

Sky News

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GEOCORONA

Igor Baliukin of the Space Research Institute at the Russian Academy of Science in Moscow, Russia, used 20-year old archived data from ESA's *SOHO* (*Solar and Heliospheric Observatory*) spacecraft's instrument called *SWAN* (*Solar Wind Anisotropies*) that detected and measured the geocorona, to prove its existence and size.

The **geocorona** is a very thin envelope of hydrogen surrounding Earth. What scientists didn't know was the geocorona extends out past the moon. It's thinner on Earth's dayside, compressed by solar wind, and the nightside is denser and more expansive. The hydrogen atoms measure 70 per cubic centimeter at 40,000 miles above the Earth, to only .2 atoms at the Moon's distance. It extends about 400,000 miles into space, or 50 times the diameter of Earth.

The geocorona was detected using the special, extremely sensitive *SWAN* that imaged hydrogen in ultraviolet wavelength called Lyman-alpha. That wavelength is absorbed in Earth's atmosphere so the geocorona cannot be seen from Earth.

In 1972, Apollo 16 astronauts used the first telescope on the Moon and captured an image of the geocorona near Earth. They didn't know they were inside the same thin cloud!

FAROUT

Scientists have found an object that is three times farther from the Sun than Pluto. It's the farthest object discovered in our solar system so far.

The object temporarily designated 2018 VG18 was nicknamed Farout. Farout orbits the Sun at a distance between 115 to 125 AUs. Its orbit will take one to three years of observation to determine its parameters.

ROGUE PLANETS

By watching 500 stars in the Trapezium cluster, astronomers believe they have discovered that some planets can escape their orbits during the first 11 million years of their formation. Some planets remain in the cluster and become free-floating intra cluster planets. Other planets leave the cluster and hurl through interstellar space.

Free-floating planets are called **rogue planets** because of their unpredictability. Astronomers believe there could be 50 billion rogue planets in the Milky Way galaxy.

EQUINOX NOT QUITE EQUAL

The vernal or spring equinox on March 21 and the autumnal or fall equinox on September 23 are the two days when the Sun passes directly over the equator. Ideally, it would mean equal times for day and night everywhere on Earth. There are two good reasons why that is not true for mid-temperate latitudes, like Northwest Indiana.

The Sun is not a single point but a disk shape in the sky, **Sunrise** is marked at the point of which the leading edge of the Sun touches the eastern horizon. **Sunset** is when the trailing edge of the Sun sinks below the western horizon. That means 2.5 to 3 minutes more of daylight.

The other reason is **atmospheric refraction**. The atmosphere acts like a lens or prism, bending light, making the Sun appear half a degree higher than its true position when it's near the horizons. With refraction, the sunrise is about 3 minutes early and sunset is 3 minutes later. There is 6 more minutes of daylight. What's even worse is atmospheric refraction varies. Air temperature, humidity, and barometric pressure can increase refraction and cannot be predicted.

APRIL PLANETS

Mars can be seen in the western sky moving through the constellation Taurus (the Bull). Mars can be seen by the Pleiades star cluster and then moving through the horns of Taurus by the end of April. Mars sets before midnight. Mars looks like a small, ruddy-colored star.

Jupiter can be seen rising in the southeastern sky in the constellation Ophiuchus (the Snake-Bearer). It will appear east (left) of the very red star Antares in Scorpius (the Scorpion). Jupiter rises about 1:00 a.m. in early April, and by 11:00 p.m. at the end of the month. Jupiter is medium-high in the southeastern sky by dawn. Jupiter looks like a bright, yellow-colored star.

Saturn can be seen rising in the southeastern sky in the constellation Sagittarius (the Archer). Saturn rises about 3:00 a.m. and 2 hours earlier by 1:00 at the end of April. Saturn looks like a bright, amber-colored star.

Venus can be seen rising in the eastern sky about an hour before sunrise passing from the constellation Aquarius (the Water-Bearer) into Pisces (the Fish). Venus rises a little later every night, and stays visible until dawn. Venus looks like a very bright white star.

Mercury can be seen rising about 20 minutes after Venus in the predawn eastern sky passing from the constellation Aquarius (the Water-Bearer) into Pisces (the Fish). Mercury is closest to Venus on April 16th. Mercury will reach its highest point in the sky on April 11th as it reaches greatest western elongation. Mercury rises later every night and will disappear in the Sun's glare by the end of April. Mercury looks like a small white star.

APRIL SUNRISE AND SUNSET (times are for mid-month)

sunrise: 6:10 a.m.
 sunset: 7:30 p.m.
 length of daylight: 13 hours, 20 minutes
 length of darkness: 10 hours, 40 minutes

SKY DATES

April

- 1 - Moon passes 2.7° S of Venus
- 2 - Moon passes 3.6° S of Mercury
- 5 - New moon at 3:50 a.m.
- 9 - Moon passes 4.7° S of Mars
- Moon passes 2.1° N of Aldebaran
- 11 - Mercury at greatest western elongation
- Mercury's highest point
- 12 - First quarter moon at 2:06 p.m.
- **VU Observatory Open House** at 8:30 p.m.
- **Yuri's Night**
- 13 - **CAS FREE Viewing event** at Conway
- Moon passes 0.2° S of Beehive cluster
- 14 - Mars passes 6.4° S of Aldebaran
- 15 - Moon passes 2.7° N of Regulus
- 16 - Mercury passes 4.3° ESE of Venus
- Moon at perigee (closest point to Earth) at 225,809 miles at 5:02 p.m.
- 17 - Venus at aphelion at 10:00 p.m.
- 19 - **Full moon** called Grass, Seed, Green, Pink, Frog, Egg, or Planter's Moon at 6:12 a.m.
- 22 - **Earth Day**
- **Lyrid meteor shower** peaks under poor conditions; look to the east around midnight until dawn
- Uranus in conjunction at 7:00 p.m.
- 23 - Moon passes 1.6° N of Jupiter
- 25 - Moon occults Saturn
- 26 - Last quarter moon at 2:18 a.m.
- Moon at apogee (farthest point from Earth) at 250,838 miles at 1:20 p.m.
- **VU Observatory Open House** at 8:30 p.m.
- 27 - **Kemil Beach FREE public viewing**

The following sources were used for this issue of Sky News:
www.nasa.gov, www.esa.int,
<https://www.astropixels.com>,
www.astroleague.org,
<https://earthsky.org>,
www.physics.valpo.edu, www.casonline.org,
www.skyandtelescope.com,
Astronomy, and Sky and Telescope.

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