

## YOUNG ASTRONOMERS NEWSLETTER

### SPACE X LAUNCHED ITS FALCON HEAVY ROCKET AND RECOVERS BOOSTERS

On February 6, the SpaceX program launched from Cape Canaveral, Florida the Falcon Heavy, the biggest rocket since the 1960's – 70's era of the Saturn V moon rocket.

The 23-stories tall rocket is able to launch into space a payload of up to 141,000 pounds and be capable of returning its booster rockets for reuse in future flights.

This rocket was given a faux payload of a Tesla roadster owned by SpaceX CEO, Elon Musk; which included a mannequin driver. In this test, two of the three boosters were recovered. The third had malfunctions in two of its three landing rockets, and so it crashed into the ocean.

The second stage of the Falcon Heavy, carrying the Tesla car and "driver" will continue on toward Mars, and eventually take on an orbit that encompasses Mars and the Sun. NASA has announced that the roadster has been included in its "artificial object catalog".

The continued success of the SpaceX program paves the way for future commercial space exploration, freight hauling and human transport. [Space.com and CNN].

### STAR FORMATION NEAR THE CENTER OF THE MILKY WAY

Astronomers at Northwestern University used ALMA (an array of radio telescopes in Chile) to penetrate the nebular cloud around the center of the Milky Way. They detected radiation and gaseous outflows from 11 sources which are believed to be young stars that are between 3,000 and 15,000 years old.

These sites are surprisingly close to the center of our galaxy; possibly only 6 to 20 light years

from the central black hole. It was always assumed that radiation from nearby massive stars would prevent the coalescing of gas and dust into new stars.

The Northwestern astronomers will continue to map the Milky Way central region located farther out from the current star-forming sites. [Sky & Tel., March, 2018].

### NASA BEGINS TO REVEAL SOME FINDINGS FROM THE CASSINI MISSION TO SATURN

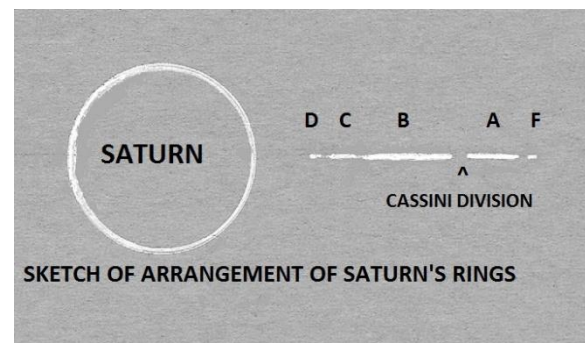
The March issue of Astronomy magazine contains an extensive article about what the Cassini probe found at Saturn.

Cassini had been orbiting Saturn, its rings and moons since 2004. It ended its mission by crash diving into the gas giant on Sept. 14, 2017.

Here are some of its findings:

There is a lot of dynamic action within the rings. The ring particles are seen to clump together and then, in a while, break apart.

The mini moons in the rings use their gravity to push and pull the ring particles into clumps and streams. It is known that the small moons Prometheus and Pandora travel at the edge of the F ring and keep it in line. The moon Mimas is believed to maintain the Cassini Division.



Scientists would like to know the mass of the rings. This could help to create a mechanism

for their formation as well as the formation of the whole solar system. To get a handle on this, NASA had Cassini fly between the innermost ring and the planet cloud tops. In this way it might be possible to separate the gravitational attraction of the rings versus just the planet. We're still waiting for the calculation results.

Cassini used its infrared cameras to probe the upper cloud tops. A lot of thunderstorms with lightening were observed. There are cyclonic storms at both poles, but only the north pole has the curious hexagonal jet stream.

Historical observations indicate that long-lasting storms pop up every 30 years, or so. These are caused by the gradual uplifting of warm, wet clouds, followed by cooling and collapsing. One would have been due in 2020, but Cassini noted a surprise storm come into view in December, 2010. This was a fortuitous event that allowed Cassini to do its observational recording. The storm stretched out to 9,000 miles by January, 2011.

Another physical feature on Saturn is its magnetic field. Cassini carried a magnetometer which indicated that the magnetic polar axis is almost exactly aligned with the planet's rotational axis. Jupiter's axes, on the other hand are angled relative to each other.

Gravitational strength measurements were difficult to obtain, although preliminary results indicate different regions of the gas layers moving at different speeds. [Astronomy, Mar. 2018].

#### **POSSIBLY ANOTHER CLOSE EXTRASOLAR PLANET**

Xavier Bonfils of the University of Grenoble Alpes, France used the HARPS telescope spectrograph located in Chile to detect the second closest extrasolar planet. This planet revolves around Ross 128, 11 light years away. The planet, Ross 128b has 1.35 times Earth's mass and has a tight orbit around its star, making one circuit every 9.9 days. This might

lead us to think that the planet is too hot to be in the habitable zone. But Ross, the star, is a small, cool star which gives its planet only 40% more light than our Sun provides for us on Earth.

So, the main critical factors suggest that Ross 128b could be the second-closest potentially habitable planet after Proxima Centauri b, which is about 4 light years away. A future important study on Ross b will be to characterize its atmosphere. [Sky & Tel. Mar. 2018].

#### **BIRTHDAYS IN MARCH**

**Albert Einstein**, (Ger. – Amer.) b. Mar. 14, 1879, d. April 18, 1955. General relativity, Special relativity. Space – time concepts.

**George Gamow**, (Ukr. – Amer.) b. Mar. 4, 1904, d. Aug. 19, 1968. Explanations of nuclear synthesis at the Big Bang and in Stars.

**Walter Baade**, (Ger. – Amer.) b. Mar. 24, 1893, d. June 25, 1960. Explained nuclear synthesis in stars. Recalibrated the Cepheid variable distances, and thus, all cosmic distances.

**Percival Lowell**, (Amer.) b. Mar. 13, 1855, d. Nov. 12, 1916. Established the Lowell observatory in Arizona. Erroneously believed that the lines on Mars were canals made by intelligent beings.

**Henry Draper** (Amer.) b. Mar. 7, 1837; d. Nov. 20, 1882. An accomplished doctor who took up studies in astronomy. A pioneer of astrophotography.

**Giovanni Schiaparelli** (Ital.) b. Mar. 14, 1835; d. July 4, 1910. Observed Mars and described seas and continents, as well as lines which he described as canali. This was misinterpreted as representing canals made by intelligent beings. He demonstrated that meteor showers were associated with comets.

**MOON PHASES IN MARCH:** Full: Thurs. the first; and Sat. the 31<sup>st</sup>; Last Qtr.: Fri. the 9<sup>th</sup>; New: Sat. the 17<sup>th</sup>; First Qtr.: Sat. the 24<sup>th</sup>.

**THE PLANETS DURING MARCH:** In the west, right after sunset, watch **Venus** and **Mercury** do a dance as Mercury brushes past Venus on the 3<sup>rd</sup>, and continues higher until the 15<sup>th</sup>. Then it sags toward the horizon and is lost by the end of the month. In the meantime, Venus continues to rise higher and brighter in the western sky, where it can be seen all summer long.

The show in the eastern sky consists of the three remaining eye-visible planets **Jupiter**, **Mars**, and **Saturn**. The trio comes on stage first with Jupiter popping up in the east shortly after midnight. Mars is a few hours later and then Saturn appears just prior to sunrise. At the end of the month, Mars and Saturn are quite close in the east. We look forward to Mars gradually becoming brighter as the weeks go by. In July, Mars will outshine Jupiter as the distance between Earth and the Red Planet decreases to almost the nearness we saw in 2003.

The editor recommends that readers check [earthsky.org](http://earthsky.org) for nice diagrams of planet locations.

**VERNAL EQUINOX MARCH 20:** The Earth's axis is gradually titling toward the Sun and we are half way toward the Summer Solstice. On the 20<sup>th</sup> the Sun shines directly overhead (90°) on the Equator at noon.

**DAYLIGHT SAVING TIME BEGINS ON SUNDAY THE 11<sup>TH</sup>**

**COSMIC PHENONENA** (Word search)

S O C C U L T A T I O N	A P H E L I O N
G R A V I T Y U R E R Y	E C L I P S E
O L S P E C T R A M I K	E M I S S I O N
R E D S H I F T N O V A	F U S I O N
B E T N U A R G S R Y P	G R A V I T Y
K C H F O L A C I B S H	N O V A
W L C A D R Y V T I F E	O C C U L T A T I O N
S I P L E K S M O T U L	O R B I T
O P P O S I T I O N S I	R A Y S
V S O L S T I C E T I O	R E D S H I F T
R E Y W E M I S S I O N	S O L S T I C E
U G R A V F E T N H N S	S P E C T R A and T R A N S I T

**SEE THE SPRING SEASON SKY MAP ON PAGE 4.**

**Some rare facts from space:**

- \*Jupiter's closest moon, Io, has volcanoes erupting almost daily. The landscape is constantly changing.
- \*In the northern hemisphere, we have the North Star (Polaris) that hovers over our north pole. But people in the southern hemisphere have no such guiding star. The sky above the south pole is devoid of any bright stars. Instead, we look for the Southern Cross for guidance. It has some stars which help us keep our bearings. (Remember this when you travel to Australia.)
- \*By the way, the North Star is not the brightest star in the sky. It is only a second magnitude star.

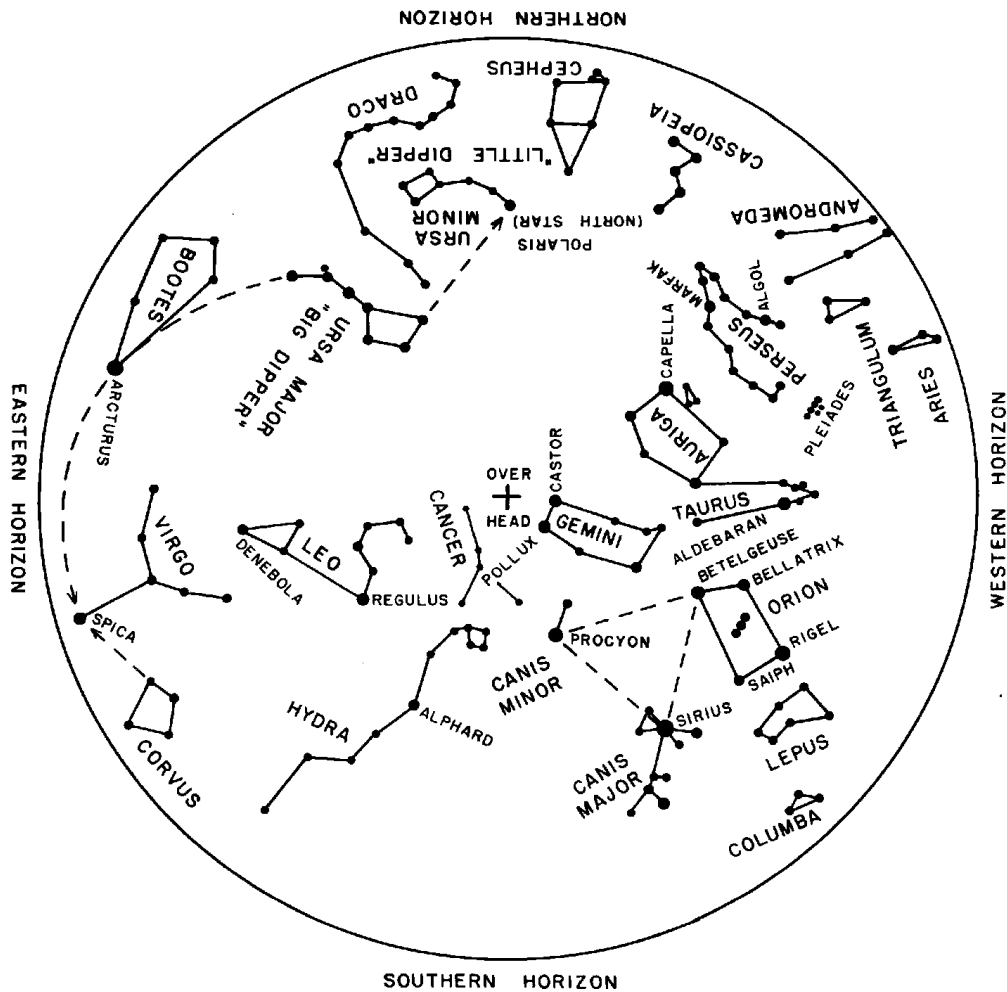
Have a happy spring season. **Forsyth Astronomical Society website:** <http://www.fas37.org>

**Kaleideum (SciWorks) phone: 336-767-6730 ext. 1000**

**Bob Patsiga editor**

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THE SPRING SKY

In the spring and fall we are looking out away from the cross-section of the Milky Way, so we do not see so many stars. In early spring, you may still see Gemini, Orion and The Pleiades drifting off to the West. The only prominent constellation in the spring is Leo. Leo has as its main star, Regulus (mag 1, 78 LY ). Leo shows up as a backward question mark and a triangle (the rump of the lion). Less obvious constellations are Boötes (look for the bright star Arcturus: mag 0, 37 LY ) and Virgo (bright star Spica: mag 1, 260 LY ). Regulus, Arcturus and Spica make up what is known as the spring triangle. The Beehive cluster can be seen with binoculars just west of the constellation Cancer. Viewers with good telescopes can spot a number of distant galaxies around the bottom and rear of Leo. If you trace a line up from the top of the lion's head, you will come to the bowl of the Big Dipper (Ursa Major) in the northern sky.



THE NIGHT SKY IN MARCH