Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

September 2020

Membership Meeting
See President's Message for September

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. See President's Message.

Faulkner Planetarium
See page 11 for Details

www.mvastro.org

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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

With August coming to a close, we bid farewell to Comet C/2020 F3 (NEOWISE). It became an inspiration for some and produced the most spectacular astrophotography for others.

With the month of September we are beginning to see the return of cooler temperatures to the region and, along with that, the shifting of the night skies to the fall constellations. Cooler weather also means better views through any telescope, or binoculars.

The Herrett Center has reopened! But for the foreseeable future, the observatory will only allow groups who arrive together to proceed to the observatory one group at a time, for time-limited views through the telescope. Telescope views on the lawn in front of the Herrett Center will also continue for September. The first will be on the 12th beginning at 8:45 pm.

Also at the Herrett Center, International Observe the Moon Night is scheduled for September 26th, 8:00 to 10:00 pm. Telescopes will be out front on the lawn. Chris Anderson is looking for volunteers. If you have not already done so, please let him know ASAP if you can help.

Sadly, the Boise Astronomical Society (BAS) has had to cancel the Idaho Star Party™ for 2020 due to the COVID pandemic. However, their guest speaker Andreas Faisst will give his talk on "The Formation of Galaxies Revealed by the Largest Time Machines" in the BAS Zoom membership meeting scheduled for Friday, September 18th at 7:00 pm. Andreas is from NASA/Caltech so it should be an interesting evening. Details will follow via an e-mail to the club members.

Our monthly meeting will be held on the 12th at 7:00 pm via virtual conference like last month. Tim Frazier will make a presentation on Astrophotography; details will be sent via the membership e-mail list.

Until next month,

David Olsen, for Rob Mayer by request.

Calendar

September 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2 Corn Moon 11:23 pm  Visible 100% Age: 15.03 Days	3	4 **BSU** **1st Friday** **Astronomy**	5
6	7	8	9	10 Last Quarter Moon  Visible: 49% ↓ Age: 22.25 Days	11	12 MVAS General Meeting at 7:00pm via Zoom Observing on the lawn in front of the Herrett Center at 8:45pm
13	14	15	16	17 New Moon  Visible 0% Age: 0.54 Days	18	19
20	21	22	23	24 First Quarter Moon  Visible 55% ↑ Age: 7.81 Days	25	26 International Observe the Moon Night Herrett Center Front Lawn 8:00pm to 10:00pm
27	28	29	30			

September Celestial Calendar by Dave Mitsky

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

9/1 The equation of time, which yields the difference between mean solar time and apparent solar time, equals 0 at 2:00
9/3 The Moon is 3.9 degrees southeast of Neptune at 1:00
9/4 The Martian winter solstice occurs at 4:00
9/6 The Moon is 0.03 degrees north of Mars, with an occultation occurring in southern Europe, northern Africa, Cape Verde Island, and central and northeastern South America, at 5:00; the Moon is at apogee, subtending 29' 28" from a distance of 405,607 kilometers (252,032 miles), at 6:29
9/7 The Moon is 3.0 degrees south of Uranus at 4:00
9/8 Mercury is at the descending node through the ecliptic plane at 18:00
9/9 The Moon is 6.2 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) in the constellation of Taurus at 0:00; the Moon is 4.1 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 18:00; Mars is stationary at 18:00
9/10 Last Quarter Moon occurs at 9:26; the Moon is at the ascending node (longitude 85.2 degrees) at 23:00
9/11 The Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to be visible at 00:32; asteroid 19 Fortuna (magnitude +9.4) is at opposition in the constellation of Pisces at 7:00; the Moon is 0.3 degrees south of the bright open cluster M35 in the constellation of Gemini at 13:00; Neptune (magnitude +7.8, angular size 2.3") is at opposition at 20:00
9/13 Jupiter is stationary, with prograde (direct or eastward) motion to resume at 0:00; the Moon is 7.9 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 0:00; the Moon is 4.3 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 5:00; Venus is 2.3 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in the constellation of Cancer at 10:00
9/14 The Moon is 2.1 degrees north-northeast of M44 at 5:00; the Moon, Venus, and M44 lie within a circle with a diameter of 4.4 degrees at 6:00; a double Galilean satellite shadow transit (Callisto's shadow follows Io's) begins at 6:57; the Moon is 4.4 degrees north-northeast of Venus at 7:00; Jupiter is at its southernmost declination at 20:00
9/15 The Moon is 4.1 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 19:00
9/16 The Sun enters the constellation of Virgo, at longitude 174.2 degrees on the ecliptic, at 14:00
9/18 The Moon is at perigee, subtending 33' 17" from a distance of 359,082 kilometers (223,123 miles), at 13:48
9/19 The Moon is 5.9 degrees north-northeast of Mercury at 3:00; Mercury is at aphelion (0.4667 astronomical units from the Sun) at 3:00; the Moon 6.4 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 10:00
9/22 Mercury is 0.3 degrees northeast of Spica at 12:00; the Sun's longitude is 180 degrees at 13:31; the northern hemisphere autumnal equinox occurs at 13:31; the Moon is 5.8 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 14:00
9/23 The Moon is at the descending node (longitude 263.9 degrees) at 13:00
9/24 First Quarter Moon occurs at 1:55; 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 13:09
9/25 The Moon is 1.6 degrees south of Jupiter at 7:00; the Moon is 2.3 degrees south of Saturn at 22:00
9/26 Venus at ascending node through the ecliptic plane at 22:00
9/29 Saturn is stationary, with prograde (direct or eastward) motion to resume, at 3:00
9/30 Asteroid 68 Leto (magnitude +9.6) is at opposition in the constellation of Cetus at 3:00; the Moon is 3.9 degrees southeast of Neptune at 6:00

On this date in History

Sept 1, 1804: Karl Harding discovered asteroid 3 Juno.
Sept 7, 1746: Jean-Dominique Maraldi discovered the globular cluster M15.
Sept 9, 1892: E. E. Barnard discovered Jupiter's fifth satellite, fourteenth-magnitude Amalthea, using the 36-inch refractor at the Lick Observatory.
Sept 11, 1746: Jean-Dominique Maraldi discovered the globular cluster M2.
Sept 12, 1784: William Herschel discovered the barred spiral galaxy NGC 7753.
Sept 13, 1850: John Russell Hind discovered the asteroid 12 Victoria.
Sept 14, 1751: Nicolas-Louis de Lacaille discovered NGC 104 (47 Tucanae), the second largest and brightest globular cluster.
Sept 17, 1789: William Herschel discovered the Saturnian satellite Mimas.
Sept 19, 1848: William Bond discovered Saturn's fourteenth-magnitude satellite Hyperion, the first irregular moon to be discovered.
Sept 27, 1793: Comet C/1793 S2 (Messier) was discovered by Charles Messier.
Sept 23, 1846: Johann Gottfried Galle discovered Neptune using Urbain Le Verrier's calculations of its position.

The Sun, the Moon, & the Planets

The **Sun** is located in Leo on September 1st. It enters Virgo on September 16th. The Sun crosses the celestial equator from north to south at 13:31 UT on September 22nd, the date of the autumnal equinox.

The **Moon** is 12.7 days old, subtends 30.4 arc minutes, is illuminated 98.1%, and is located in Capricornus on September 1st at 0:00 UT. The Moon is at its greatest northern declination (+24.3 degrees) on September 12th and its greatest southern declination (-24.4 degrees) on September 25th. Longitudinal libration is at a maximum of +7.1 degrees on September 25th and a minimum of -7.2 degrees on September 13th. Latitudinal libration is at a maximum of +6.5 degrees on September 3rd and a minimum of -6.5 degrees on September 17th. Favorable librations for the following lunar features occur on the indicated dates: Crater Compton on September 1st, Vallis Bouvard on September 14th, Crater Oken on September 21st, and Crater Humboldt on September 22nd. Parts of the eastern limb like Mare Marginis and the craters Goddard and Neper will be visible due to a favorable libration beginning on September 19th. New Moon occurs on September 17th. Large tides will occur for several days thereafter. The Moon is at apogee (63.59 Earth-radii distant) on September 6th and at perigee (56.30 Earth-radii distant) on September 18th. The Moon occults Mars on September 6th from certain parts of the world.

Mercury lies low in the west and sets less than 50 minutes after sunset as the month ends. The waxing crescent Moon passes six degrees north of Mercury on September 19th. Mercury passes within 0.7 degrees of Spica on September 21st. The two very different celestial objects are only five degrees in altitude 20 minutes after the Sun sets.

During September, **Venus** attains an altitude of almost 40 degrees in the mid-northern latitudes. It rises at approximately 3:00 a.m. local daylight-saving time on September 1st. The brightest planet is located in Gemini as September begins, crosses through Cancer, and ends the month in Leo. Venus decreases in brightness from magnitude -4.3 to magnitude -4.1, decreases in apparent size from 19.5 arc second to 15.6 arc seconds, and increases in illumination from 60% to 71%. At the time that the waning crescent Moon passes four degrees north of Venus on the morning of September 14th, the planet lies 2.5 degrees south of the large open cluster M44 in Cancer.

Mars rises about two hours after sunset as September begins and culminates around 4:00 a.m. local daylight-saving time. It brightens from magnitude -1.8 to magnitude -2.5, making it a bit brighter than Jupiter, and increases in angular size from 18.9 arc seconds to 22.4 arc seconds this month. Mars attains a maximum altitude of almost 60 degrees from mid-northern latitudes in the United States. The waning gibbous Moon passes very close to the Red Planet on the morning of September 6th, with an occultation taking place in certain parts of the world. Mars reaches its first stationary point approximately five degrees north of the fourth-magnitude star Alrescha (Alpha Piscium) on September 9th and then begins a retrograde loop. Prominent Martian surface features visible at 2:00 a.m. local daylight-saving time include Syrtis Major and the Hellas basin in early September, Mare Sirenum and Mare Cimmerium during the second week of the month, the Tharsis Ridge and Olympus Mons at mid-month, Vallis Marineris during the third week in September, and Sinus Sabaeus and Sinus Meridiani at the end of the month.

Jupiter decreases in brightness to magnitude -2.4 and shrinks in angular diameter by 3.6 arc seconds this month. The gas giant reaches its second stationary point on September 13th. It then resumes prograde or eastward motion. The gap between Jupiter and Saturn that has grown by three degrees since May begins to close by month's end as Saturn also resumes eastward motion. The waxing gibbous Moon passes less than two degrees south of the Jupiter on September 25th. A double Galilean satellite shadow transit takes place on the morning of September 14th. Information on Great Red Spot transit times and Galilean satellite events is available on pages 50 and 51 of the September 2020 issue of Sky & Telescope, and browse Sky and Telescope.

During September, **Saturn** fades from magnitude +0.3 to magnitude +0.5 and shrinks in apparent size from 18.0 arc seconds to 17.2 arc seconds. Saturn's rings span 40 arc seconds and are tilted 23 degrees with respect to the Earth. The waxing gibbous Moon passes two degrees south of the Ringed Planet on September 25th. Saturn reaches its second stationary point on September 29th and subsequently begins prograde or eastward motion. Eighth-magnitude Titan, Saturn's largest and brightest satellite, is due north of the planet on September 1st and September 17th and due south of it on September 9th and September 25th. Saturn's peculiar satellite Iapetus shines at almost eleventh magnitude on September 7th, when it is passes 63 arc seconds due north of the planet. For information on Saturn's satellites, browse Sky and Telescope.

Uranus is located in southwestern Aries, eleven degrees south of the second-magnitude star Hamal (Alpha Arietis). The planet is located 0.6 degrees southwest of the sixth-magnitude star 19 Arietis on September 1st. By the end of the month,

Uranus is more than one degree from the star. The waning gibbous Moon passes three degrees south of Uranus on the morning of September 7th. A finder chart is available at Naked Eye Planets .

Neptune can be found 2.5 degrees east of the fourth-magnitude star Phi Aquarii on the first day of September. The planet lies 1.5 degrees east of the star on September 30th. Neptune subtends 2.4 arc seconds, shines at magnitude +7.8, and lies at a distance of 4.0 light hours when it reaches opposition on September 11th. The Full Moon passes four degrees south of Neptune on September 1st. The waxing gibbous Moon passes four degrees south of the planet on the night of September 29th. An article on Neptune complete with finder charts appears on page 48 of the September 2020 issue of Sky & Telescope. See this Naked Eye Planet site for a finder chart.

The dwarf planet **Pluto** is located in the vicinity of the Teaspoon asterism in northeastern Sagittarius at a declination of more than -22.5 degrees. 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.

This month, for the first time in decades, four planets (**Venus, Mars, Jupiter, and Saturn**) are all nearly at their best.

During the month of September, **Mercury** is located in the west, **Jupiter** and **Saturn** in the south, and **Neptune** in the east during the evening. At midnight, **Mars** and **Uranus** can be found in the east, **Jupiter** and **Saturn** in the southwest, and **Neptune** in the south. In the morning sky, **Venus** is in the east, **Mars** and **Uranus** in the southwest, and **Neptune** is in the west.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data
Mercury (magnitude -0.6, 5.0", 92% illuminated, 1.34 a.u., Leo)
Venus (magnitude -4.3., 19.5", 60% illuminated, 0.86 a.u., Gemini)
Mars (magnitude -1.8, 18.9", 92% illuminated, 0.50 a.u., Pisces)
Jupiter (magnitude -2.6, 44.3", 99% illuminated, 4.45 a.u., Sagittarius)
Saturn (magnitude +0.3, 18.0", 100% illuminated, 9.24 a.u., Sagittarius)
Uranus (magnitude +5.7, 3.7", 100% illuminated, 19.08 a.u. on September 16th, Aries)
Neptune (magnitude +7.8, 2.4", 100% illuminated, 28.93 a.u. on September 16th, Aquarius)
Pluto (magnitude +14.3, 0.1", 100% illuminated, 33.40 a.u. on September 16th, Sagittarius).

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 88P/Howell travels southeastward through Libra and Scorpius. It is at perihelion on Sept 26th and may reach a maximum brightness of approximately ninth magnitude. On Sept 4th, the periodic comet passes 14 arc minutes southwest of the eighth-magnitude globular NGC 5897 in Libra. It glides between the globular clusters M80 and M4 in Scorpius on the evenings of Sept 22nd through Sept 25th. Comet Howell passes approximately one degree north of Antares on the evenings of Sept 26th and 27th. Consult p. 49 of the Sept 2020 issue of Sky & Telescope for a finder chart.

Meteor Showers

Only very minor meteor showers occur this month.

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

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

This Time & Date site will display, for *any* given date/time, the apparent and comparative sizes of the planets, along with their magnitudes and distances!

Author Phil Harrington offers an excellent *freeware* planetarium program for binocular observers known as TUBA (Touring the Universe through Binoculars Atlas), which also includes information on purchasing binoculars!

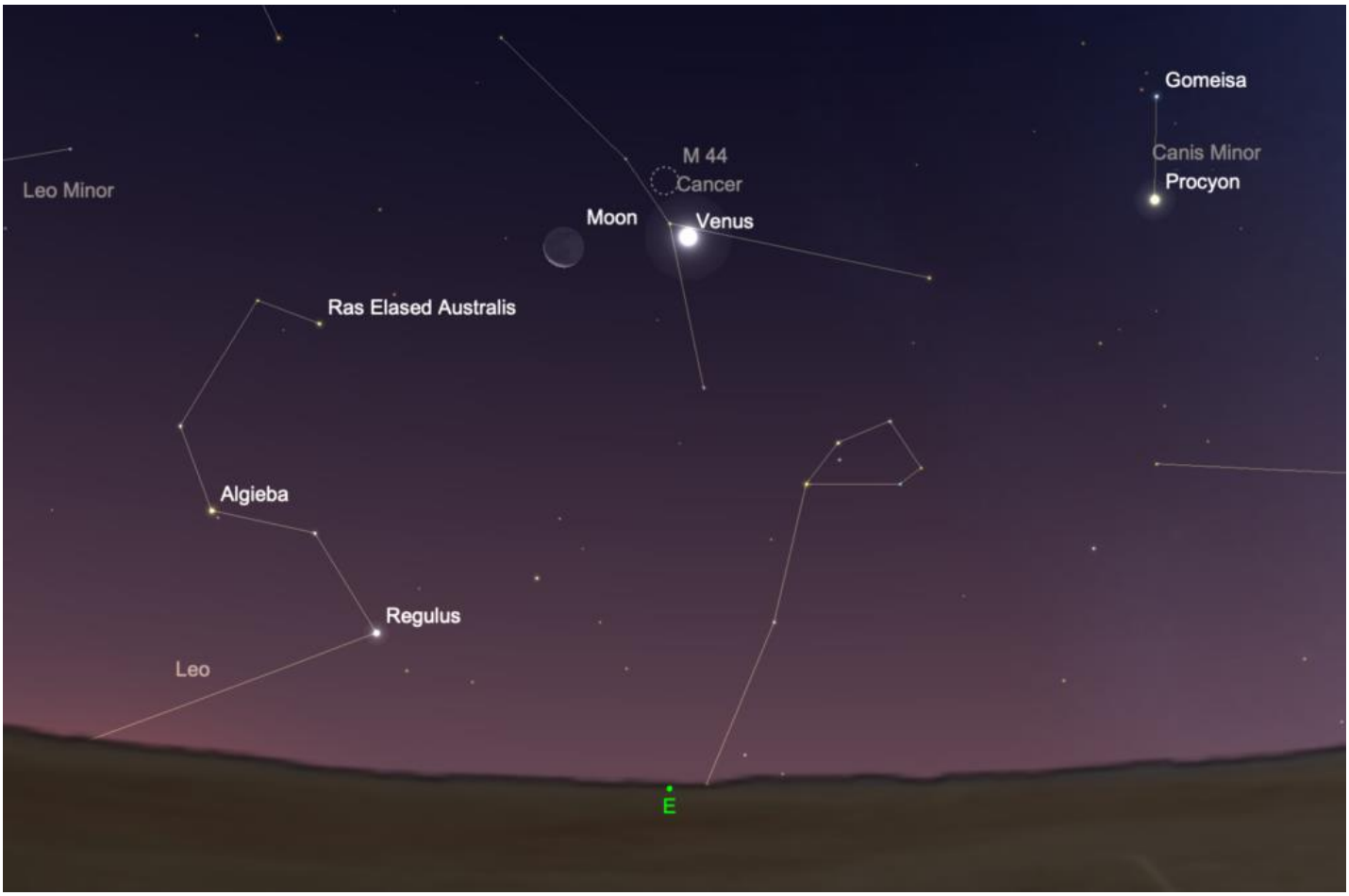
Deep Sky

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

Fifty deep-sky objects for September: M2, M72, M73, NGC 7009 (Aquarius); M30, NGC 6903, NGC 6907 (Capricornus); B150, B169, B170, IC 1396, NGC 6939, NGC 6946, NGC 6951, NGC 7023, NGC 7160, NGC 7142 (Cepheus); B343, B361, Ba6, Be87, Cr 421, Do9, IC 4996, M29, M39, NGC 6866, NGC 6871, NGC 6888, NGC 6894, NGC 6910, NGC 6960, NGC 6992, NGC 6994, NGC 6995, NGC 7000, NGC 7008, NGC 7026, NGC 7027, NGC 7039, NGC 7048, NGC 7063, NGC 7086 (Cygnus); NGC 6891, NGC 6905, NGC 6934, NGC 7006 (Delphinus); NGC 7015 (Equuleus); M15 (Pegasus); NGC 6940 (Vulpecula)

Top ten binocular deep-sky objects for September: IC 1396, LDN 906, M2, M15, M29, M30, M39, NGC 6939, NGC 6871, NGC 7000

Top ten deep-sky objects for September: IC 1396, M2, M15, M30, NGC 6888, NGC 6946, NGC 6960, NGC 6992, NGC 7000, NGC 7009



The Moon, Venus, and the Beehive star cluster at dawn in the eastern sky on September 14, 2020.


International OBSERVE
THE MOON NIGHT 2020
September
26TH
#ObserveTheMoon
MOON.NASA.GOV/OBSERVE

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!

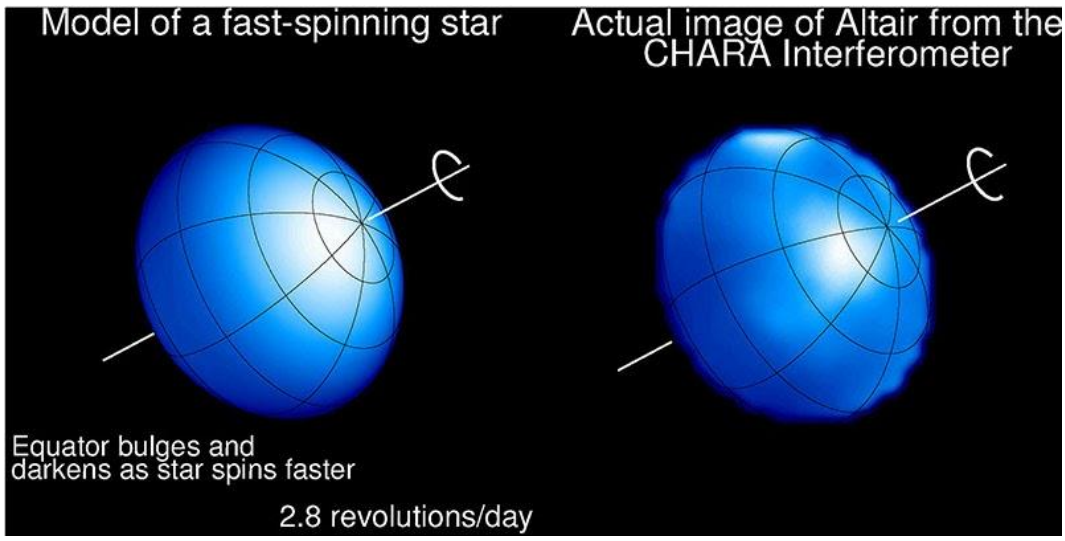
Summer Triangle Corner: Altair
David Prosper

Altair is the final stop on our trip around the Summer Triangle! The last star in the asterism to rise for Northern Hemisphere observers before summer begins, brilliant Altair is high overhead at sunset at the end of the season in September. Altair might be the most unusual of the three stars of the Triangle, due to its great speed: this star spins so rapidly that it appears "squished."

A very bright star, Altair has its own notable place in the mythologies of cultures around the world. As discussed in our previous edition, Altair represents the cowherd Niulang in the ancient Chinese tale of the "Cowherd and the Weaver Girl." Altair is the brightest star in the constellation of Aquila the Eagle; while described as part of an eagle by ancient peoples around the Mediterranean, it was also seen as part of an eagle by the Koori people in Australia! They saw the star itself as representing a wedge-tailed eagle, and two nearby stars as his wives, a pair of black swans. More recently one of the first home computers was named after the star: the Altair 8800.

Altair's rapid spinning was first detected in the 1960s. The close observations that followed tested the limits of technology available to astronomers, eventually resulting in direct images of the star's shape and surface by using a technique called *interferometry*, which combines the light from two or more instruments to produce a single image. Predictions about how the surface of a rapidly spinning massive star would appear held true to the observations; models predicted a squashed, almost "pumpkin-like" shape instead of a round sphere, along with a dimming effect along the widened equator, and the observations confirmed this! This equatorial dimming is due to a phenomenon called *gravity darkening*. Altair is wider at the equator than it is at the poles due to centrifugal force, resulting in the star's mass bulging outwards at the equator. This results in the denser poles of the star being hotter and brighter, and the less dense equator being cooler and therefore dimmer. This doesn't mean that the equator of Altair or other rapidly spinning stars are actually dark, but rather that the equator is dark in comparison to the poles; this is similar in a sense to sunspots. If you were to observe a sunspot on its own, it would appear blindingly bright, but it is cooler than the surrounding plasma in the Sun and so appears dark in contrast.

As summer winds down, you can still take a Trip Around the Summer Triangle with this activity from the Night Sky Network. Mark some of the sights in and around the Summer Triangle at: bit.ly/TriangleTrip. You can discover more about NASA's observations of Altair and other fast and furious stars at nasa.gov.



The image on the right was created using optical interferometry: the light from four telescopes was combined to produce this image of Altair's surface. Image credit: Ming Zhao. More info: bit.ly/altairvsmodel

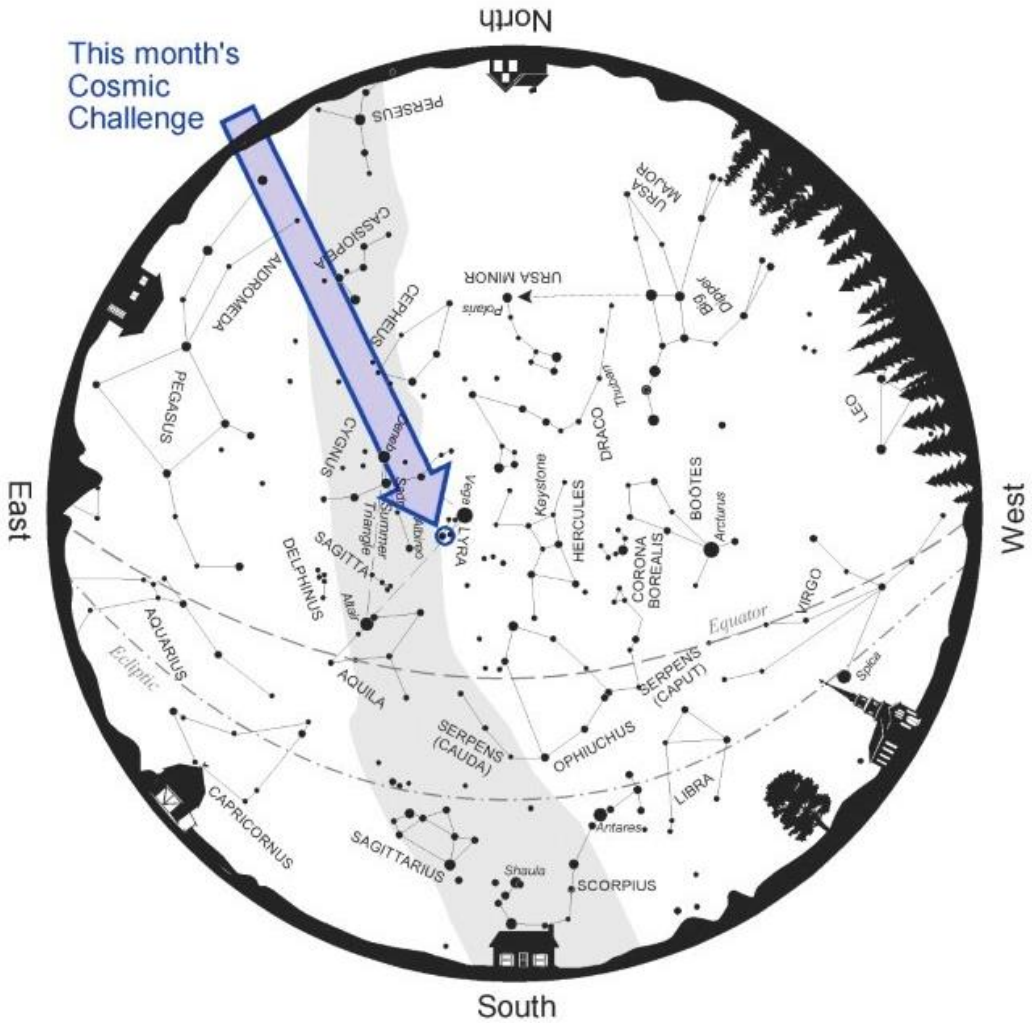
Ring Nebula Central Star and Galaxy IC 1296

Monster scopes
15 inch (38 cm) and larger

Target	Type	RA	DEC	Const.	Mag	Size
IC 1296	Galaxy	18h 53.3m	+33° 04.0'	Lyra	14.3	0.9' x 0.5'
M57 central star	Central star in planetary nebula	18h 53.6m	+33° 01.7'	Lyra	15.2	n/a

As we say goodbye to summer and get ready to welcome in autumn, I thought I would offer not one, but two challenges this month to bridge the seasonal change. Both appear right next to each other in our sky but are millions of light years apart. And both require all the aperture you can throw at them to be seen.

One of the classic challenges facing deep-sky observers at this time of year is spotting the Ring Nebula's central star, the progenitor sun that started it all some 6,000 to 8,000 years ago. Seeing the Ring's central star is one of those tests that every visual amateur needs to take at one point or another.

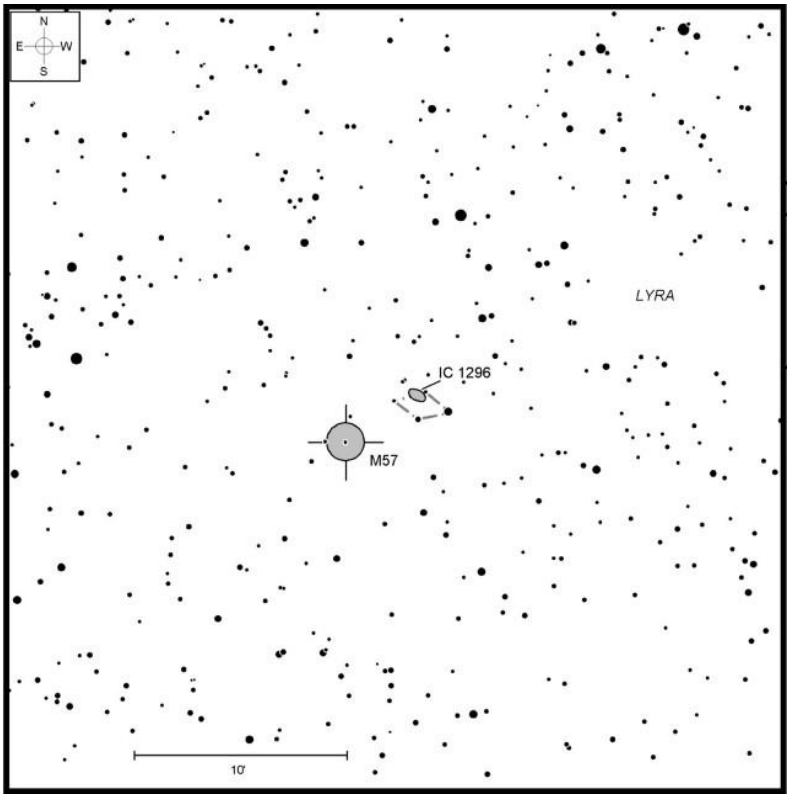


Summer star map adapted from **Star Watch** by Phil Harrington. This view Sept 1 at 7 pm.

Looking through observing handbooks, reading on-line deep-sky logs, speaking with friends and colleagues whom I consider to be seasoned veterans, and my own personal experience all seem to show that spotting the central star takes nothing short of "the perfect storm." Unless everything comes together just right, the star will remain hidden from view.

You might be wondering what all the fuss is about. After all, the star is listed as 15th magnitude, which is dim, but within the grasp of 15-inch (38 cm) telescopes, perhaps even less under dark, transparent skies. So why then is the central star so difficult through even the largest backyard scopes?

Here's an interesting observation that I have noticed time and again when trying to see the central star. It requires transparent skies, but not necessarily dark skies. Many amateurs equate one with the other, that dark skies are transparent skies, and vice versa. Not so.



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

From a stargazer's perspective, sky conditions can be divided into three categories: transparency, seeing, and sky darkness. "Transparency" refers to how clear the sky is, while "seeing" refers to the steadiness of the air mass overhead. Clouds, haze, humidity, and artificial and natural air pollutants all adversely affect both in different ways. Finally, "sky darkness" speaks to the ambient level of background light. Light pollution raises this level. People often confuse the terms transparency and sky darkness. It is certainly possible to have a city sky that is more transparent than a rural sky, but because of the lower level of sky darkness (due to urban light pollution), fainter stars will still be visible from the country site, even with its poorer transparency.

But to the topic here, I have seen the central star on several occasions through my 18-inch (46 cm) reflector from my naked-eye limiting magnitude 5 suburban backyard, but I have missed it entirely on many other occasions using the same equipment from markedly darker sites. Why? Those other sites were darker (i.e., less light pollution), but the sky was not as transparent. That increased level of haze lowered the contrast between the star and the surrounding nebulosity just enough to mask the star.

That brings us to the second ingredient to seeing the star: seeing. Without steady seeing conditions, atmospheric turbulence will blur the star just enough to blend its already low-contrast glow into the Ring's donut hole. Without both conditions – transparency and exceptional seeing -- the central star will evade even the most careful search. But it still takes more than these. Your telescope's optics must be clean as well. Any contamination, notably skin oils on the eyepiece's lens, will be enough to lose the star.

(Right) M57's central star and galaxy IC 1296 as sketched through the author's 18-inch (46 cm) reflector. South is up in this portrayal.

Take a look at the amazing image of M57 and IC 1296 {on next page} posted by {Cloudy Nights} member tolgagumus in the CCD/CMOS Astro Camera Imaging & Processing forum back in September 2018. It's the culmination of almost 30 hours of data collection taken with a Planewave 14-inch (36cm) CDK modified Dall-Kircham scope and a Finger Lakes Instrumentation MLx694 CCD imager at DSW Remote Observatories in Rowe, New Mexico. You can read more details about the image by following the link back to the forum.

(Left) M57 and IC 1296.
Image credit: CN member tolgagumus

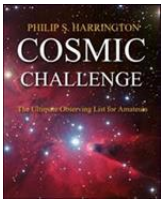
A faint, far-off barred spiral galaxy floats in the same field as you try to eye the Ring's central star. Can you also spot IC 1296? It is a tougher task than its 14th-magnitude rating would imply. That's because, as we have seen so often before, the galaxy's surface brightness skews the integrated magnitude. In 15-inch-plus (38+ cm) telescopes, 14th-magnitude galaxies are fairly routine. That's assuming their light is concentrated evenly across their disk. In the case of IC 1296, the central hub of the galaxy is nearly stellar in appearance, while its broad spiral arms are unusually faint.

Back in August 2013, a Type-II supernova, SN2013ev, appeared in IC 1296. Even though it barely cracked 16th magnitude, it was actually easier to spot than its home galaxy because its feeble light was concentrated into a point source.

IC 1296 is just 4' northwest of M57, near a diamond of four 11th- to 14th-magnitude stars, as shown in the accompanying sketch and image. More specifically, it is positioned 20" southeast of the star at the diamond's northern facet. Proper magnification, in addition to dark skies and properly collimated optics, are key to spotting its dim glow.

I can probably count on one hand the number of times in the past half-dozen years when I have seen both of these challenges through my 18-inch (46cm) scope from my suburban backyard observatory. Summer haze, air turbulence, and light pollution quickly extinguish both. But on those rare evenings when the humidity is low, the seeing is calm, and the Ring is high in the sky, the elusive central star and its tiny galactic companion shine through. Indeed, under superior skies, telescopes as small as 10 inches (25cm) have shown both, so be sure to give it a go.

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.

Observatory and Planetarium

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!

Centennial Observatory Upcoming Events

Event	Place	Date	Time	Admission
Monthly Free Star Party	Herrett Center front lawn, with limited access to observatory	Saturday, September 12th, 2020	8:45 PM	FREE
International Observe the Moon Night	Herrett Center front lawn	Saturday, September 26th, 2020	8:00 to 10:00 PM	FREE

Due to limited space for social distancing within the confined space of the observatory dome, the observatory is currently closed until further notice.

Faulkner Planetarium
Now Showing!

Visit the Herrett Center Video Vault

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.