

Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

August 2020

Membership Meeting

See President's Message for August
Centennial Observatory

Due to the impossibility of maintaining proper social distance within the confined space of the observatory dome, the observatory is currently closed until further notice.

Faulkner Planetarium

See page 11 for Details

www.mvastro.org

Club Officers

Robert Mayer, President
mayerrbrt@gmail.com

Gary Leavitt, Vice President
leavittg@cableone.net

Dr. Jay Hartwell, Secretary

Jim Tubbs, Treasurer / ALCOR
jtubbs015@msn.com
208-404-2999

David Olsen, Newsletter Editor
editor@mvastro.org

Rick Widmer, Webmaster
rick@developersdesk.com

Magic Valley Astronomical Society is a
member of the Astronomical League



M-51 imaged by
Rick Widmer &
Ken Thomason
Herrett Telescope - Shotwell Camera

MVAS President's Message

Colleagues,

Thank you for your support and attendance at last month's Zoom meeting. While the July meeting was relatively brief and of short notice, it was still well attended and a positive start as we work our way out of this. As of this moment, we are still working on the August presentation, but hope to have details soon.

That same day the Herrett Center under the supervision of Chris Anderson beamed the views of the Centennial Observatory telescope into Faulkner Planetarium. It was quite clear the event was a technological success. We are grateful to Chris for all of the work he put into making that work, and we're curious as to what he will come up with August.

In the meantime, we have seen some great photos of Comet NEOWISE. It is great to have an event like this at this time. The images have come from a variety of sources and skill sets, and have easily been welcomed. It will be hard-pressed to find a better comet in a long, long time; the next comet of an interest is supposed to be 88P/Howell in the southern September skies, but some data suggests it won't reach the hoped magnitude of 9.5, which in itself paled in comparison to NEOWISE.





In the meantime, keep the images coming. We look forward to what you're seeing. August is always a great time for the southern skies, so it will be exciting to see what you come up with.

Clear Views,

Rob Mayer

Calendar

August 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
2	3 Sturgeon Moon 9:59 am  Visible 100% Age: 14.62 Days	4	5	6		1/8
9	10	11 Last Quarter Moon  Visible: 52% ↓ Age: 21.97 Days	12	13	14	15
16	17	18	19 New Moon  Visible 0% Age: 0.44 Days	20	21	22
23	24	25 First Quarter Moon  Visible 47% ↑ Age: 7.11 Days	26	27	28	29
30	31					

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Be Careful – Be Safe – Get Out There – Explore Your Universe

August Celestial Calendar by Dave Mitsky

All times, unless otherwise noted, are UT (subtract 7 hours and, when appropriate, 1 calendar day for MDT)

- 8/1 Mercury is at the ascending node through the ecliptic plane at 12:00; Venus is at its southernmost latitude from the ecliptic plane (-3.4 degrees) at 15:00
- 8/2 The Moon is 1.5 degrees south of Jupiter at 0:00; Mercury is 6.6 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 1:00; the Moon is 1.1 degrees south of Pluto, with an occultation taking place in most of eastern Antarctica, at 6:00; Uranus is at western quadrature at 11:00; the Moon is 2.3 degrees southeast of Saturn at 14:00
- 8/3 Mars is at perihelion (1.3814 astronomical units from the Sun) at 9:00; Full Moon (known as the Fruit, Grain, Green Corn, or Sturgeon Moon) occurs at 15:59
- 8/6 The astronomical cross-quarter day known as Lammas or Lughnasadh occurs today; Mercury is at perihelion (0.3075 astronomical units from the Sun) at 4:00; the Moon is 4.0 degrees southeast of Neptune at 19:00
- 8/9 Mercury is 0.1 degrees southeast of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 1:00; the Moon is 0.8 degrees southeast of Mars, with an occultation occurring in the Ascension Islands, southeastern South America, and most of western Antarctica, at 8:00; the Moon is at apogee, subtending 29' 32" at a distance of 404,659 kilometers (251,443 miles) at 14:00
- 8/10 The Sun enters the constellation of Leo, at longitude 138.2 degrees on the ecliptic, at 9:00; Venus is 4.4 degrees south of the bright open cluster M35 in Gemini at 11:00
- 8/11 The Moon is 3.3 degrees southeast of Uranus at 0:00; Last Quarter Moon occurs at 16:45
- 8/12 The Curtiss Cross, an X-shaped clair-obscur illumination effect located between the craters Parry and Gambart, is predicted to be visible at 12:56; the peak of the Perseid meteor shower (a zenithal hourly rate of 90 or more per hour) occurs at 13:00; the Moon is 6.4 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 16:00; Venus is at dichotomy (50% illumination) at 21:00
- 8/13 Venus is at greatest western elongation (45.8 degrees) at 0:00; the Moon is 3.9 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 10:00
- 8/14 The Moon is at the ascending node (longitude 87.8 degrees) at 19:00
- 8/15 A double Galilean shadow transit (Io's shadow follows Ganymede's) begins at 4:08; the Moon is 0.6 degrees southeast of the bright open cluster M35 at 5:00; the Moon is 4.0 degrees north of Venus at 14:00; Uranus is stationary, with retrograde (western) motion to begin, at 17:00
- 8/16 Mercury is at its northernmost latitude from the ecliptic plane (7.0 degrees) at 9:00; the Moon is 8.1 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 15:00; the Moon is 4.5 degrees south of the first-magnitude star Pollux at 20:00
- 8/17 Mercury is in superior conjunction with the Sun (1.354 astronomical units from Earth, latitude 7.0 degrees) at 15:00; the Moon is 2.0 degrees north-northeast of the bright open cluster M44 at 19:00
- 8/19 New Moon (lunation 1208) occurs at 2:42; the Moon is 2.7 degrees north-northeast of Mercury at 6:00; the Moon, Mercury, and the first-magnitude star Regulus (Alpha Leonis) lie within a circle with a diameter of 4.0 degrees at 8:00; the Moon is 4.1 degrees north-northeast of Regulus at 9:00
- 8/20 Mercury is 1.3 degrees north-northeast of Regulus at 4:00
- 8/21 The Moon is at perigee, subtending 32' 52" from a distance of 363,513 kilometers (225,876 miles), at 11:00; the Sun's longitude is 150 degrees at 16:00
- 8/22 A double Galilean shadow transit (Ganymede's shadow follows Io's) begins at 6:32
- 8/23 The Moon is 6.6 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 2:00; Mars and Neptune are at heliocentric conjunction (longitude 349.4 degrees) at 22:00
- 8/25 First Quarter Moon occurs at 17:58
- 8/26 The Lunar X, also known as the Werner or Purbach Cross, an X-shaped clair-obscur illumination effect involving various ridges and crater rims located between the craters La Caille, Blanchinus, and Purbach, is predicted to be fully formed at 1:06; the Moon is 6.0 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 8:00
- 8/27 The Moon is at the descending node (longitude 266.8 degrees) at 12:00
- 8/28 The dwarf planet/asteroid 1 Ceres is at opposition at 12:00
- 8/29 The Moon is 1.4 degrees south of Jupiter at 2:00; the Moon is 1.2 degrees south of Pluto, with an occultation taking place in most of western Antarctica and Queen Maude Land, at 11:00; the Moon is 2.2 degrees southeast of Saturn at 18:00
- 8/31 Venus is 8.6 degrees south of Pollux at 21:00

The Sun, the Moon, & the Planets



The **Sun** is located in Cancer on August 1st. It enters the constellation of Leo on August 10th and achieves an ecliptic longitude of 150 degrees on August 21st.

The **Moon** is 11.1 days old, is illuminated 91.3%, subtends 31.6 arc minutes, and is located in Sagittarius on August 1st at 0:00 UT. The Moon is at its greatest northern declination on August 16th (+24.1 degrees) and its greatest southern declination on August 1st (-24.0 degrees) and on August 29th (-24.1 degrees). Longitudinal libration is at a maximum of +4.9 degrees on August 2nd and +5.9 degrees on August 28th and a minimum of -6.3 degrees on August 16th. Latitudinal libration is at a maximum of +6.7 degrees on August 7th and a minimum of -6.6 degrees on August 21st. Favorable librations for the following lunar features occur on the indicated dates: Mare Marginis on August 1st, Mare Orientale on August 16th, Mare Australe on August 24th, and Mare Smythii on August 27th. An article on observing lunar maria during librations taking place this month appears on pages 52 and 53 of the August 2020 issue of *Sky & Telescope*. The Moon is at apogee (at a distance 63.45 Earth-radii) on August 9th and at perigee (at a distance of 57:00 Earth-radii) on August 21st. New Moon (i.e., the dark of the Moon) occurs on August 19th. A young waxing crescent Moon passes a bit more than one degree from the binary star Porrima (Gamma Virginis) on August 21st. The Moon occults Pluto on August 2nd and August 29th and Mars on August 9th from certain parts of the world.

Mercury lies very low in the sky at dawn. It's at perihelion on August 6th and at its greatest heliocentric latitude north on August 16th. The speediest planet is in inferior conjunction on August 17th. It will become visible again in the evening sky near the end of the month.

During August, **Venus** dips in brightness from magnitude -4.5 to magnitude -4.3 and in angular size from 27.2 arc seconds to 21.7 arc seconds, while it grows in illumination from 43% to 59%. Venus and the third-magnitude star Zeta Tauri are less than two degrees apart in early August. Venus is at its greatest heliocentric latitude south on August 2nd. It reaches greatest western elongation on August 12th but doesn't attain its highest sunrise altitude of approximately 40 degrees until month's end. The waning crescent Moon passes four degrees to the north of the planet on August 15th. Venus travels eastward through Taurus and northern Orion and enters southern Gemini near the end of August.

Mars rises two hours after sunset by the end of August. The Red Planet brightens from magnitude -1.1 to magnitude -1.8 and increases in angular diameter from 14.6 arc seconds to 18.7 arc seconds. Mars is at perihelion on August 3rd. An impressive lunar conjunction takes place on August 9th, when the waning gibbous Moon passes about one degree to the south of Mars.

Jupiter decreases slightly in brightness from magnitude -2.7 to magnitude -2.6 and diminishes in apparent size from 47.2 to 44.4 arc seconds during August. Jupiter remains approximately eight degrees west of Saturn this month. The distance slowly increases as both gas giants retrograde. The waxing gibbous Moon passes two degrees to the south of Jupiter on August 1st/August 2nd and again on August 28th/August 29th. Double Galilean satellite shadow transits occur on August 14th and August 22nd.

Saturn shrinks from 18.4 to 18.0 arc seconds in angular diameter and drops in brightness from magnitude +0.1 to +0.3 this month. Its rings are inclined by more than 22 degrees with respect to the Earth and span 42 arc seconds. On August 2nd and August 29th, the waxing gibbous Moon passes two degrees to the south of Saturn. For information on Saturn's satellites, browse [Sky and Telescope](#).

Uranus is located in southern Aries. It transits the meridian around sunrise. The waning gibbous Moon passes three degrees southeast of Uranus on the night of August 10th/August 11th. Uranus reaches its first stationary point on August 15th. On that date, it will be at its highest declination (almost +15 degrees) since the early 1960s. A finder chart is available at [Naked Eye Planets](#).

Neptune can be found in eastern Aquarius. The waning gibbous Moon passes four degrees southeast of Neptune on August 6th. Mars and Neptune are at heliocentric conjunction on August 23rd. See [this Naked Eye Planet site](#) for a finder chart.

The dwarf planet **Pluto** is occulted by the Moon from some parts of the world on August 2nd and August 29th. Finder charts can be found at pages 48 and 49 of the July 2020 issue of *Sky & Telescope* and on page 243 of the RASC Observer's Handbook 2020.

Asteroids



Asteroid 1 Ceres (magnitude +7.7), which is also classified as a dwarf planet, reaches opposition in southern Aquarius on August 28th. An article on the largest of the asteroids appears on pages 50 and 51 of the August 2020 issue of *Sky & Telescope*. Other asteroids brighter than magnitude +11.0 reaching opposition include 44 Nysa (magnitude +10.6), 138 Tolosa (magnitude +10.8), and 20 Massalia (magnitude +9.7). Information on asteroid occultations taking place this month is available at [Asteroid Occultations](#).

Comets



Comet C/2020 F3 (NEOWISE) put on a fine show last month, reaching naked-eye visibility from reasonably dark sites and producing rather long ion and dust tails. It reached perihelion on July 3rd and made its closest approach to the Earth on July 23rd. Comet NEOWISE will continue to dim as it moves increasingly farther from the Earth.

Meteor Showers



The peak of the **Perseid meteor shower** takes place on the night of August 11th/August 12th and is compromised by moonlight from an almost Last Quarter Moon. The periodic comet 109P/Swift-Tuttle is the source of Perseid meteors. The shower's radiant lies just to the southeast of the Double Cluster (NGC 869 and NGC 884).

Orbiting Earth & Miscellaneous



Information on passes of the ISS, the USAF's X-37B, the HST, Starlink, and other satellites can be found at <http://www.heavens-above.com/>

A wealth of current information on solar system celestial bodies is posted at <http://nineplanets.org/> and <http://www.curtrenz.com/astronomy.html>

Information on the celestial events transpiring each week can be found at <https://stardate.org/nightsky> and <http://astronomy.com/skythisweek> and <http://www.skyandtelescope.com/observing/sky-at-a-glance/>

Free star maps for July can be downloaded at <http://www.skymaps.com/downloads.html> and <https://www.telescope.com/content.jsp?pageName=Monthly-Star-Chart>

Data on current supernovae can be found at <http://www.rochesterastronomy.org/snimages/>

Finder charts for the Messier objects and other deep-sky objects are posted at <https://freestarcharts.com/messier> and <https://freestarcharts.com/ngc-ic> and [https://www.cambridge.org/turnleft/seasonal skies july-september](https://www.cambridge.org/turnleft/seasonal_skies_july-september)

Telrad finder charts for the Messier Catalog and the SAC's 110 Best of the NGC are posted at <http://www.custerobservatory.org/docs/messier2.pdf> and <http://www.saguaroastro.org/content/db/Book110BestNGC.pdf> respectively.

Information pertaining to observing some of the more prominent Messier galaxies can be found at <http://www.cloudynights.com/topic/358295-how-to-locate-some-of-the-major-messier-galaxies-and-helpful-advice-for-novice-amateur-astronomers/>

Stellarium and Cartes du Ciel are two excellent freeware planetarium programs that are available at <http://stellarium.org/> and <https://www.ap-i.net/skychart/en/start>

Deep-sky object list generators can be found at <http://www.virtualcolony.com/sac/> and <http://tonightssky.com/MainPage.php> and <https://dso-browser.com/>

Freeware sky atlases can be downloaded at <http://www.deepskywatch.com/files/deepsky-atlas/Deep-Sky-Hunter-atlas-full.pdf> and <http://astro.mxd120.com/free-star-atlases>

The multiple star 36 Ophiuchi consists of three orange dwarf stars. For more on this interesting system, see <https://stardate.org/radio/program/orange-triplets> and <http://www.solstation.com/stars/36ophiu3.htm>

Deep Sky



Deep-sky object list generators can be found at <http://www.virtualcolony.com/sac/> and <https://dso-browser.com/> and <http://tonightssky.com/MainPage.php>

Sixty binary and multiple stars for August: 5 Aquilae, Struve 2404, 11 Aquilae, Struve 2426, 15 Aquilae, Struve 2449, 23 Aquilae, Struve 2532, Pi Aquilae, 57 Aquilae (Aquila); Beta Cygni (Albireo), 16 Cygni, Delta Cygni, 17 Cygni (Cygnus); 41 & 40 Draconis, 39 Draconis, Struve 2348, Sigma Draconis, Struve 2573, Epsilon Draconis (Draco); 95 Herculis, 100 Herculis, Struve 2289, Struve 2411 (Hercules); Struve 2349, Struve 2372, Epsilon-1 & Epsilon-2 Lyrae (the Double-Double), Zeta-2 Lyrae, Beta Lyrae, Otto Struve 525, Struve 2470 & Struve 2474 (the Other Double-Double) (Lyra); 67 Ophiuchi, 69 Ophiuchi, 70 Ophiuchi, Struve 2276, 74 Ophiuchi (Ophiuchus); Mu Sagittarii, Eta Sagittarii, 21 Sagittarii, Zeta Sagittarii, H N 119, 52 Sagittarii, 54 Sagittarii (Sagittarius); Struve 2306, Delta Scuti, Struve 2373 (Scutum); Struve 2296, Struve 2303, 59 Serpentis, Theta Serpentis (Serpens Cauda); Struve 2445, Struve 2455, Struve 2457, 4 Vulpeculae, Struve 2521, Struve 2523, Struve 2540, Struve 2586, Otto Struve 388, Struve 2599 (Vulpecula)

Notable carbon star for August: V Aquilae

Eighty deep-sky objects for August: B139, B142, B143, NGC 6709, NGC 6738, NGC 6741, NGC 6751, NGC 6755, NGC 6772, NGC 6778, NGC 6781, NGC 6804, PK64+5.1 (Aquila); NGC 6819, NGC 6826, NGC 6834, (Cygnus); NGC 6643, NGC 6742 (Draco); DoDz 9 (Hercules); M56, M57, NGC 6703, NGC 6791, Ste1 (Lyra); NGC 6572, NGC 6633 (Ophiuchus); H20, M71 (Sagitta); B86, B87, B90, B92, B93, M8, M17, M18, M20, M21, M22, M23, M24, M25, M28, M54, M55, M69, M70, M75, NGC 6520, NGC 6544, NGC 6546, NGC 6553, NGC 6565, NGC 6603, NGC 6818, NGC 6822 (Sagittarius); IC 4703, IC 4756, M16, NGC 6604 (Serpens Cauda); B100, B101, B103, B104, B110, B111, B113, Bas 1, IC 1295, M11, M26, NGC 6649, NGC 6712 (Scutum); Cr 399 (asterism), M27, NGC 6802, NGC 6823, NGC 6834, NGC 6940, St 1 (Vulpecula)

Top ten binocular deep-sky objects for August: Cr 399, IC 4756, M8, M11, M17, M22, M24, M25, M27, NGC 6633 (IC 4756 and NGC 6633 are collectively known as the Binocular Double Cluster)

Top ten deep-sky objects for August: M8, M11, M16, M17, M20, M22, M24, M27, M55, M57

Challenge deep-sky object for August: Abell 53 (Aquila)

The objects listed above are located between 18:00 and 20:00 hours of right ascension.

On this Date in History

Aug 1, 1729: Nicolas Sarabat discovered Comet C/1729 P1 (Sarabat).

Aug 1, 1786: Caroline Herschel discovered Comet C/1786 P1 (Herschel).

Aug 5, 1835: Dominique Dumouchel was the first person to observe the return of Comet 1P/Halley.

Aug 11, 1877: Asaph Hall discovered Deimos.

Aug 13, 1847: John Russell Hind discovered asteroid 7 Iris.

Aug 13, 2002: The Jovian satellite 2002 Laomedeia was discovered by Matthew Holman.

Aug 17, 1877: Asaph Hall discovered Phobos.

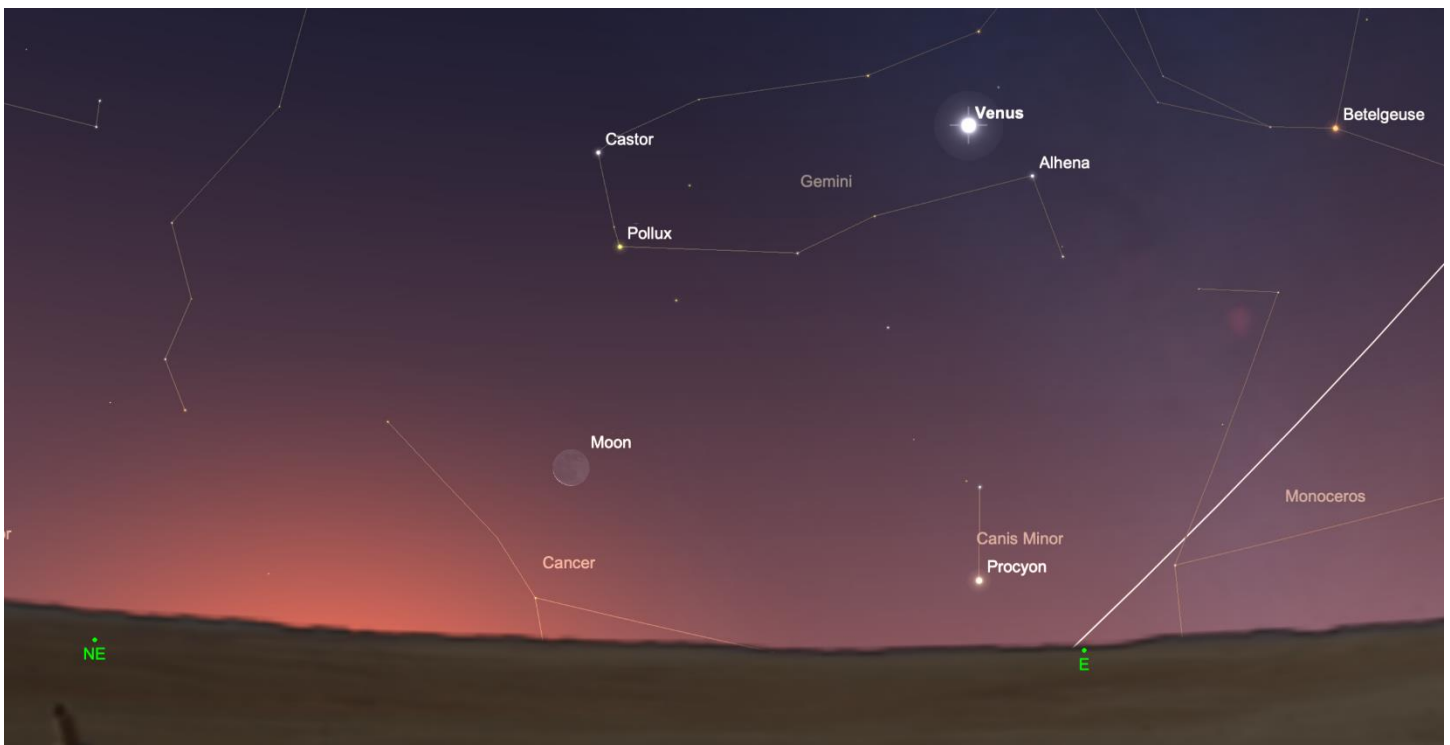
Aug 20, 1885: The first extragalactic supernova, S Andromedae, was discovered by Ernst Hartwig.

Aug 24, 1638: The gibbous phase of Mars was first observed by Francesco Fontana.

Aug 26, 1665: Abraham Ihle discovered the globular cluster M22.

Aug 28, 1789: The Saturnian satellite Enceladus was discovered by William Herschel.

Aug 30, 1992: David Jewitt and Jane Luu discovered the trans-Neptunian object (15760) 1992 QB1.



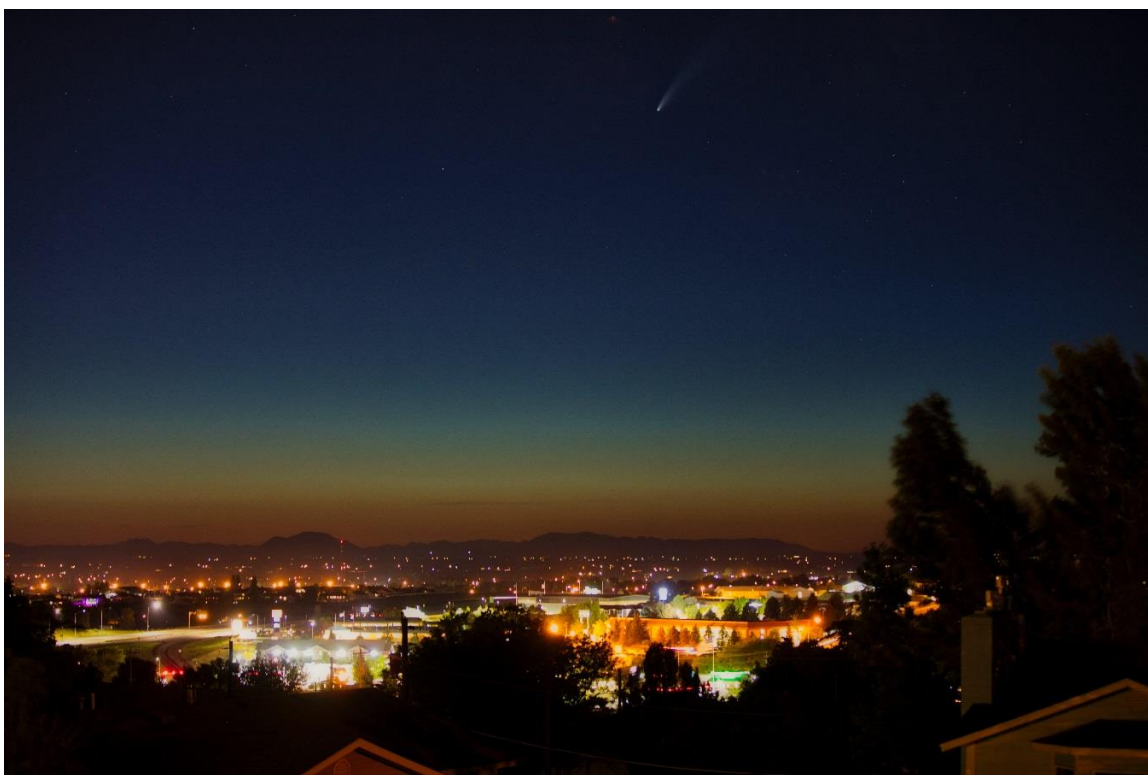
The Beehive star cluster (Messier 44) joins a slender crescent Moon in the eastern pre-dawn sky on August 17, 2020.

Comet C/2020 F3 (NEOWISE) Photos

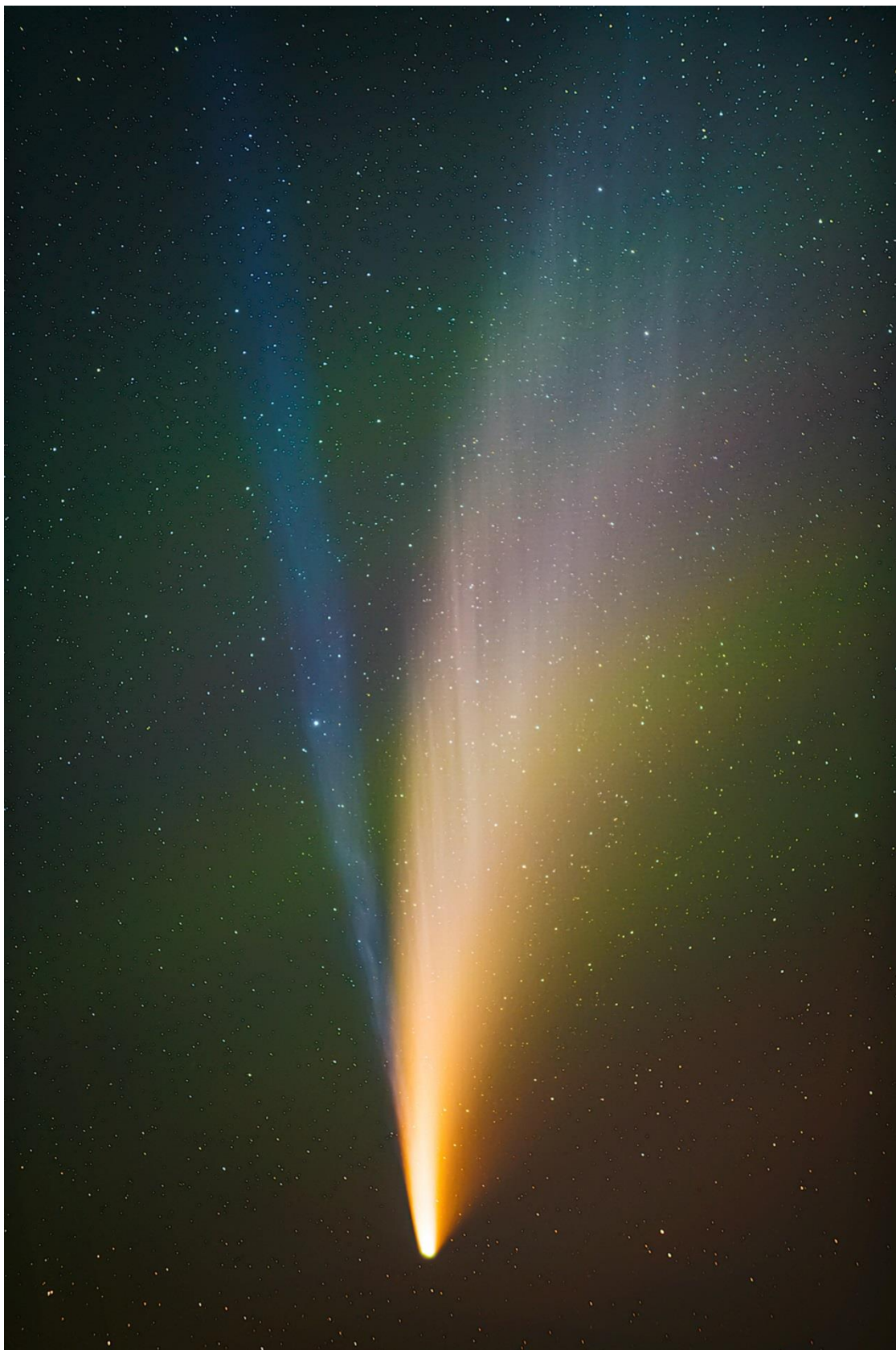
Photos here are considered public domain if the photographer is not listed.



From V.P. Dr. Jay A. Hartwell



Above Pocatello, Idaho



Over Craters of the Moon National Monument

Credit: © Matt Dieterich used with permission

www.NightWorkshops.com

Www.YouTube.com/MattDieterich



Haley, Idaho area / Credit: Tim Frazier



Chimney Rock in Nebraska NPS photo



Over the abandoned LDS Church in Ovid, ID



Over Twin Falls, Idaho / Credit Gary Leavitt



With the Aurora Borealis visible just outside of Vancouver, BC CA
Liron Gertsman / @ liron_gertsman_photography

COMET NEOWISE PUT ON QUITE A SHOW

Did you get a chance to see comet NEOWISE last month? In case you missed it, here is a [link to an article](#) in [Forbes](#), “15 Fabulous and Final Photos of our Fuzzy Friend NEOWISE as ‘Comet of the Century’ Fades”. I know, that’s a really long title for a very small article (word-wise). But the images are truly amazing! For a full description of each image, click on the [+] below it. The only image I can reproduce here is this one taken from the International Space Station [Credit: NASA].

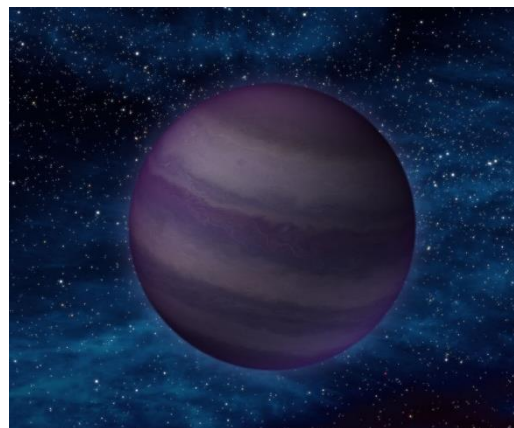


NASA CALLING ON YOU TO HELP IDENTIFY PLANET NURSERIES

NASA has a project - Disk Detective - that you can join to help them identify early planet formation. As stated in [this NASA news story](#), “Planets form from gas and dust particles swirling around baby stars in enormous spinning disks. But because this process takes millions of years, scientists can only learn about these disks by finding and studying a lot of different examples.” This is not a new project; some citizen scientists have been identifying and classifying planetary disks since 2014. However, the ‘news’ is that the project is relaunched with a [new website](#) where you can learn about and join the project. For advanced users who make substantial contributions, they may “receive credit on scientific papers describing the discoveries made through Disk Detective’s efforts.” Also, there are ~150,000 stars in the new dataset, stars that are predominantly M dwarfs and brown dwarfs.

The large dataset of images was gathered from multiple sources: [1] the NASA-funded Two Micron All-Sky Survey (2MASS), operated from 1997 to 2001; [2] the ground-based Panoramic Survey Telescope and Rapid Response System (Pan-STARRS) in Hawaii; [3] NASA’s Wide-Field Infrared Survey Explorer ([WISE](#)), recently repurposed as NEOWISE. Launched on December 14, 2009 (the same year the Kepler space telescope planet-finding mission launched), WISE scanned the entire sky in infrared light twice by 2011, when it was put to sleep. Two years later, it was awakened with a new mission – scan for near-Earth objects (NEOs).

The image at right (Credit: NASA/JPL-Caltech) is an artist’s concept of a Y dwarf, a type of star first identified by WISE and the coolest of known stars, so cool it is only visible via infrared. Stars are classified by temperature. With the addition of the Y dwarfs, the stellar types are, in order of heat generated: O, B, A, F, G, K, M, L, T, Y. Our Sun is type G. Types M and L are ‘shiny’ stars and brown dwarfs, while L and T are all brown dwarfs. A brown dwarf doesn’t accumulate the mass needed to fuse atoms and ‘shine’; rather, they emit ‘cooler’ infrared light. No one knows what color a Y dwarf star really is.



NASA Night Sky Notes



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

The Summer Triangle is high in the sky after sunset this month for observers in the Northern Hemisphere, its component stars seemingly brighter than before, as they have risen out of the thick, murky air low on the horizon and into the crisper skies overhead. Deneb, while still bright when lower in the sky, now positively sparkles overhead as night begins. What makes Deneb special, in addition to being one of the three points of the Summer Triangle? Its brilliance has stirred the imaginations of people for thousands of years!

Deneb is the brightest star in Cygnus the Swan and is positioned next to a striking region of the Milky Way, almost as a guidepost. The ancient Chinese tale of the Cowherd (Niulang) and the Weaver Girl (Zhinü) - represented by the stars Altair and Vega - also features Deneb. In this tale the two lovers are cast apart to either side of the Milky Way, but once a year a magical bridge made of helpful magpies – marked by Deneb – allows the lovers to meet. Deneb has inspired many tales since and is a staple setting of many science fiction stories, including several notable episodes of *Star Trek*.



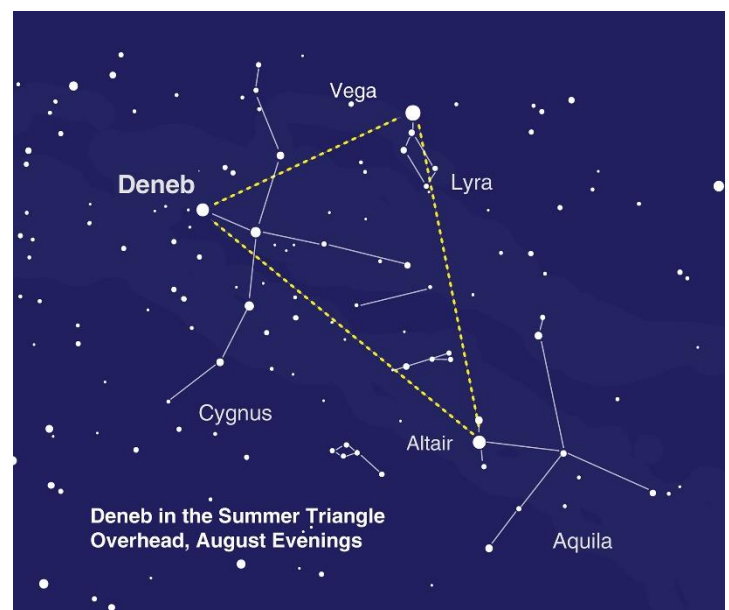
At Left: long exposure shot of Deneb (brightest star, near center) in its richly populated Milky Way neighborhood. Photo credit: [Flicker user JPStanley](#)

Astronomers have learned quite a bit about this star in recent years, though much is still not fully understood – in part because of its intense brightness. The distance to Deneb from our Sun was measured by the ESA's Hipparcos mission and estimated to be about 2,600 light years. Later analysis of the same data suggested Deneb may be much closer: about 1,500 light years away. However, the follow-up mission to Hipparcos, Gaia, is unable to make distance measurements to this star! Deneb, along with a handful of other especially brilliant stars, is too bright to be accurately measured by the satellite's ultra-sensitive instruments.

Deneb is unusually vivid, especially given its distance. Generally, most of the brightest stars seen from Earth are within a few dozen to a few hundred light years away, but Deneb stands out by being thousands of light years distant! In fact, Deneb ranks among the top twenty brightest night time stars (at #19) and is easily the most distant star in that list. Its luminosity is fantastic but uncertain, since its exact distance is also unclear. What is known about Deneb is that it's a blue-white supergiant star that is furiously fusing its massive stocks of thermonuclear fuel and producing enough energy to make this star somewhere between 50,000 and 190,000 times brighter than our Sun if they were viewed at the same distance! The party won't last much longer; in a few million years, Deneb will exhaust its fuel and end its stellar life in a massive supernova, but the exact details of how this will occur, as with other vital details about this star, remain unclear.

Spot Vega and the other stars of the Summer Triangle by looking straight up after sunset in August!

Discover more about brilliant stars and their mysteries at nasa.gov.



Phil Harrington's Cosmic Challenge

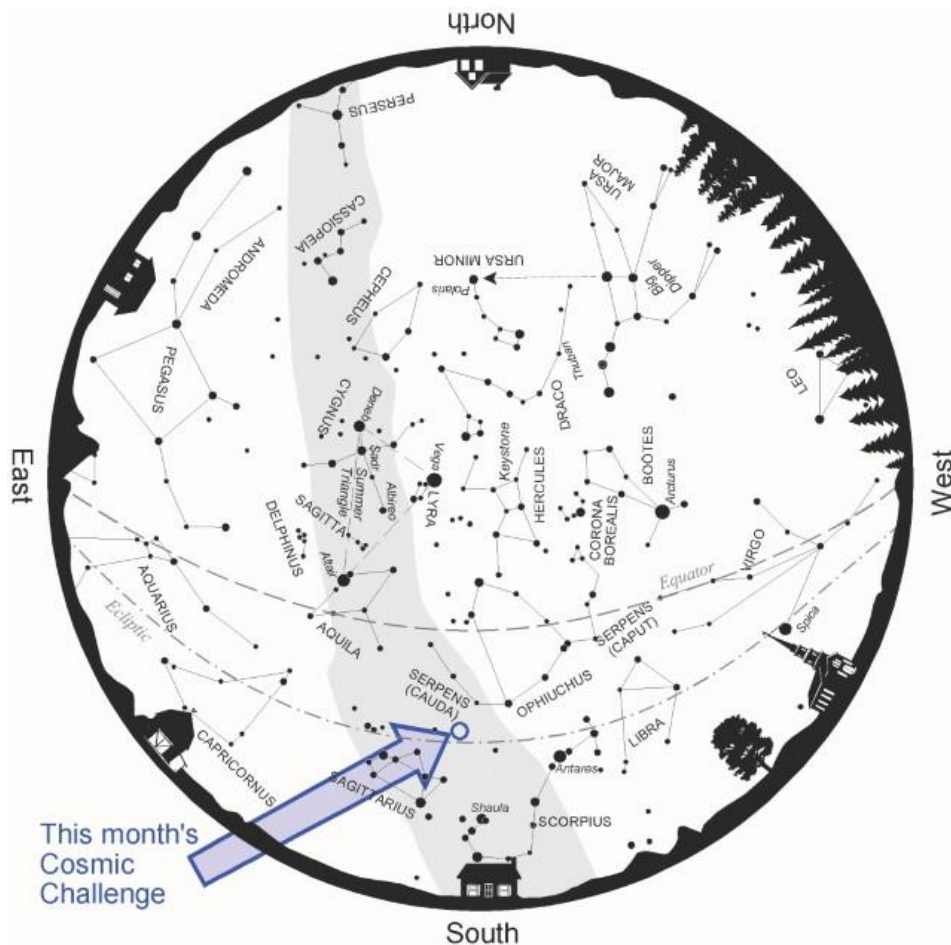
NGC 6445, The Box Nebula



Medium scopes
6- to 9.25-inch (15-23cm)

Target	Type	RA	DEC	Const.	Mag	Size
NGC 6445	Planetary Nebula	17h 49.3m	-20° 00.6'	Sagittarius	11.2	44" x 30"

The sky is full of weird sights. And among planetary nebulae, NGC 6445 is one of the strangest. Discovered by William Herschel on May 28, 1786, NGC 6445 shines at 11th magnitude. That's bright enough to be seen even through giant binoculars. Although visible in smaller apertures, it takes a 6-inch telescope for NGC 6445's true, if bizarre, nature to shine through. The nebula's brighter central shell looks like a dented rectangle. Nature rarely creates an amorphous form with sharp edges, and indeed, the peculiar appearance of NGC 6445 is due largely to our perspective as well as its age. But, nonetheless, the look is very odd. No wonder NGC 6445 has been nicknamed the Box Nebula.



This month's
Cosmic
Challenge

Timetable

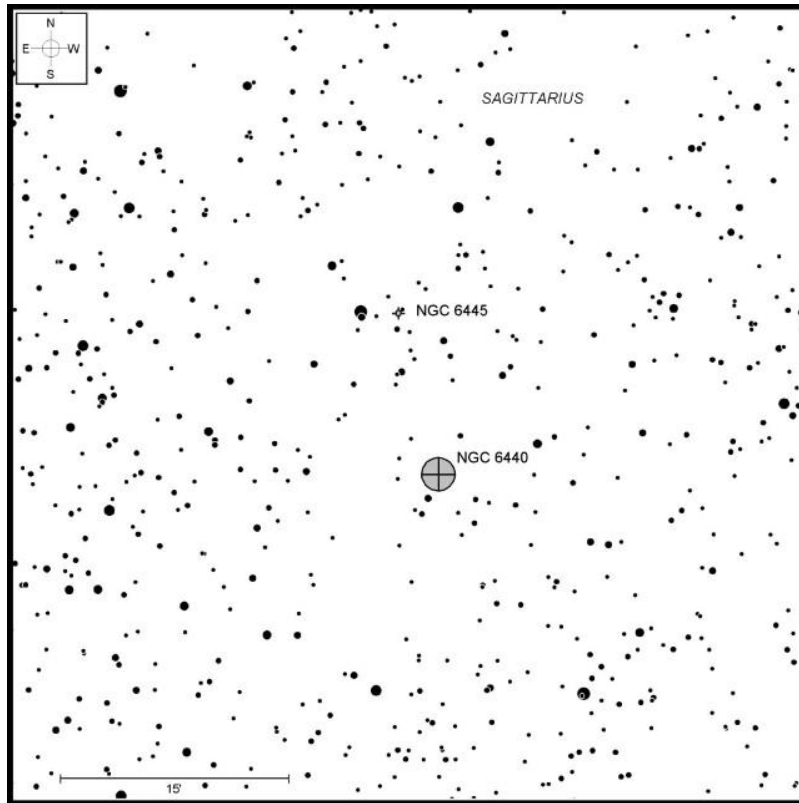
April 1	5 a.m.	July 1	11 p.m.
May 1	3 a.m.	August 1	9 p.m.
June 1	1 a.m.	September 1	7 p.m.

All times are standard time. Add 1 hour for daylight savings time.

Summer star map adapted from [Star Watch](#) by Phil Harrington

As the material that will ultimately form a planetary nebula is expelled by its star, it takes on a cylindrical shape. If we look along its axis, we see the classic smoke-ring effect of the Ring Nebula, M57. But then, over time, gravitational influences from other sources, such as an outflowing stream of particles from the progenitor star, as well as from the gravity of companion stars or perhaps a family of planets, contort the shell into bizarre, distended shapes.

Studies show that NGC 6445 is one of the sky's oldest planetary nebulae at an estimated 3,300 years, so there has been plenty of mixing time. From its full size, some 3'x1', and great distance, 4,500 light years, these same studies conclude the NGC 6445 is also one of the sky's largest, spanning perhaps 4 light years. Deep photos reveal its true asymmetrical bipolar structure, with a bright central ring surrounded by fainter nebulous tendrils. It is believed that most, if not all, planetary nebulae show bipolar tendencies owing to highly energetic streams of particles that flow from their progenitor stars. These streams, called bipolar outflows, are focused into cones of gas by the star's magnetic fields or perhaps by binary companions.



(Left) Finder chart for this month's Cosmic Challenge adapted from [Cosmic Challenge](#) by Phil Harrington

When examined visually under high magnification, the nebula's disk expands into a strange specter floating amid a very rich field of stars. The sketch below shows the scene through my 8-inch reflector at 112x. I can readily see that the nebula is not only rectangular, but also that it has what appears to be a hollow center, akin to a withered version of M57. Closer scrutiny also discloses several brighter patches stitched within the nebula's outer edges, with the most prominent knots seen toward the eastern and southern limits.

One of the challenges presented by NGC 6445 is simply finding it among the star-rich fields of the Sagittarius Milky Way. The easiest way to starhop there is to begin at the bright open cluster M23, itself a wonderful target at low power. Slide 1° to the south-southwest toward 7th-magnitude SAO 160868, the brightest of five stars in an arc that curves away from M23 toward the west-southwest. From there, hop southwest for about 45 arc-seconds to an 8th-magnitude point. Through your telescope, this last star is joined by two fainter companions that collectively form a right triangle that points right at our quarry.



NGC 6445 by [PanSTARRS](#). Image from WikiCommons.



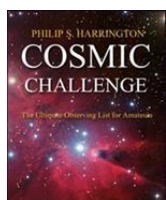
Will the real Box Nebula please stand up? Yes, there are two. NGC 6445 here as well as NGC 6309 in Ophiuchus. To my eye, NGC 6445 appears bigger and boxier than NGC 6309. Some readers might prefer referring to it by another nickname, the Little Gem Nebula. Problem is, there are two little gems. NGC 6818, also in Sagittarius, goes by that moniker, as well. There seems no consensus as to who is who. The decision is left to you, dear reader.

Before we go, there's a bonus object, globular cluster NGC 6440, nestled just a third of a degree south of our planetary challenge. Both will squeeze into a wide-field eyepiece's field, but high magnification is needed to enjoy the cluster, as it is with the planetary. Even at 284x, my 8-inch gives no hint of resolution within this packed swarm of ancient stars. Instead, NGC 6440 is simply a small, faint, diffuse ball of fuzz

surrounding a somewhat brighter central core. The stars in the globular shine no greater than 16th magnitude, bringing them just within the range of giant backyard scopes.

Have a favorite challenge object of your own? I'd love to hear about it, as well as how you did with this month's test. Contact me through my [web site](#) or post to this month's discussion forum.

Until next month, remember that half of the fun is the thrill of the chase. Game on!



About the Author: Phil Harrington writes the monthly [Binocular Universe](#) column in [Astronomy](#) magazine and is the author of 9 books on astronomy. Visit his web site at [www.philharrington.net](#) to learn more.

A revised, second printing of [Cosmic Challenge: The Ultimate Observing List for Amateurs](#) is now available with updated data tables and charts for finding various solar system objects, such as Pluto and Vesta, as well as improved renditions of the many eyepiece sketches that accompany each of the 187 challenges encompassing more than 500 individual objects. The book is available from [Amazon.com](#).

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Observatory and Planetarium



Due to the impossibility of maintaining proper social distance within the confined space of the observatory dome, the observatory is currently closed until further notice.



The Herrett Center has re-opened, with [COVID-19 safety protocols](#) for your protection. Check out our [reopening video message](#) and we hope to see you soon!

Now Showing!



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https://herrett.csi.edu/video_vault.asp

About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
550 Sparks St.
Twin Falls, ID

The Magic Valley Astronomical Society (MVAS) was founded in 1976. The Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy.

In partnership with the Centennial Observatory, Herrett Center, College of Southern Idaho - Twin Falls; we hold regularly scheduled monthly meetings and observation sessions, at which we share information on current astronomical events, tools and techniques for observation, astrophotography, astronomical computer software, and other topics concerning general astronomy. Members enthusiastically share their telescopes and knowledge of the night sky with all who are interested. In addition to our monthly public star parties we hold members only star parties at various locations throughout the Magic Valley.

MVAS promotes the education of astronomy and the exploration of the night sky along with safe solar observing through our public outreach programs. We provide two types of outreach; public star parties and events open to anyone interested in astronomy, and outreach programs for individual groups and organizations (e.g. schools, churches, scout troops, company events, etc.), setting up at your location. All of our outreach programs are provided by MVAS volunteers at no cost. However, MVAS will gladly accept donations. Donations enable us to continue and improve our public outreach programs.

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy. Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be:

\$20.00 for individuals, families, and \$10.00 for students.

Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com

Donations to our club are always welcome and are even tax deductible. Please contact a board member for details.

Membership Benefits:

Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Robert Mayer, for more information on these and other benefits.



Telescopes are an individual thing and not practical for public use. However, everyone should have the experience of a good look at the moon for at least 5 minutes in their life time. It is a dimension and feeling that is unexplainable. Pictures or TV can't give this feeling, awareness, or experience of true dimension. A person will not forget seeing our closest neighbor, the moon. Norman Herrett in a letter to Dr. J. L. Taylor, president of the College of Southern Idaho, Twin Falls, ID, USA.