

LONGMONT ASTRONOMICAL SOCIETY

DECEMBER 2021

“HEART NEBULA”
BY TALLY O’DONNELL

VOLUME 37, No 12, DEC. 2021
ISSN 2641-8886 (WEB)
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Purchase your LAS 2022 Calendar!



JANUARY 2022						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
						New Year's Day
2	3 Quadrantids meteor shower	4	5	6	7	8
9	10	11	12	13	14	15
16	17 Martin Luther King Jr. Birthday	18	19	20	21	22
23	24	25	26	27 LAS Meeting 7 pm	28	29
30	31			Apollo 1 fire 1967		
	Apollo 14 launch 1971					

FEBRUARY 2022						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
			Groundhog Day			
6	7	8	9	10	11	12
13	14	15	16	17	18	19 Lincoln's Birthday
	Valentine's Day					
20	21	22	23	24	25	26
	Washington's Birthday President's Day					
27	28					

The LAS 2022 calendar is available for purchase on the LAS website at <https://www.longmontastro.org/store>. Price for a single calendar including postage is \$8.90. A two pack including postage is \$16.08. If you wish more than two calendars to be mailed to you, select multiple two packs. Postage rates are such that it is less expensive to mail multiple two packs than put them in a box up to about 20 calendars. If you wish to save some postage and don't mind driving to Louisville to pick them up, a four pack is \$24.69 and a six pack is \$36.18.

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> and the webmaster is Paul Kammermeier. 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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Back Cover	“Messier 33, Triangulum Galaxy” by Rolando Garcia

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

Notes for Thurs. Nov. 18 meeting by Sven Schmidt

I. Call to Order

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

II. New Members and Visitors

No new members and no visitors.

III. Astronomical History – Stephen Garretson

First successful stellar parallax measurement in 1838 by [Friedrich Wilhelm Bessel](#) at [Königsberg observatory](#) (then Prussia).



Figure 1: Friedrich Wilhelm Bessel, Stephen Garretson



Figure 2: Königsberg observatory, Stephen Garretson

Bessel used star [61 Cygni](#) for parallax measurement.



The device used is called a [heliometer](#),

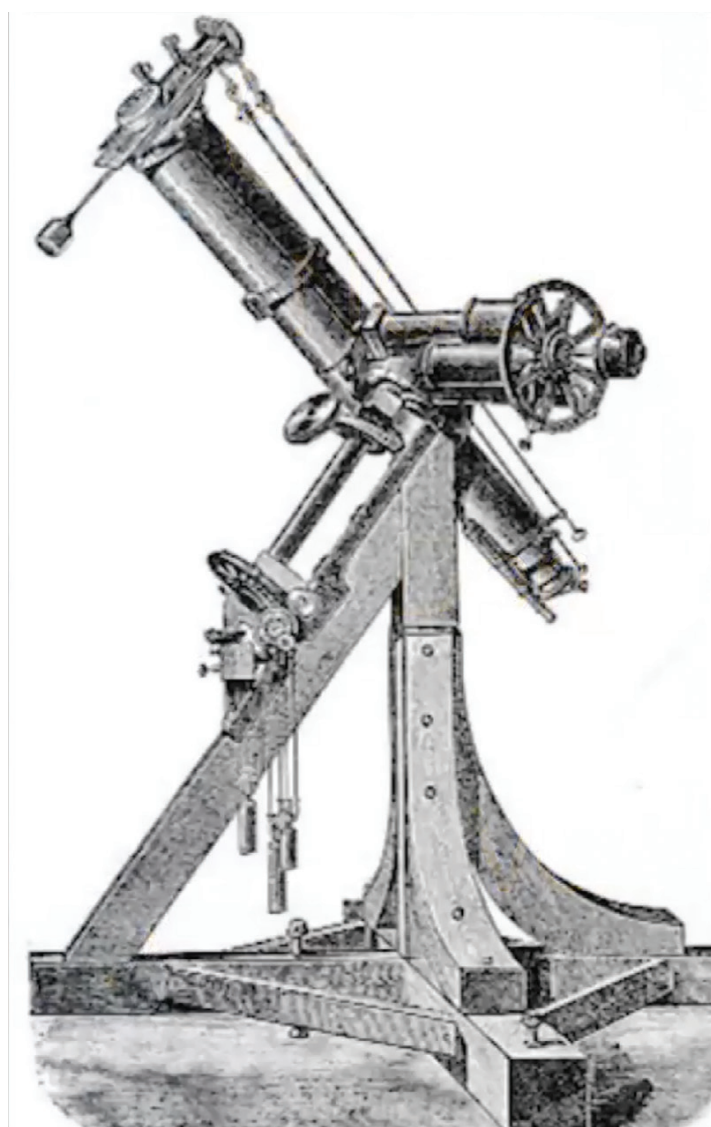
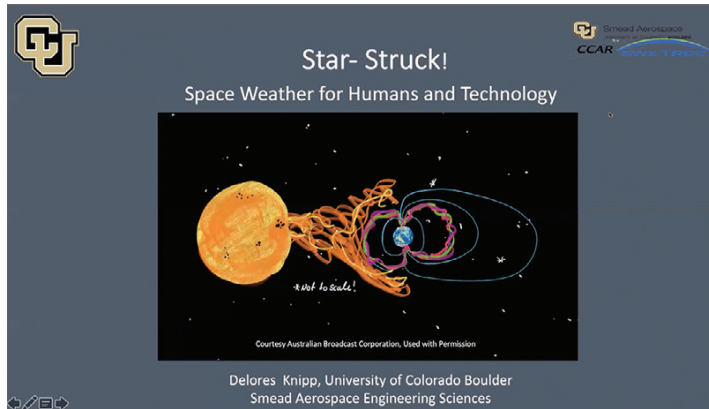


Figure 3: Heliometer, Stephen Garretson

Bessel calculated a distance of 10.3 lys, very close to the established distance of 11.4 [light years](#).

IV. Main Presentation

[Prof. Dr. Dolores Jane Knipp](#): Star-Struck! Space Weather For Humans and Technology



V. Financial Report - Bruce Lamareaux

Main Checking Account - \$6,560
2-Year Savings Account - \$8,100
Telescope Fund - \$1,100
Petty Cash - \$50
Total Assets - \$15,810

VI. Old Business

- LAS calendars are ready. Can be purchased through LAS' online shop.

VI. New Business

- Members who wish to serve on the board for calendar year 2022 should come forward
- No December meeting

VII. Adjournment

Stephen adjourns meeting at 9:04pm.

Sven Schmidt, Secretary

Newsletter Archives

10 Years Ago - Dec. 2011



The Prez, Vern, Raben got up early and took these pictures in Gary's yard
Longmont Astronomy Society Newsletter
December 2011



The main topic of the meeting this month will be our proposal to the city of Longmont for an observatory south of the Sunset Golf Course.

Gary, Dan, and Vern have met with Dr. Frank Melsheimer (DFM Engineering) and Meinte Veldhuis (president of the Little Thompson Observatory board of directors) about the site. Their advice about the placement and design of the observatory is greatly appreciated. Dan Davis has been working on a preliminary design for the observatory which will be presented at the meeting.

Next year is the 25th year anniversary of the founding of the Longmont Astronomical Society. Our silver anniversary is a significant milestone and is cause for celebration!!

20 Years Ago - Dec. 2001



Leonid Meteor Shower of 2001. There were at least 60 people at "Cactus Flats" (along CR65, Pawnee National Grassland) to watch the meteor shower. We had great fun viewing with scopes until about 11:30 when it clouded over. It started to clear about 1:30 am and a few meteors were seen; they kept increasing.

Around 2:30 am 2 or 3 at a time could be seen. At the predicted peak at 3 am we were seeing 8 to 10 per second. We estimated the hourly rate to be about 10,000. There were at least 5 bolides. Some left trails lasting 15 minutes. The main meteor shower lasted about 2.5 hours. It was a night that everyone will remember the rest of their lives.

No newsletter was published for Dec. 1991

Electronically Assisted Astronomy by Vern Raben

What to do if you love exploring objects in the night sky and yet live in a bright suburban area? You can drive for several hours and spend a few days under wonderful dark skies. But wouldn't it be nice if you could view those same objects with your own telescope from your own back yard? Electronically assisted astronomy (EAA) offers a solution to that problem by replacing our limited eyesight at the telescope eyepiece with much more sensitive electronic devices. This article will discuss the use of video cameras and ignore other alternatives such as image intensifiers.

The requirements for EAA equipment are somewhat less than for long exposure astrophotography. Exposure time needed is a few seconds and not several hours. Less expensive mounts or even alt-azimuth mounts may be used as the exposures are only a few seconds long.

The objective of EAA is to view an astronomical object and not to produce a work of art. The images produced are near real time and can be viewed as soon as the software outputs them.

At the present time the most popular software for EAA is an application called "SharpCap" developed by Robin

Glover and David Richards in the UK. A free version maybe downloaded from <https://www.sharpcap.co.uk/sharpcap/downloads>. Note that for EAA the "pro" version is needed (\$16 per year).

To produce images in a short time interval "fast" optics are needed, a focal ratio of F/5 or less is typical. Also needed is a sensitive video camera. Zwo Optical's ASI 294 is a current popular choice for EAA. UV and IR filters are often used and occasionally a light pollution filter. People currently active in EAA are starting to use multi-band filters which have become available in the last couple years.

A few weeks ago I decided to give EAA a try. I purchased an Optolong L-Pro filter and put it on the Hyperstar for my old 11 inch Celestron (which is then a fast F/2). I looked around the basement and found the Zwo ASI-071-Cool camera I bought about six years ago (and never used much). I was impressed what SharpCap could do with the images from the Fastar and ASI; I've been out every clear night since.

Below is an image of the Rosette nebula. It is the result of only six 20 second exposures. It is a snap shot of the



NGC 2237 "Rosette" Nebula in Monoceros

"Live Stack" image produced by the SharpCap application. Other than being resized and cropped for publication it has not been processed or enhanced in any way. The SharpCap "Live Stack" software handles dark frame subtraction, flat

fielding, and uses an interactive histogram tool so you can bring out some of the details. It takes only two 20 sec images in “Live Stack” to see a similar image on the notebook’s screen. Exposure for all images below was 20 sec with a gain of 350; stack size was six; flat field corrected and dark frame subtracted; images are resized and cropped for publication only. The times are totally arbitrary settings but the goal was to wait a very short period before the object was apparent (20 sec) and complete all adjustments in a couple of minutes. It takes about 3 minutes to slew and view each object.



The Planets in December by Vern Raben

Mercury

Mercury becomes visible in the evening between 5:30 and 6 at the end of the month. Its apparent brightness will be magnitude -0.7 and the disk 6 arc sec across.

Venus

Venus is the brightest object in the southwest in the evening around 6 pm. It is around magnitude -4.7 to -4.3 in brightness and increases in apparent diameter from 40 arc sec across to 60 arc sec this month.

Mars

Mars may be seen very low in the ESE around 6:30 am in constellation Libra. It moves into Scorpio on the 15th and then to Ophiuchus on the 25th. It will be magnitude +1.6 in brightness and its disk will be 3.9 arc sec across. Next Mars opposition is Dec. 7, 2022.

Jupiter



Jupiter is in constellation Capricornus in the SSW during the early evening. It moves into Aquarius on the 14th. It decreases in brightness from magnitude -2.3 to -2.2 and decreases in size from 38 to 35 arc sec across. The Great Red Spot crosses the center of its disk at the following times this month:

Dec 2 at 8:14 pm at altitude 26°

Dec 5 at 5:45 pm at altitude 36°

Dec 7 at 7:25 pm at altitude 27°

Dec 12 at 6:35 pm at altitude 31°

Dec 17 at 5:45 pm at altitude 34°

Dec 19 at 7:24 pm at altitude 22°

Dec 24 at 6:35 pm at altitude 27°

Dec 29 at 5:45 pm at altitude 31°

Saturn

Saturn is visible low in the SW in constellation Capricornus during early evenings. It about magnitude +0.7 in brightness and its disk is 16 arc sec across.



Uranus

Uranus is in the constellation Aries. It is magnitude 5.7 in brightness and the disk is 3.7 arc sec across. It is at opposition on Nov. 4.

Neptune

Neptune is visible in the constellation Aquarius. It is magnitude 7.9 in brightness and its disk is 2.2 arc sec across.

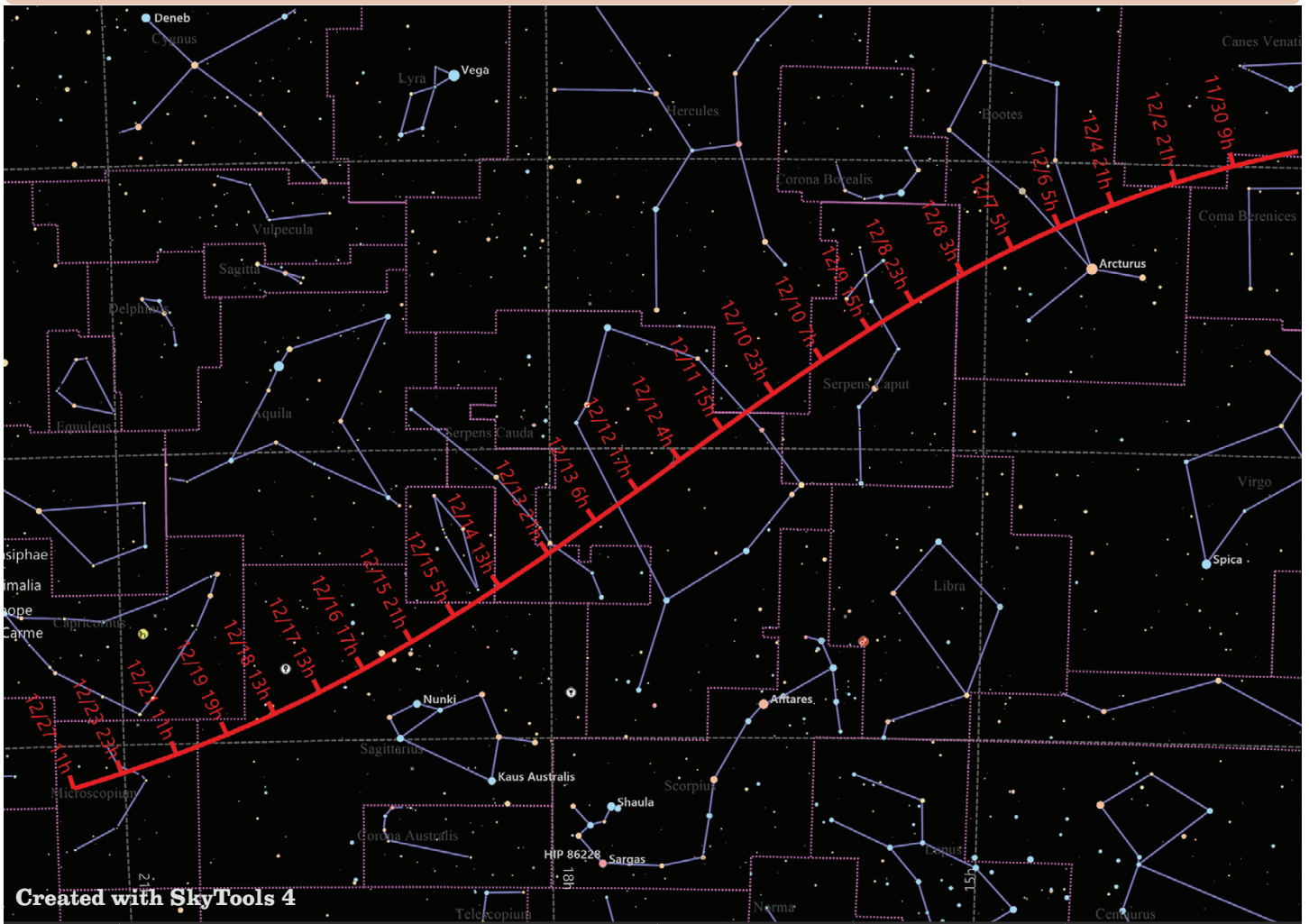
Lunar Phases



Meteor Showers

The Geminids meteor shower will peak on the 18th around 8pm. Typically the Geminids is the best meteor shower of the year. Unfortunately it peaks the same night as the full moon so only the brightest will be visible.

Comet 2021 A1 (Leonard)



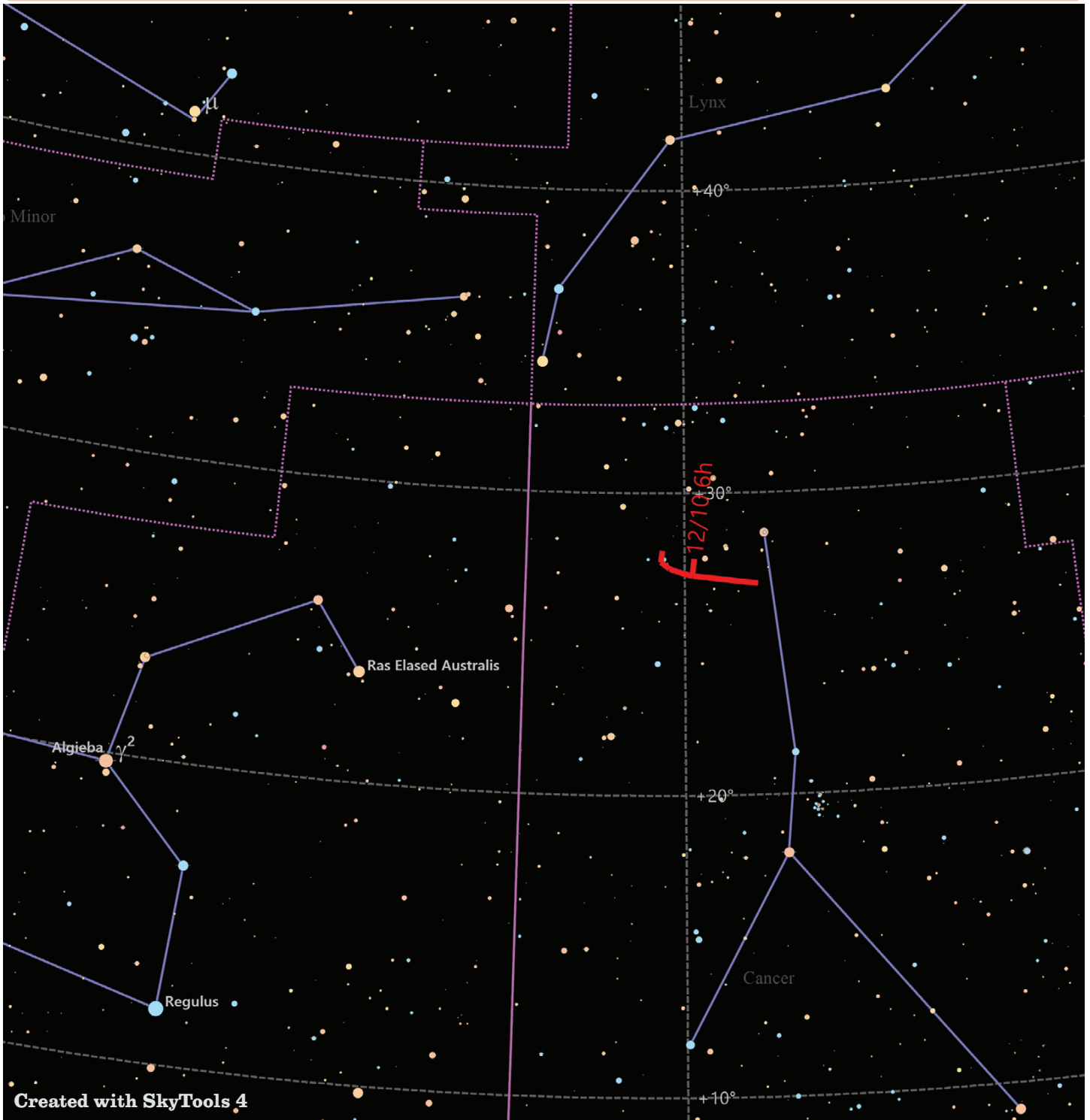
Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Dec 1	5:29 am	13h36m13.4s	+28°45'05"	Canes Venatici	5.8	16.7
Dec 7	5:38 am	15h12m03.0s	+17°53'10"	Serpens	4.2	27.4
Dec 14	5:42 pm	18h26m53.0s	-15°08'27"	Scutum	3.5	31.0
Dec 19	5:52 pm	20h15m57.5s	-29°05'08"	Sagittarius	4.1	20.3



Comet C/2021 A1 (Leonard) by Jim Pollock on Nov 29

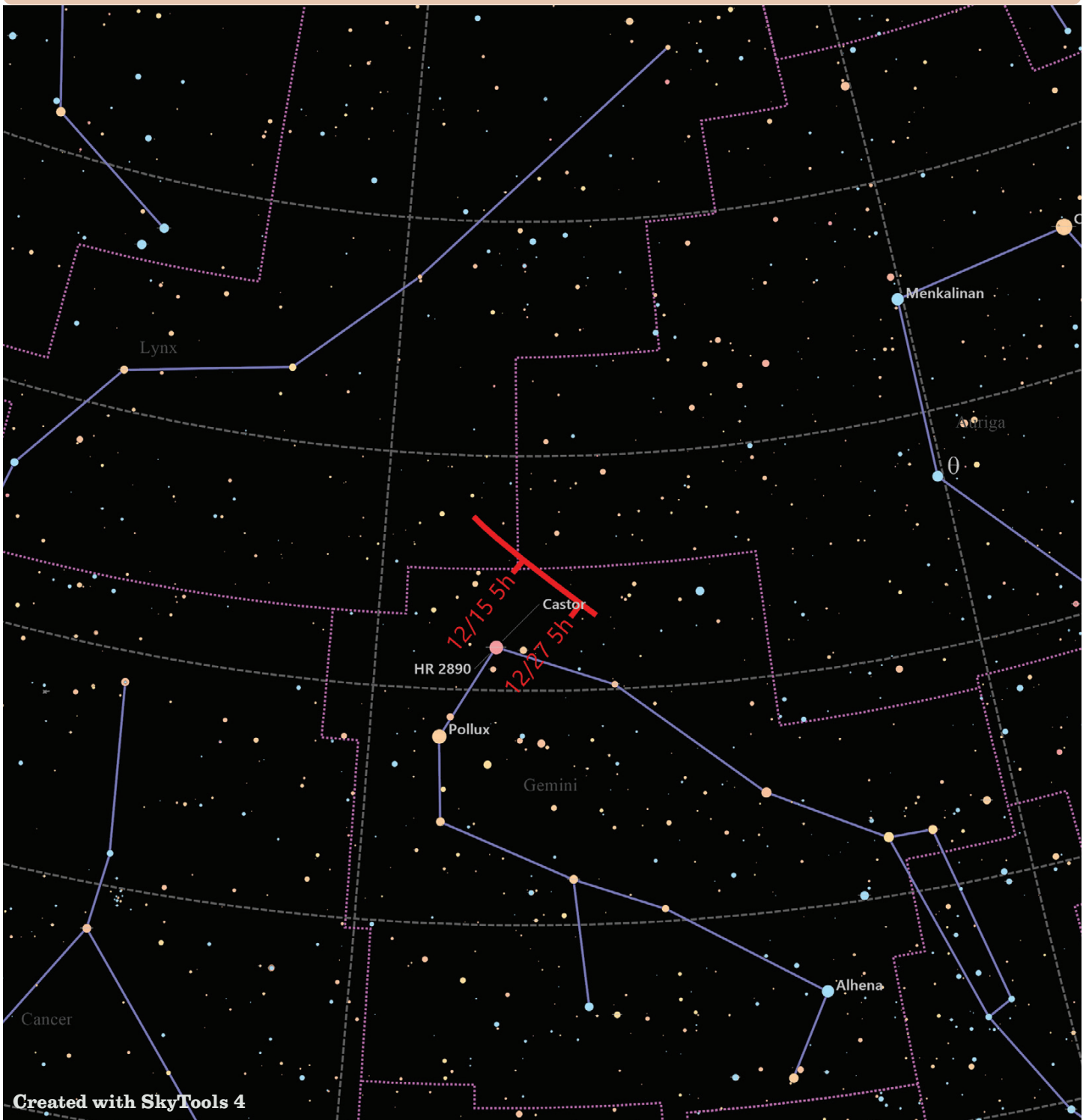
Comet 67P/Churyumov-Gerasimenko



Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Dec 1	4:03 am	08h48m59.7s	+26°58'56"	Cancer	9.6	5.0
Dec 7	3:47 am	08h56m51.8s	+27°10'43"	Cancer	9.8	4.9
Dec 14	4:01 am	09h02m14.1s	+27°30'09"	Cancer	9.9	4.8
Dec 19	5:00 am	09h03m41.3s	+27°47'07"	Cancer	10.0	4.7
Dec 25	2:35 am	09h03m04.5s	+28°08'42"	Cancer	10.2	4.6
Dec 31	2:16	09h00m12.5s	+28°30'11"	Cancer	10.4	4.4

C/2019 L3 (ATLAS)



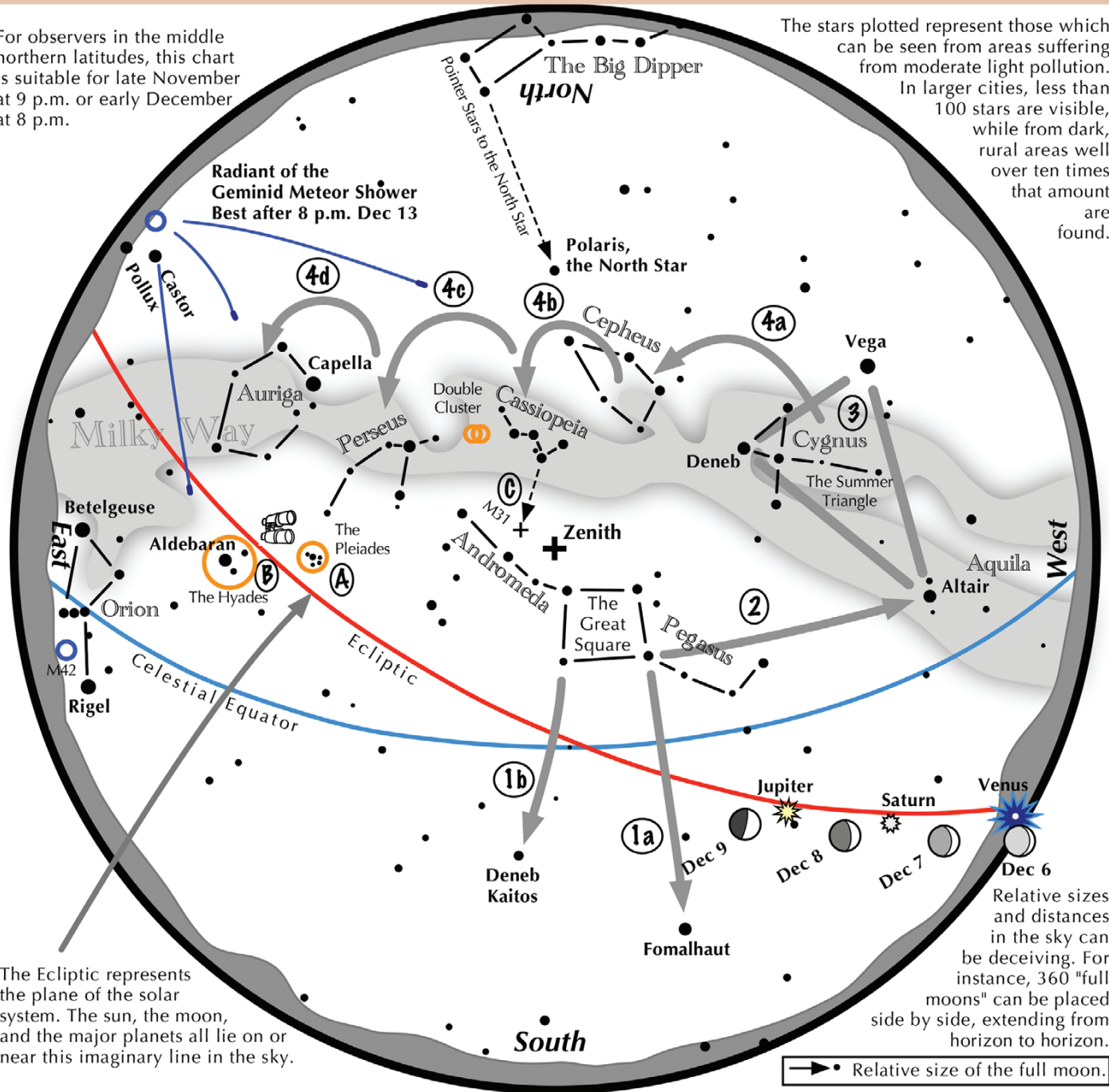
Created with SkyTools 4

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Dec 1	2:56 am	07h40m42.5s	+37°17'32"	Lynx	9.6	3.5
Dec 7	2:28 am	07h36m29.0s	+36°32'56"	Lynx	9.6	3.6
Dec 14	3:56 am	07h30m33.4s	+35°34'54"	Auriga	9.5	3.7
Dec 19	3:31 am	07h25m53.2s	+34°50'09"	Gemini	9.5	3.7
Dec 25	11:33 pm	07h20m03.2s	+33°53'39"	Gemini	9.5	3.8
Dec 31	12:31 am	07h13m46.5s	+32°50'37"	Gemini	9.5	3.8

Navigating the mid December Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for late November at 9 p.m. or early December at 8 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.



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

- 1 Face south. Almost overhead is the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend an imaginary line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the southwest. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second bright star in the south.
- 2 Draw another line, this time westward following the southern edge of the Square. It strikes Altair, part of the "Summer Triangle."
- 3 Locate Vega and Deneb, the other two stars of the "Summer Triangle." Vega is its brightest member while Deneb sits in the middle of the Milky Way.
- 4 Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, to Perseus, and finally to Auriga with its bright star Capella.

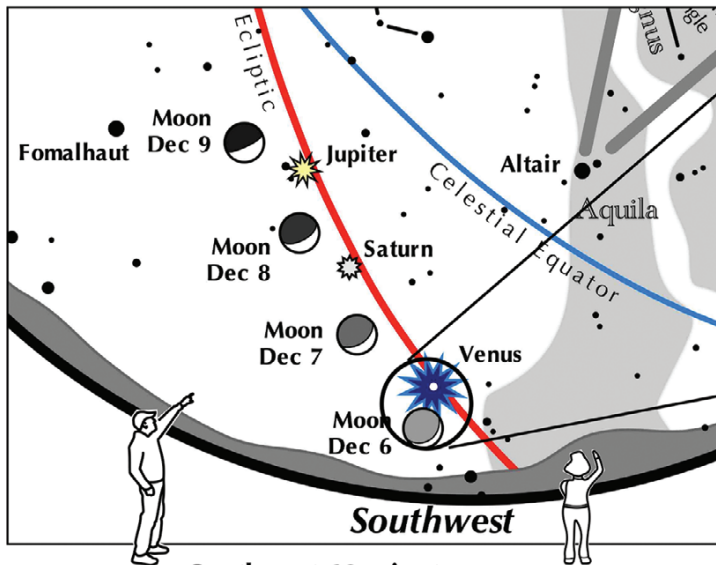
Binocular Highlights

- A and B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters.
- C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D:** Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas.

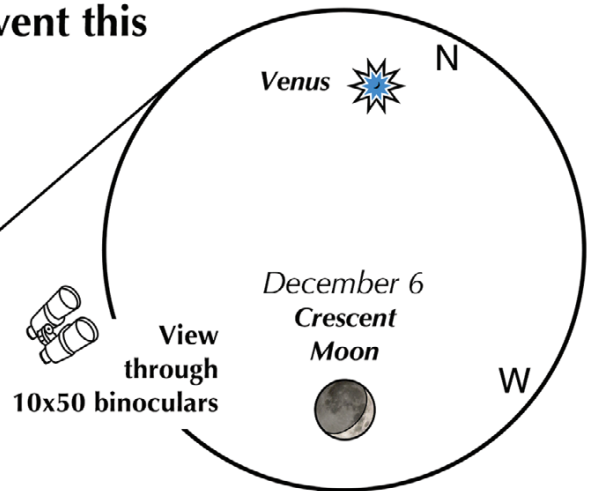


Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.

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



Southwest 60 minutes after sunset in early December



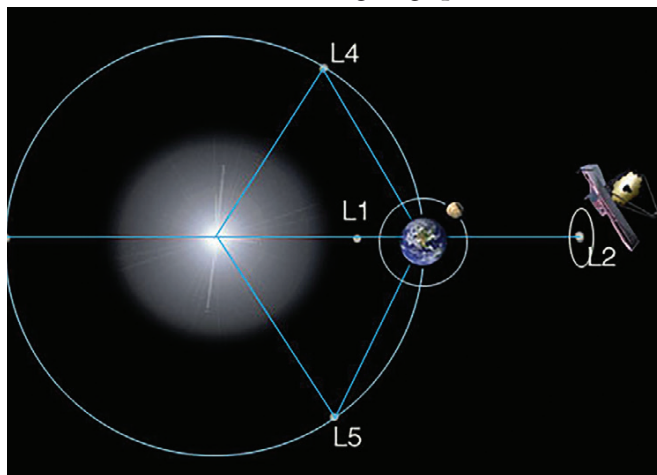
Crescent Moon slides under crescent Venus

Look to the southwest 60 minutes after sunset during the first week of December.

- The planets – Venus, Saturn, and Jupiter – will be evenly spaced with Venus nearest the horizon.
- On December 6, Venus will be at its most brilliant.
- On December 6, the thin crescent Moon lies under Venus. Look at them through binoculars. Venus will show a tiny thin crescent, looking like a miniature Moon. The Moon will reveal its night side due to the magical light of Earthshine.
- For the next three nights, the Moon seems to slide up an invisible celestial necklace, first passing Saturn, then Jupiter.

James Web Space Telescope to launch in late December

The James Web Telescope is currently scheduled for launch on December 22 aboard a European Space Agency Ariane-5 rocket from ELA-3 launch complex Kourou, French Guiana. It will then begin a 30 day journey to its orbit around the Earth's second Lagrange point (L2).



Development of the JWST began in 1996 with a launch planned for 2007 at an initial budget of \$500 million. The project has had numerous delays and cost overruns. The projected cost is currently about \$10 billion.

The telescope is designed for observing in near infrared but can also view mid infrared as well as orange and red visible light. It has a 21 foot diameter reflector mirror fabricated from beryllium with a gold coating.

The objectives are to:

- Look back in time to see the first galaxies
- Image the universe in unprecedented clarity
- See how the structure and composition of galaxies evolve across cosmic time
- Study how stars form and chemical elements are produced

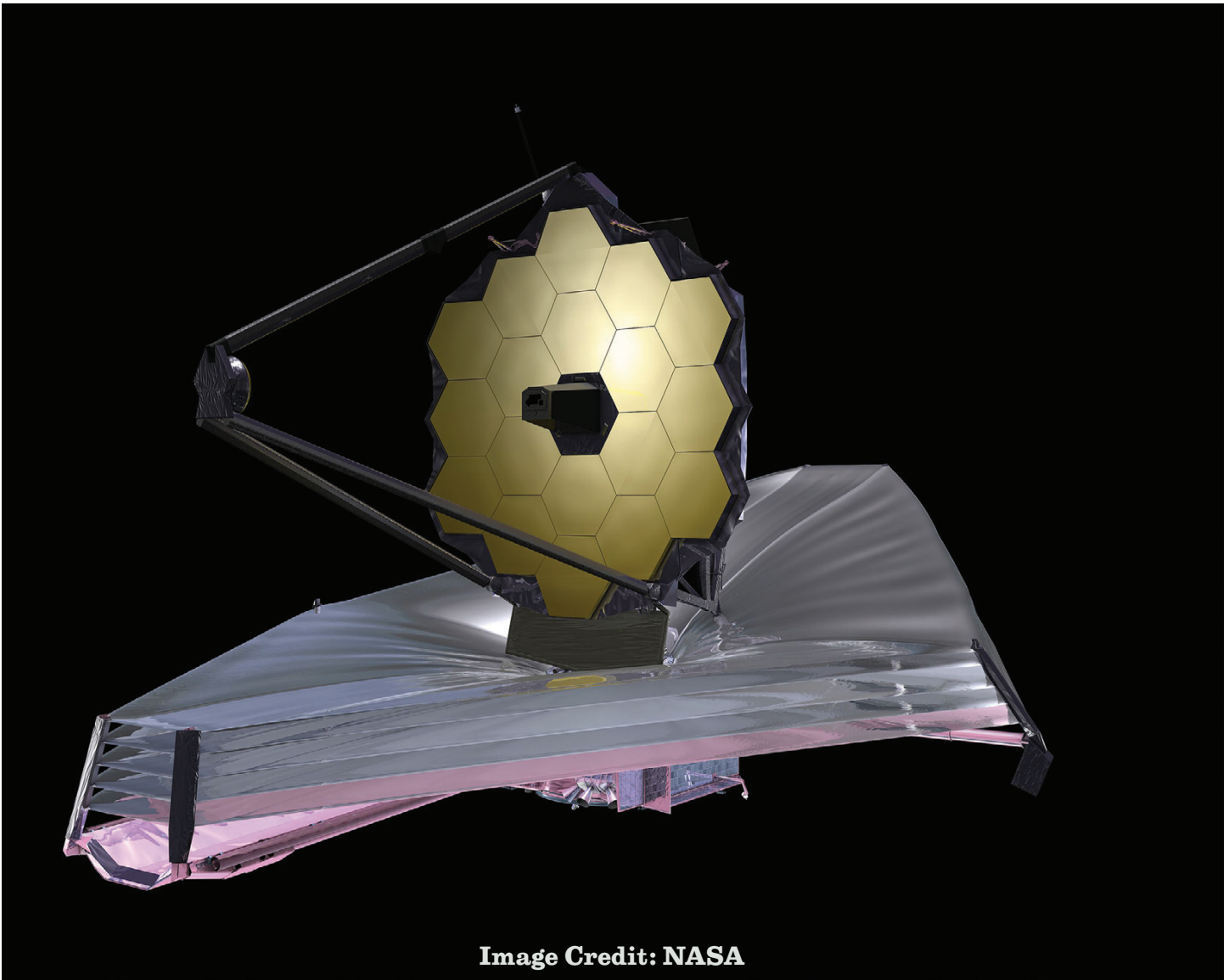


Image Credit: NASA

JWST will revolutionize our understanding of exoplanet atmospheres.

To meet the objectives JWST requires the largest cryogenic telescope ever built

- 7X the light gathering capability of the Hubble space telescope
- Observing capability optical to mid infrared spectrum
- Hubble like angular resolution in the near infrared

The JWST will be able to observe the entire sky while remaining in the shadow of its sun shield.

The JWST space vehicle consists of three elements:

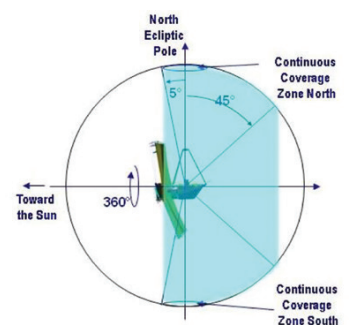
- Optical telescope element (OTE) to collect star light from distant objects
- Integrated Science Instrument Module (ISIM) to extract physics information from star light
- Spacecraft to control attitude, telecom, power, and other

systems

The ISIM consists of

- NIRCam to image early galaxy formation
- NIRSpec to obtain spectrum of 100 compact galaxies simultaneously
- MIRA will provide first high definition view of the mid-infrared universe
- FGS to sense pointing to millionth degree precision

With the JWST we will see the beginning of everything!





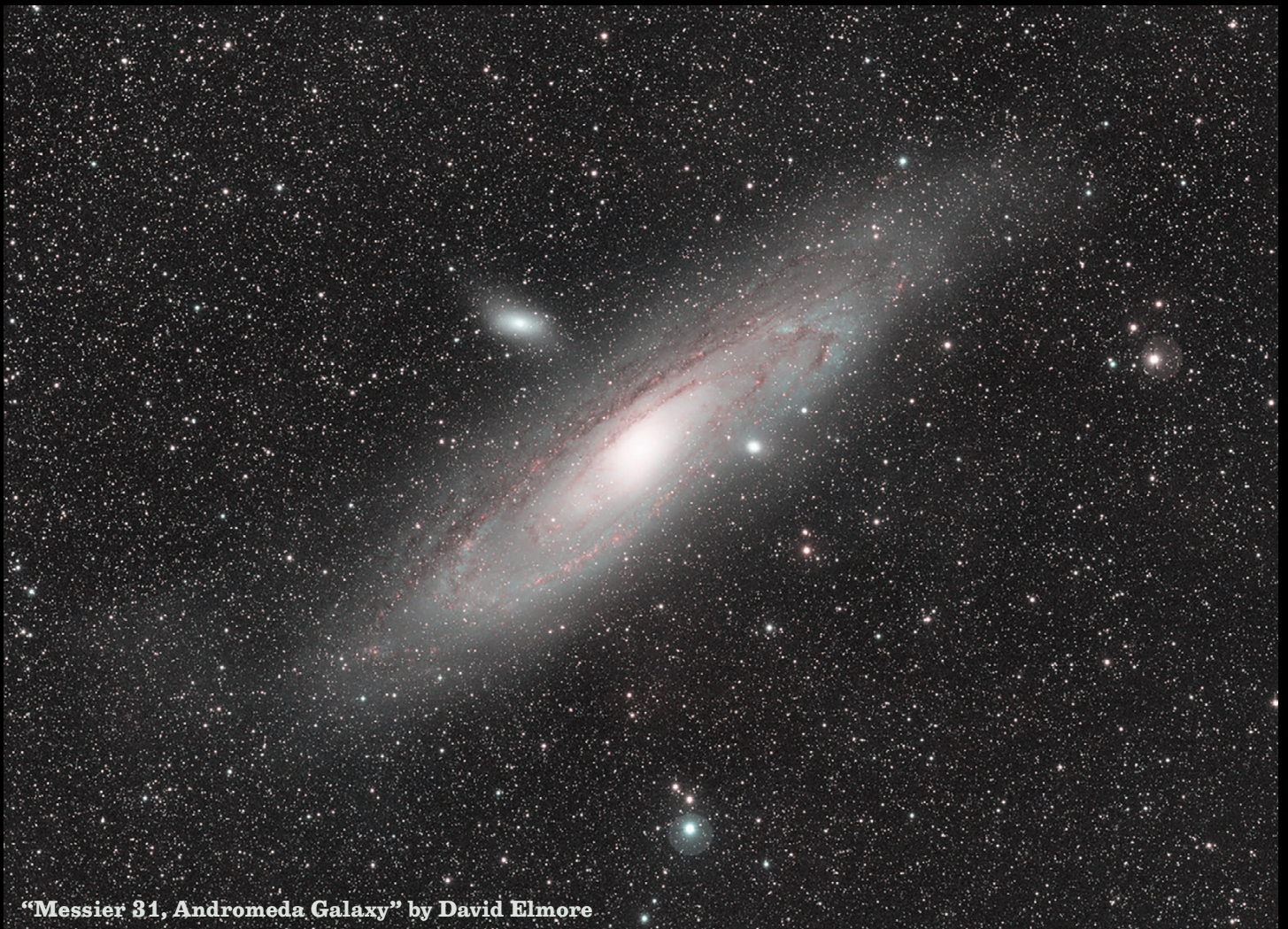
“LBN 853” by David Elmore. Two panel mosaic composed from 44 exposures each 10 minutes (7+ total hours). Borg 55FL 200mm focal length F/3.6 astrograph, ZWO ASI2400MC Pro, IDAS NBZ dual band H-alpha/Oxygen III filter. From my observatory at Dark Sky New Mexico 8/9 November 2021.



"Dark Shark" in constellation Cepheus by David Elmore on Nov 5



"Dark Shark's partner" by David Elmore



"Messier 31, Andromeda Galaxy" by David Elmore



“Partial Lunar Eclipse” by Gary Garzone on Nov. 19

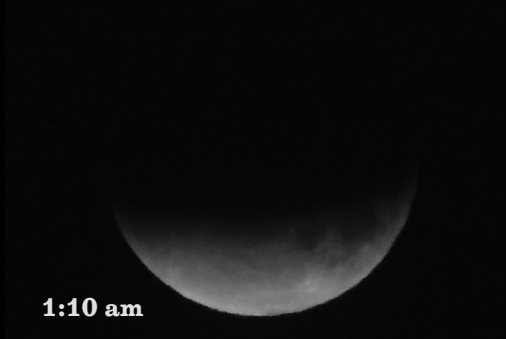


“Comet 67P” by Gary Garzone on Nov. 20



“Messier 15, globular cluster in constellation Pegasus” by Gary Garzone

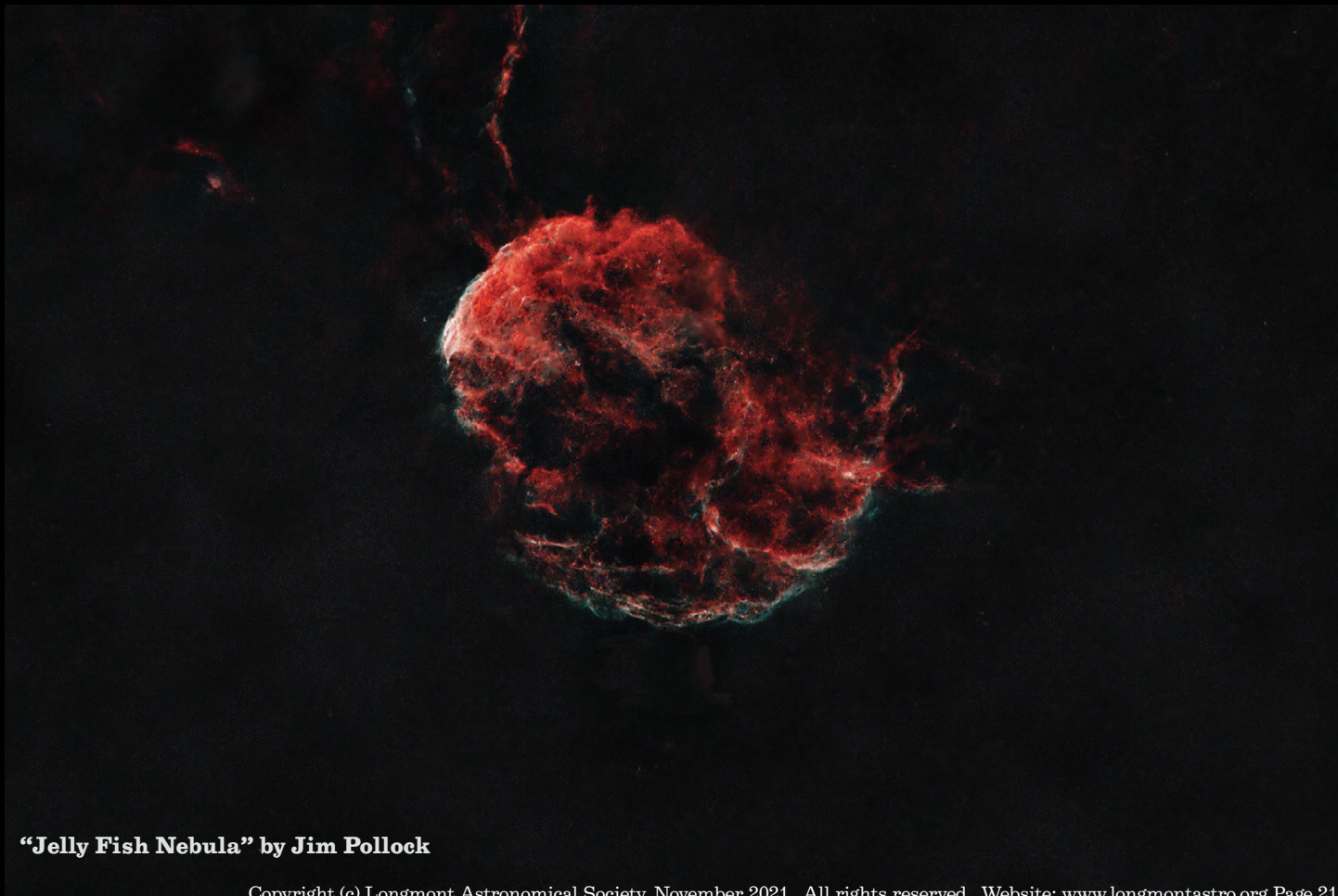
M 15 GC



"Partial Lunar Eclipse on Nov. 19 by Jim Elkins



“Rosette Nebula” by Jim Pollock



“Jelly Fish Nebula” by Jim Pollock



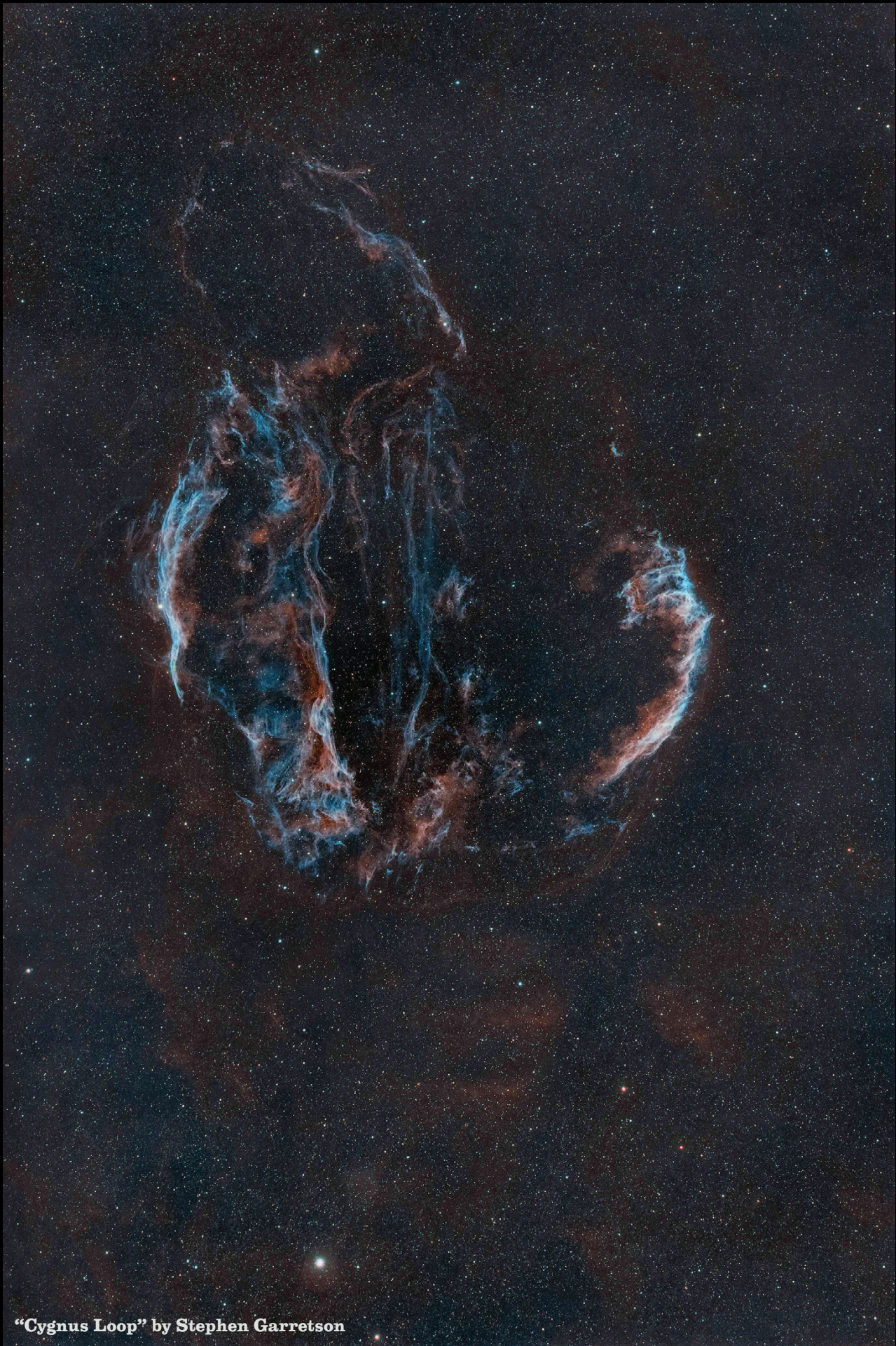
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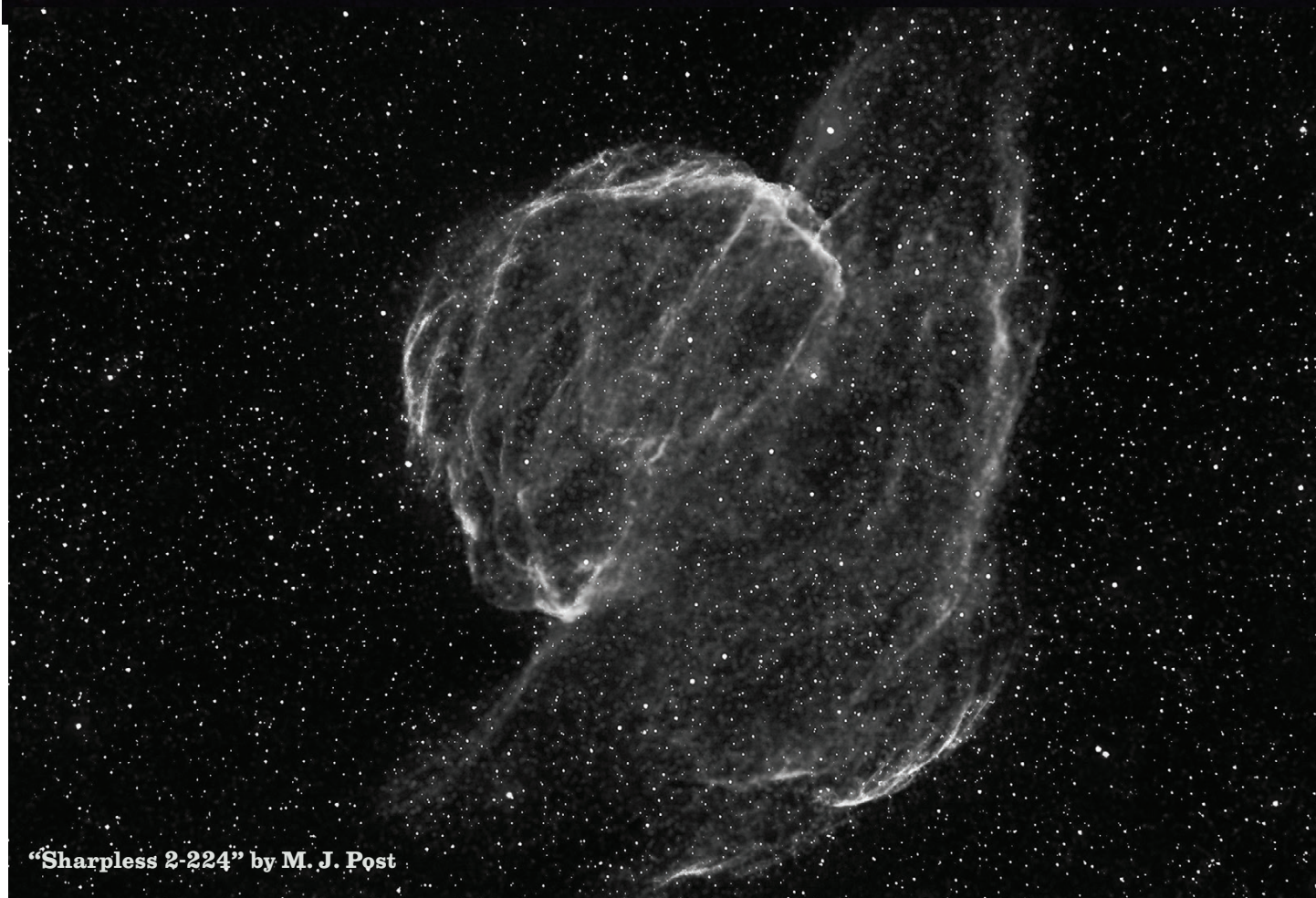
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“Messier 45, Pleiades” by Daryl Hedges and processing by Robert Arn

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“M33, TRIANGULUM GALAXY” BY ROLANDO GARCIA