astronomical calendar

BUHL PLANETARIUM & OBSERVATORY

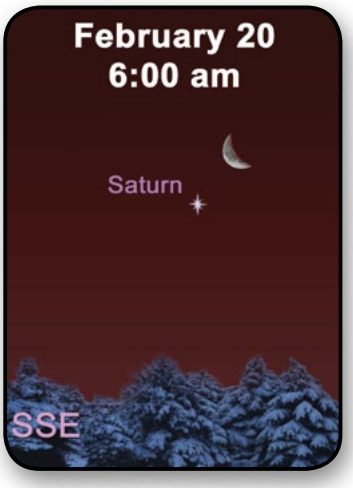
winter
2016–2017

DECEMBER

3	Sat		Venus 6 degrees below Crescent Moon (Look southwest after sunset)
4	Sun		Mars 6 degrees left of Crescent Moon (Look southwest in pm)
7	Wed	◐	First Quarter Moon – 4:03 am
11	Sun		Mercury at greatest elongation (Look west at dusk)
13	Tue	○	Full Moon “Cold Moon” – 7:05 pm Geminid Meteor shower maximum (Mid-evening until dawn Dec. 14)
20	Tue	◑	Last Quarter Moon – 8:55 pm
21	Wed		Winter Solstice – 5:44 am
22	Thu		Jupiter 2 degrees below Moon (Look southeast in the am)
29	Thu	●	New Moon – 1:53 am

JANUARY

2	Mon		Crescent Moon between Venus and Mars (Look southwest in pm)
3	Tue		Quadrantid Meteor Shower (Overnight until dawn on Jan. 4)
4	Wed		Earth reaches perihelion (closest) 91,400,000 miles from the Sun
5	Thu	◐	First Quarter Moon – 2:46 pm
9	Mon		Saturn 7 degrees to upper right of Mercury (Look southeast before dawn)
12	Thu	○	Full Moon “Wolf Moon” – 6:33 am Venus at Greatest Elongation (Look southwest at dusk)
19	Thu	◑	Last Quarter Moon – 5:13 pm Jupiter 3 degrees right of the Moon (Look south in the am)
27	Fri	●	New Moon – 7:07 pm
31	Tue		Venus & Mars within 3 degrees of Crescent Moon (Look west-southwest in pm)



FEBRUARY

2	Thu		Venus 5 degrees lower right of Mars (Look west-southwest after sunset)
3	Fri	◐	First Quarter Moon – 11:18 pm
6	Mon		Venus 5 degrees to lower right of Mars (Look west in pm)
10	Fri	○	Full Moon “Snow Moon” – 7:32 pm
12	Sun		Venus at highest altitude after sunset (Look west)
18	Sat	◑	Last Quarter Moon – 2:33 pm Venus attains greatest brilliancy -4.5 magnitude (Look west in pm)
20	Mon		Saturn 5 degrees south of the Moon (Look south-southeast before dawn)
23	Thu		Jupiter 4 degrees north of Spica (Look southwest in the am)
26	Sun	●	New Moon – 9:58 am

OBSERVATORY SkyWatch

Join stargazers rain or shine on Dec. 21 for Solstice SkyWatch.

$4 for non-members / $2 for members and as an add-on to general admission or Omnimax show
For dates and details visit CarnegieScienceCenter.org/planetarium

Winter Planet Visibilities

December	**Morning:**	Jupiter (SE)
	Evening:	Mercury, Venus, and Mars (SW)
January	**Morning:**	Jupiter (S), Mercury, and Saturn (SE)
	Evening:	Venus and Mars (S-SW)
February	**Morning:**	Jupiter (SW) and Saturn (SE)
	Evening:	Venus and Mars (W)

Venus' Brilliant Winter Display

Our dazzling bright "evening star" Venus will light up the western sky this winter. Our sister planet will steadily climb higher and brighten until it reaches a stunning shadow-casting -4.5 magnitude in February.

Our sister planet undergoes a 548-day cycle from a "morning star" to "evening star" and back to "morning star" again. When Venus is a "morning star," it can be seen in the eastern sky before sunrise. When it's an "evening star," it's visible in the western sky after sunset. Each appearance lasts for nearly nine months, during which the planet slowly moves away from the Sun as viewed from Earth. When Venus reaches its greatest elongation on January 12, the planet is at a point in its orbit where it is furthest from the sun and highest in the sky. Venus won't be at its brightest, however, until about four weeks after its greatest elongation on February 18. Venus will then rapidly sink to the western horizon and disappear from the evening sky in the middle of March. It then reappears in the morning sky in early April.

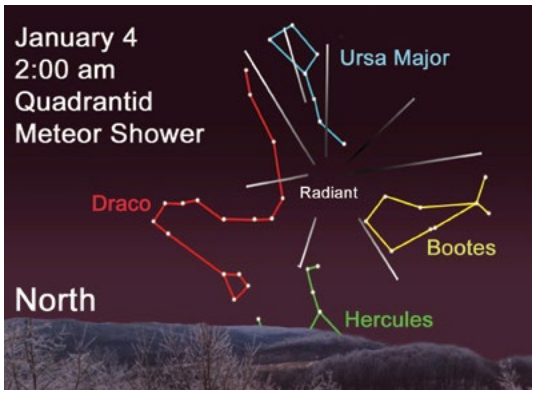
Look for Venus in mid-December, about 25 degrees above the south-western horizon 30 minutes after sunset. By mid-January, our dazzling bright "evening star" will have climbed about 10 degrees higher and sit about 35 degrees above the southwestern horizon. On February 18, when Venus is at its brightest, our stunning sister planet will sit about 33 degrees above the western horizon.

astronomical fact:

After more than 12 years studying Saturn and its rings and moons, NASA's Cassini spacecraft will enter the final year of its epic voyage in 2017. The conclusion of this historic mission is planned for September, but not before the spacecraft passes through the gap between Saturn and the rings - an unexplored region only about 1,500 miles wide. The spacecraft is expected to plunge 22 times through this gap, beginning with its first dive in late April.

Quadrantid Meteor Shower

One of the most intense and briefest meteor showers of the year, the Quadrantids, will peak overnight on January 3 and until dawn on January 4. The waxing crescent moon sets early enough so it should not interfere with this year's display. Observers under a dark sky could see as many as 40 shooting stars per hour.



To view the Quadrantids, simply go outside after midnight on January 4 and face north. The shower's radiant (a point in the sky from which meteors appear to stream) will lie between Draco, Bootes, and the Big Dipper. Quadrantid meteors can appear anywhere in the heavens, but their trails will point back toward the radiant.

Preview of 2017 Celestial Events

The first coast-to-coast total solar eclipse over the U.S mainland in 38 years occurs on August 21, 2017. The Moon's shadow will darken skies on approximately a 70-mile-wide path across twelve states from Oregon to South Carolina. Since western Pennsylvania and the tri-state region is not in the path of totality, this event will be a partial eclipse in our region.

2017 will be a good year for viewing Saturn. Because its stunning rings are angled wide open and fully displayed, pale-yellow Saturn will shine at its brightest since 2002. Saturn starts the year low in the eastern sky at dawn. The ring world will be at its brightest in the evening sky when it goes into opposition and reaches its closest point to the Earth on June 15. Jupiter will begin the year in the morning sky in Virgo very close to Spica. The Jovian giant will return to the evening sky in mid-March before going into opposition on April 7. Venus starts the year high in the western evening sky after sunset close to Mars. Our sister planet will shine at its brightest in February before sinking below the western horizon in mid-March. Venus rapidly returns as a "morning star" in April and reaches greatest brilliancy in early May. Mercury will make its best evening sky appearances in late March and July. The diminutive world will make its best morning sky appearances in January and September. Mars starts the year as an object visible to the naked eye in the southwestern evening sky, but will continue to dim before sinking out of the sky in May.

This should also be a good year for viewing meteor showers, especially the Geminids in December. Unfortunately, light from the waning gibbous moon in August will somewhat interfere with viewing most of the fainter Perseid meteors.