Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, June 9th 2018
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

June 2018

Toward the end of last month I gave two presentations to two very different groups. One was at the Sawtooth Botanical Gardens in their central meeting room and covered the spring constellations plus some simple setups for astrophotography. The other was for the Sun Valley Company and was a telescope viewing session given on the lawn near the outdoor pavilion. The composition of the two groups couldn't be more different and yet their queries and interests were almost identical. Both audiences were genuinely curious about the universe and their questions covered a wide range of topics. How old is the moon? What is a star made of? How many exoplanets are there? And, of course, the big one: Is there life out there?

The SBG's observing session was rained out but the skies did clear for the Sun Valley presentation. As the SV guests viewed the moon and Jupiter, I answered their questions and pointed out how one of Jupiter's moons was disappearing behind the planet and how the mountains on our moon were casting shadows into the craters. Regardless of their age, everyone was surprised at the details they could see and many expressed their amazement at what was "out there".

After both of these evenings, I felt a sense of accomplishment in opening people's minds to what is in our universe and particularly what is in our immediate cosmic neighborhood. It is this feeling, as much as my personal joy in observing, that gives me my astronomy "fix". In reflecting on what MVAS's mission is, I come back to opening the community's eyes to the universe and enjoying their pleasure in discovering what literally surrounds them.

Summer is coming fast and so is the prime observing season of the year. The time for our most popular star parties is upon us and we can all enjoy the great star clouds of the Milky Way and derive the vicarious pleasure of seeing others discover the beauty of night sky. This month features three major star parties with the possibility of a fourth. On June 8th, we are meeting in Filer for the Girl Scouts, on the 15th the Boise Astronomical Society is having a star party in Stanley, the 16th in Hagerman and the 22nd at Wine Cup Ranch. If you are interested in attending the Stanley gathering, make reservations for lodging or camping immediately as spaces there are very limited. All of these are opportunities for us to share our knowledge and enthusiasm with others.

New observing sites as well as a presentation about the Central Idaho Dark Sky Reserve is our June 9th meeting topic. Betsy Mizell from the Idaho Conservation League is presenting information about the reserve as well as locations of good observing locations within the CIDSR. This is an excellent opportunity to learn about new places to observe under dark skies. I'll see everyone there.

Keep looking up,

Tim

Calendar

June 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6 Last Quarter Visible 53% ↓ Age: 21.9 Days 	7	8	9 MVAS Meeting at 7:00pm at the Herrett Center Faulkner Planetarium Public Star Party Centennial Obs.
10	11	12	13 New Moon Lunation 1181 1% Visible ↓ Age: 0.00 Day 	14 Flag Day 	15	16 Hagerman Star Party details found on page 10 
17 Father's Day 	18	19	20 First Quarter 51% Visible ↑ 	21 Summer Solstice 	22	23
24	25	26	27	28 Full Moon 100% Visible Strawberry Moon 	29	30

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.

Be Safe – Get Out There – Explore Your Universe

Celestial Events Calendar

All times, unless otherwise noted, are UT (subtract seven hours and, when appropriate, one calendar day for MST)

6/1 The Moon is 1.6 degrees north of Saturn at 1:00; Mercury is at the ascending node through the ecliptic plane.
6/2 The Moon is at apogee, subtending 29' 29" from a distance of 405,317 Km's (251,852 miles) 6/3 Mercury is 5.8 degrees north-northwest of the first-magnitude star Aldebaran (Alpha Tauri) at 11:00; the Moon is 3.1 degrees north of Mars at 11:00; the Moon is at the descending node (longitude 307.1degrees) at 12:37
6/5 Venus is 8.1 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 21:00
6/6 Mercury is at superior conjunction with the Sun (1.322 astronomical units from the Earth) at 2:00; Mercury is at perihelion (0.3075 astronomical unit from the Sun) at 10:00; Venus is at its greatest latitude north of the ecliptic plane (3.4 degrees) at 15:00; Last Quarter Moon occurs at 18:32
6//7 The Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to be visible at 9:52
6/8 Venus is 4.7 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 9:00
6/9 Mars and Saturn are at heliocentric conjunction (heliocentric longitude 275.8 degrees) at 4:00
6/10 The Moon is 4.6 degrees south-southeast of Uranus at 6:00
6/12 The Moon is 8.8 degrees south-southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 8:00; the Moon is 1.2 degrees north of Aldebaran at 23:00
6/13 The equation of time, which is the difference between mean solar time and apparent solar time, is 0 at 4:00. Mercury is 0.81degree north of the bright open cluster M35 in Gemini at 21:00
6/14 The earliest sunrise of the year at latitude 40 degrees north occurs today; the Moon is 3.8 degrees south of M35 at 11:00; the Moon is 4.6 degrees south of Mercury at 14:00; Mercury is at its greatest declination north (25.2 degrees) at 22:00; the Moon is at perigee, subtending 32' 14" from a distance of 359,503 kilometers (223,385 miles), at 23:53
6/15 Asteroid 29 Amphitrite (magnitude +9.5) is at opposition at 13:00
6/16 The Moon is 2.3 degrees south of Venus at 13:00; Mercury at its greatest latitude north of the ecliptic plane (7.0 degrees) at 15:00; the Moon is at the ascending node (longitude 126.5 degrees) at 17:52; the Moon is 1.2 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 20:00; asteroid 9 Metis (magnitude +9.7) is at opposition at 20:00
6/17 The earliest morning twilight of the year at latitude 40 degrees north occurs today
6/19 Neptune is stationary in right ascension, with retrograde (westward) motion to begin, at 9:00; asteroid 4 Vesta (magnitude +5.3) is at opposition at 10:00
6/20 Venus is 0.69 degree north-northeast of M44 at 10:00.
6/21 Sunrise takes place on the isolated lunar mountain Mons Pico at 3:19; summer solstice in the northern hemisphere occurs at 10:08; sunrise takes place on the isolated lunar mountain Mons Piton at 18:55; the Sun enters Gemini (longitude 90.43 degrees on the ecliptic) at 21:00
6/22 The Moon is 7.1 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 8:00
6/23 Mercury (magnitude -0.5) is 8.2 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 7:00; the Moon is 4.0 degrees north-northeast of Jupiter at 21:00
6/24 The latest evening twilight of the year at latitude 40 degrees north occurs today
6/25 Mercury is 4.8 degrees south-southwest of the first-magnitude star Pollux (Beta Geminorum) at 1:00
6/26 The Moon is 8.9 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 1:00; Mars is stationary in longitude at 21:00
6/27 The latest sunset of the year at latitude 40 degrees north occurs today; the Moon is 0.3 degree north of asteroid 4 Vesta, with an occultation taking place in the Galapagos Islands, Central America, southern Mexico, northern French Polynesia, Kiribati, and Micronesia, at 9:00; Saturn is at opposition (angular size 18.4", magnitude 0.0) at 13:00
6/28 The Moon is 1.8 degrees north of Saturn at 4:00; Mars is stationary in right ascension, with retrograde (westward) motion to begin at 14:00
6/30 The Moon is at apogee, subtending 29' 26" from a distance of 406,061 kilometers (252,315 miles), at 2:43; the Moon is at the ascending node (longitude 306.0 degrees) at 16:45

Giovanni Cassini (1625-1712), Charles Messier (1730-1817), George Ellery Hale (1868-1938), and Carolyn Shoemaker (1929) were born this month.

The French astronomer Nicolas Louis de Lacaille discovered the globular cluster M55 on June 16, 1752. A transit of the Sun by Venus was observed by Austrian, British, and French astronomers from various parts of the world on June 6, 1761. The French astronomer Charles Messier discovered the globular cluster M14 on June 1st, 1764, the emission and reflection nebula M20 (the Trifid Nebula) on June 5, 1764, and the open cluster M23 on June 20, 1764. The globular cluster M62 was discovered by Charles Messier on June 7, 1771. The French astronomer Pierre Méchain discovered his first deep-sky object, the spiral galaxy M63 (the Sunflower Galaxy), on June 14, 1779. The German/English astronomer William Herschel discovered the globular cluster NGC 6288 on June 24, 1784. The Italian astronomer Giovanni Battista Donati discovered Comet C/1858 L1 (Donati), the first comet to be photographed, on June 2, 1858. The Tunguska event occurred on June 30, 1908. The Georgian astronomer Givi Kimeridze discovered a Type Ia supernova in the spiral galaxy M58 on June 28, 1989.

The Sun, the Moon, & the Planets

The Sun is located in Taurus on June 1st. It enters Gemini on June 21st. The Sun reaches its farthest position north for the year on June 21st. There are 15 hours and one minute of daylight at latitude 40 degrees north on June 21st, the day of the summer solstice. At latitude 40 degrees north, the earliest sunrise occurs on June 14th and the latest sunset on June 27th.

Mercury is in the northwest, Venus is in the west, Jupiter is in the south, and Saturn is in the southeast in the evening sky. At midnight, Mars and Saturn lie in the southeast and Jupiter lies in the southwest. Mars can be found in the south, Saturn in the southwest, Uranus in the east, and Neptune in the southeast at dawn. Mercury is at superior conjunction with the Sun on the night of June 5th/June 6th and is not visible again until mid-month. On June 14th, a very thin waxing crescent Moon and Mercury are nearly eight degrees apart very low in the west-northwest 30 minutes after sunset. Mercury is at its greatest heliocentric latitude north on June 16th. It sets 90 minutes after sunset by the end of the month.

Venus is easily visible at dusk for the entire month. It brightens from magnitude -3.9 to magnitude -4.1, increases in angular size from 13.1 arc seconds to 15.6 arc seconds, and decreases in illumination from 80% to 70%. Venus reaches its highest altitude at sunset (nearly 28 degrees for observers at latitude 40 degrees) for the year on June 6th. It enters Cancer on June 11th. The Moon passes two degrees south of the planet on June 16th. Venus passes through the far northern portion of M44 on the night of June 19th.

Mars rises around midnight as the month begins and around 10:30 p.m. local daylight time as June ends. During June, it brightens by almost a full magnitude, from magnitude -1.2 to magnitude -2.1, and grows in angular size from 15.3 arc seconds to 20.7 arc seconds. The waning gibbous Moon passes three degrees north of Mars on June 3rd. Two of the most prominent Martian surface features, the dark triangular region Syrtis Major and the bright Hellas basin, lie on the planet's central meridian on the nights of June 6th through June 10th. The Red Planet ends its prograde (eastward) motion through Capricornus on June 28th.

Jupiter can be seen at dusk and culminates around 11:00 p.m. local daylight time as June begins. It decreases in angular diameter from 44.1 to 41.5 arc seconds and dims from magnitude -2.5 to magnitude -2.2 this month. The waxing gibbous Moon passes four degrees north of Jupiter on June 23rd. Browse http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ or http://www.projectpluto.com/jeve_grs.htm in order to determine transit times of Jupiter's central meridian by the Great Red Spot. GRS transit times are also available on page 50 of the June 2018 issue of Sky & Telescope. Javascript Jupiter at http://www.shallowsky.com/jupiter/ shows Galilean satellite events.

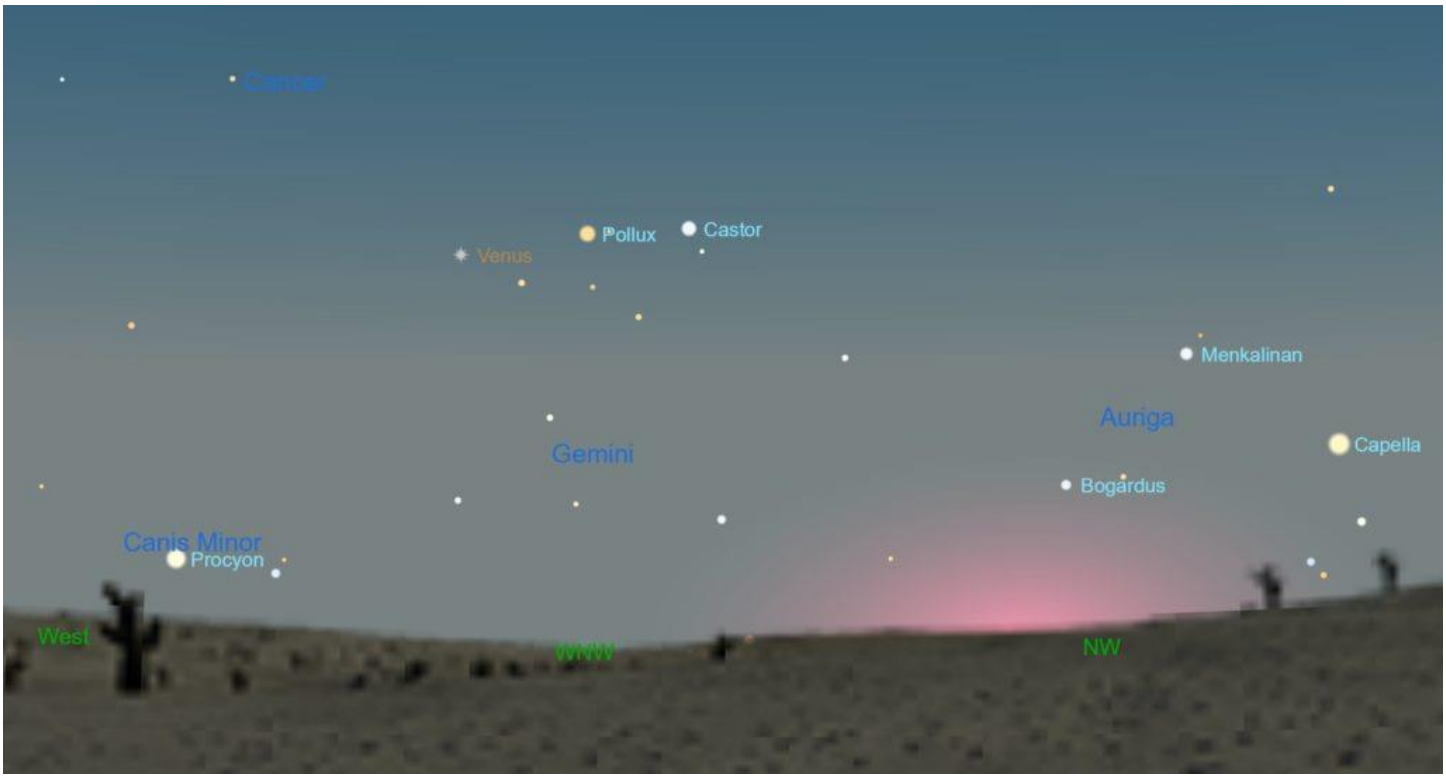
Saturn rises not long after 10:00 p.m. local daylight time in early June. It is located 3.2 degrees south of the bright open cluster M25 and 1.9 degrees northwest of the bright globular cluster M22 on June 1st. The Ringed Planet's retrograde motion carries it to a position approximately midway between M25 and the bright emission nebula M8 (the Lagoon Nebula) by June 31st. Saturn is visible for the entire night when it reaches opposition on June 27th. On that date, the planet shines at magnitude 0.0 and subtends 18.4 arc seconds at its equator, while its rings span 41.7 arc seconds and are inclined 25.7 degrees. The planet is located 22.5 degrees south of the celestial equator and is 75 light minutes (9.05 a.u.) from Earth at opposition. An article on Saturn at opposition appears on page 50 of the June 2018 issue of Sky & Telescope. The waning gibbous Moon passes less than two degrees north of Saturn on June 1st. On June 27th, the almost Full Moon passes less than two degrees from the planet. For information on Saturn's satellites, browse http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/

Uranus achieves an altitude of 20 degrees in the east as twilight ends in late June. The ice giant is situated in southwestern Aries, some twelve degrees south of the first-magnitude star Hamal (Alpha Arietis).

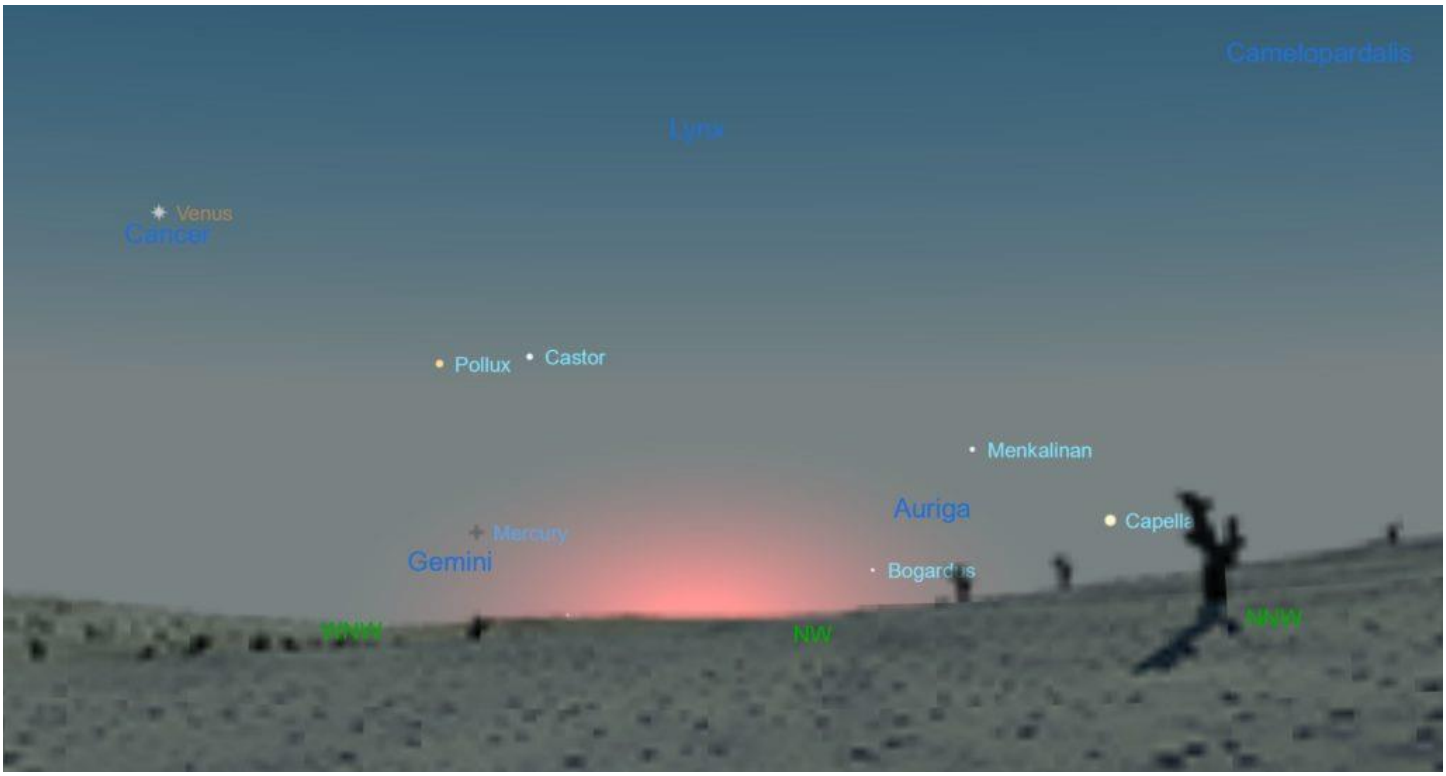
In early June, **Neptune** rises about 2:00 a.m. local daylight time. The eighth planet lies one degree west-southwest of the fourth-magnitude star Phi Aquarii.

Pluto resides in northeastern Sagittarius. A finder chart appears on page 48 and 49 of the July 2018 issue of Sky & Telescope and on page 243 of the RASC Observer's Handbook 2018.

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



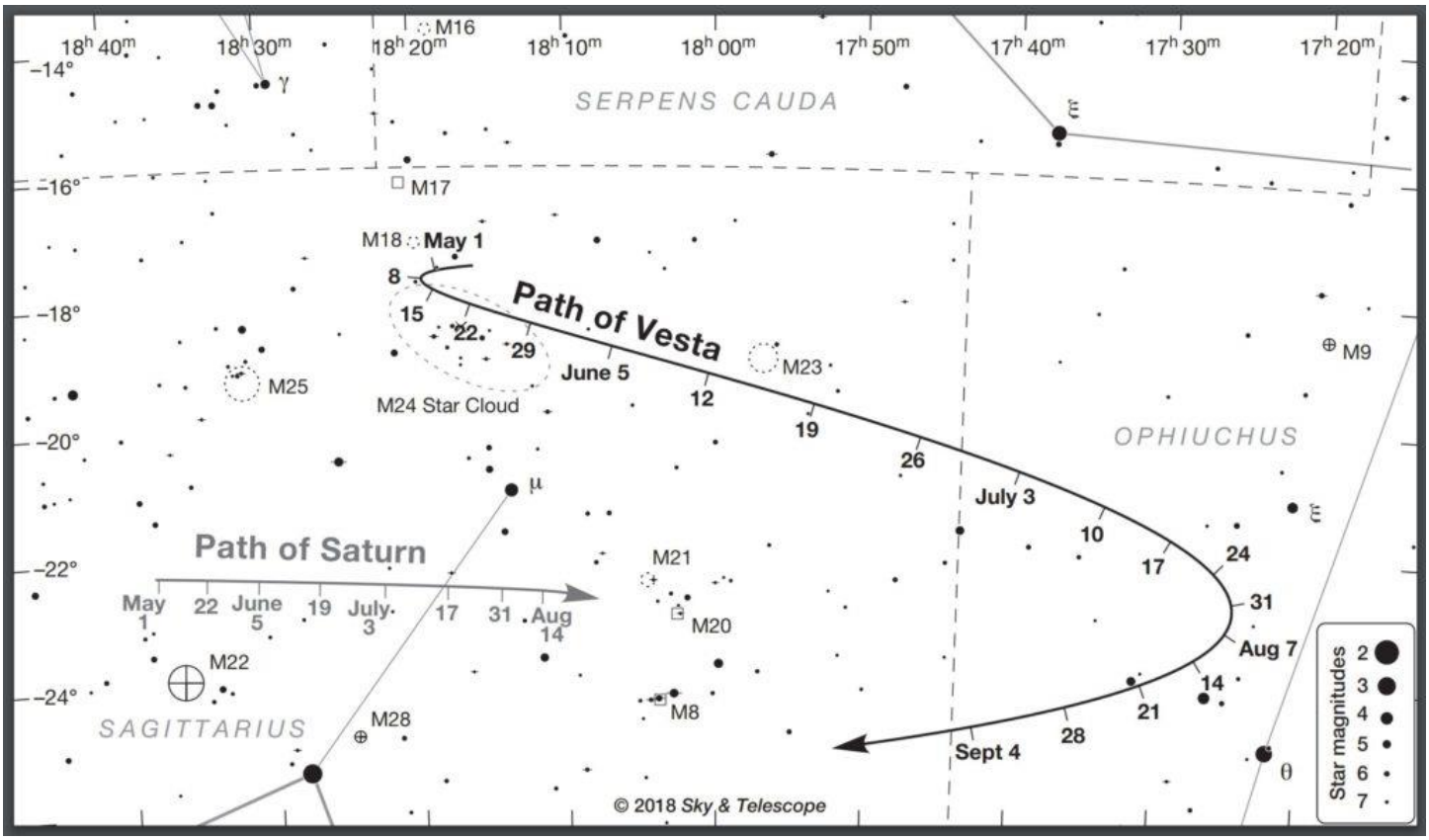
Venus, Castor, and Pollux in the western sky after sunset on June 10, 2018.



Mercury and Venus in the western sky after sunset in late June 2018.

Asteroids

Asteroid **4 Vesta** (angular diameter 0.69", magnitude +5.3) reaches opposition in northwestern Sagittarius on June 19th. The brightest of all the asteroids travels southwestward through Sagittarius and into Ophiuchus this month. It passes south of the bright open cluster M23 in mid-June. A finder chart can be found on page 48 of the June 2018 issue of Sky & Telescope. Asteroid 4 Vesta should be visible without optical aid from a dark site. It will not be this bright again until 2031. The dwarf planet/asteroid **1 Ceres** shines at ninth magnitude as it travels southeastward through Leo this month. It passes within 0.1 degree of the third-magnitude star Epsilon Leonis on June 3rd and the second-magnitude star Algieba (Gamma Leonis) on June 27th. Asteroid **29 Amphitrite** (magnitude +9.5) is at opposition on June 15th and asteroid 9 Metis (magnitude +9.7) is at opposition on June 16th. Information on asteroid occultations taking place this month is available at http://www.asteroidoccultation.com/2018_06_si.htm



A chart showing the position of Vesta (and Saturn) through June and July. Credit: Sky and Telescope.

Carbon Star

Notable carbon star for June: **V Coronae Borealis** a Mira-type long period variable star and carbon star in the constellation Corona Borealis. Right Ascension: $15^h\ 49^m\ 31.31093^s$ Declination: +39° 34′ 17.9111″

Comets

Comet C/2016 M1 (PanSTARRS) may shine at tenth magnitude as it travels southwestward through Sagittarius this month. It passes approximately 40 arc minutes from the eighth-magnitude globular cluster M54 on the nights of June 9th and June 10th and about twice that distance from the eighth-magnitude globular cluster M70 on the nights of June 12th and June 13th. Visit http://cometchasing.skyhound.com/ and http://www.aerith.net/comet/future-n.html for information on other comets visible this month.

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/

Meteors

The minor Ophiuchid meteor shower (5 per hour) peaks on the morning of June 20th. Browse https://in-the-sky.org/news.php?id=20180620_10_100 for additional information.

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

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.skyandtelescope.com/observing/sky-at-a-glance/

Free star maps for June 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 http://www.cambridge.org/features/turnleft/seasonal_skies_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.com/messier/messier_finder_charts/map1.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 Deep Sky

Forty binary and multiple stars for June: Struve 1812, Kappa Bootis, Otto Struve 279, Iota Bootis, Struve 1825, Struve 1835, Pi Bootis, Epsilon Bootis, Struve 1889, 39 Bootis, Xi Bootis, Struve 1910, Delta Bootis, Mu Bootis (Bootes); Struve 1803 (Canes Venatici); Struve 1932, Struve 1964, Zeta Coronae Borealis, Struve 1973, Otto Struve 302 (Corona Borealis); Struve 1927, Struve 1984, Struve 2054, Eta Draconis, 17-16 Draconis, 17 Draconis (Draco); 54 Hydrae (Hydra); Struve 1919, 5 Serpentis, 6 Serpentis, Struve 1950, Delta Serpentis, Otto Struve 300, Beta Serpentis, Struve 1985 (Serpens Caput); Struve 1831 (Ursa Major); Pi-1 Ursae Minoris (Ursa Minor); Struve 1802, Struve 1833, Phi Virginis (Virgo)

Fifty deep-sky objects for June: NGC 5466, NGC 5676, NGC 5689 (Bootes); M102 (NGC 5866), NGC 5678, NGC 5879, NGC 5905, NGC 5907, NGC 5908, NGC 5949, NGC 5963, NGC 5965, NGC 5982, NGC 5985, NGC 6015 (Draco); NGC 5694 (Hydra); NGC 5728, NGC 5791, NGC 5796, NGC 5812, NGC 5861, NGC 5878, NGC 5897 (Libra); M5, NGC 5921, NGC 5957, NGC 5962, NGC 5970, NGC 5984 (Serpens Caput); M101, NGC 5473, NGC 5474, NGC 5485, NGC 5585, NGC 5631 (Ursa Major); NGC 5566, NGC 5634, NGC 5701, NGC 5713, NGC 5746, NGC 5750, NGC 5775, NGC 5806, NGC 5813, NGC 5831, NGC 5838, NGC 5846, NGC 5850, NGC 5854, NGC 5864 (Virgo)

Top ten deep-sky objects for June: M5, M101, M102, NGC 5566, NGC 5585, NGC 5689, NGC 5746, NGC 5813, NGC 5838, NGC 5907

Top five deep-sky binocular objects for June: M5, M101, M102, NGC 5466, NGC 5907

Challenge deep-sky object for June: Abell 2065 Right Ascension: $15^{h}\ 22^{m}\ 31.8^{s}$ Declination: +27° 42′ 04″

Abell 2065, photographed with amateur equipment Skywatcher 10" Quattro Newtonian, Skywatcher AZ-EQ6 GT mount, Skywatcher f4 aplanatic coma corrector, Skywatcher 9x50 finder scope, Lacerta MGEN-II Superguider Canon EOS100D camera, 1x10 min exposures, ISO 800, 13x10 min dark frames, processing made with DeepSkyStacker 3.3.4 and StarTools 1.3.5.289 Baiculesti commune, Arges county, Romania Avg. outside temp: 17ºC

The objects listed above are located between 14:00 and 16:00 hours of right ascension.

The trailer purchased through grant funds.

Inside with plenty of room for equipment. Note: The Editor is jealous because the Boise Astronomical doesn't have one.

5th annual

Hagerman Fossil Beds Star Party

See cosmic light as old as the Hagerman Horse

Saturday, June 16th, 2018

- ★ 2:00-8:30 PM — **Solar viewing & hands-on activities**, Visitors' Center, 221 N State St., Hagerman, ID
- ★ 8:30-9:00 PM — **Night sky orientation talk**, Visitors' Center
- ★ 9:45 PM-12:00 AM+ — **Star party** (telescope viewing), Oregon Trail Overlook, Bell Rapids Rd., Hagerman Fossil Beds NM

Telescopes provided. Free admission.

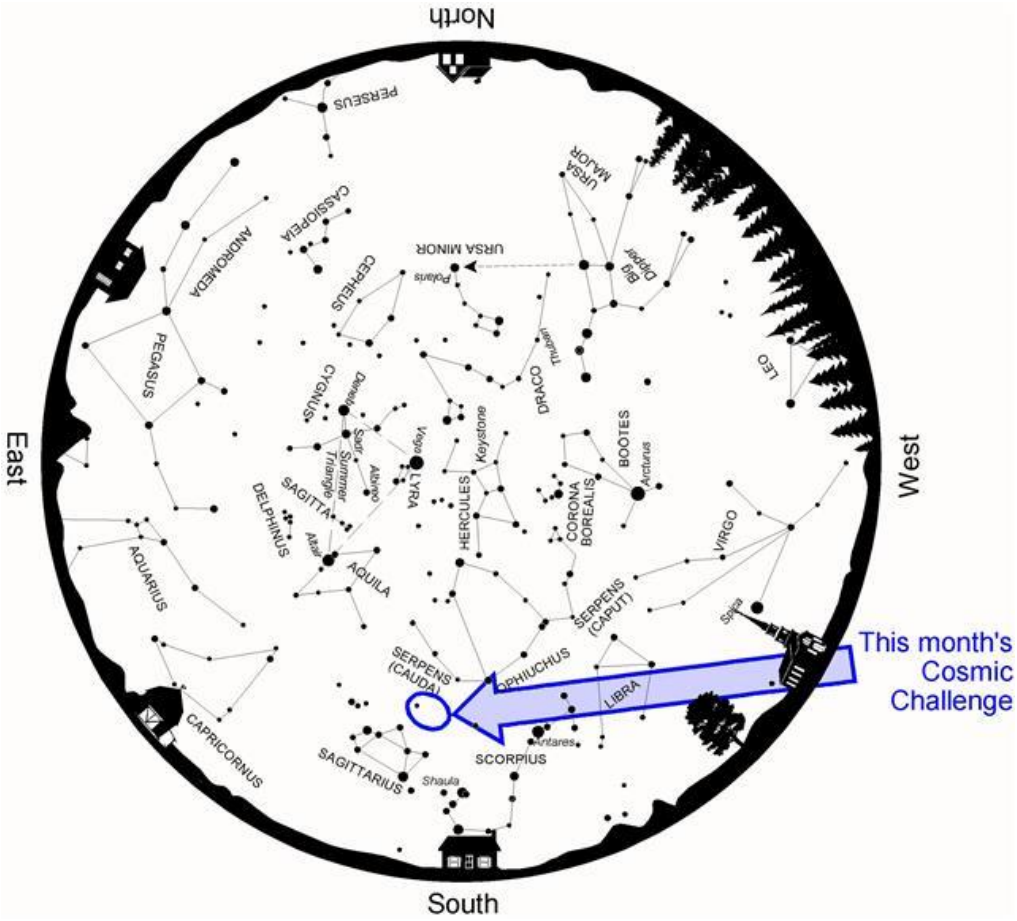
Hosted by: Hagerman Fossil Beds National Monument, Magic Valley Astronomical Society, and the College of Southern Idaho's Centennial Observatory.

Cosmic Challenge – Glimpsing Vesta

The solar system became a little more crowded on January 1, 1801. That night, the Sicilian astronomer Giuseppe Piazzi stumbled upon the first asteroid, which he named Ceres after the Roman goddess of agriculture and grain. Now reclassified as a dwarf planet by the International Astronomical Union, Ceres was the first object discovered to be orbiting the Sun between Mars and Jupiter.

As is so often the case in astronomy, once the first of something is discovered, the flood gates open. That certainly has been the case with asteroids. The second asteroid, Pallas, was found in 1802, while the third, Juno, was discovered in 1804. By the end of the 19th century, several hundred were known.

Surprisingly, even though Ceres is the largest member of the clan at about 600 miles (960 km), it is not the brightest. That honor goes to Vesta, the fourth asteroid discovered. Vesta was first spotted on March 29, 1807, by the German physician Heinrich Olbers. Olbers had also discovered Pallas two years earlier.



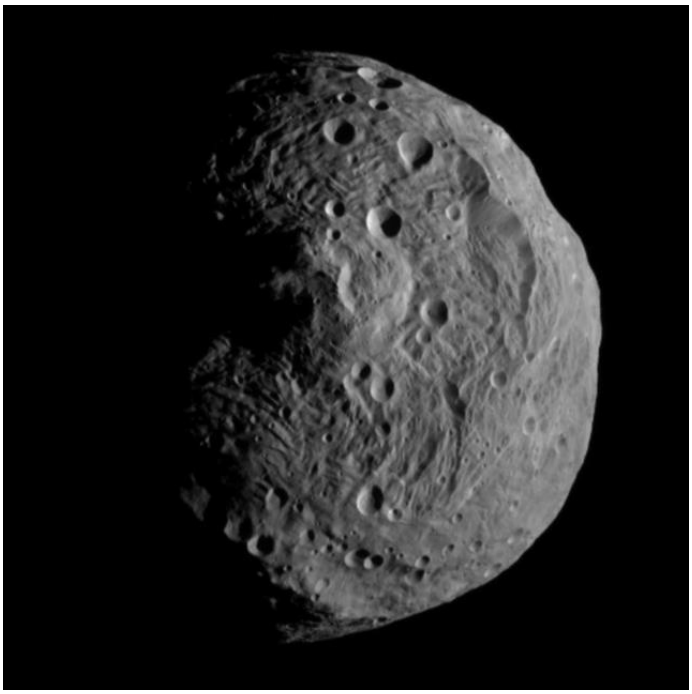
Above: Late night June star map showing the location of this month's Cosmic Challenge.
***Credit:** Map adapted from **Star Watch** by Phil Harrington*

Although oblong Vesta only has an average diameter of about 320 miles (520 km), it can outshine Ceres by more than a full magnitude at times. While Ceres reflects about 10% of the sunlight striking it, Vesta's bright surface reflects more than 30%. Decades ago, it was found that Vesta's surface is apparently covered with basalt, a byproduct of volcanism. This suggested that at some point in the distant past, Vesta was volcanically active.

To learn more about both of these fascinating members of our solar system, NASA launched the Dawn spacecraft in September 2007. Dawn's dual destinations made it the first spacecraft to visit two targets in a single mission. It arrived at Vesta in July 2011, where it spent more than a year in orbit.
It then fired its ion engine to leave Vesta in September 2012 and move on to Ceres. It went into orbit there in March 2015, where it remains today. These diverse worlds offer scientific snapshots of the birth of our solar system 4.6 billion years ago.

Vesta turns out to be more like a mini-planet than like the chunks of rock most think of as asteroids. Dawn's measurements of the gravity field provided good evidence that Vesta's interior is separated into layers, much like Earth did as the planet was forming. Vesta's dense core - apparently once molten, but now solidified - is composed principally of iron and nickel, just like Earth's. Estimates place it at 125 to 150 miles (200 to 250 kilometers) across. Surrounding that is the mantle, which in turn is covered by the veneer of the crust, about 12 miles (20 kilometers) thick. It is now believed that early on Vesta was likely still accumulating material to become a full-fledged planet when Jupiter's immense gravity intervened, putting a stop to that. As a result, when we look at Vesta, many believe that we are seeing a protoplanet frozen in time.

Dawn also discovered that Vesta's surface is heavily cratered with two huge impact basins near its south pole. The larger, named Rheasilvia, is 310 miles (500 km) wide, while the second, Veneneia, is 250 miles (400 km) wide. Rheasilvia is 95% of the mean diameter of Vesta and it is about 12 miles (19 km) deep. Its central peak rises 12-16 miles (19-26 km) and spans 100 miles (161 km), virtually tying it with Mars' Olympus Mons as the largest mountain in the solar system.



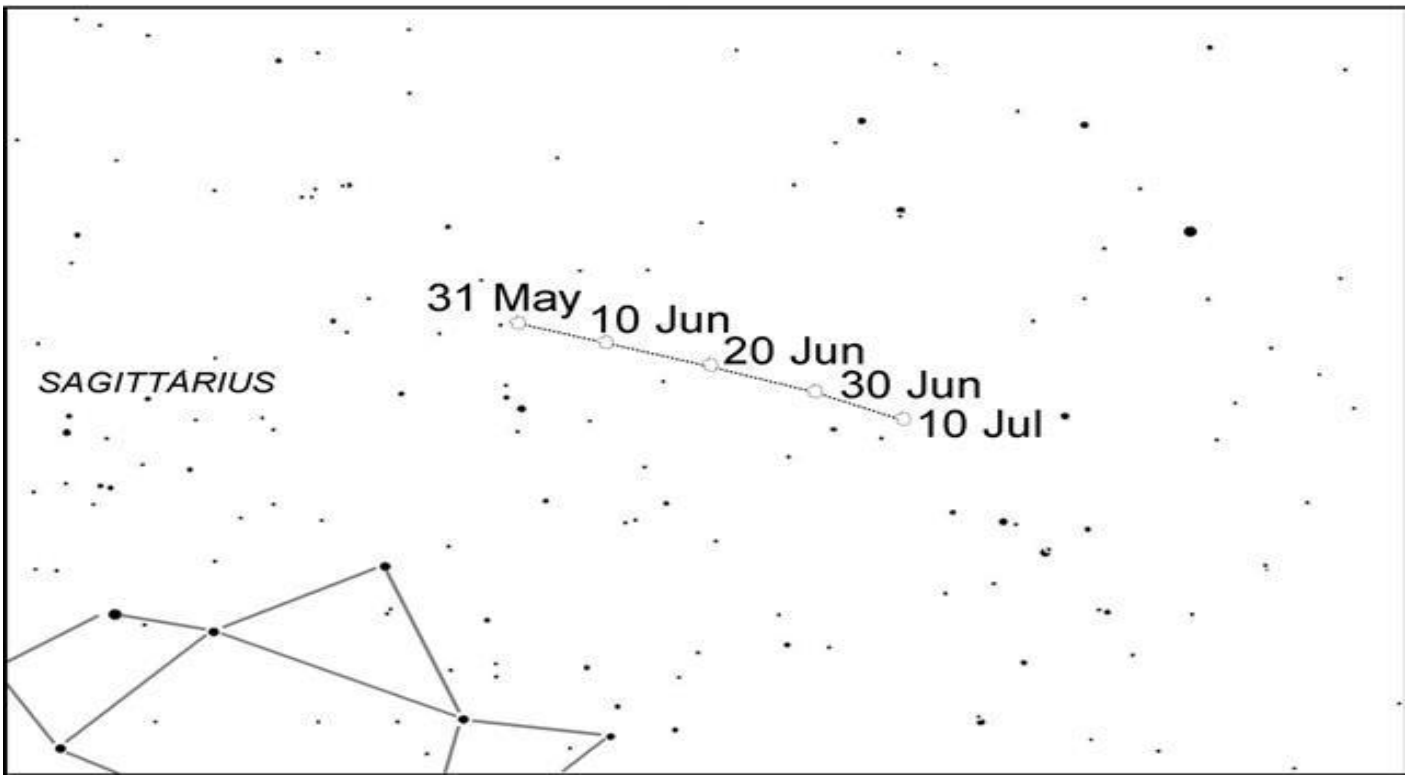
Above: The southern hemisphere of Vesta, centered on Rheasilvia's central mountain.
Credit: NASA/JPL-Caltech/UCAL/MPS/DLR/IDA

Back here on Earth, Vesta has the distinction of being the only asteroid to crack the naked-eye barrier. For one to three weeks either side of opposition, Vesta can be seen without any optical aid provided the sky is clear and dark, and you know exactly where to look. The table below lists future oppositions for the next 7 years.

Year	Date of opposition	Constellation	Magnitude
2018	19 June	Sagittarius	5.3
2019	12 November	Cetus	6.5
2021	4 March	Leo	6.0
2022	22 August	Aquarius	5.8
2023	22 December	Orion	6.4
2025	1 May	Libra	5.6

As you can tell from that table, Vesta will be exceptionally bright at this year's opposition on June 19, reaching approximately magnitude 5.3. That's because it passed the perihelion point in its orbit on May 10, only 40 days earlier.

Unfortunately, Vesta is also currently passing through Sagittarius, an area so full of faint stars that trying to figure out which one it is will prove quite challenging indeed. To help you in your quest, the finder chart below plots the path that Vesta will follow this month and next. The chart also shows stars down to approximately 7th magnitude.



Above: Finder chart for this month's Cosmic Challenge. ***Credit:*** *Chart adapted from* ***Cosmic Challenge*** *by Phil Harrington*
Click on the chart to open a printable PDF version in a new window

I'd recommend first spotting it through binoculars. Even though there are many stars in the area, Vesta should still be fairly easy to identify. Then, without changing the angle of your gaze, move away from the eyepieces and see if you can spot it by eye alone. It might be easier if the binoculars are mounted on a tripod, so you don't have to keep recentering them on Vesta if you need to try again.

Good luck. And be sure to post your results in this column's discussion forum! Oh, and if you want to see where Dawn is now, this month Ceres is in the western sky, passing through the Sickle of Leo. But at a little brighter than 9th magnitude, it will take well-aimed binoculars to spot. You can create your own customized chart by going to TheSkyLive.com's Ceres-Tracker. They also have a Vesta-Tracker that is worth a bookmark.

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!

This article is provided by NASA Space Place.
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What Is the Asteroid Belt?

By Linda Hermans-Killiam

There are millions of pieces of rocky material left over from the formation of our solar system. These rocky chunks are called asteroids, and they can be found orbiting our Sun. Most asteroids are found between the orbits of Mars and Jupiter. They orbit the Sun in a doughnut-shaped region of space called the asteroid belt.

Asteroids come in many different sizes—from tiny rocks to giant boulders. Some can even be hundreds of miles across! Asteroids are mostly rocky, but some also have metals inside, such as iron and nickel. Almost all asteroids have irregular shapes. However, very large asteroids can have a rounder shape.

The asteroid belt is about as wide as the distance between Earth and the Sun. It's a big space, so the objects in the asteroid belt aren't very close together. That means there is plenty of room for spacecraft to safely pass through the belt. In fact, NASA has already sent several spacecraft through the asteroid belt!

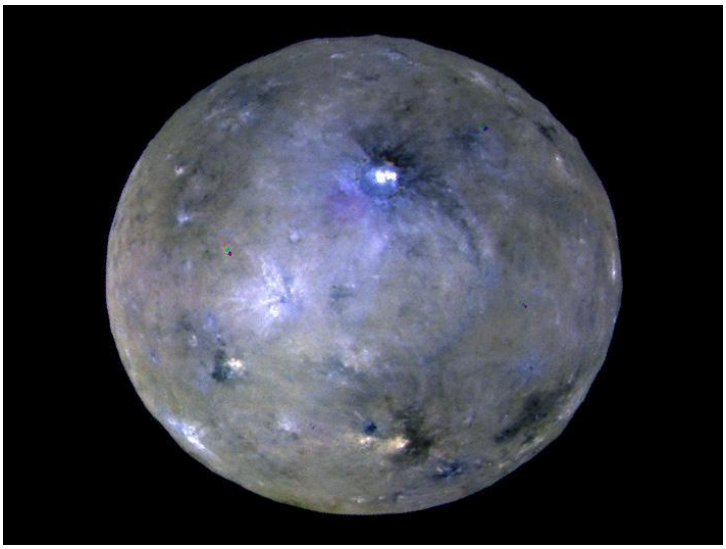
The total mass of objects in the asteroid belt is only about 4 percent the mass of our Moon. Half of this mass is from the four largest objects in the belt. These objects are named Ceres, Vesta, Pallas and Hygiea.

The dwarf planet Ceres is the largest object in the asteroid belt. However, Ceres is still pretty small. It is only about 587 miles across—only a quarter the diameter of Earth's moon. In 2015, NASA's Dawn mission mapped the surface of Ceres. From Dawn, we learned that the outermost layer of Ceres—called the crust—is made up of a mixture of rock and ice.

The Dawn spacecraft also visited the asteroid Vesta. Vesta is the second largest object in the asteroid belt. It is 329 miles across, and it is the brightest asteroid in the sky. Vesta is covered with light and dark patches, and lava once flowed on its surface.

The asteroid belt is filled with objects from the dawn of our solar system. Asteroids represent the building blocks of planets and moons, and studying them helps us learn about the early solar system.

For more information about asteroids, visit: https://spaceplace.nasa.gov/asteroid



Caption: This image captured by the Dawn spacecraft is an enhanced color view of Ceres, the largest object in the asteroid belt.
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

Observatories and Planetarium

CSI Centennial Observatory / Faulkner Planetarium Herrett Center

Event	Place	Date	Time	Admission
Summer Solar Session #2	Centennial Observatory	Wednesday, June 6th, 2018	1:30 to 3:30 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, June 9th, 2018	10:00 PM to midnight	FREE
Summer Solar Session #3	Centennial Observatory	Wednesday, June 13th, 2018	1:30 to 3:30 PM	FREE
Hagerman Star Party (5th annual)	Hagerman Fossil Beds National Monument	Saturday, June 16th, 2018	2:00 PM to 12:00 AM	FREE
Summer Solar Session #4	Centennial Observatory	Wednesday, June 20th, 2018	1:30 to 3:30 PM	FREE
Summer Solar Session #5	Centennial Observatory	Wednesday, June 27th, 2018	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

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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.