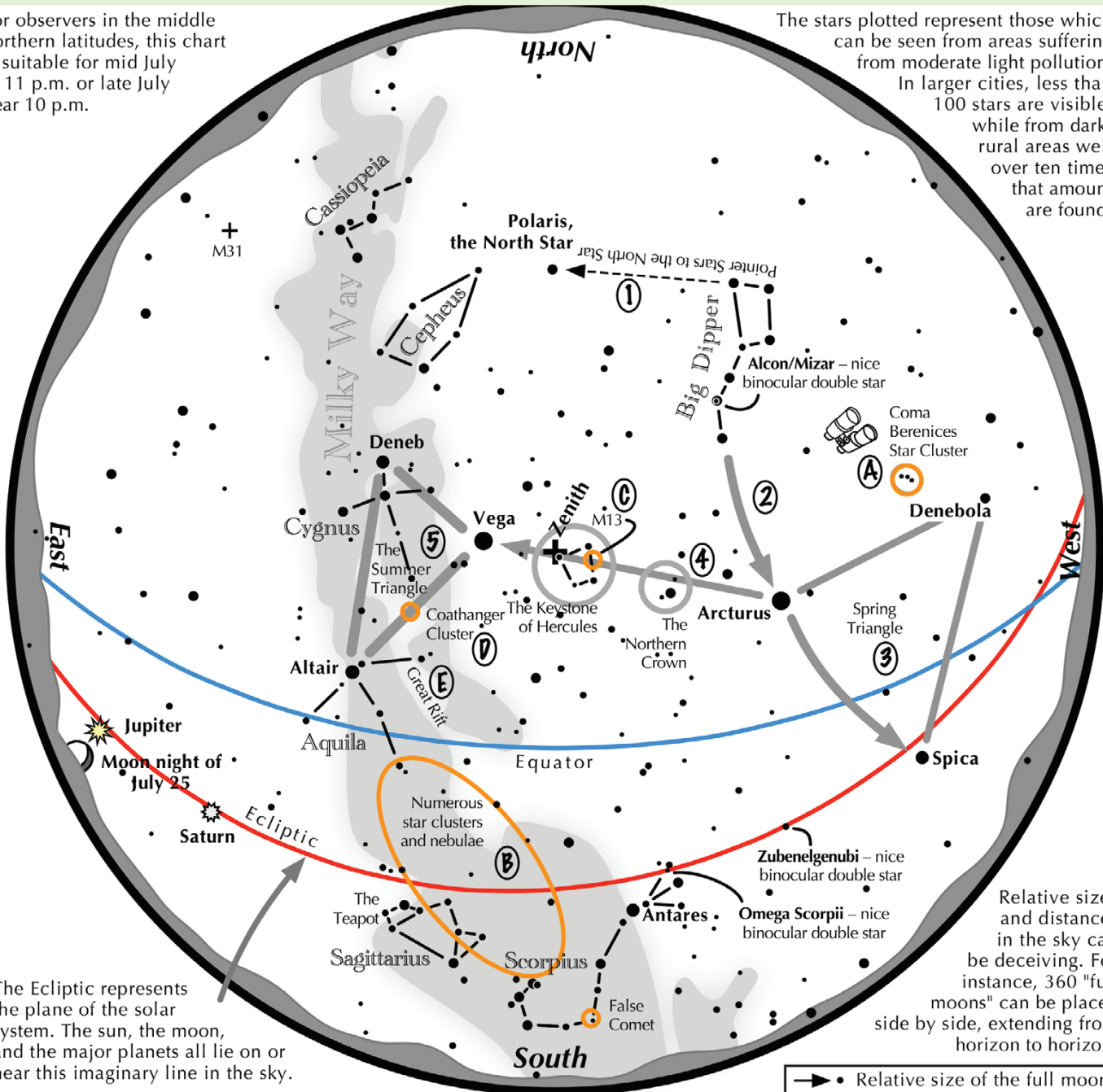
Registration for our virtual convention is now open at the following link. IT'S FREE!! The convention features virtual tours, professional and youth speakers, a Slooh presentation, all 2020 and 2021 youth and general award presentations, over \$3,000 in door prizes donated by our member clubs, our League business meeting, an international star party, and a keynote address by Dr. Jocelyn Bell Burnell, discoverer of pulsars. To be eligible, you must register your name and email address. It only takes a minute to do, and League membership is not required.

<https://www.alconvirtual.org>

Navigating the mid July Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for mid July at 11 p.m. or late July 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 July 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 first intersects Arcturus, the brightest star in the July evening sky, then continues to Spica.
- 3 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 4 To the northeast of Arcturus shines another star of similar 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.
- 5 High in the East lies the Summer Triangle stars of 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 Antares and Altair, hides an area containing many star clusters and nebulae.
- C: On the western side of the Keystone glows the Great Hercules Cluster, containing nearly 1 million stars.
- D: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- E: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.

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





Front Cover by M. J. Post of “NGC 4567 and 4568”

A pair of merging galaxies in Virgo, about 60 million light years away, NGCs 4567 and 4568. Both are unbarred spirals, and there’s starburst activity occurring in the overlap region. To the north of the “colliding” pair is elliptical NGC 4564.

Image taken at DSNM, 1.75 hours exposure on a OSC camera, augmented by 7% H-alpha light. FOV is about 40 x 27 arc min.



Back Cover by Stephen Garretson of “North America and Pelican in HOO”.

Stars 56 Cyg and 57 Cyg, the two bright stars in the Pelican, are notorious halo producers in OIII; the Chroma 3nm does a fine job rendering them without halos.

[18] 300s guided OIII subs

[19] 300s guided Ha subs

3 hours, 5 minutes total integration

William Optics RedCat f/4.9 Petzval Astrograph

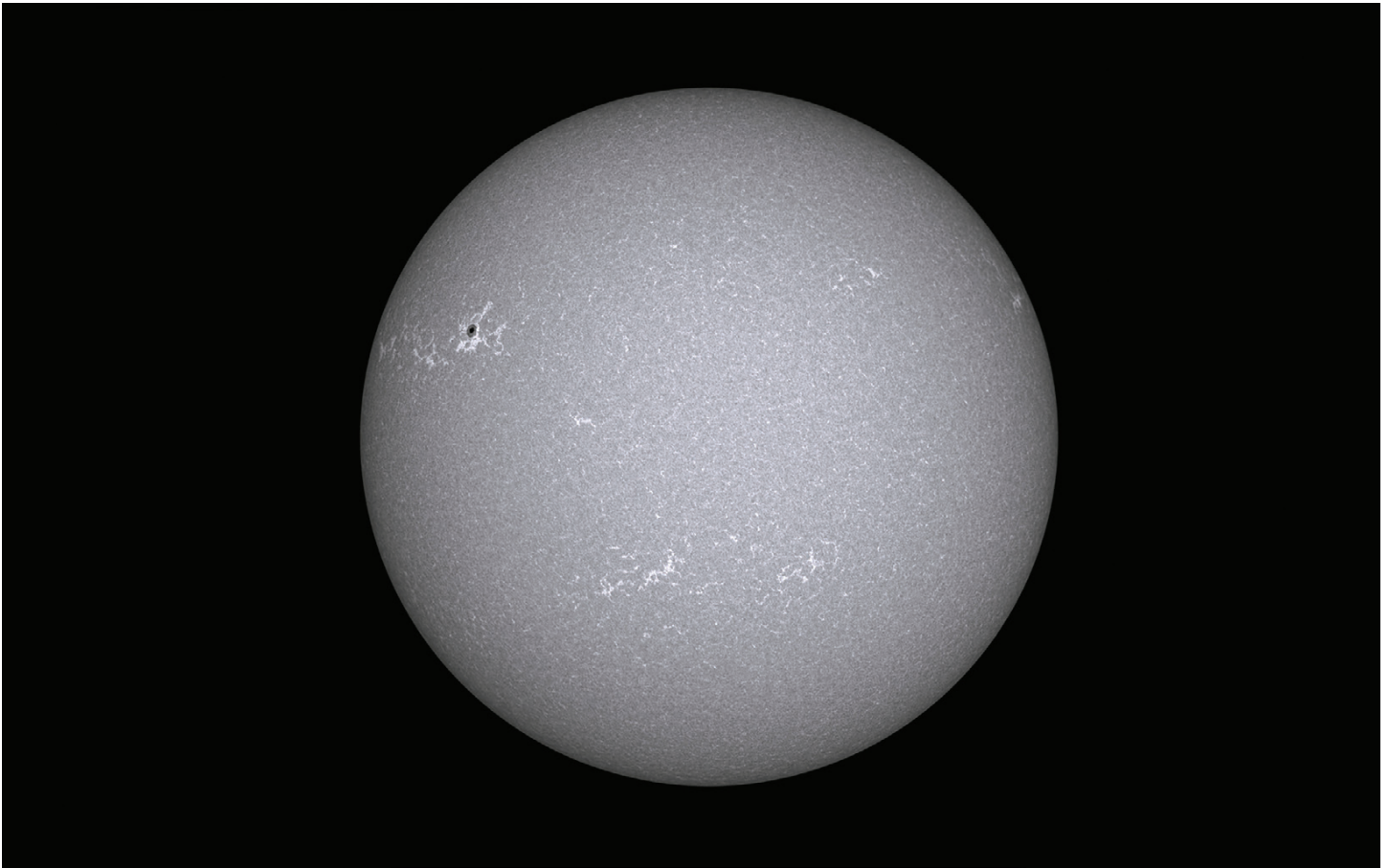
ASI 2600MM Pro

Baader 3.5nm Ha filter

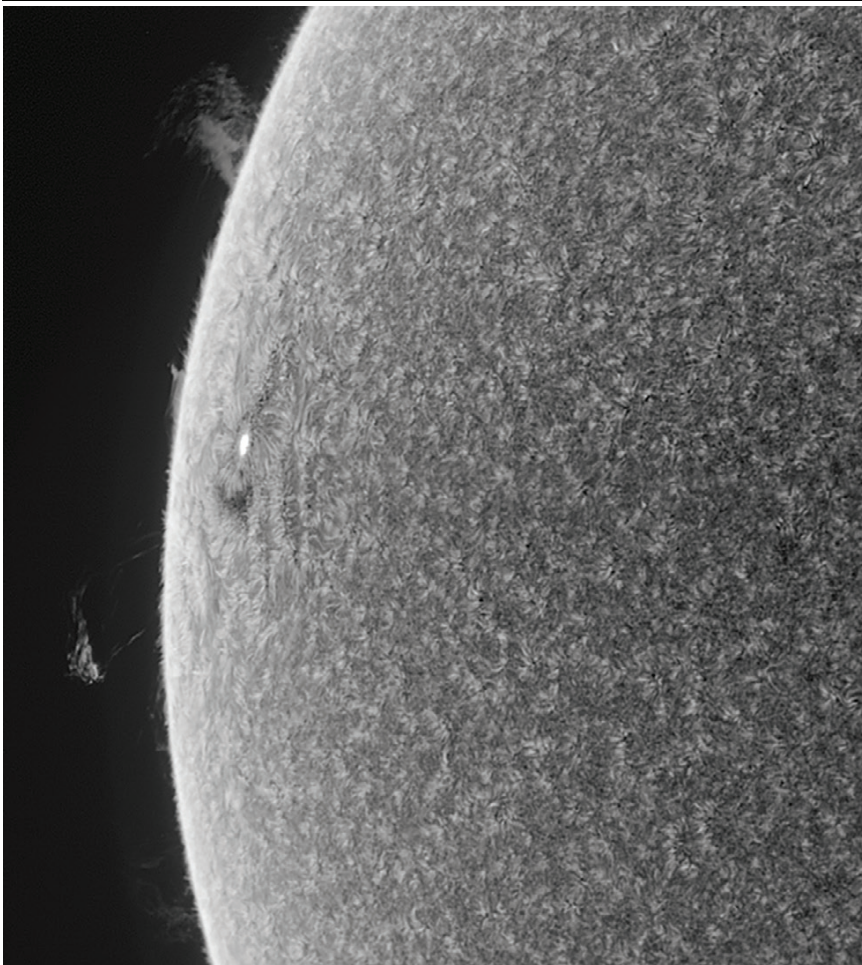
Chroma 3nm OIII filter



Crescent moon on evening of June 16 by Sarah Detty.



Above: Full disk image of the sun on June 15 by Brian Kimball.



Left: solar active AR2833 and detached (eruptive) prominence above the sun's eastern limb on June 13

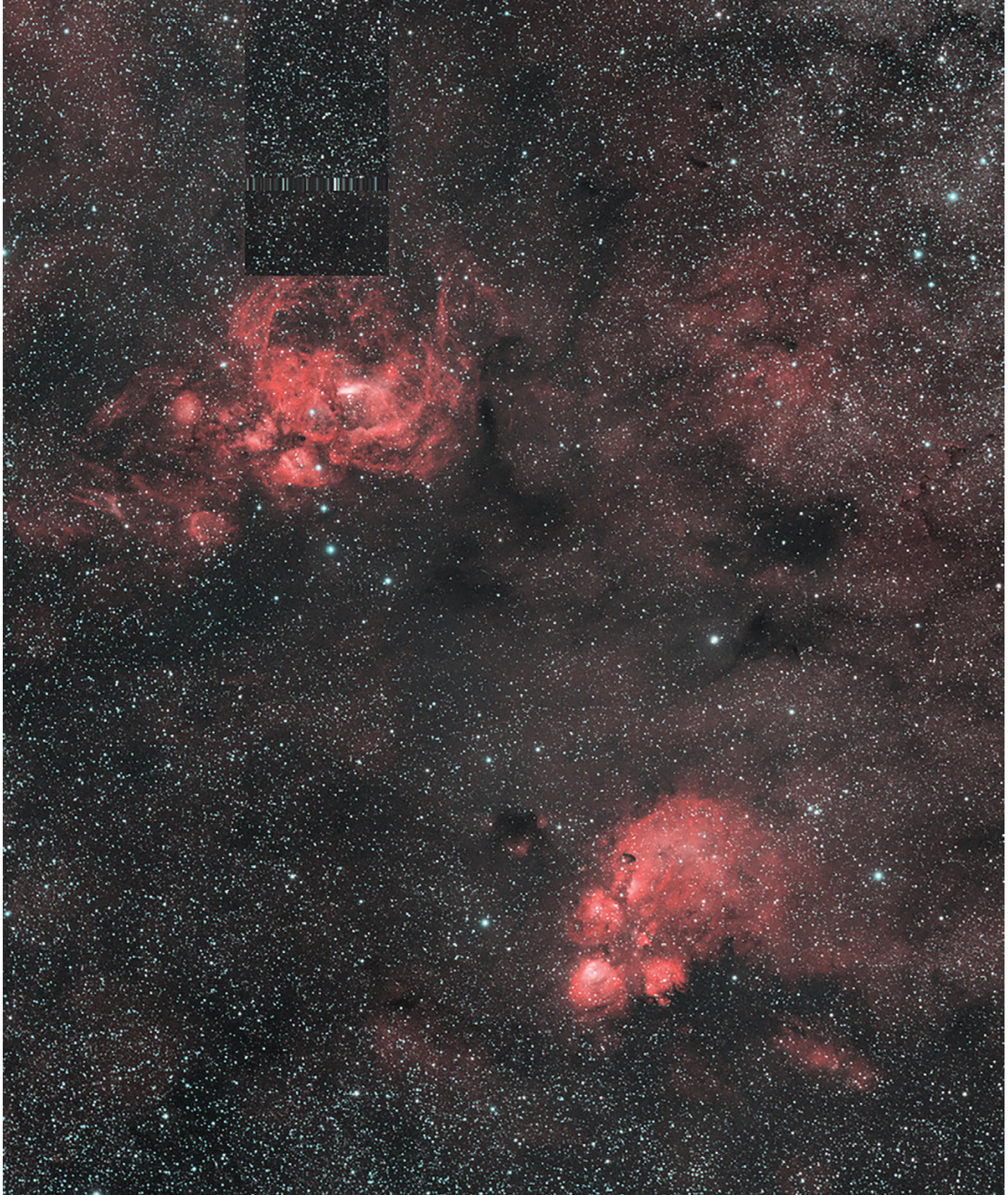


Two panel mosaic of the North America region and Sh2-119 above it by David Elmore. The North America and Pelican side was recorded 16 March 2021 and the portion on the left, Sh2-119 on June 7 using the same setup at Dark Sky New Mexico.

Borg 55FL F/3.6 astro-graph, ASI2400MC Pro camera, IDAS NBZ dual bandpass Ha/OIII filter, off-axis guider on another telescope on the same iOptron GEM45EC mount. One field (NA) is 18 sub exposures, the other 15. All exposures 10 minutes long for a total of 5.5 hours if I do my math correctly.

Dark subtraction, Flat fielding, stacking, sky background removal (not much needed) and conversion to non-linear color in AstroPixelProcessor. Final color balance in MacOS Photos.

The Lobster and Cat's Paw by David Elmore. Low in Scorpius are these star forming regions about 5500 light years distant. Vixen VSD 100 F/3.8 380mm focal length, Baader H-alpha and Oxygen III filters, ASI6200MM Pro camera. Fifteen H-alpha and Sixteen OIII images each 10 minutes for a total of 5+ hours of exposure time. Processed in AstroPixelProcessor with final rendering in MacOS Photos.





“M27, the Dumbbell Nebula” by Eddie Hunnell with C11 scope, Taken from Longmont; full frame with L-enhance filter; only 9 sub images.



“M10 Globular Cluster” by Eddie Hunnell. 19 subs of 1 min in the C11 at F7.

“NGC 4631 spiral, edge-on galaxy and 4627 elliptical galaxy” by Gary Garzone. Taken with C 14 F 7.7 STL 1000 ccd camera, ccd/stack2. photo shop.



“M100 spiral galaxy and companion galaxies NGC 4328, 4323, and others” by Gary Garzone. Taken with C 14 F 7.7 STL 1000 ccd camera, ccd/stack2. photo shop.





“M51 Whirlpool Galaxy” by Jim Pollock
Scope: 11” EdgeHD at f/7 on CEM70
Guide: OAG 1970mm w/ ZWO 174mm mini
Image: ZWO 2600mc, gain 100, -20°C
Exposure: 20x 180sec = 60 minutes
Filter: Optolong CLS Filter
Process: Pixinsight: BkgdNeut, PhotoMetric; Photoshop stretching



“M63, Sunflower Galaxy” by Jim Pollock.
25 frames of 180s each (75 minutes of exposure).



Iris Nebula” by Martin Butley. This reflection nebula is illuminated by a magnitude +7.4 star at its center, designated SAO 19158. The nebula is 1,300 light-years distant, and is six light-years across. The bright red star in the upper right corner is T Cephæi - a Mira variable in the constellation Cepheus. T Cephæi is a red giant of spectral type M6-9e with an effective temperature 2,400 K. The star fluctuates between magnitude 5.2 and 11.3 over a period of about a year. It lies 570 ly away. If it were in the place of the Sun, its photosphere would engulf the orbit of Mars. LRGB image - 5 minute exposures, one hour in each channel, taken with a Takahashi FSQ 130.



IC 1318 by Martin Butley. This region has a strong signal in all three emission bands - Ha, OIII, and SII.



“M13 Globular Cluster” by Rolando Garcia



NGC4565, the Needle Galaxy” by Rolando Garcai. Photographed over two nights: about 2.5 hours total (180 s subs at ISO 800, Nikon D5600).



“NGC 6888 to Sharpless 2-101 in H α ”
by Stephen Garretson

“Sharpless 2-313” by M. J. Post. This is an old planetary nebula produced by a binary central star. The planetary nebula probably resulted from death of a second star which is not a white dwarf that causes all the ionization and emission. The pair generates a systematic “solar wind” that is blowing outward through the planetary debris causing the central bow shockwave. Scope was PlaneWave CDK14 at Dark Sky New Mexico. Camera was ZWO ASI 6200MC at -10C, unguided on an MEII mount. FOV is about 24 x 16 arc min.



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



“NORTH AMERICA AND PELICAN IN HOO”