

# Sky News

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## INTERSTELLAR VISITOR

A comet or asteroid from outside our solar system made an extreme orbit around our Sun in September and October, 2017. The object was moving at 15.8 miles per second from the direction of Lyra (the Harp) above the ecliptic plane of our solar system. It passed inside of Mercury's orbit on September 9<sup>th</sup>. On October 14<sup>th</sup>, the object passed under Earth's orbit (about 15 million miles away), did a hairpin turn (from the Sun's gravity) and speeded up to 27 miles per second. It returned above the ecliptic plane and is on its way in the direction of Pegasus (the Winged Horse). The CNEO (Center for Near-Earth Objects) says it will never return. The Minor Planet Center has temporarily named the object A/2017 U1. More information on NEOs and asteroids can be found at <https://cneos.jpl.nasa.gov>, or <https://www.jpl.nasa.gov/asteroidwatch>.

## NOAA WINTER FORECAST

The NOAA (National Oceanic and Atmospheric Administration) forecasters at their Climate Prediction Center have released the U.S. Winter Outlook. Keep in mind that Arctic Oscillation can influence the number of polar air masses coming our way and they cannot be predicted for more than two weeks ahead of time.

They believe a weak **La Nina** weather pattern will develop in the Pacific Ocean. La Nina is a phenomenon occurring when there are cooler than average sea surface temperatures in the central Pacific Ocean near the Equator. Typical weather patterns for the Great Lakes region during a La Nina are colder than average temperatures and above average precipitation. The Northwest Indiana area should expect an increase in precipitation (snow or rain) greater than 40% more than average. See the maps at <http://www.noaa.gov>.

## LAUNCH YOUR ART

The European Space Agency (ESA) is planning to launch the *Cheops* satellite into orbit aboard a Soyuz rocket in late 2018. Its mission is to observe bright stars known to have planets.

ESA is offering an opportunity for artists and graphic designers to submit their original artwork to be added to the **fairing**, which is an outer shell that goes over the satellite during launch. The fairing can be seen at the top of the rocket as it sits on the launch pad. At about 62 miles up, the fairing will be shed and fall back to Earth.

To see the rules, go to their website at <http://www.esa.int> or directly to the contest at [http://www.esa.int/Our\\_Activities/Space\\_Science/Launch\\_your\\_design\\_with\\_Cheops](http://www.esa.int/Our_Activities/Space_Science/Launch_your_design_with_Cheops).

## EARLY MARS LIKE EARTH

NASA's *Mars Reconnaissance Orbiter's* report of early conditions on Mars has researchers making comparisons to early Earth's life-forming conditions.

Mars had a large sea in its southern hemisphere that held 10 times as much water as all the Great Lakes combined. The Eridania basin once held the ancient Eridania Sea. Hot springs fed mineral-laden water directly into the ancient sea. Like Earth about 3.7 billion years ago, the undersea hydrothermal conditions occurred on both planets. These venting areas are suspected of being where and when life may have begun on Earth, maybe on Mars too.

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The following sources were used  
for this issue of *Sky News*:  
[www.jpl.nasa.gov](http://www.jpl.nasa.gov), [www.physics.valpo.edu](http://www.physics.valpo.edu),  
<http://www.noaa.gov>, [www.esa.int](http://www.esa.int),  
<http://www.astropixels.com>,  
*Astronomy, Sky and Telescope*.

## DECEMBER PLANETS

Mars can be seen rising in the southeastern sky about 3:00 a.m. passing from the constellation Virgo (the Maiden) into Libra (the Scales). Mars nears Jupiter. Mars looks like a ruddy-colored star.

Jupiter can be seen rising in the southeastern sky in the constellation Libra (the Scales) just on its western edge. Jupiter rises an hour after Mars. Jupiter can be seen passing medium high in the southeastern sky at dawn. Jupiter looks like a very bright, yellow-colored star.

Venus can be seen for a short time before dawn rising in the southeastern sky moving through the constellation Scorpius (the Scorpion). Venus appears later every morning until it disappears in the Sun's glare around midmonth. Venus passes behind the Sun on January 9<sup>th</sup>. Venus will return in the western sky after sunset as the "Evening Star" for the winter and spring. Venus looks like a bright white star.

Mercury passes between the Sun and Earth on December 6<sup>th</sup> so it cannot be seen most of the month. Mercury will return to the predawn southeastern sky by the end of the month in the constellation Ophiuchus (Serpent-Bearer). Mercury looks like a small white star.

Saturn cannot be seen as it has moved into the Sun's glare and will pass behind the Sun on December 21<sup>st</sup>. Saturn will return to a predawn southeastern sky above the spout of the "Teapot" in Sagittarius (the Archer). Saturn looks like an amber-colored star.

## DECEMBER SUNRISE AND SUNSET (times are for mid-month)

sunrise: 7:09 a.m.  
 sunset: 4:20 p.m.  
 length of daylight: 9 hours, 11 minutes  
 length of darkness: 14 hours, 49 minutes

This edition of the  
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 was written by  
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## SKY DATES

### December

- 2 - Moon at aphelion
- 3 - Moon passes 0.8° N of Aldebaran  
 - Full moon called Christmas Moon, Cold Moon, Long Night Moon, and Before Yule Moon at 9:47 a.m.  
 - Largest full moon of 2017
- 4 - Moon at perigee (closest point to Earth) at 221,340 miles at 2:42 a.m.
- 6 - Mercury passes 1.3° of Saturn
- 7 - Moon passes 2.5° S of Beehive cluster  
 - Earliest sunset for 40° N Lat. at 4:35 p.m.
- 8 - Moon passes 0.7° N of Regulus  
 - Moon passes 8.41° S of Ceres  
 - Puppis-Velid meteor shower peaks  
 - **VU Public Lecture** "The Christmas Star: An Astronomer's Investigation" by Dr. Bruce Hrivnak of VU  
 - **VU Observatory** 8:30 to 9:30 p.m.  
 - Monocerotid meteor shower peaks
- 10 - Last quarter moon at 1:51 a.m.
- 11 - CAS Christmas Party at Planetarium
- 12 - Moon passes 25.59° S of Makemake  
 - Mercury at perihelion at 6:00 a.m.  
 - Mercury at inferior conjunction  
 - Geminid meteor shower peaks (Class 1)
- 13 - Moon passes 4.2° N of Mars  
 - Moon passes 24.14° S of Haumea
- 14 - Moon passes 4.2° N of Jupiter
- 15 - Coma Berenicid meteor shower peaks
- 17 - Moon passes 1.45° N of Mercury  
 - Asteroid Massalia at opposition  
 - Moon passes 4.08° N of Venus
- 18 - New moon at 12:31 a.m.  
 - Moon at apogee (farthest point from Earth) at 252,095 miles at 7:27 p.m.  
 - Moon at perihelion
- 19 - Leonis Minorid meteor shower peaks  
 - Moon passes 1.53° N of Pluto
- 21 - Winter solstice at 10:16 a.m.  
 - Saturn in conjunction at 2:00 p.m.  
 - Longest night of the year
- 22 - Ursid meteor shower peaks (with fireballs)
- 26 - First quarter moon at 3:20 a.m.
- 27 - Moon passes 7.49° N of Eris  
 - Mercury at dichotomy
- 30 - Moon passes 0.7° N of Aldebaran