

# Sky News

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## VESTA

NASA's *Dawn* spacecraft travelled four years to reach the asteroid Vesta, located in the asteroid belt between the orbits of Mars and Jupiter. Scientists discovered a complex asteroid that's more like a small, terrestrial planet.

Like Earth and other inner planets, Vesta has ancient basaltic lava flows on its surface. Its tectonic, or mountain-building, features include troughs, ridges, hills, cliffs, and mountains. Vesta has other topographic, or surface features like plains and craters of all sizes. Scientists compare its surface to Hawaii, where basaltic lava flows have solidified.

Scientists believe that Vesta is differentiated. That means during its formation, Vesta was big enough to internally heat up and separate into layers of different materials. The heavier materials sink to the center, the lighter materials float to the top, which is the planet's surface. Like Earth, Vesta has a heavy iron core, a mantle, and a lighter crust.

Vesta's year is about 3.6 years on Earth. It's the second largest object in the asteroid belt. Vesta isn't quite round in shape. Vesta is tilted on its axis by 27°, Earth is tilted at 23.5°. Vesta has seasons similar to Earth and Mars because of the tilt. Vesta's temperature at the poles is -200°F and at the equator is about -190°F. Water could remain frozen at the poles for billions of years. Water as ice is being looked for by the gamma ray and neutron detector spectrometer on the *Dawn* spacecraft.

Scientists believe during the early formation of the solar system, Jupiter's powerful gravity disrupted the asteroid belt and stopped further coalescence, or growth, of bodies in the asteroid belt. Vesta could have been a regular planet before its growth was interrupted and stopped. Vesta and Ceres are probably remnant protoplanets.

Scientists are trying to prove through their mineral composition that many of the meteorites discovered on Earth have come from Vesta. Vesta's 13-mile high mountain, higher than any Earth mountains and almost as high as the highest mountain in our solar system, Olympus Mons on Mars, may have been hit by other asteroids. Fragments travelled to Earth and probably can be found in museum collections.

The International Astronomical Union will consider formally reclassifying Vesta from asteroid to dwarf planet, like Ceres, the largest asteroid-turned-dwarf planet located in the asteroid belt.

## THREE SMALL PLANETS

Using data from NASA's *Kepler* mission, astronomers have discovered three small planets orbiting a red dwarf star called KOI-961. Red dwarf stars are the most common type of star in the Milky Way galaxy. The diameter of KOI-961 is only one-sixth that of our sun, or about 70% bigger than Jupiter. The whole solar system is comparable in size to Jupiter and its moons. It's the smallest solar system discovered so far.

The three planets are all smaller than Earth, at 78%, 73%, and 57%. The smallest planet is about the size of Mars. All three planets are believed to be rocky, like Earth. Very few exoplanets are believed to be made of rock, most are gaseous like Jupiter. All three planets orbit very close to their tiny, red sun. They make a complete orbit around their star in less than two Earth days. They are out of the habitable zone and too hot to contain life.

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The following sources were used  
for this issue of Sky News:

[www.nasa.gov](http://www.nasa.gov), [www.physics.valpo.edu](http://www.physics.valpo.edu), [www.astronomy.com](http://www.astronomy.com),  
*Astronomical Calendar 2012*,  
*Astronomy, and Sky and Telescope.*

## FEBRUARY PLANETS

Venus can be seen in the western sky after sunset in the constellation Pisces (the Fishes). Venus appears higher and grows brighter all month. Venus looks like a very bright white star.

Jupiter can be seen medium-low in the southwestern sky after sunset passing low in the constellation Aries (the Ram). Jupiter is getting dimmer as Venus grows brighter and they move closer together. Jupiter sets around midnight. Jupiter looks like a very bright, yellow-colored star.

Mars can be seen rising in the southeastern sky in the constellation Leo (the Lion). Mars is in retrograde motion, moving westward among the stars. Mars rises shortly before 9 at the beginning of the month, and almost at sunset by the end of the month as it nears opposition in March. Mars grows brighter every night. Mars passes high through the southern sky overnight and appears in the southwestern sky at dawn. Mars looks like a bright, ruddy-colored star.

Saturn can be seen rising in the eastern sky about 3 hours after Mars in the constellation Virgo (the Maiden). Saturn rises earlier every night, about 9 early in the month until shortly after sunset by the end of the month. Saturn passes through the southern sky overnight and is in the southwestern sky at dawn. Saturn looks like a bright, amber-colored star.

Mercury can only be seen low in the western sky after sunset in the last half of the month as it moves from the constellation Capricornus (the Sea Goat) into Aquarius (the Water-Bearer). Mercury looks like a small white star.

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

sunrise: 6:45 a.m.  
 sunset: 5:23 p.m.  
 length of daylight: 10 hours, 22 minutes  
 length of darkness: 13 hours, 38 minutes

## SKY DATES

### February

- 1 - Moon passes between the Hyades and Pleiades star clusters in Taurus
- 2 - Cross-quarter day; halfway point between solstice and equinox, or mid-winter
  - Mars/Neptune in heliocentric opposition
- 3 - VU Observatory 8:30 to 9:30 p.m.
- 7 - Mercury in superior conjunction at 3 a.m.
  - Full moon called Full moon called Snow Moon, Hunger Moon, Trapper's Moon, or Raccoon Moon at 3:54 p.m.
  - Moon passes 5.5° SW of Beehive cluster
- 8 - Saturn is stationary at 6 a.m.
  - Moon 5.5° SW of Regulus
- 9 - Mars rises left of the moon about 8 p.m.
- 10 - Venus passes .3° N of Uranus
- 11 - Moon at perigee (closest point to Earth) at 228,616 miles at 12:35 p.m.
- 12 - Moon passes 6° S of Saturn
  - Moon passes 1.7° SSW of Spica
- 14 - Last quarter moon at 11:04 a.m.
- 15 - Mars at aphelion at 154.9 million miles
  - Moon 4.5° NNE of Antares
- 17 - VU Observatory 8:30 to 9:30 p.m.
  - Moon passes 1.7° SE of Pluto
- 19 - Neptune in conjunction with the sun
- 21 - New moon at 4:35 p.m.
- 22 - Asteroid Pallas in conjunction with the sun
  - Moon passes 4° N of Uranus
- 23 - Crescent moon 5.6° NNW of Mercury
- 24 - Moon passes 5.3° NNW of Uranus
- 25 - Crescent moon passes 3° N of Venus
- 27 - Crescent moon passes 3.8° NW of Jupiter
  - Moon at apogee (farthest point from Earth) at 251,570 miles at 9:01 a.m.
  - Asteroid Hebe in opposition
- 29 - Leap Day
  - First quarter moon at 7:21 p.m.
  - Moon 3.3° S of Pleiades

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This edition of the  
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 was written by  
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