

Sky News

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EARLY MILKY WAY

Astronomers believe the early Milky Way Galaxy collided with another galaxy and formed our current Milky Way. The other galaxy was small, a little larger than the Small Magellanic Cloud seen from the Southern Hemisphere. Astronomers named it Gaia-Enceladus.

About 10 to 13 billion years ago, the small Gaia-Enceladus collided with the four times bigger and metal-rich early Milky Way. The stars of the small galaxy formed our halo, and the present flat disk shape of the Milky Way was formed. Until just six billion years ago, there were violent bursts of star formation while the dwarf galaxy blended into the larger galaxy. The gas finally settled into the current thin disk shape. Stars had been forming already, and the extra materials from the little galaxy added to it.

Astronomers believe there is evidence in the blue stars in the Milky Way's halo. The spherical halo surrounding our Milky Way is composed of thinly scattered stars, globular clusters and gas. Other small galaxies have collided and been absorbed into the Milky Way too. Slowly, the Large and Small Magellanic Clouds are streaming into join the other stars in the Milky Way Galaxy.

TARDIGRADES ON THE MOON

Tardigrades, sometimes called water bears, are tiny microscopic-sized animals less than a millimeter long. They are known for surviving in extremely harsh conditions, even space. Israeli's *Beresheet* spacecraft carried a few thousand dehydrated tardigrades to the Moon along with a lunar library to create a backup of planet Earth, but crashed in the Sea of Serenity. Scientists believe the spacecraft didn't fall apart and everything may still be intact, having nickel plated walls. Tardigrades can't reproduce without water, but they are still alive!

RAINING MICROPLASTIC

Plastic is obviously polluting the oceans. Garbage patches, like islands of floating plastic, contain 5.25 trillion pieces of plastic debris. Scientists believe it may triple by 2025. What we don't see is the plastics in fish guts and in the bellies of birds that feed off the fish. Now plastics have been discovered in our rainwater and our freshwater systems, including one of the freshest lakes in the United States.

The United States Geological Survey (USGS) took samples of rainwater all around Colorado. They discovered microplastic shards, beads, and fibers in 90% of them. Microplastics are any small plastic fragments less than 5 millimeters or .2 inches across. USGS research chemist Gregory Weatherbee says "I think the most important result that we can share with the American public is that there's more plastic out there than meets the eye. It's in the rain, it's in the snow. It's a part of our environment now."

Lake Tahoe, in California/Nevada, is one of the freshest lakes in the United States. Wastewater doesn't flow into the Tahoe Basin, but is piped out of the area. Normally, that would be a major polluter. Microplastics are coming from the rain, but here they may be brought in by improperly disposed of trash from beach visitors too.

Microplastics have been found in remote areas like high in the Pyrenees Mountains, in the deepest part of the ocean, in Arctic Sea ice, and in U.S. groundwater.

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

www.casonline.org, www.physics.valpo.edu,
www.astropixels.com,
Earthsky.com,
<https://publicholidays.cn/mid-autumn-festival/>,
Astronomy, and *Sky and Telescope*.

SEPTEMBER PLANETS

Jupiter can be seen low in the west-southwestern sky after sunset in the constellation Scorpius (the Scorpion) above the red star Antares. Jupiter can be seen for several hours as it moves toward the western horizon. Jupiter looks like a bright, yellow-colored star.

Saturn can be seen low in the southern sky after sunset in the constellation Sagittarius (the Archer), by the handle of “Teapot”. Saturn is great to view through a telescope with the rings tilted. Saturn sets in the southwestern sky around 1 a.m. and by 11 p.m. at the end of the month. Saturn looks like a bright, amber-colored star.

Mars might be seen at the end of the month, rising in the predawn eastern sky in the Sun’s glare in the constellation Virgo (the Maiden). Mars is returning to the morning sky after passing behind the Sun on September 2nd. Mars will rise earlier and be visible longer throughout the fall months. Mars looks like a ruddy, red-colored star.

Mercury cannot be seen as it passes behind the Sun on September 3rd (superior conjunction), but will return in the western sky after sunset. Mercury looks like a small white star.

Venus cannot be seen as it passed behind the Sun on August 14th. Venus will return after sunset in the western sky this fall as the “Evening Star”. Venus looks like a bright white star.

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

sunrise:	6:29 a.m.
sunset:	6:59 p.m.
length of daylight:	12 hours, 30 minutes
length of darkness:	11 hours, 30 minutes

This edition of the
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was written by
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SKY DATES

September

- 1 - Alpha Aurigid meteor shower peaks
- 2 - Mars in conjunction at 5:00 a.m.
- 3 - Mercury at superior conjunction
- 5 - First quarter moon at 10:10 p.m.
- 6 - **Observe the Moon Night**
- VU Observatory viewing 8:30 p.m.
- Moon passes 2.3° N of Jupiter
- 7 - **CAS** hosts free telescopic viewing at Indiana Dunes State Park 8-11 p.m.
- 8 - Moon occults Saturn
- Neptune in opposition
- 9 - Piscid meteor shower
- 13 - Mid-Autumn Moon Festival
- Moon at apogee (farthest point from Earth) at 251,954 miles at 8:32 p.m.
- **Full moon** called Harvest, Fruit, Nut, Mulberry, or Singing Moon at 11:33 p.m.
- 20 - VU Observatory viewing 8:30 p.m.
- Moon passes 2.6° N of Aldebaran
- 21 - Last quarter moon at 9:41 p.m.
- 22 - **Autumnal equinox** at 2:50 a.m.
- 23 - Moon passes 5.9° S of Pollux
- 24 - Moon passes 0.4° N of Beehive cluster
- Moon at perigee (closest point to Earth) at 221,838 miles
- 28 - New moon at 1:01 p.m.
- Mercury passes 1.2° N of Spica
- **Kemil Beach** FREE observing at dusk
- 30 - First day of **Fall Astronomy Week**

MID-AUTUMN MOON FESTIVAL

Asians celebrate the Moon Festival, also called Mid-Autumn Festival on September 13th this year. It’s a celebration of the Moon and a time for families and happiness. The legend is the world had ten Suns that scorched the Earth. Hou Yi made a bow and shot down all but one of the Suns. The Queen of Heaven rewarded him with an immortality potion, which he gave to his wife, **Chang’e** for safe keeping. She drank it, became immortal, and flew to the Moon. Red lanterns with riddles, family reunions, and moon cakes are a part of the celebration. China’s moon rover **Chang’e 4** is named for the goddess.