

# Sky News

Merrillville Community Planetarium  
Clifford Pierce Middle School  
199 East 70th Avenue  
Merrillville, Indiana 46410  
(219) 650-5486

Gregg L. Williams, Director

---

September, 2010

volume 23, number 1

---

## HAYABUSA RETURNS

Japanese space probe *Hayabusa* returned to Earth after a 7-year mission to collect samples of Comet 25143 Itokawa in 2005. The capsule from the probe landed in the Australian Outback on June 13th.

Footage of the re-entry was recorded by a high school science teacher from Brookline, Massachusetts and three of his best students. After studying and planning for over a year, they flew halfway around the world to help NASA track the spacecraft moving through Earth's atmosphere at 27,000 miles per hour. The teacher and students flew aboard a DC-8 at an altitude of 41,000 feet to record the fiery re-entry. The spacecraft shattered into many pieces and blazed a fantastic, multi-lit streak across the sky. The return capsule flew out in front of the burning debris of the spacecraft and reached the ground safely by using its parachute. The video footage of the re-entry can be seen at [http://science.nasa.gov/science-news/science-at-nasa/2010/25jun\\_hayabusa/](http://science.nasa.gov/science-news/science-at-nasa/2010/25jun_hayabusa/)

*Hayabusa* was launched on May 9, 2003 and traveled a round trip covering 7 billion miles. Its mission was to gather samples of asteroid 25143 Itokawa and keep them sealed inside the return capsule. Japan's Aerospace Exploration Agency used an X-ray scanner and confirmed the capsule's seals were intact. No particles larger than 1 mm (millimeter) were inside. A multi-national research team will open the capsule under clean-room conditions. The study of the microscopic pieces of the asteroid will not be complete for months.

---

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

[www.astronomy.com](http://www.astronomy.com), [science.nasa.gov](http://science.nasa.gov),  
[www.physics.valpo.edu](http://www.physics.valpo.edu), [www.casonline.org](http://www.casonline.org),  
*Astronomical Calendar 2010*, *Skywatch*,  
*Astronomy*, and *Sky and Telescope*.

## LIGHT INSIDE THE SUN

The sun can be divided into layers where different things occur. The center or core of the sun is where nuclear fusion occurs. Hydrogen atoms are combined under tremendous heat and pressure to fuse or combine together to make a helium atom. This process is called nuclear fusion. Nuclear reactions produce light and other types of radiation. The light, called a photon, moves outward to the next layer of the sun and eventually reaches the surface where it escapes into space as sunlight.

Because light travels at a very fast, constant speed, the light from the fusion process in the core should reach the surface in just 2 seconds. But scientists believe the light takes about 200,000 years to reach the surface. The light from the core doesn't travel in a straight line. The light is scattered many times as it encounters different molecules in the sun, like electrons, atoms, and molecules. The light photon bounces all around inside the sun. Eventually, the photon doesn't run into anything and escapes.

## HELIUM RAIN ON JUPITER

In 1995, the spacecraft *Galileo* entered Jupiter's atmosphere and discovered the upper atmosphere is very low in atoms of helium and neon. Scientists from the University of California at Berkeley ran simulations to solve this mystery. They believe that helium condenses as mist, forming clouds in the upper atmosphere. As the droplets get larger, they eventually fall as rain into the lower atmosphere. Since neon mixes and bonds very easily with helium, scientists believe neon dissolves in the helium and they rain down together.

---

This edition of the  
*Sky News*  
was written by  
Linda K. Charnetzky

**SEPTEMBER PLANETS**

Venus can be seen all month in the west-southwestern sky after sunset in the constellation Virgo (the Maiden), passing into Libra (the Scales) late in September. Venus appears at its brightest on the 23rd and is the brightest object in the sky after the moon. Venus appears higher than Mars by the end of the month. Venus is brilliant as the “Evening Star”. Venus looks like a very bright white star.

Mars can be seen in the west-southwestern sky after sunset in the constellation of Virgo (the Maiden), passing into Libra (the Scales) late in September. Mars is very faint and stays low near the horizon. Mars looks like a ruddy-colored star.

Jupiter can be seen rising in the southeastern sky after sunset just below the Great Square of Pegasus in the constellation Pisces (the Fishes). Jupiter reaches its closest point to Earth on the 20th. Jupiter reaches opposition and appears at its brightest on the 21st. Jupiter looks like a very bright, yellow star.

Saturn cannot be seen as it slips into the sun’s glare in the southwestern sky at sunset in the constellation Virgo (the Maiden). Saturn reaches conjunction, passing behind the sun as seen from Earth on the 30th. Saturn will reappear in the early morning sky next month, but will be hard to view so close to the southeastern horizon. Saturn looks like a bright amber-colored star.

Mercury cannot be seen as it reaches inferior conjunction, passing between the sun and Earth on the 3rd. Mercury will reach its highest point in the eastern sky on the 19th. Mercury reaches aphelion, its closest point to the sun, on the 21st. Mercury looks like a small 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

**SKY DATES**September

- 1 - Last quarter moon at 12:22 p.m.
- Delta Aurigid meteor shower peaks
- Venus passes 1.2° south of Spica
- Venus, Mars, and Spica align after sunset
- 3 - Valparaiso University (VU) Observatory from 8:30 to 9:30 p.m. followed by SARA Public Observing from 9:30 to 10:30
- Mercury reaches inferior conjunction (between the sun and Earth)
- 4 - Mars passes 2° north of Spica
- 7 - Moon at perigee (closest point to Earth) at 221,948 miles at 10:58 p.m.
- 8 - New moon at 5:30 a.m.
- Saturn crosses the equator into the southern hemisphere of the sky
- 9 - Moon passes 8° south of Saturn
- Sun’s North Pole most inclined or tilted toward Earth at 7.25°
- September Perseid meteor shower peaks
- 11 - Calumet Astronomical Society hosts a FREE public Observing Event at Conway Observatory from 7:30 to 11:00 p.m.
- 15 - First quarter moon at 12:50 a.m.
- 17 - VU Observatory form 8:30 to 9:30 p.m.
- 19 - Mercury at greatest western elongation at 18° at 12:00 p.m.
- 20 - Jupiter at its closest point to Earth
- Neptune at its closest point to Earth
- 21 - Moon at apogee (farthest point from Earth) at 252,379 miles at 3:02 a.m.
- Jupiter in opposition at 7:00 a.m.
- Jupiter at its brightest and largest
- Uranus in opposition at 12:00 p.m.
- Mercury at perihelion (closest point to sun)
- 22 - Autumnal equinox occurs at 10:09 p.m.
- First day of fall in the northern hemisphere
- 23 - Full moon called Harvest, Fruit, Nut, Mulberry, or Singing Moon at 4:17 a.m.
- Moon passes 6° north of Jupiter
- Venus at its brightest at -4.8 magnitude
- 27 - Pleiades star cluster 2° left of the moon
- 29 - Venus passes 6° south of Mars
- Delta Aurigid meteor shower peaks
- 30 - Saturn in conjunction (passing behind the sun as seen from Earth) at 8:00 p.m.
- Last quarter moon at 10:52 p.m.