

LONGMONT ASTRONOMICAL SOCIETY

JULY 2020

CYGNUS LOOP
BY STEPHEN GARRETSON

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LAS Virtual Meeting July 16 from 7 to 9 pm

“Pluto’s Planetary Status” by Dr. Hal Levinson

July’s presentation is by Dr. Hal Levinson, who spoke to LAS last year about the Lucy Project, studying the Trojan asteroid swarms that preceded and follow along Jupiter’s orbit. This time Dr. Levinson will share his perspective on Pluto’s planetary status.

A little topical background. Pluto was demoted from planet to dwarf planet in 2006 by the International Astronomical Union [IAU]. When astronomer Mike Brown discovered the Kuiper Belt Object that is now named Eris, it created a dilemma: what defines a planet? Eris was thought to be much like Pluto, and it looked like there would potentially be several if not many more such objects lurking in the neighborhood. If Eris et.al. were accorded planetary status, where would it end? The IAU developed three criteria to be met for an object to be declared a planet:

[1] orbit the Sun; [2] be essentially round; and [3] clear the area of other bodies, i.e., be the dominant object. Pluto, alas, only met the first two requirements.

One other note, this about our old friend Charles Pickering, who got fed up with the performance of his minions and hired his then maid Willemina Fleming. She went on to discover many objects including the inaccurately named Pickering’s Triangle in the Cygnus Loop [Veil Nebula]. Pickering was a planet hunter who collaborated with Percival Lowell looking for Planet X; neither found it. But before Clyde Tombaugh did finally spot Pluto, sixteen other observatories had actually imaged it, they just didn’t know it at the time.

Stephen Garretson, LAS VP

Events in July

- All LAS public events this month have been canceled due to the Covid-19 flu pandemic.



LAS Officers and Board Members in 2020

- Bill Tschumy, President
- Stephen Garretson, Vice President
- Michelle Blom, Secretary
- Bruce Lamoreaux, Treasurer

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



Image Credit: NASA

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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.



Solar System Highlights for July 2020



Full Moon: July 4 at 10:45 pm

Third Quarter: July 12 at 5:30 pm

New Moon: July 20 at 11:34 am

First Quarter: July 27 at 6:34 am

Mercury

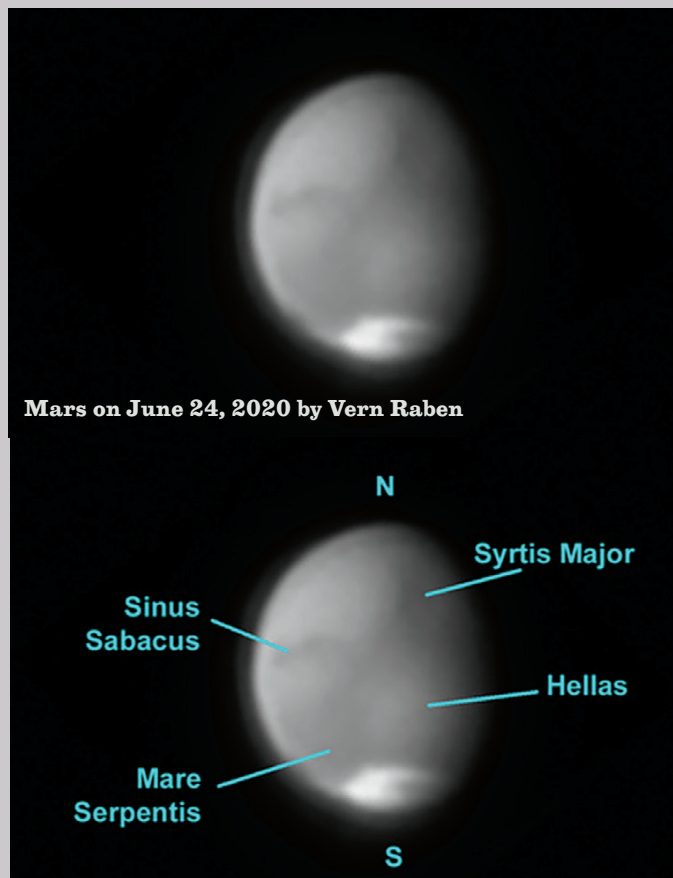
Mercury is not visible this month.

Venus

Venus is in morning sky in constellation Taurus. It is 43 arc sec across and magnitude -4.5 on the first and 28 arc sec across and magnitude -4.4 on the 31st.

Mars

View Mars around 1 to 2 am in constellations Pisces and Cetus this month. On July 1st it is -0.5 magnitude in brightness and 11 arc sec across. It is 14 arc sec across and -1.1 in brightness at month end.



Mars on June 24, 2020 by Vern Raben

Jupiter

Jupiter is visible in the morning sky in constellation Sagittarius. Opposition is on the 14th when it is -2.7 magnitude and 48 arc sec across.

The Great Red Spot mid transit times this month are:

June 30 at 12:03 am altitude 23°

July 2 at 1:42 am altitude 30°

July 4 at 3:20 1 am altitude 26°

July 4 at 11:11 pm altitude 20°

July 7 at 12:49 am altitude 29°

July 9 at 2:27 am altitude 28°

July 11 at 11:56 pm altitude 27°

July 14 at 1:34 am altitude 29°

July 16 at 3:12 am altitude 22°

July 16 at 11:03 pm altitude 24°

July 19 at 12:41 am altitude 29°

July 21 at 2:20 am altitude 25°

July 21 at 10:11 pm altitude 21°

July 23 at 11:49 pm altitude 29°

July 26 at 1:27 am altitude 27°

(Assuming a GRS longitude of 331°)

Saturn

Saturn is visible in the morning sky in constellation Capricornus. It is at opposition on July 20. It is magnitude 0.1 in brightness and the disk is 18 arc sec across.

Uranus

Uranus is visible in the morning sky in constellation Aries. It is magnitude +5.8 in brightness and its disk is 3.5 arc sec across.

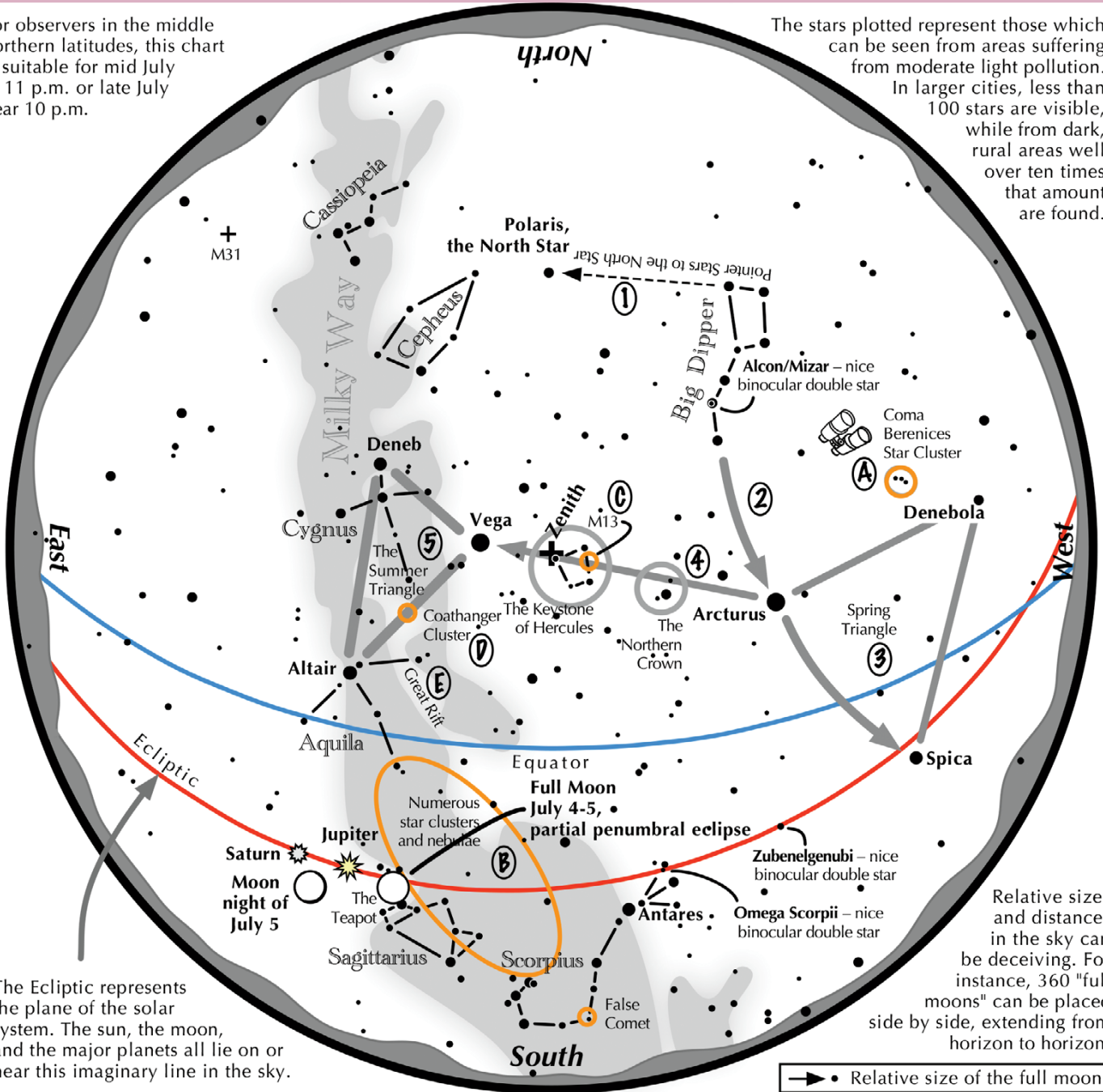
Neptune

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

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.

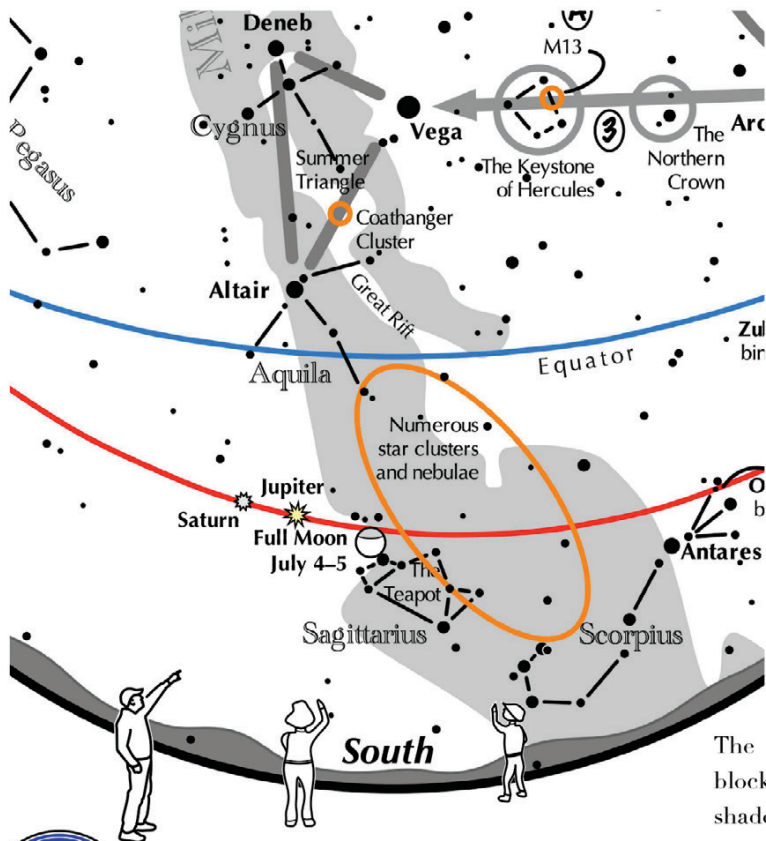
Binocular Highlights

- 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.

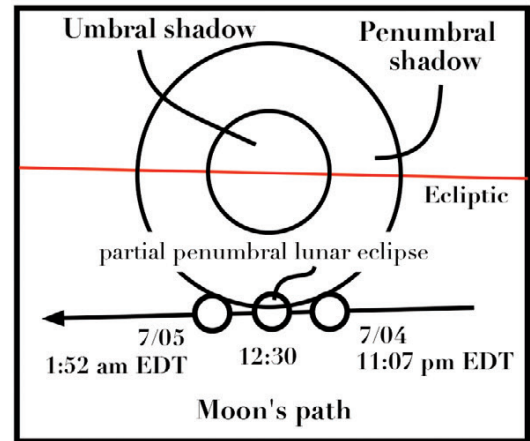
Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.



If you have a clear southern horizon on the night of July 4, try this challenge:



View to the south from July 4 at 11 pm through July 5 at 2 am EDT



The Moon slides through a partial penumbral eclipse

Two weeks after a solar eclipse, a lunar eclipse often occurs. June 20 saw a partial solar eclipse and on the night of July 4, a lunar eclipse follows. But it will be an unusual event in that it will be a partial penumbral eclipse.

The penumbral shadow is caused by an opaque body not blocking all the light from an illuminating body. As a result, the shadow isn't completely dark, only partially so. In this case, the opaque body is the Earth, the illuminating source is the sun.

On July 5 at 12:30 a.m. EDT, the penumbral shadow covers only the northern 1/3 of the lunar disk. It may not be an obvious sight. Can you spot it?

Newsletter Archives

10 Years Ago - July 2010



The speaker at the July 15, 2010 meeting was Chris Peterson who operates the "Cloud Bait Observatory" in Guffey, CO. His talk was about the "Colorado Allsky Network" established by the Denver Museum of Natural History. Although originally intended to locate meteorites the data was found useful for orbit analysis and particle size statistics.

The annual star party at Fox Park this year has been canceled as area used to stage equipment to remove beetle kill trees.

20 Years Ago - July 2000



Thirty people attended the July meeting including 5 visitors. There was a beautiful presentation of the astrophotographic work of club members Brian Kimball and Tom Teeters. Jim Sapp showed slides of activities at this years Rocky Mountain Star Stare. There was some talk of forming a radio astronomy mini-group.

30 Years Ago - July 1990

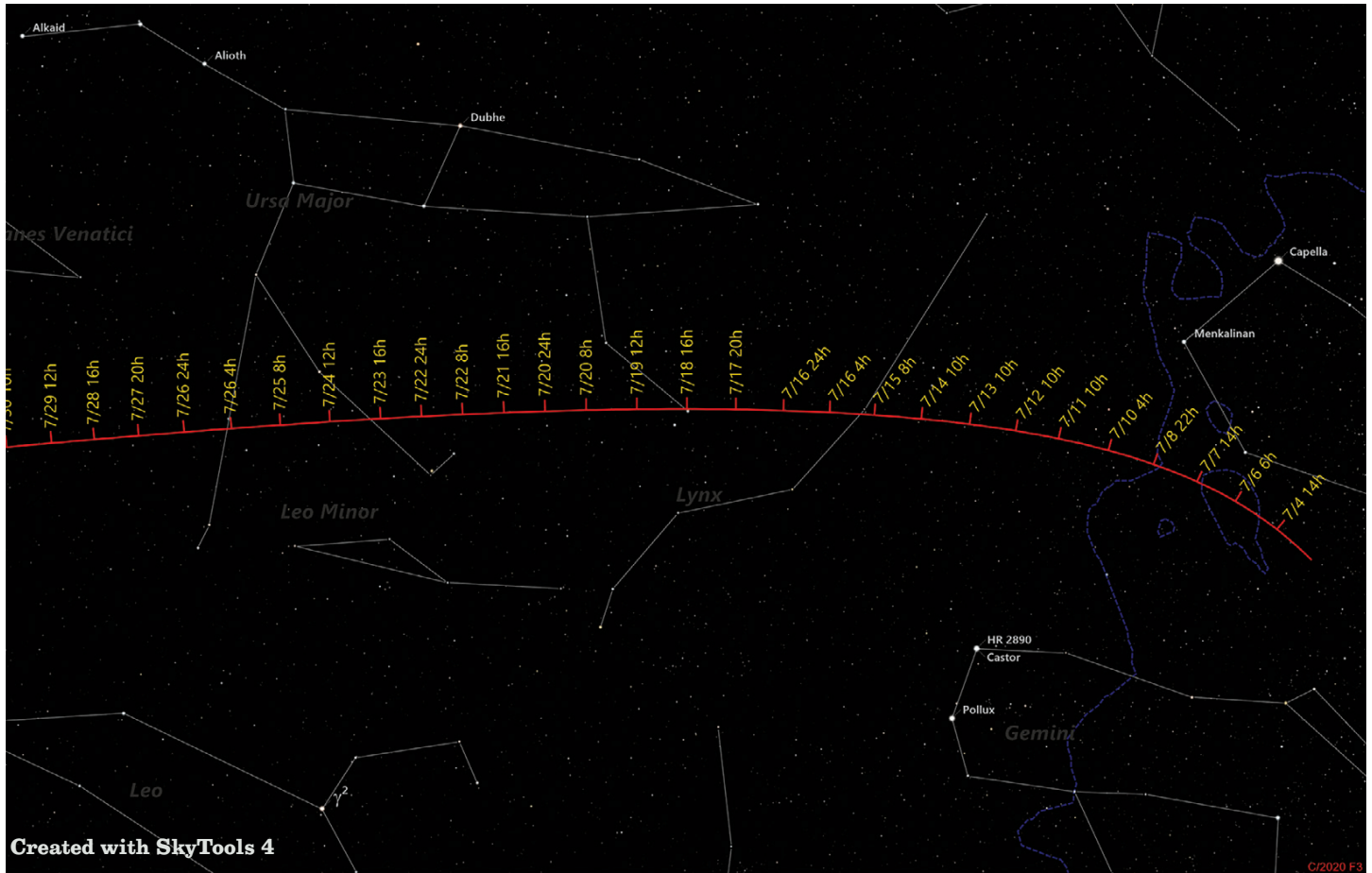


NASA's revealed last week that because of a design error the Hubble Space Telescope will not work properly. LAS meeting was at the Fiske Planetarium. The show was about the history of our understanding of Mars as well as what possible future visits would be like. After the presentation we went to the Sommers-Bausch Observatory and looked at M13, M57, and other objects. Saturn made its appearance around 11 pm.

Last but not least we welcome our newest member, Brian Kimball.

Comets in July

Comet C/2020 F3 (NEOWISE)



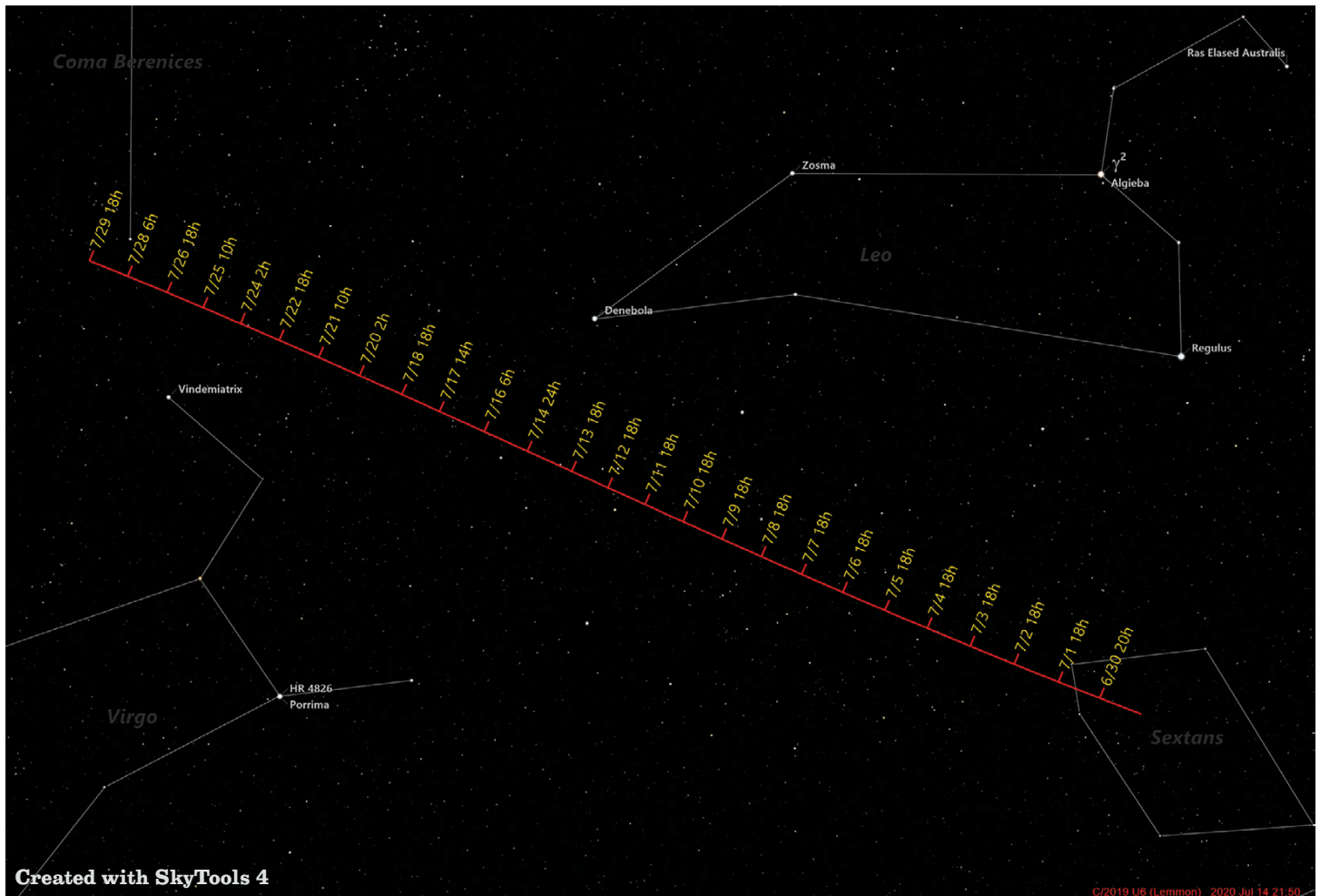
As of this date (July 2) the comet is reported to be about magnitude 1 which is about 2 magnitudes brighter than predicted below. If it survives the perihelion pass by the sun it may be an impressive naked eye object this month. The fan tail shape shown in SOHO images is evident in Paul's image below.

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
July 1	04:47 am	05h58m58.0s	+28°50'52"	3.4	6.8	Auriga
July 8	04:41 am	06h33m18.6s	+39°59'40"	3.4	8.5	Auriga
July 15	09:40 pm	08h15m28.7s	+47°46'53"	4.0	10.6	Lynx
July 22	09:45 pm	10h42m21.2s	+43°34'14"	4.7	11.8	Ursa Major
July 30	09:40 pm	12h30m55.8s	+28°11'02"	5.8	10.7	Coma Berenices



Comets in July

Comet C/2019 U6 (LEMMON)



Comet C/2019 U6 (LEMMON) was discovered by the Mount Lemmon Sky Survey on Oct. 31, 2019. It was at perihelion in mid-June; it is now about magnitude 6 in constellation Sextans.

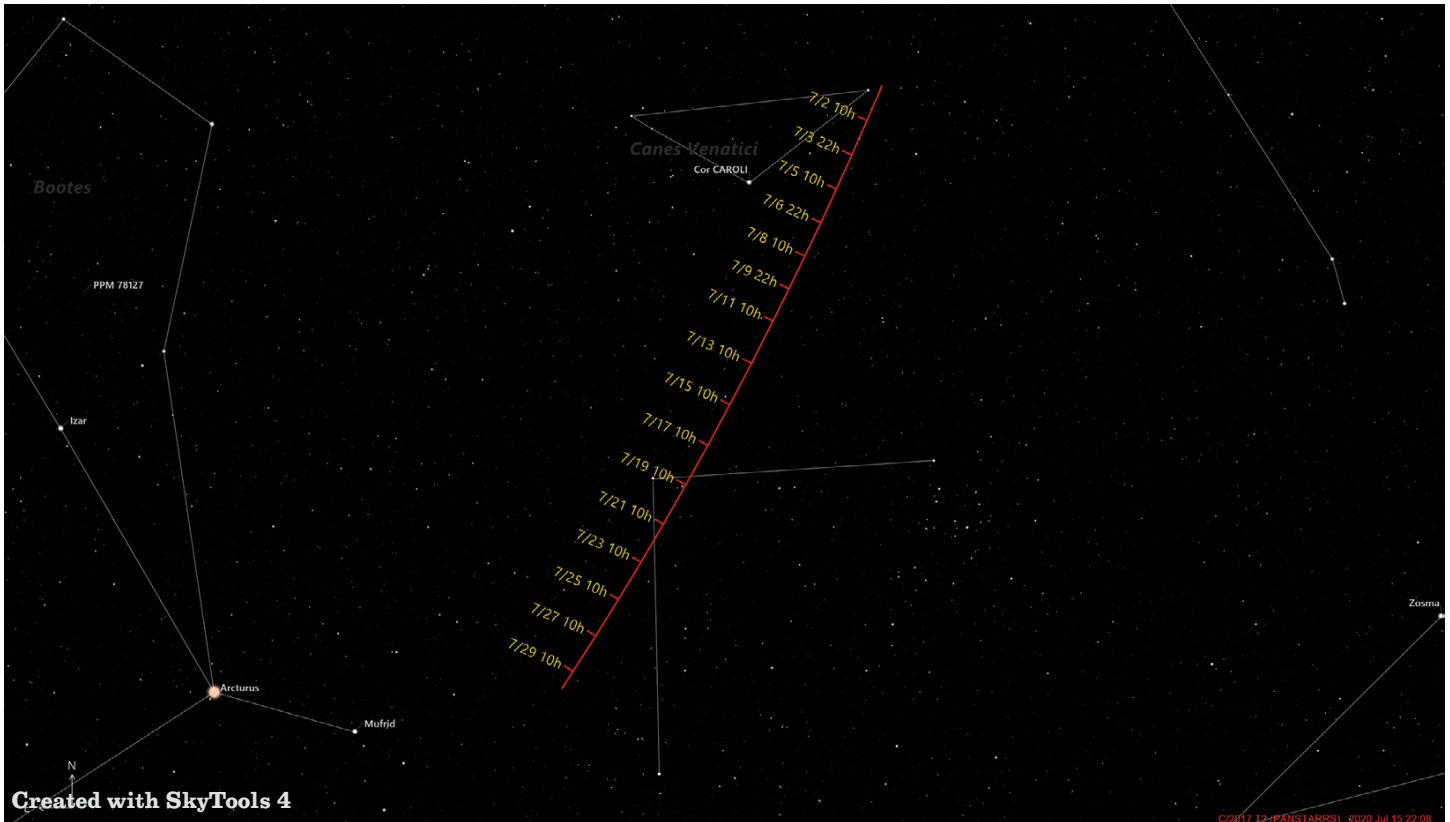
Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
July 1	9:41 pm	10h31m51.3s	-01°39'48"	6.4	8.8	Sextans
July 8	9:48 pm	11h27m18.2s	+04°55'32"	6.7	8.4	Leo
July 15	9:50 pm	12h10m32.3s	+09°52'27"	7.1	7.8	Virgo
July 22	9:49 pm	12h48m20.2s	+13°46'51"	7.5	7.1	Coma Berenices
July 30	9:41 pm	13h25m31.1s	+17°03'02"	8.0	6.4	Coma Berenices



Credit: Esteban J. Andrada desde Mar del Plata, Argentina on Jun 21, 2020

Comets in July

Comet C/2017 T2 (PANSTARRS)



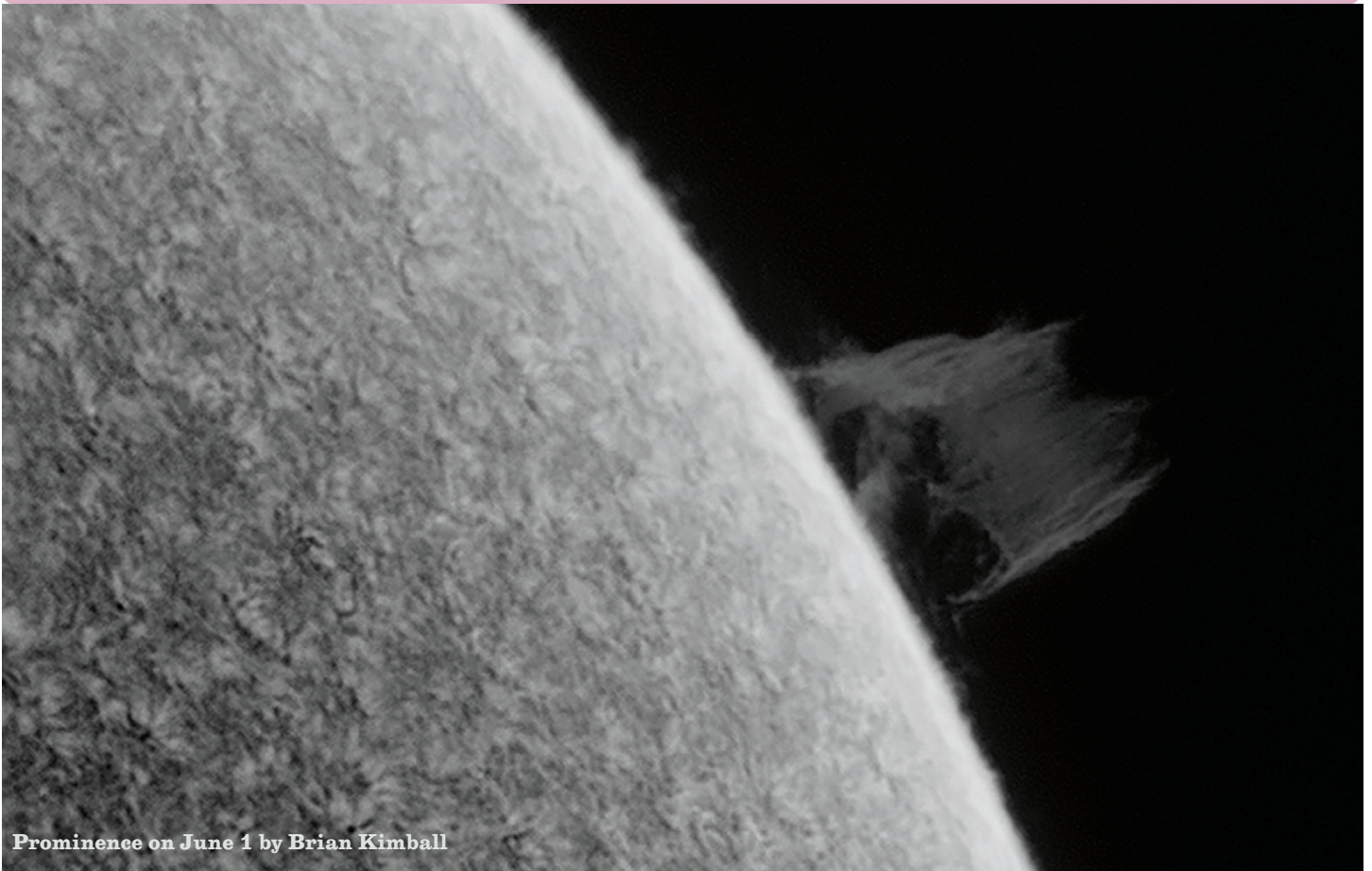
Comet C/2017 T2 (PANSTARRS) is currently moving through constellation Canes Venatici. It is magnitude 9.1 in brightness. It was discovered by the two 1.8 meter PANSTARRS telescopes located at the Haleakala Observatory in Hawaii.

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
July 1	10:17 pm	12h35m24.3s	+40°09'32"	9.1	4.6	Canes Venatici
July 8	10:14 pm	12h49m33.2s	+34°46'23"	9.2	4.5	Canes Venatici
July 15	10:08 pm	13h02m28.3s	+29°37'42"	9.4	4.3	Canes Venatici
July 22	10:00 pm	13h14m30.2s	+24°46'30"	9.6	4.1	Coma Berenices
July 30	9:48 pm	13h27m27.9s	+19°37'13"	9.9	3.9	Coma Berenices

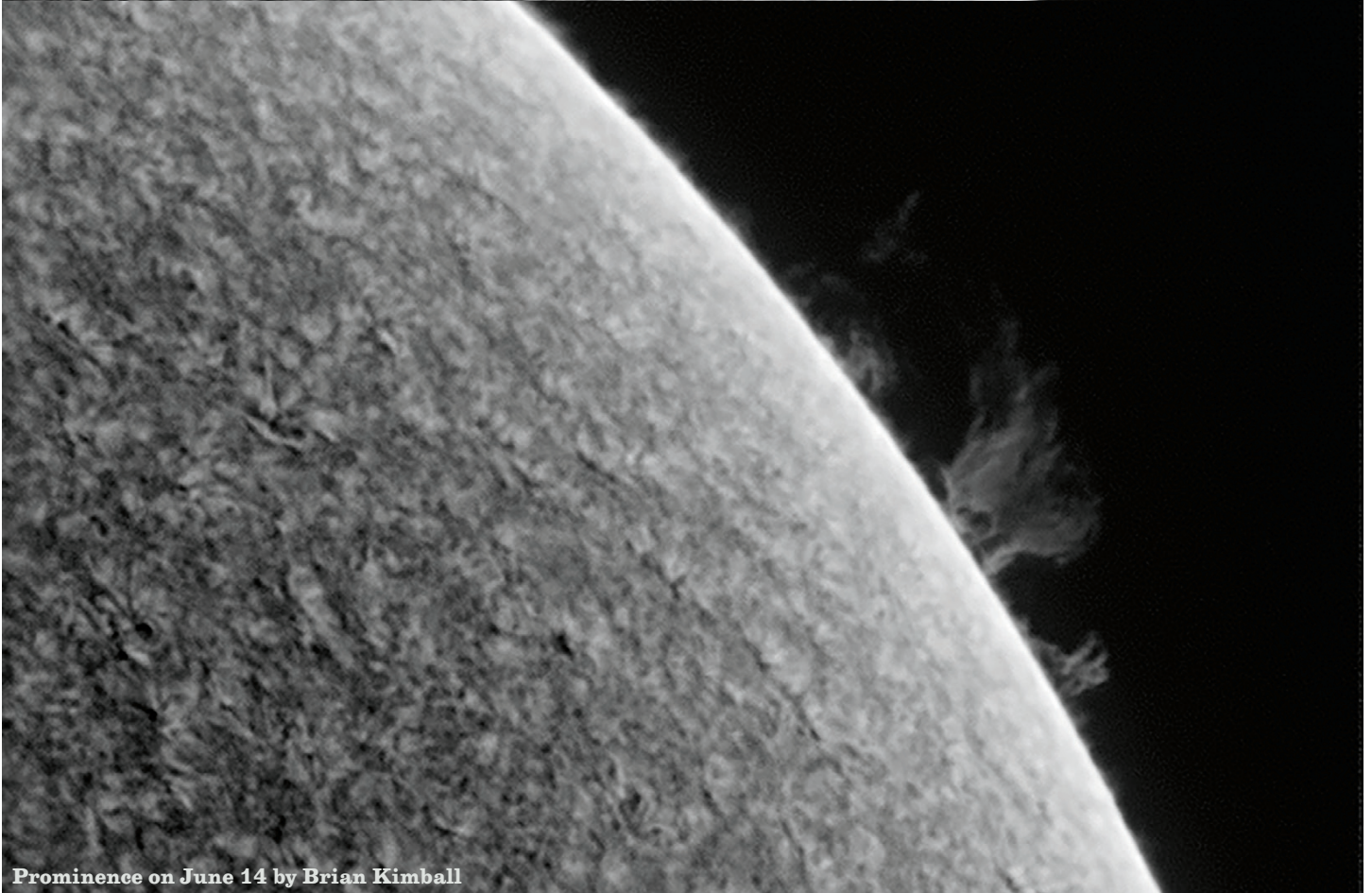


Comet C/2017 T2 (PANSTARRS) on June 23 by Gary Garzone

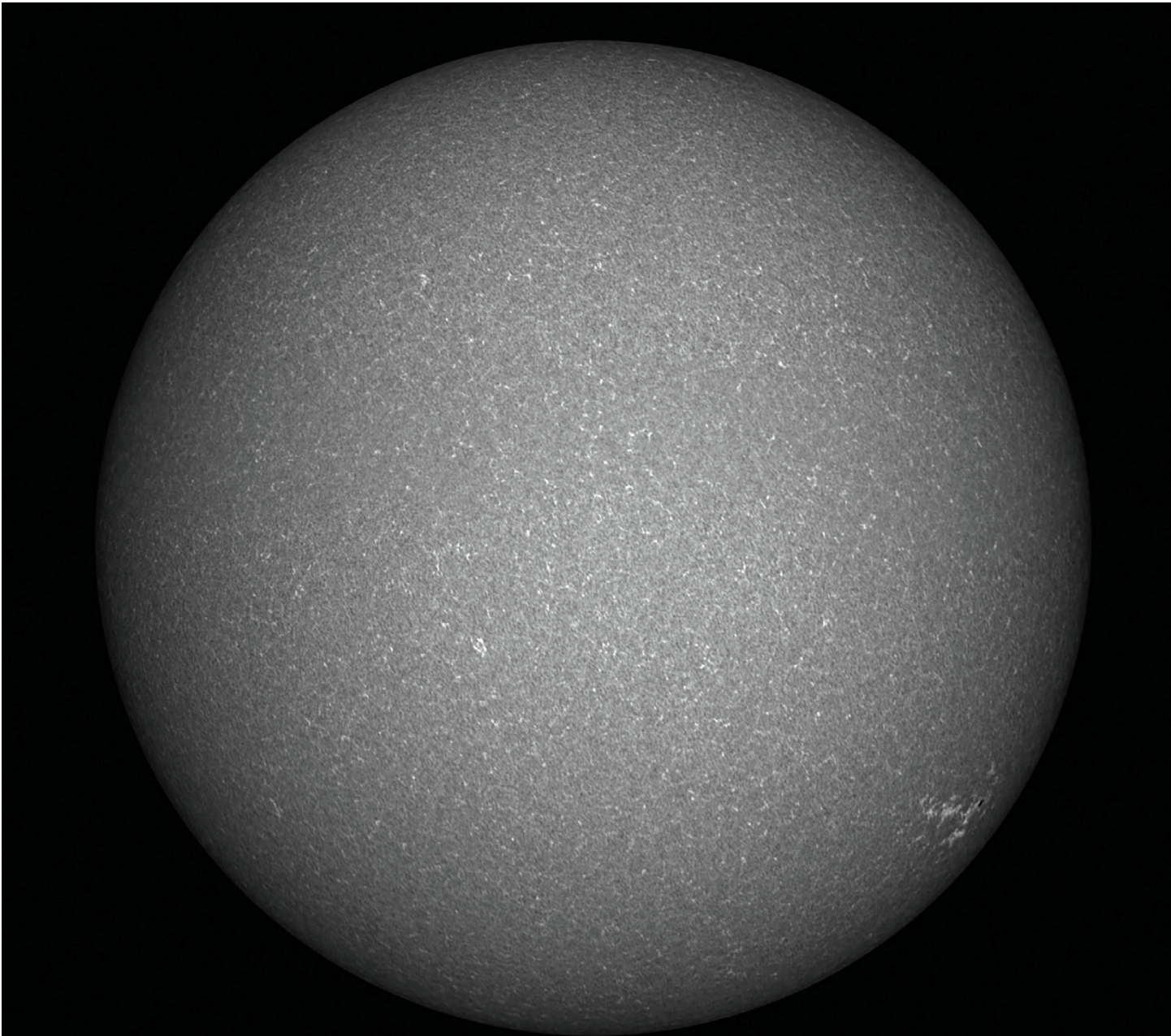
LAS Member Images in June 2020



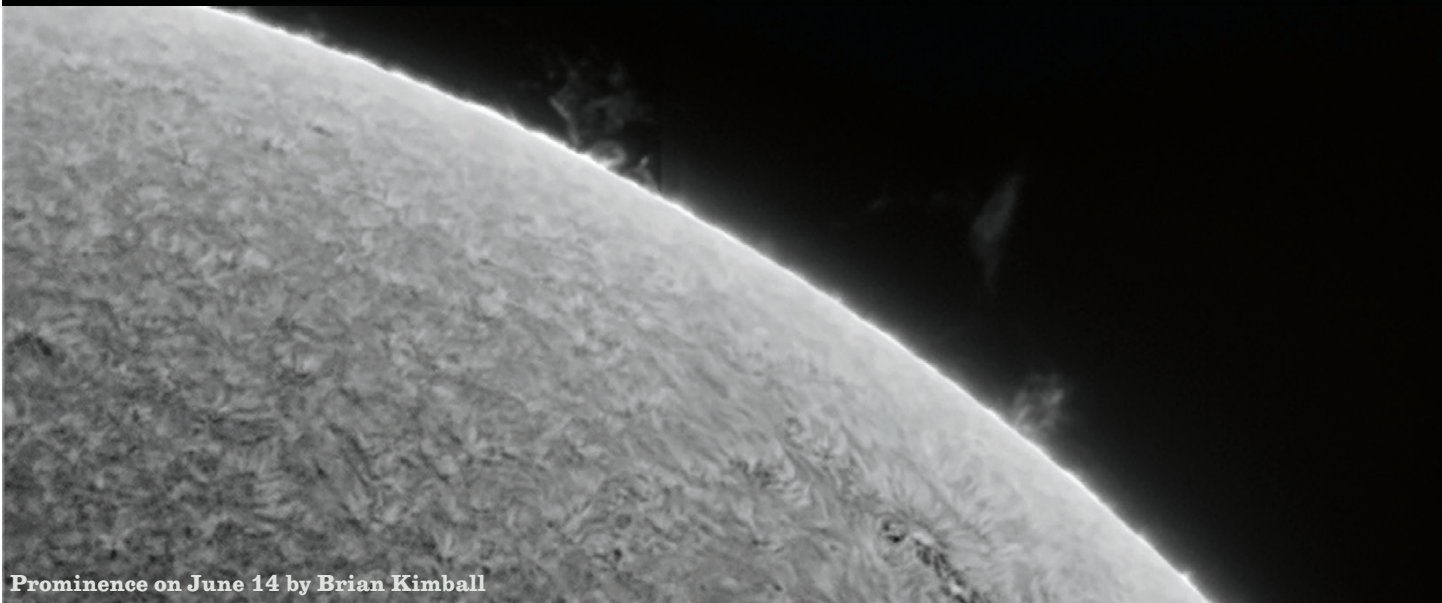
Prominence on June 1 by Brian Kimball



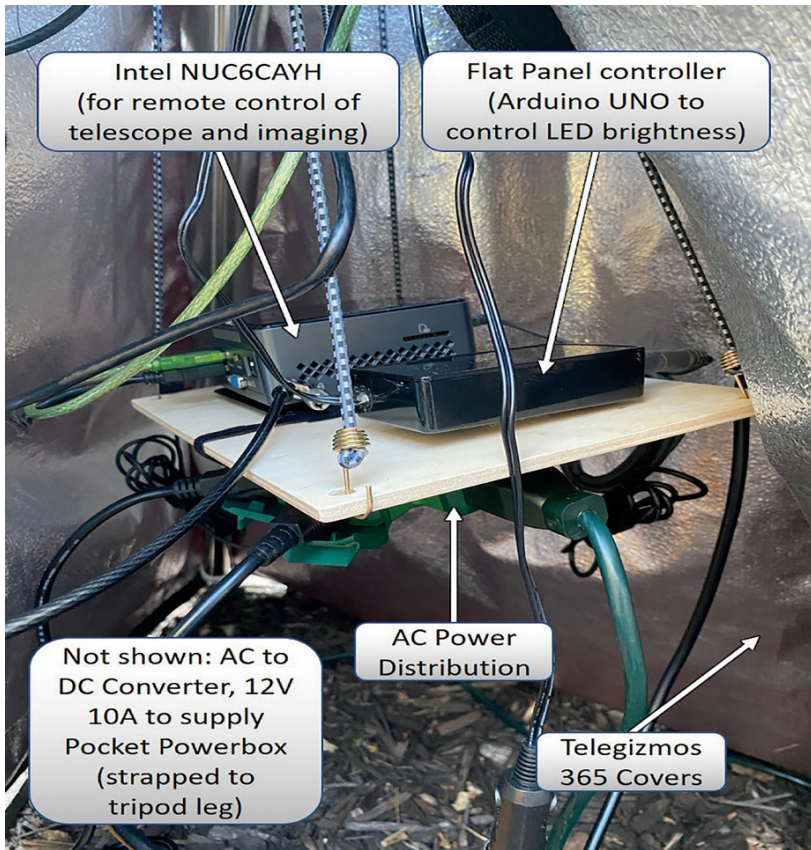
Prominence on June 14 by Brian Kimball



Sun in Calcium K on June 14 by Brian Kimball



Prominence on June 14 by Brian Kimball



Chris Faule took advantage of some recent telescope equipment sales to update his setup.

Congratulations Chris, looks great!

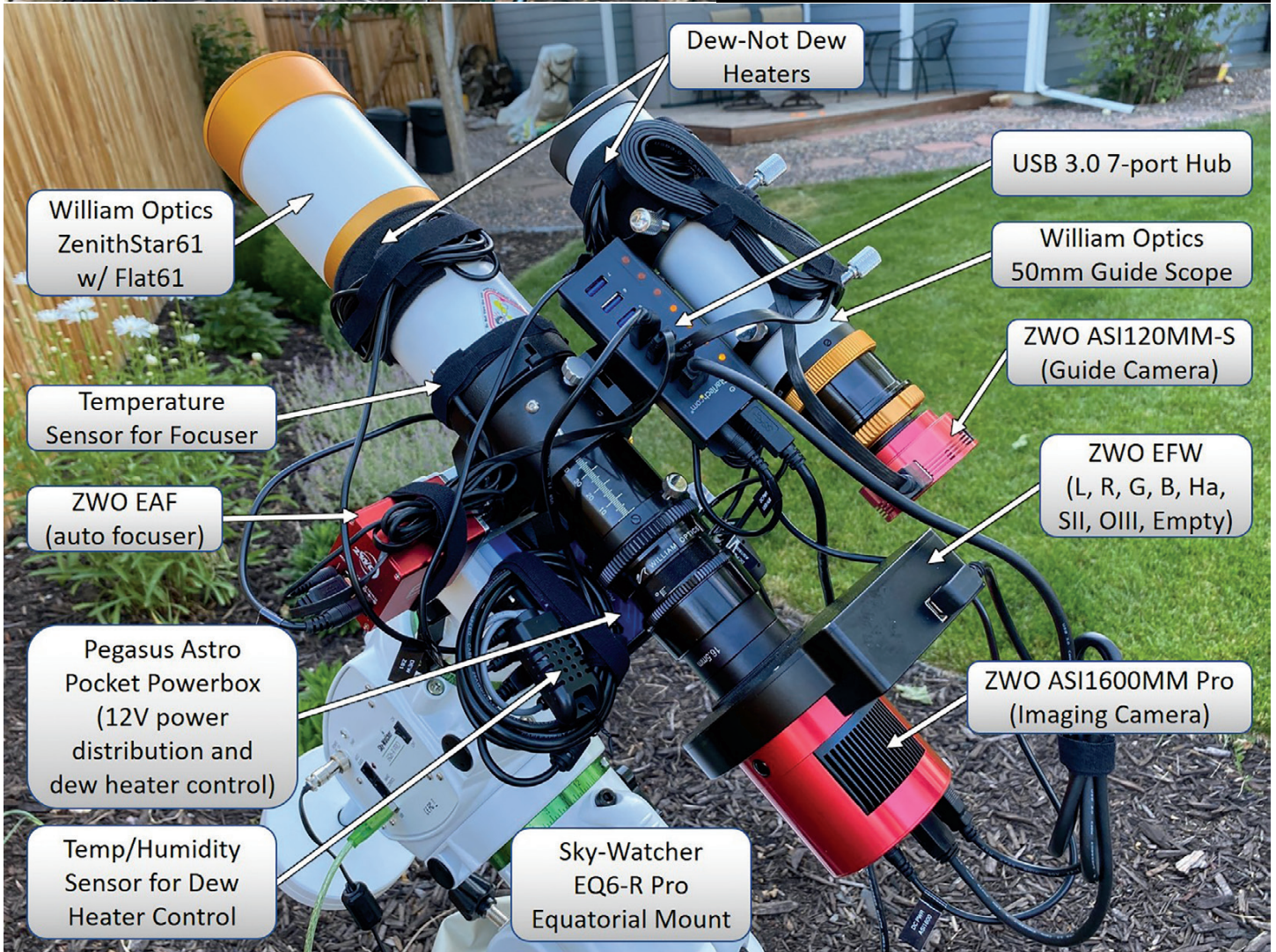




Photo by Chris Fauble



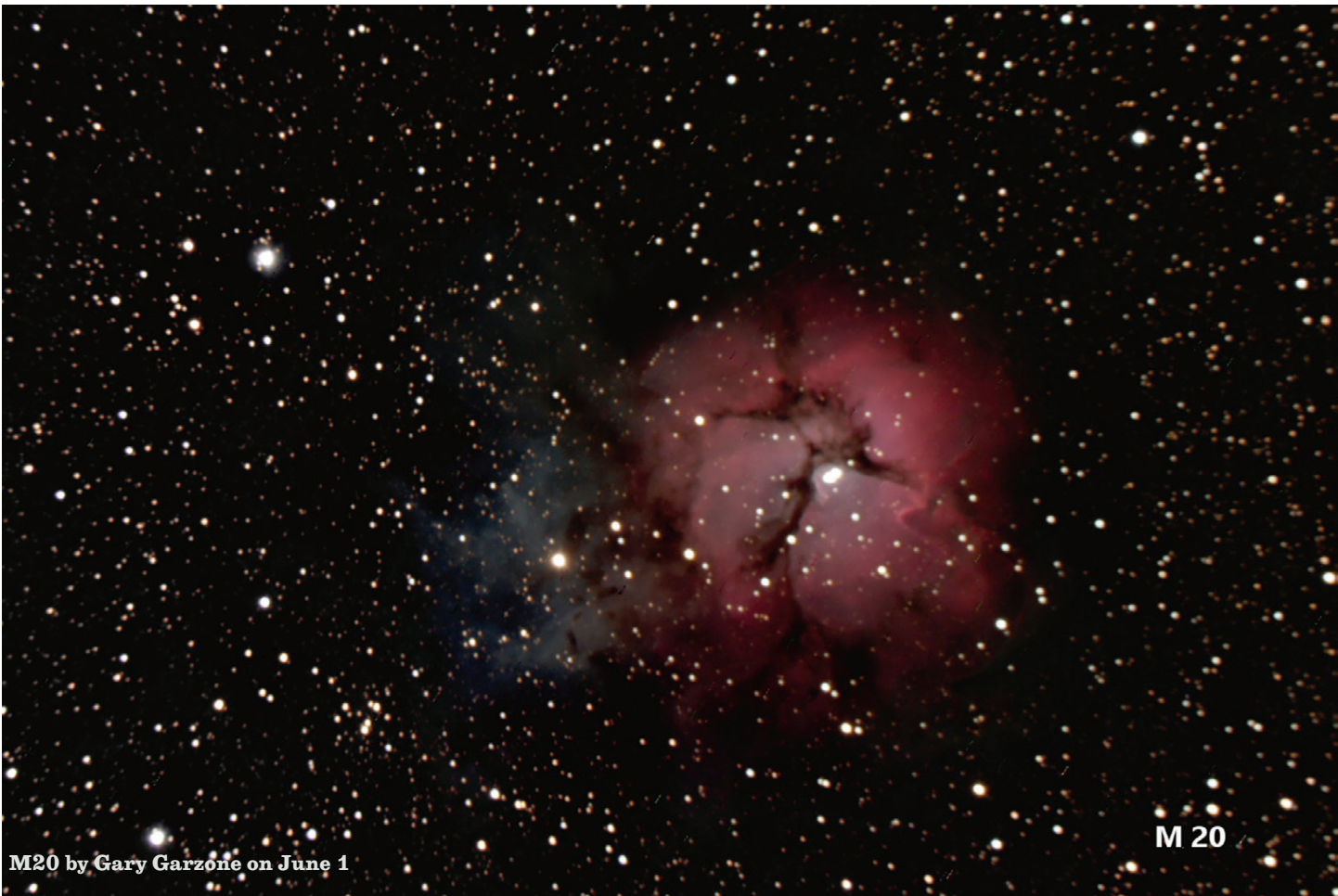
M27 Dumbbell and NGC 6823 in HOO by David Elmore on June 18



M57 - Ring Nebula by Eddie Hunnell on June 7



M16 Eagle Nebula by Eddie Hunnell on June 12



M20 by Gary Garzone on June 1

M 20



Saturn on June 7 by Gary Garzone



Jupiter on June 19 by Gary Garzone



Comet C/2017 T2 (PANSTARRS) on June 23 by Gary Garzone

Comet T 2



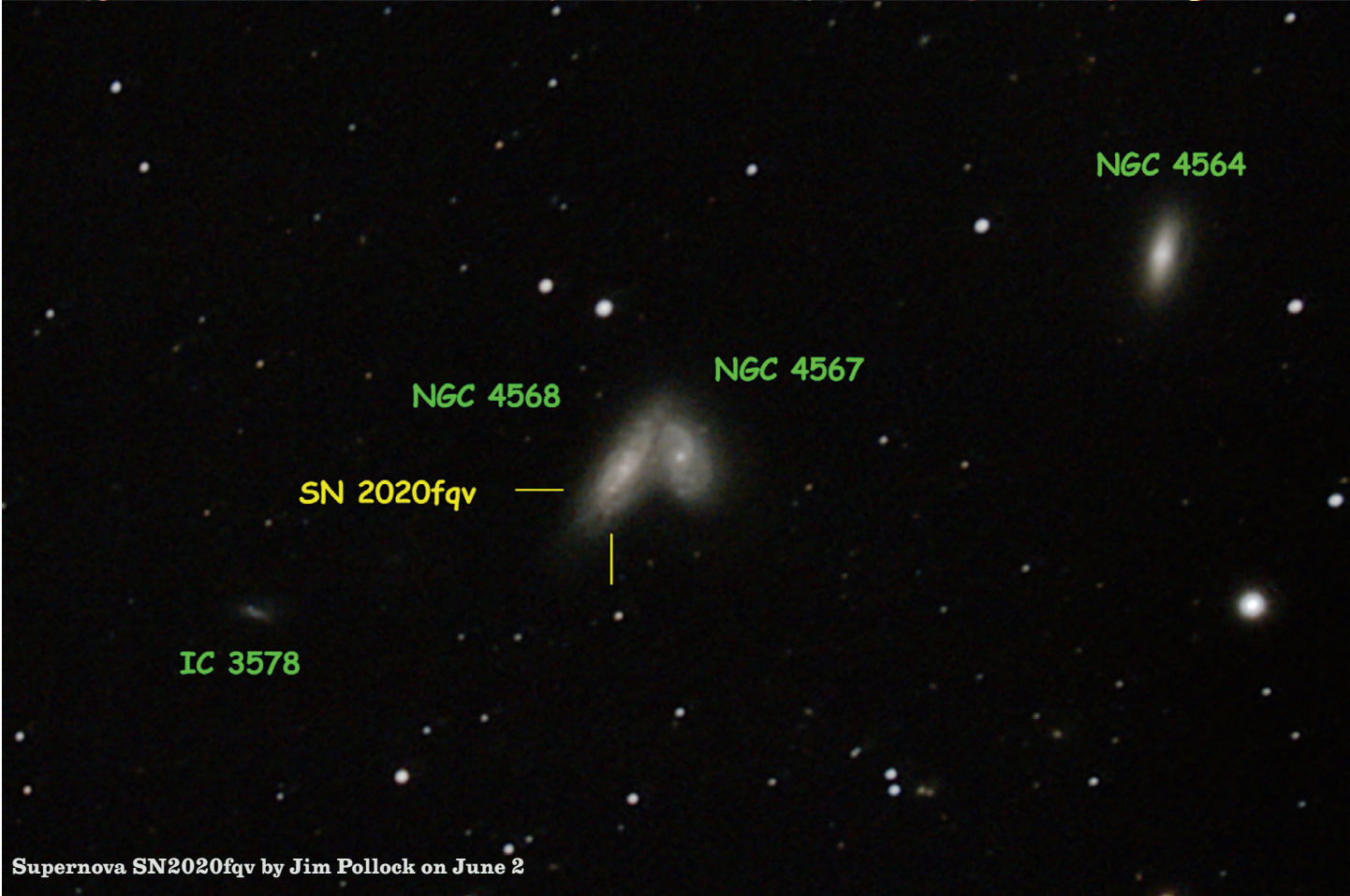
M 15

M15 Globular Cluster by Gary Garzone



M 101

M101 by Gary Garzone



NGC 4564

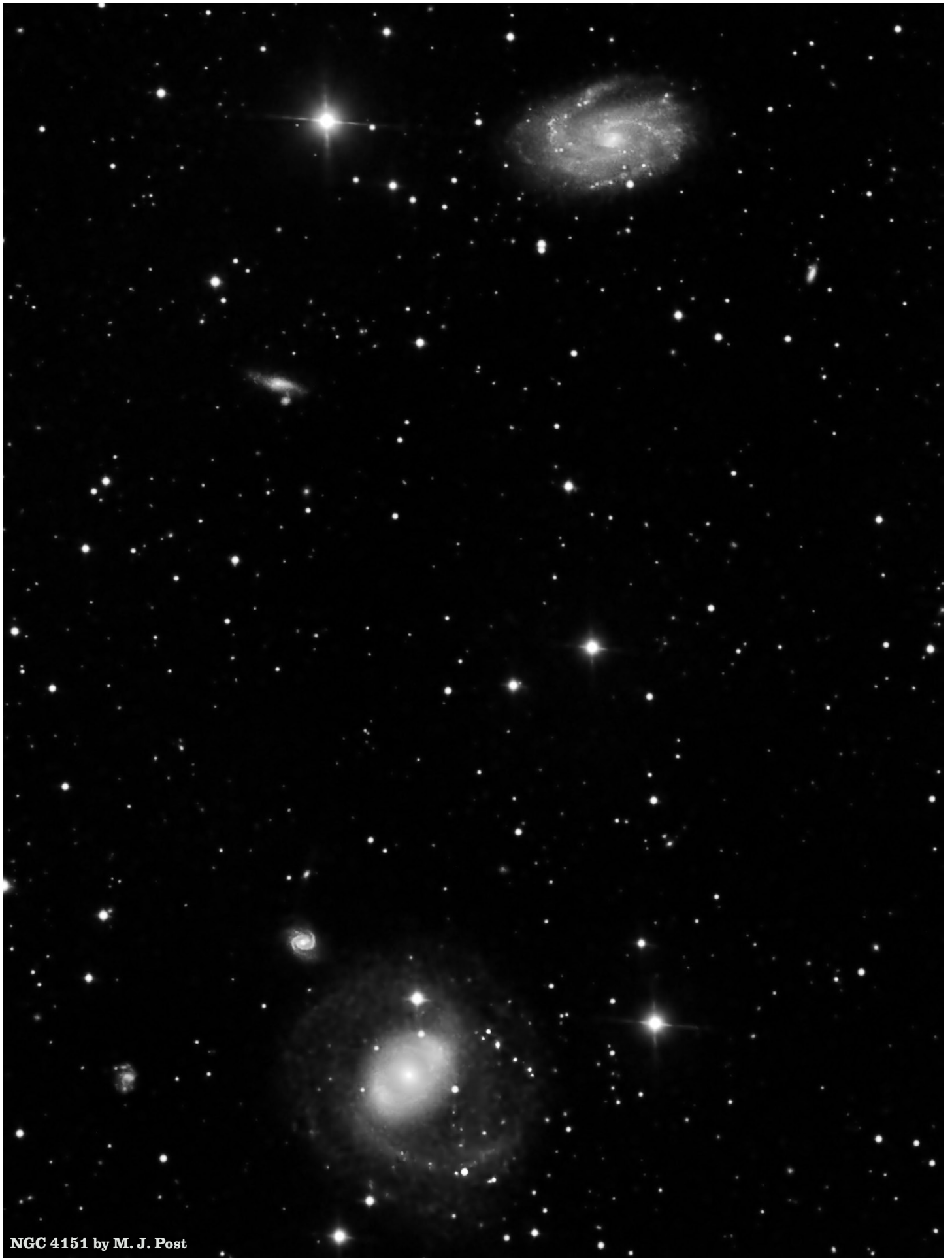
NGC 4567

NGC 4568

SN 2020fqv

IC 3578

Supernova SN2020fqv by Jim Pollock on June 2



NGC 4151 by M. J. Post



M94 by M. J. Post



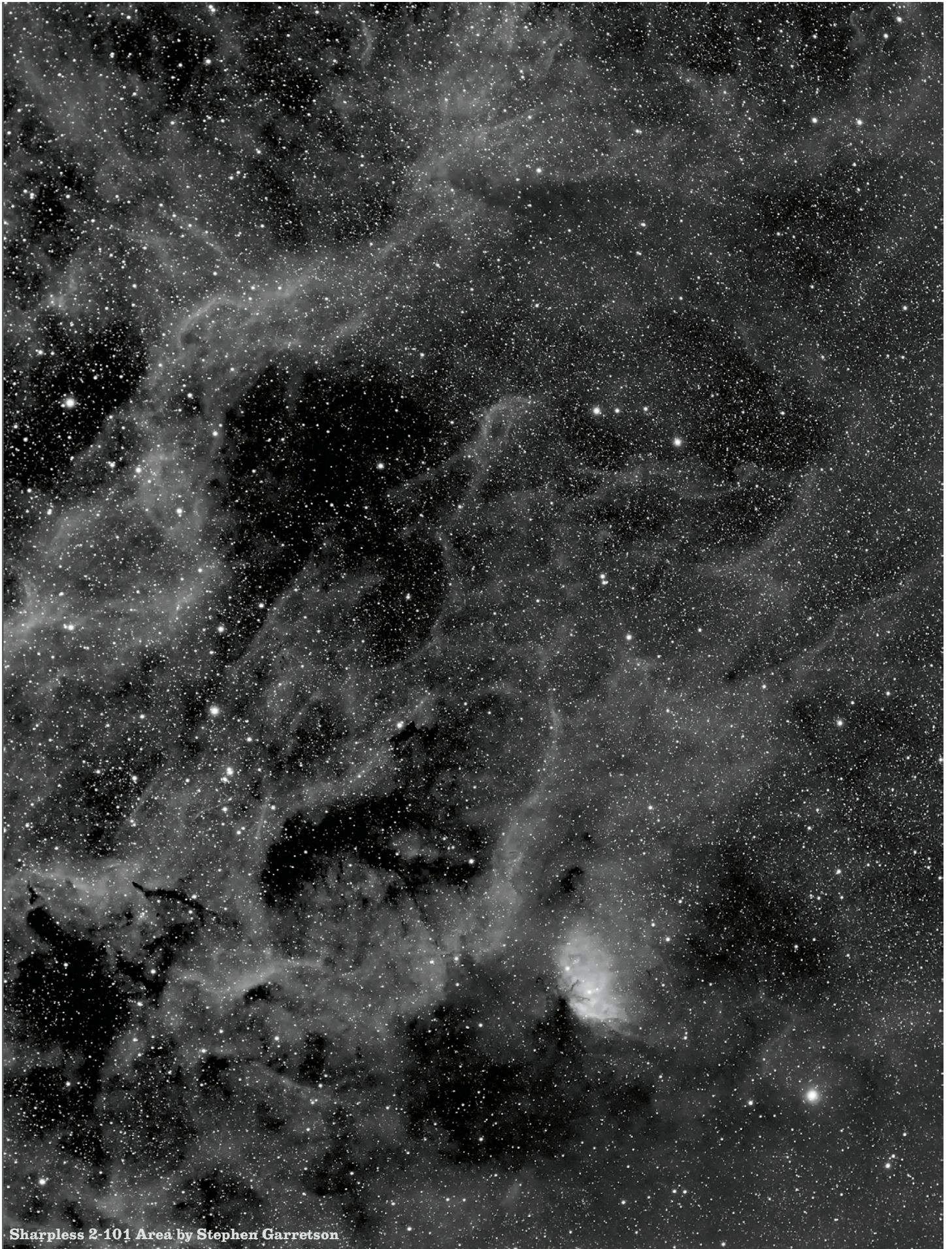
NGC 4725 by M. J. Post



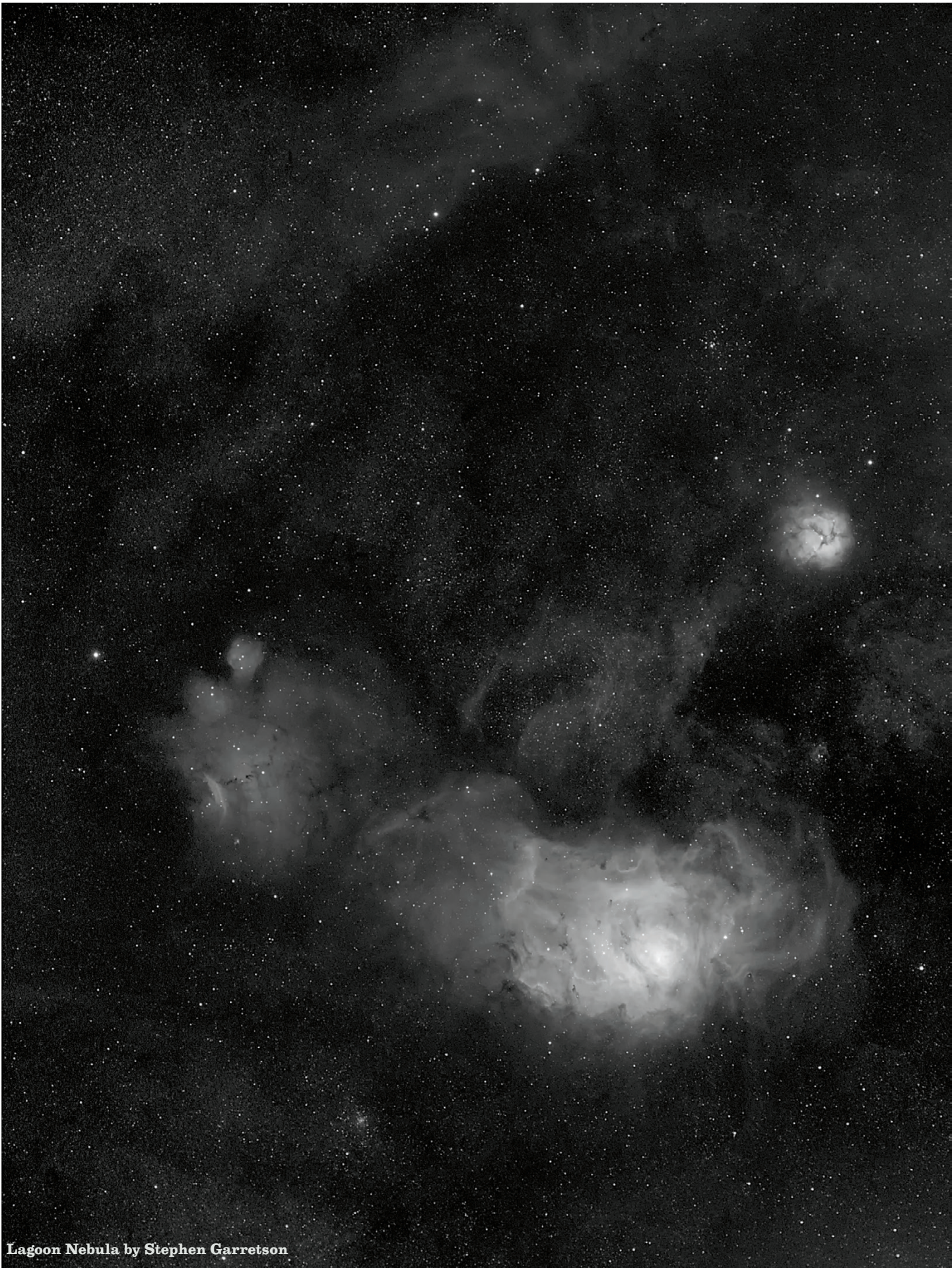
M13 by Rolondo Garcia



Markarian's Chain by Rolondo Garcia



Sharpless 2-101 Area by Stephen Garretson



Lagoon Nebula by Stephen Garretson



Sharpless 2-101 by Tally O'Donnell

Summary of June 18, 2020 Meeting by Vern Raben

Bill Tschumy opened the meeting at 7 pm. He introduced the speaker, Paul Robinson. Paul became interested in comets since viewing Kohoutek (C/1973 E1) in 1974. Since then he has observed 120 more.

He talked about the difference between a comet and meteor. A comet is a chunk of rock and ice but meteor is a chunk of rock and/or ice. The size of a comet may be several kilometers; the size of meteor may be several meters. Both orbit around the sun. A meteor becomes visible once enters Earth's atmosphere; hopefully a comet never will! A comet appears as a fuzzy star more or less stationary in the sky; a meteor appears to streak across the sky and burn for several seconds.

When considering the orbit of a comet we assume that only the force of gravity is acting on the comet. The gravity force acts toward the sun and strength drops as distance squared to the sun. Because of that it moves fast when near the sun and slower when away from the sun. Orbit shape is determined by the comet's speed. Very slow -> circular; slow -> an ellipse

A comet's orbit may be fully described by its orbital elements.

- T - which is the date a comet is nearest the sun or perihelion; q - the distance from the sun in AU (astronomical unit -- distance from earth to the sun);
- i - inclination of the comet's orbit to earth's orbit. A i value of 0 means it lies on the earth's orbit; if it is 90 it is perpendicular to earth's orbit; it is greater than 90 but less than 180 then the orbit is the reverse direction to earth's orbit.

- e - eccentricity of orbit; if eccentricity is 0 it has a circular orbit; values above one means it is elliptical; if it is 1 the orbit is parabolic; if the eccentricity is greater than 1 it is hyperbolic.
- The elements ascending node and argument of perihelion are not of much interest to observers.

If you take look at a comet ephemeris you may note the following terms:

- Delta - distance from the comet to earth in astronomical units (au)
- R - distance from the sun in au
- Elongation - angular distance between the sun and the comet as seen from somewhere on earth. Elongation needs to be about 18 for the comet to be seen in a dark sky.

Some things to note when viewing comets:

- Ion (gas) tail - points directly at the sun; it is usually green or blue depending on the comet's composition
- Dust tail - lags "behind" along the orbital plane; it is usually white or tan in color
- Grains - lags way behind along the orbital plane; this is rarely visible except with very large comets

Since comet tails lie in the plane of its orbit we get an edge-on view of the tail when it crosses the earth's orbit.

When this happens:

- Dust tail becomes thin and very sharp
- Dust tail becomes very bright
- Often there is an apparent sun-ward pointing tail

Paul showed everyone several images of various edge views of comets in the past.

Paul then presented a plot of comet C/2020 F3 (NEOWISE), the earth, and sun in the coming weeks. After the 4th of July we should be able to view comet F3 NEOWISE in mornings around 4:15 am; later in month it will be best seen in dark sky in the early evenings around 10 pm.

Business Meeting

Treasurer Report by Bruce Lamoreaux

Four memberships were paid during the past month. Total club assets are around \$16.5K. There are currently 75 regular members and 2 student members.

No old business.

New business.

Vern Raben gave a report regarding costs of printing the paper edition of the newsletter. From November 2018 to March the cost of printing calendars and newsletters was \$1464.15. Total income from cash and web sales was \$879.45. The loss was \$584.70. It does not appear that the newsletter should be printed monthly. There is a possibility that it could be printed quarterly and still be sold for a reasonable price. The LAS Exec board will consider prepaid subscriptions for those who wish to have paper copies.

Paul provided the following URLs for those interested in observing comets:

<https://www.spaceweather.com/> (what's up in sky right now)

<http://www.aerith.net/comet/weekly/current.html> (overview of all observable comets)

<http://astro.vanbuitenen.nl/comets> (most current info including light curve)

<https://cometografia.es/> (more good info)

<https://sohowww.nascom.nasa.gov/data/realtime/c3/512/> (Soho C3 coronagraph)

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“M27, DUMBELL NEBULA” BY EDDIE HUNNELL