Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, August 10th 2019
7:00pm at the
Herrett Center for Arts & Science
College of Southern Idaho.

Public Star Party follows at the Centennial Observatory

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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

August 2019

Colleagues,

I hope you found the third week of July exhilarating. The 50th Anniversary of the first moon landing was the common theme. I capped my observance by watching the C-SPAN replay of the CBS broadcast. It was not only exciting to watch the landing, but to listen to Walter Cronkite and Wally Schirra discuss what Neil Armstrong and Buzz Aldrin was relaying back to us. It was fascinating to hear what we have either accepted or rejected for years come across as something brand new. Hearing Michael Collins break in from his orbit above in the command module also reminded me of the major role he played and yet others in the past have often overlooked – fortunately, he is now receiving the respect he deserves. If you didn't catch that, then hopefully you caught some other commemoration, such as *Turner Classic Movies* showing *For All Mankind,* a spellbinding documentary of what it was like for all of the Apollo astronauts who made it to the moon.

For me, these moments of commemoration made reading the moon landing's anniversary issue from the Association of Lunar and Planetary Observers (ALPO) come to life as they wrote about the features these astronauts were examining – including the little craters named after the three astronauts.

In the October 2018 issue of *Astronomy,* there was not only discussion of *ALPO, Zooniverse, The Astronomical League,* and *The International Occulation Timing Association,* but other opportunities as well. If you're a paying member of MVAS, you're already a member of *The Astronomical League*, but I invite you to stretch out and connect other groups to Idaho. Right now, I'm just looking up *ALPO's* back issues, but hope to become a paying member myself someday. The opportunities you will find won't replace MVAS, but enhance it.

As for MVAS, you've got two chances this month. Just as you open this newsletter, we'll be headed off to a MVAS star party on Friday, Aug. 2. Right now, the site will either be a long-awaited return to Thorn Creek Ridge, the Jerome Gun Club, or another site we are currently examining. We'll put out the final deals just after this goes to press. We can only hope the spectacular skies of late July will turn over into August.

The week after the star party is the regular MVAS meeting on Saturday, Aug. 9. Jim Tubbs will be back to present us with his latest work on spectroscopy I forgot to check if Jim is a member of the American Association of Variable Star Observers, but I do know he has referred to them before.
Until then, clear skies,

Rob Mayer

Calendar

August 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7 First Quarter Moon 	8	9	10 MVAS Meeting at 7:00pm at the Herrett Center Public Star Party Centennial Obs. 9:45p - 12:00a
11	12	13	14	15 Full Moon 100% Visible 	16	17
18	19	20	21	22	23 CENTRAL IDAHO DARK SKY RESERVE Star Party See page 9 for details.	24
25	26	27	28	29	30 New Moon Lunation 1196 0% Visible ↑ 	31

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.
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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 six hours and, when appropriate, one calendar day for MDT)

8/1 The Moon, Venus, and the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer lie within a circle having a diameter of 2.7 degrees at 1:00; the Moon is 0.6 degree northeast of M44 at 2:00; New Moon (lunation 1195) occurs at 3:12; Mercury is stationary in longitude, with direct (eastward) motion to begin, at 4:00; the Moon is 1.6 degrees north of Mars at 21:00
8/2 The Moon is at perigee, subtending 33' 15" from a distance of 359,398 kilometers (223,320 miles), at 7:11; the Moon is 3.1 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 14:00
8/3 Venus is 0.3 degree south of M44 at 7:00
8/6 Asteroid 16 Psyche (magnitude +9.3) is at opposition at 4:00; the Moon is 7.3 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 6:00
8/7 The astronomical cross-quarter day known as Lammas or Lughnasadh occurs today
8/8 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 begin at 3:43; Mercury is 9.1 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 5:00; Venus is at perihelion (a distance of 0.7185 astronomical units from the Sun) at 9:00
8/9 The Moon is 7.7 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 17:00; the Moon is 2.0 degrees south of Jupiter at 23:00; Mercury is at greatest western elongation (19.0 degrees) at 23:00
8/11 The Sun enters Leo, at longitude 138.2 degrees on the ecliptic, at 3:00; Jupiter is stationary in right ascension, with direct (eastern) motion to begin, at 16:00
8/12 Uranus is stationary in right ascension, with retrograde (western) motion to begin, at 6:00; the Moon is 0.04 degree south of Saturn, with an occultation taking place in most of Polynesia, Melanesia, northern New Zealand, most of Australia, and eastern Indonesia, at 10:00; the Moon is at the descending node (longitude 287.4 degrees) at 15:00; Jupiter is 6.7 degrees northeast of Antares at 17:00
8/13 Asteroid 15 Eunomia (magnitude +8.2) is at opposition at 6:00; the peak of the Perseid meteor shower (a zenithal hourly rate of 150 or more per hour) occurs at 7:00
8/14 Venus is in superior conjunction with the Sun (1.731 astronomical units) at 6:00
8/15 Venus is at its brightest (magnitude -3.9) at 12:00; Mercury is at the ascending node through the ecliptic plane.
8/17 Asteroid 39 Laetitia (magnitude +9.1) is at opposition at 3:00; the Moon is at apogee, subtending 29' 25" from a distance of 406,244 kilometers (252,429 miles), at 10:49; Mercury is 0.9 degree south of M44 at 11:00; the Moon is 3.5 degrees southeast of Neptune at 17:00
8/18 Mars is 0.7 degree north-northeast of Regulus at 9:00
8/20 Mercury is at perihelion (a distance of 0.3075 astronomical units from the Sun) at 7:00
8/21 Venus, Mars, and Regulus lie within a circle with a diameter of 2.1 degrees at 9:00; Venus is 0.9 degree north-northeast of Regulus 11:00; the Moon is 4.4 degrees southeast of Uranus at 19:00
8/22 Asteroid 4 Juno is in conjunction with the Sun at 22:00
8/23 The Moon is 7.8 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) at 17:00
8/24 The Curtiss Cross, an X-shaped clair-obscur illumination effect located between the craters Parry and Gambart, is predicted to be visible at 4:36; the Moon is 2.4 degrees north of the first-magnitude star Aldebaran (Alpha Taurii) at 10:00; Venus is 0.3 degree north-northeast of Mars at 18:00
8/26 Mars is at aphelion (1.6661 astronomical units from the sun) at 1:00; the Moon is 2.2 degrees south of the bright open cluster M35 in Gemini at 2:00
8/27 The Moon is at the ascending node (longitude 106.7 degrees) at 2:00; the Moon is 9.7 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 10:00; the Moon is 6.1 degrees south of Pollux at 15:00
8/28 The Moon is 0.3 degree north of M44 at 12:00
8/29 Mercury is 1.3 degrees north-northeast of Regulus at 9:00
8/30 The Moon, Mercury and Regulus lie within a circle having a diameter of 3.1 degrees at 0:00; the Moon is 3.1 degrees north-northeast of regulus at 1:00; Venus is at its northernmost latitude from the ecliptic plane (3.4 degrees) at 1:00; the Moon is 1.9 degrees north-northeast of Mercury at 3:00; New Moon (lunation 1196) occurs at 10:37; the Moon, Mercury and Mars lie within a circle having a diameter of 5.6 degrees at 11:00; Mercury is at its northernmost latitude from the ecliptic plane (7.0 degrees) at 12:00; the Moon is 2.9 degrees north-northeast of Mars at 13:00; the Moon, Venus, and Mars lie within a circle having a diameter of 4.00 degrees at 14:00; the Moon is at perigee, subtending 33' 28" from a distance of 357,176 kilometers (221,939 miles), at 15:53; the Moon is 2.8 degrees north-northeast of Venus at 19:00

John Flamsteed, Christian Mayer, Pierre François André Méchain, Maria Mitchell, and Otto Struve were born this month.

The Sun, the Moon, & the Planets

The gibbous phase of Mars was first observed by Francesco Fontana on August 24, 1638. Abraham Ihle discovered the globular cluster M22 on August 26, 1665. Nicolas Sarabat discovered Comet C/1729 P1 (Sarabat) on August 1, 1729. Caroline Herschel discovered Comet C/1786 P1 (Herschel) on August 1, 1786. The Saturnian satellite Enceladus was discovered by William Herschel on August 28, 1789. Dominique Dumouchel was the first person to observe the return of Comet 1P/Halley on August 5, 1835. John Russell Hind discovered asteroid 7 Iris on August 13, 1847. Asaph Hall discovered Deimos on August 11, 1877 and Phobos on August 17, 1877. The first extragalactic supernova, S Andromedae, was discovered by Ernst Hartwig on August 20, 1885. David Jewitt and Jane Luu discovered the trans-Neptunian object (15760) 1992 QB1 on August 30, 1992. The Jovian satellite 2002 Laomedeia was discovered by Matthew Holman on August 13th, 2002.

The Moon is 29.3 days old, is illuminated 0%, subtends 33.1 arc minutes, and is located in Cancer on August 1st at 0:00 UT. The Moon is at its greatest northern declination on August 27th (+22.4 degrees) and its greatest southern declination on August 12th (-22.4 degrees). Longitudinal libration is at a maximum of +7.2 degrees on August 9th and a minimum of -7.3 degrees on August 25th. Latitudinal libration is at a maximum of +6.8 degrees on August 25th and a minimum of -6.7 degrees on August 6th. The Moon is at perigee (at a distance of 56.35 Earth-radii) on August 2nd and again (at a distance of 56.00 Earth-radii) on August 30th and at apogee (at a distance of 63.69 Earth-radii) on August 17th. New Moon (i.e., the dark of the Moon) occurs on August 1st and August 30th. Large tides will take place following New Moon on August 30th. The waxing gibbous Moon occults Saturn and Pluto on August 12th from certain parts of the world. The waning crescent Moon occults the third-magnitude star Zeta Taurii on the morning of August 25th. The event is visible from the western continental United States and Mexico. For more on this occultation, see page 50 of the August 2019 issue of Sky & Telescope.Browse http://www.lunar-occ...bstar/bstar.htm for information on upcoming lunar occultations. Visit http://saberdoesthes...does-the-stars/ for tips on spotting extreme crescent Moons. Click on https://www.calendar...dar/2019/august for a lunar phase calendar for this month. Times and dates for the lunar crater light rays predicted to occur in August are available at http://www.lunar-occ.../rays/rays.htm

The Sun is located in Cancer on August 1st. It enters the constellation of Leo on August 11th and achieves an ecliptic longitude of 150 degrees on August 23rd.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto on August 1: Mercury (magnitude +2.0, 9.7", 13% illuminated, 0.70 a.u., Gemini), Venus (magnitude -3,9, 9.7", 100% illuminated, 1.73 a.u., Cancer), Mars (magnitude +1.8, 3.5", 100% illuminated, 2.65 a.u., Leo), Jupiter (magnitude -2.4, 42.7", 99% illuminated, 4.62 a.u., Ophiuchus), Saturn (magnitude +0.2, 18.3", 100% illuminated, 9.11 a.u., Sagittarius), Uranus (magnitude +5.8, 3.6", 100% illuminated, 19.53 a.u. on August 16th, Aries), Neptune (magnitude +7.8, 2.4", 100% illuminated, 29.02 a.u. on August 16th, Aquarius), and Pluto (magnitude +14.2, 0.1", 100% illuminated, 33.00 a.u. on August 16th, Sagittarius).

Mercury undergoes one of its best morning appearances of the year beginning at the middle of August. The speediest planet reaches its greatest heliocentric latitude south and is inferior conjunction on August 9th. The speediest planet is stationary on August 1st, reaches a greatest western elongation of 19 degrees on August 9th, and is at the ascending node on August 15th. It is at perihelion on August 20th and is at its greatest heliocentric latitude north on August 30th. The New Moon passes two degrees north-northeast of Mercury on August 30th.

Venus is lost in the glare of the Sun this month. It's in superior conjunction with the Sun at ecliptic latitude 3.1 degrees on August 14th. On that date, Venus is 1.731 a.u. from the Earth. The brightest planet attains its greatest heliocentric latitude north on August 30th.

Mars is also too close to the Sun to be seen during August.

Jupiter sets around midnight local daylight-saving time by the end of the month. It decreases in brightness from magnitude -2.4 to magnitude -2.2 and diminishes in angular diameter from 42.7 to 39.1 arc seconds during August. Jupiter reaches its second stationary point on August 11th. At mid-month, the gas giant is situated approximately seven degrees from Antares. The waxing gibbous Moon passes two degrees south of Jupiter on August 9th.
Jupiter passes very close to the tenth-magnitude globular cluster NGC 6235 from August 25th through August 27th. The four Galilean satellites are positioned in order of increasing distance from the planet on August 20th. Callisto, the outermost of the Galilean satellites, is located south of the planet on the night of August 16th/17th. Information on Great Red Spot transit times and Galilean satellite events is available on pages 50 and 51 of the August 2019 issue of Sky & Telescope and online at http://www.skyandtel...watching-tools/ and https://www.projectp...m/jevent.htm

Saturn transits around 11:30 p.m. local daylight-saving time as August begins. The Ringed Planet is located 0.6 degree south of the fourth-magnitude star Omicron Sagittarii on the night of August 7th/8th. Saturn is currently 18 arc seconds in angular diameter. Its ring system spans 41 arc seconds and is inclined by 25 degrees with respect to the Earth. The waxing gibbous Moon passes three degrees to the west of Saturn on August 11th. Saturn's peculiar satellite Iapetus passes 1.4 arc minutes north of the planet and shines at eleventh magnitude on the night of August 4th/5th. For additional information on Saturn's satellites, browse http://www.skyandtel...atching-tools/

Uranus lies eleven degrees southeast of the second-magnitude star Hamal (Alpha Arietis) this month. The ice giant is located 2.3 degrees south-southeast of the sixth-magnitude star 19 Arietis. Uranus is stationary in right ascension and begins retrograde (westward) motion on August 12th. The ice giant achieves its highest declination (+13 degrees) since the early 1960s on that date. A waning gibbous Moon passes five degrees south of the planet on August 21st. Visit http://www.bluewater...anus_2019_1.pdf and http://www.nakedeyep....com/uranus.htm for finder charts.

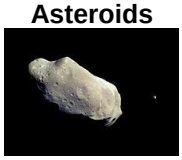
Neptune is located in eastern Aquarius. As the month begins, the eighth planet is situated 0.9 degree east-northeast of the fourth-magnitude star Phi Aquarii. By the end of August, Neptune lies just 0.15 degree from that star. A waning gibbous Moon passes four degrees south of Neptune on August 17th. Browse http://www.bluewater...tune_2019_1.pdf and http://www.nakedeyep...com/neptune.htm for finder charts.

Finder charts for Uranus and Neptune are also available at https://www.skyandte...WEB_UrNep19.pdf

The dwarf planet **Pluto** is occulted by a waxing gibbous Moon from some parts of the world on August 12th. On August 18th, Pluto passes 12 arc minutes north of the ninth-magnitude star HD 183431. On August 13th, Pluto can be found two arc minutes north of a tenth-magnitude field star. Finder charts can be found at http://www.bluewater...9/Pluto2019.jpg and on page 48 and 49 of the July 2019 issue of Sky & Telescope and on page 243 of the RASC Observer's Handbook 2019.

For more on the planets and how to locate them, browse http://www.nakedeyeplanets.com/

Asteroids



Asteroid 15 Eunomia (magnitude +8.2) reaches opposition in Aquarius on August 13th, asteroid 16 Psyche (magnitude +9.3) reaches opposition in Capricornus on August 6th, and asteroid 39 Laetitia (magnitude +9.1) reaches opposition in Capricornus on August 16th. A finder chart showing all three asteroids appears on page 48 of the August 2019 issue of Sky & Telescope. For information on asteroid occultations taking place this month, see http://www.asteroido.../2018_08_si.htm

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Carbon Star

Notable carbon star for August: V Aquilae Right Ascension: $19^h\ 04^m\ 24.155^s$ | Declination: −05° 41′ 05.44″

Comets

Comet C/2018 W2 (Africano) may shine at eleventh magnitude as it heads southwestward through Camelopardalis during August. It passes just to the north of the fifth-magnitude star SAO 24064 on August 29th. For further information on comets visible this month, browse http://cometchasing.skyhound.com/ and http://www.aerith.ne.../future-n.html http://cometchasing.skyhound.com/ and http://www.aerith.net/comet/future-n.html for information on comets visible this month.

Meteors

The peak of the Perseid meteor shower takes place on the night of August 12th/August 13th and is severely compromised by moonlight from a 95%-illuminated waxing gibbous Moon. Perhaps a dozen Perseids an hour may be visible during the peak. The shower's radiant is just to the southeast of the Double Cluster (NGC 869 and NGC 884). For more on this year's Perseids, see page 50 of the August 2019 issue of Sky & Telescope or click on https://earthsky.org...d-meteor-shower

Once called the Tears of St. Lawrence, this meteor shower occurs as the Earth moves through a stream of debris left by Comet 109P/Swift-Tuttle. The Perseids are a long-lasting show, running from July 17 through August 25. So take a look when the Moon is out of the way about a week before or a week after the peak on August 12. With patience and dark sky, you will see some meteors!

Orbiting Earth

Information on Iridium flares and passes of the ISS, the Tiangong-2, the USAF's X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/. Satellite information with ISS Live HD streaming https://www.n2yo.com

Information on the celestial events transpiring each week can be found at http://astronomy.com/skythisweek and http://www.skyandtel...ky-at-a-glance/

The Deep Sky

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 Vupeculae, Struve 2521, Struve 2523, Struve 2540, Struve 2586, Otto Struve 388, Struve 2599 (Vulpecula)

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) R.A. 16h 27m 33.7s | Dec +27* 54m 33.6s.

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

Various events taking place within our solar system are discussed at http://www.bluewater...ed-4/index.html

Information on the celestial events transpiring each week can be found at http://astronomy.com/skythisweek and http://www.skyandtel...ky-at-a-glance/

Free star charts for the month can be downloaded at http://www.skymaps.com/downloads.html and https://www.telescop...thly-Star-Chart

Data on current supernovae can be found at http://www.rochester...y.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 http://www.cambridge..._april-june.htm

Telrad finder charts for the Messier Catalog and the SAC's 110 Best of the NGC are posted at http://www.astro-tom...charts/map1.pdf and http://www.saguaroas...o110BestNGC.pdf respectively.

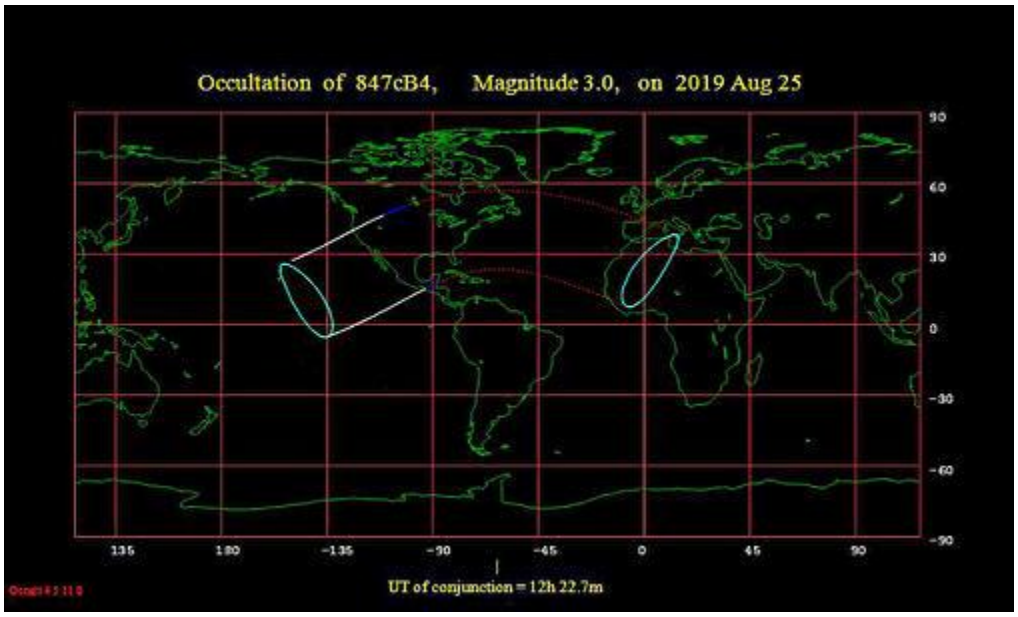
Information pertaining to observing some of the more prominent Messier galaxies can be found at http://www.cloudynig...ur-astronomers/

Stellarium and Cartes du Ciel are useful 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.deepskywa...-atlas-full.pdf and http://astro.mxd120....ee-star-atlases

On the morning of August 25th, the Moon will pass less than half a degree from Zeta Tauri, one of the stars at the tip of the 'horns' of Taurus. Observers in parts of western North America will see the Moon pass in front of Zeta Tauri. Timing and location here.. Boise is listed, but not Twin Falls.



Mercury rising in the eastern sky before sunrise on August 9, 2019. The planet reaches greatest western elongation on this day.

Idaho Dark Sky Reserve

Happy summer!

As the sky gets dark a bit earlier this time of year it's the perfect time for sitting outside under a starry sky with a favorite beverage, a star chart and a pair of binoculars. Ahh, summer....

UPCOMING EVENTS

Friday August 23

The Sawtooth Interpretive and Historical Assn (SIHA) Forum and Lecture Series will feature "**Astronomy Before Galileo**" presented by Brian Jackson from BSU's Physics Department. The program begins at 5:00 at the Stanley Museum.

Later that night, join local astronomers at dusk in the Stanley Park for **Stargazing over the Sawtooths**. Sponsors for the event include the Boise Astronomical Society, SIHA, the City of Stanley, and the Stanley-Sawtooth Chamber of Commerce.

NOTE: Members of the Magic Valley Astronomical Society are invited to attend this event.

Saturday August 31

CIDSR has been invited to have a booth at the Salmon Festival again this year. The Festival is based at the Stanley Museum and sponsored by Idaho Rivers United and SIHA.

Please let me know if you can help out at the booth this year. You can assist with set up from 9:00 -10:00 am or sign up for a two hour shift between 10:00 and 6:00. It's a great opportunity to talk with folks about the effects of light pollution on salmon and other wildlife.

DARK SKY NEWS

SIGNS

CIDSR Welcome signs have arrived thanks to Betsy's perseverance. The signs will let visitors know about the Reserve and remind those of us who live here that our night sky is worth preserving.
Please send photos of the signs as they get installed.

Check out the Central Idaho Dark Sky Facebook page for more photos.

LED Lighting

The NPR program Here and Now had an interesting segment on the status of LED lighting this past Monday (7/29). Mark Rea, professor and former director of the Lighting Research Center talked about the impacts of LEDs in addition to current lighting research and technology. There's a summary of the LED discussion on the Here and Now website. Or listen to the program podcast that includes other topics with the LED discussion at 11:50.

JUST FOR FUN

This bumper sticker was a Tim Frazier find. Even though it is no longer available it's a good message I thought it was worth sharing.

www.idahodarksky.org
idahodarksky@gmail.com
Look Up. Be Amazed.

CENTRAL IDAHO
DARK SKY
RESERVE

This information was provided through a newsletter from the CIDSR. It is reprinted here for publicity purposes.

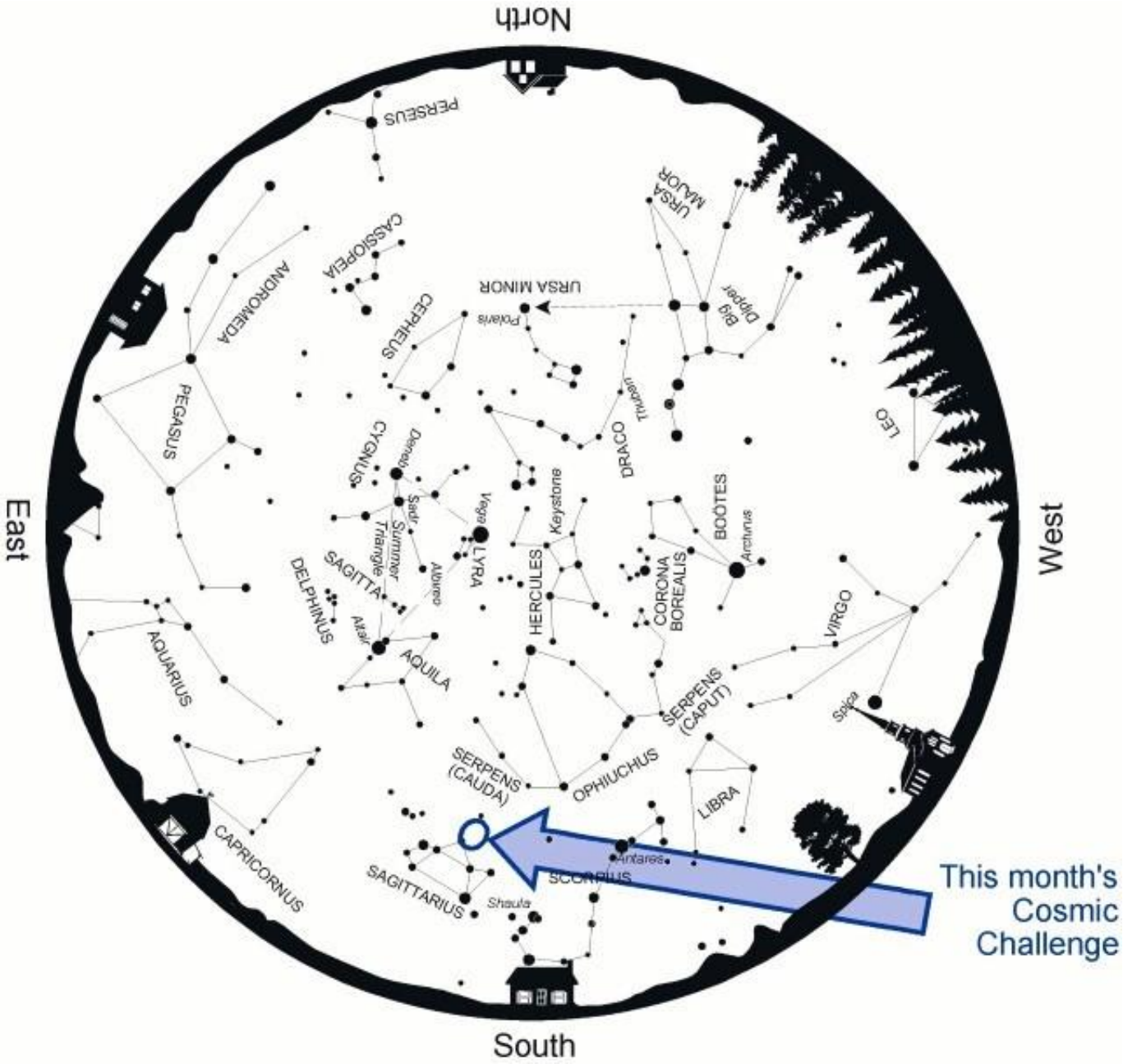
Phil Harrington's Cosmic Challenge

Cosmic Challenge: Planetary nebula IC 4732

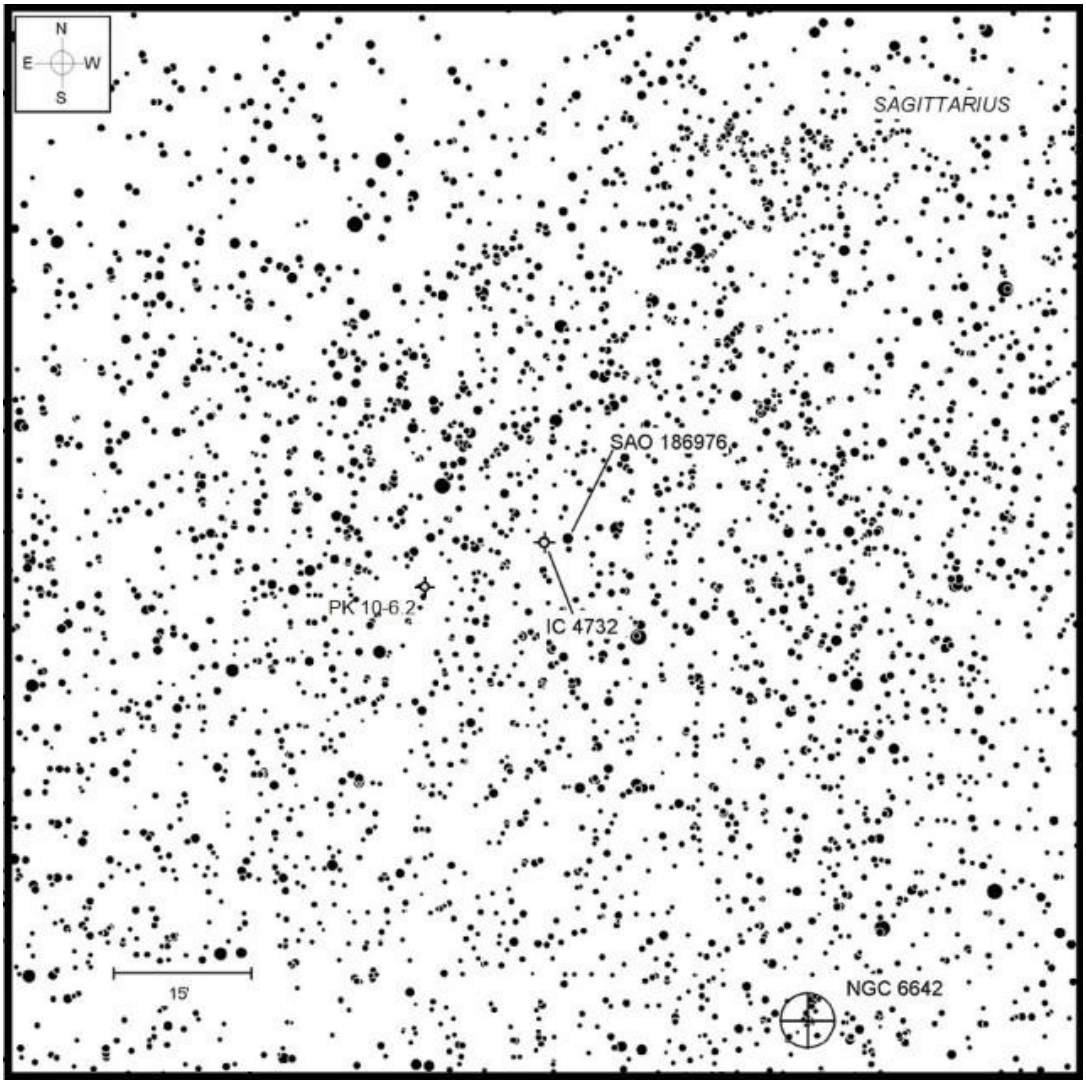
	10-inch (25 cm) to 14-inch (36 cm) telescopes

Target	Type	RA	DEC	Constellation	Magnitude	Size
IC 4732	Planetary nebula	18h 33.9m	-22° 38.7'	Sagittarius	12.1	3"

Whenever I am asked to name my favorite globular clusters, M22 in Sagittarius is always high on my list. I find it more impressive than M13 in Hercules. A 4-inch (10.2cm) aperture is all it takes to begin to crack its stellar vault into myriad faint points around a densely packed core. In a 10- to 14-inch, it's a wondrous sight.



Summer star map. Credit: Map adapted from Star Watch by Phil Harrington



Above: Finder chart for this month's Cosmic Challenge. Click on the chart to open a printable PDF version.

M22 is right in the thick of it, not far from the galactic center of the Milky Way. As such, it has lots of company. One particular planetary nebula proves a worthy adversary through 10- to 14-inch scopes: IC 4732. IC 4732 lies just 1.4° north-northwest of M22. Cataloged at magnitude 12.1, its tiny disk is difficult to pick out from the mob of field stars -- difficult, but not impossible.

To find IC 4732, center on M22 with a wide-field eyepiece in place. From the center of the globular, slide half a degree due north to 9th-magnitude SAO 187033, and then another half degree further northward to SAO 187032, also 9th magnitude. Finally, shift another half degree northwest to 8th-magnitude SAO 187000. By offsetting that last star toward the northwest of the eyepiece field, IC 4732 will lie close to the center, just 2' to the east of 10th-magnitude SAO 186976.

Under a steady suburban sky several years ago, my old 13.1-inch (33cm) reflector at 214x picked it out from the crowd using the "in-and-out" nebula-filter method. Center your telescope on the field suspected of containing IC 4732, hold your filter in between the eyepiece and your eye, and take a careful look. By alternately moving the filter in and out of the optical train, you will see the planetary "blink." Stars, which are broadband emission objects, will dim more noticeably than the planetary, which focuses its energy emissions only in a narrow portion of the visible spectrum. Do this back and forth rapidly, checking each stellar point as you go, and the planetary will have no choice but to reveal itself. I have had the greatest success using an OIII filter.

Regardless of the instrument and magnification used, IC 4732 will not show up as much more than a point of faint light. Its "stellar" rating of Class 1 on the Vorontsov-Velyaminov scale of planetary nebulae morphologies, created in 1934, indicates that even the professionals cannot resolve its disk beyond a small sphere. For those who are unfamiliar, the Vorontsov-Velyaminov planetary-nebula rating system was devised by the Russian astrophysicist Boris Vorontsov-Velyaminov (1904-1994). His 6-point system describing a planetary's morphology is summarized in the table below.

1	Stellar image
2	Smooth disk (a, brighter toward center; b, uniform brightness; c, traces of a ring structure)
3	Irregular disk (a, very irregular brightness distribution; b, traces of ring structure)
4	Ring structure
5	Irregular form, similar to a diffuse nebula
6	Anomalous form
Planetary nebulae with more complex structures are characterized by combinations of classes. For instance, M27, the Dumbbell Nebula in Vulpecula is rated "4+3a" for its complex disk morphology.	

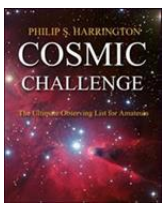
And while few amateurs have spotted IC 4732, even fewer can claim to have glimpsed its central star. It glows at a dismal magnitude 16.6.

IC 4732 as sketched through the author's 18-inch (46cm) reflector

Another planetary nebula just 14' to the east-southeast of IC 4732 proves to be even more challenging. **PK 10-6.2** shines at photographic magnitude 15.1 and measures only 8" across. Rated as Class 2, PK 10-6.2 also looks like a star even when viewed at magnifications exceeding 400x. Once again, try the in-and-out filter method to identify it.

As long as we are nearby, be sure to check out the 9th-magnitude globular cluster **NGC 6642**. You may have already noticed it as you were traveling from M22 to IC 4732. Through my 10-inch reflector, NGC 6642 looks like a small ball of celestial cotton with some faint 13th- and 14th-magnitude points around the edges.

There is also a planetary nebula hidden among the stars of M22, but I doubt that PK 9-7.1 is viewable through 10- to 14-inch scopes. We'll leave that one for another time. 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.

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Chill Out: Spot an Ice Giant in August

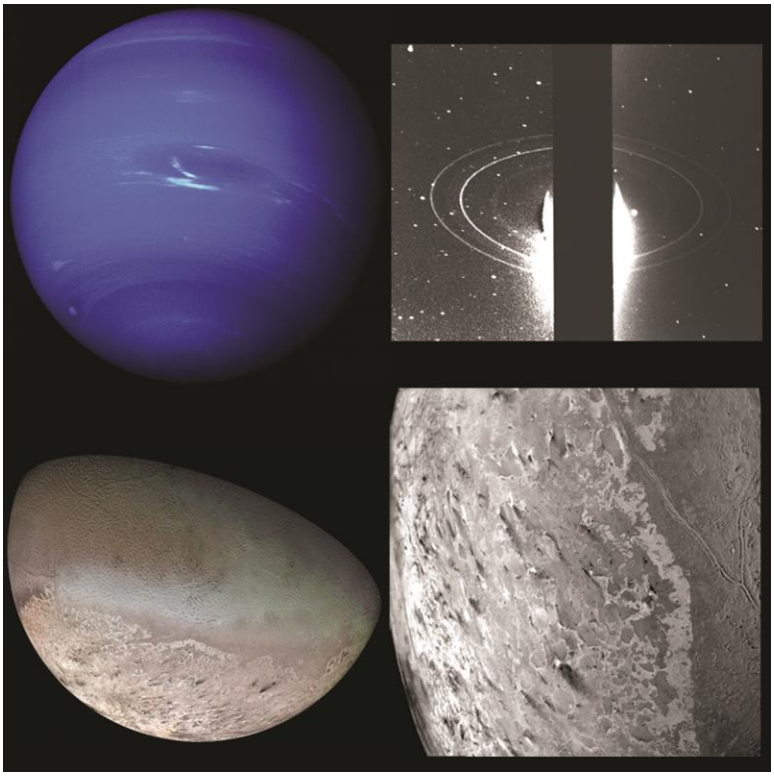
By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system's ice giants: **Neptune**! It's the perfect way to commemorate the 30th anniversary of Voyager 2's flyby.

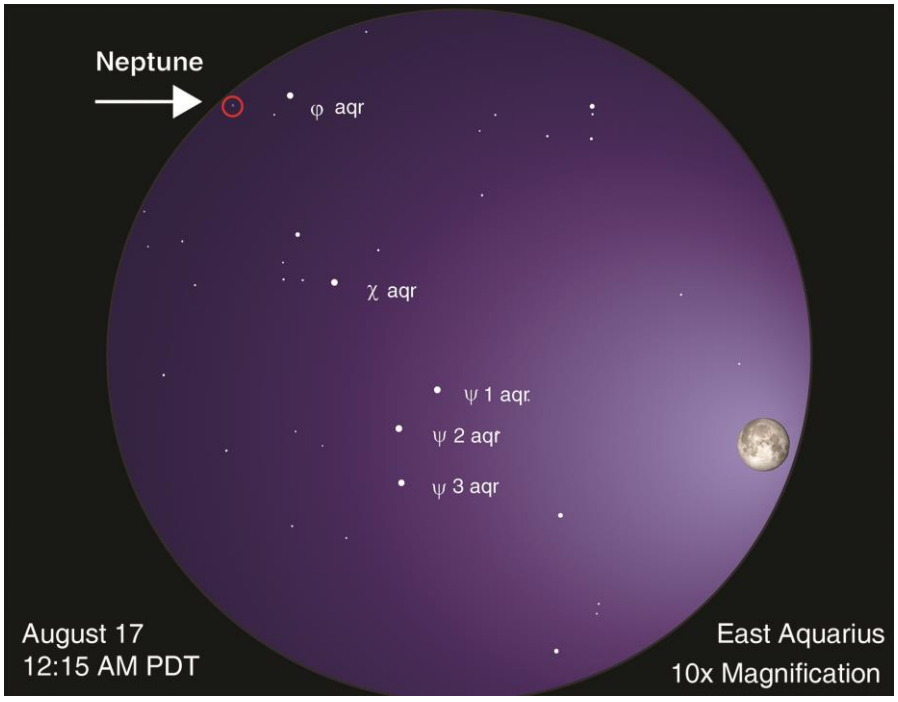
Neptune is too dim to see with your unaided eye so you'll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won't change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon's glare overwhelms Neptune's dim light, you can still use the its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope's eyepiece to zoom in as much as possible. Is the suspect blue "star" now a tiny disc, while the surrounding stars remain points of white light? You've found Neptune!

Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune's atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The "ice" in "ice giant" refers to the mix of ammonia, methane, and water that makes up most of Neptune's mass, located in the planet's large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA's Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet's surprisingly strong internal heating. Triton, Neptune's largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled "cantaloupe" terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet's rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA's past, present, and future missions, at nasa.gov



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune's rings; Triton and its famed icy cantaloupe surface; close of up Triton's surface, with dark streaks indicating possible cyrovolcano activity. Find more images and science from Voyager 2's flyby at bit.ly/NeptuneVoyager2 *Image Credit: NASA/JPL*



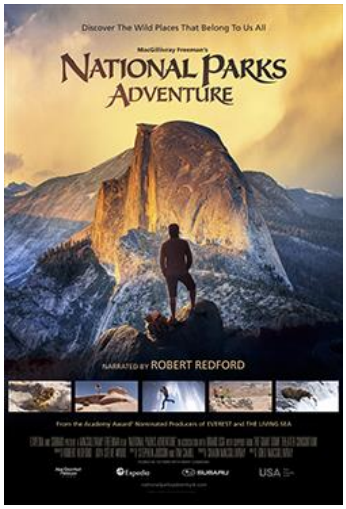
Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. *Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium.*

Observatory and Planetarium

CSI Centennial Observatory / Faulkner Planetarium Herrett Center

Event	Place	Date	Time	Admission
Summer Solar Session #11	Centennial Observatory	Wednesday, August 7th, 2019	1:30 to 3:30 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, August 10th, 2019	9:15 PM to midnight	FREE
Summer Solar Session #12	Centennial Observatory	Wednesday, August 14th, 2019	1:30 to 3:30 PM	FREE
Summer Solar Session #13	Centennial Observatory	Wednesday, August 21st, 2019	1:30 to 3:30 PM	FREE
KVMT Kids' Fest Solar Viewing	Centennial Observatory	Saturday, August 24th, 2019	10:00 AM to 2:00 PM	FREE
Summer Solar Session #14	Centennial Observatory	Wednesday, August 28th, 2019	1:30 to 3:30 PM	FREE

College of Southern Idaho Campus Twin Falls, ID
Faulkner Planetarium / Show Times
http://herrett.csi.edu/astronomy/planetarium/showtimes.asp



Now Showing
3 of the shows currently showing at the Faulkner Planetarium. Visit the link above for show times.

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.