

# Galactic Observer

John J. McCarthy Observatory

Volume 4, No. 6

June 2011

## Cradle of Creation

*A "close-up" image of the Carina nebula, taken on the 20<sup>th</sup> anniversary of the Hubble launch in April, 2010. Nebulas are stellar nurseries, formed by the debris of exploded stars. For more on star nurseries, come to Second Saturday Stars at the McCarthy Observatory on June 11 for a close-up presentation.*

*Credit: NASA, ESA, and M. Livio and the Hubble 20th Anniversary Team (STScI)*

*[http://www.nasa.gov/mission\\_pages/hubble/science/hubble20th-img.html](http://www.nasa.gov/mission_pages/hubble/science/hubble20th-img.html)*



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It is through their efforts that the McCarthy Observatory has established itself as a significant educational and recreational resource within the western Connecticut community.

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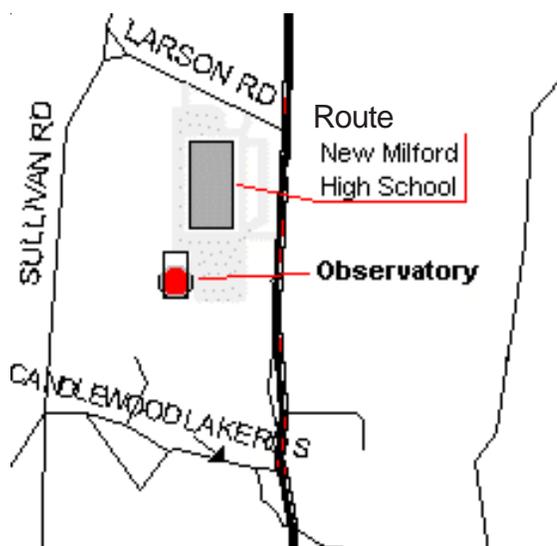
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## Year of the Solar System

NASA announced on Oct. 7, 2010 that the upcoming year would be “The Year of the Solar System.” The “Year,” however, is a Martian year and, as such, 23 months in length. Some of the highlights of the “Year” of exploration are:

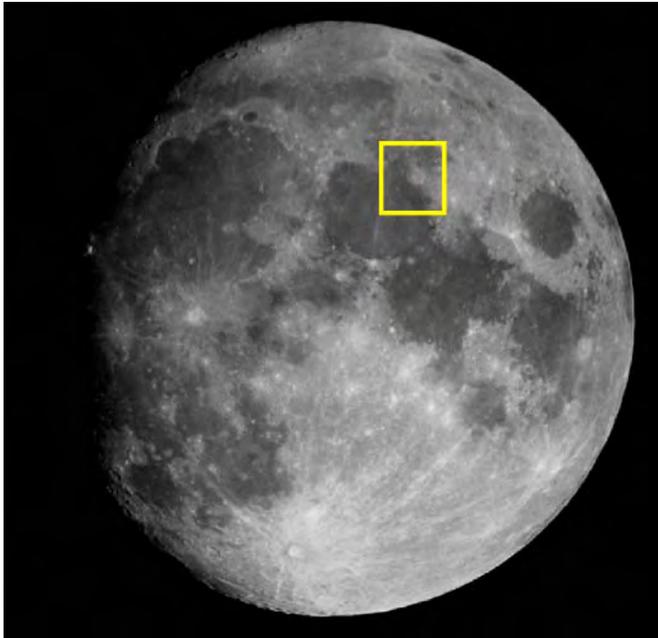
Date	Mission	Status
4 Nov 2010	Deep Impact encounters Comet Hartley 2	Successful rendezvous, see <a href="http://www.nasa.gov/mission_pages/epoxi/index.html">http://www.nasa.gov/mission_pages/epoxi/index.html</a>
19 Nov 2010	Launch of O/OREOS, a shoebox-sized satellite designed to test the durability of life in space	Ground stations receiving data
19 Nov 2010	Launch of an experimental solar sail (NanoSail-D) aboard the Fast Affordable Scientific and Technology Satellite (FASTSAT)	Delayed separation from FASTSAT on 17 Jan 2011, deployment confirmed, sail is operational
7 Dec 2010	Japan's Akatsuki (Venus Climate Orbiter) spacecraft	Spacecraft fails to enter orbit around Venus - now in orbit around the Sun
14 Feb 2011	Stardust NExT encounters Comet Tempel 1	Successful rendezvous; see <a href="http://stardustnext.jpl.nasa.gov/">http://stardustnext.jpl.nasa.gov/</a>
17 Mar 2011	MESSENGER enters orbit around Mercury	First spacecraft to achieve orbit around Mercury; see <a href="http://messenger.jhuapl.edu/">http://messenger.jhuapl.edu/</a>
18 Mar 2011	New Horizons spacecraft crosses the orbit of Uranus	4+ more years to Pluto; see <a href="http://pluto.jhuapl.edu/">http://pluto.jhuapl.edu/</a>
16 Jul 2011	Dawn spacecraft arrives at the asteroid Vesta	
5 Aug 2011	Launch of the Juno spacecraft to Jupiter	
8 Sept 2011	Launch of twin GRAIL spacecraft to map Moon's gravitational field	
8 Nov 2011	Launch of the Phobos-Grunt sample-return mission	
25 Nov 2011	Launch of Mars Science Laboratory (MSL)	
Aug 2012	MSL lands on Mars	

### Other notable events:

- June 28, 2011                      Pluto at Opposition
- Mid 2011                              End of the Space Shuttle Program
- October 8, 2011                    2<sup>nd</sup> International Observe the Moon Night
- March 3, 2012                      Mars at Opposition
- June 6, 2012                        Venus Transit
- Mid 2012                              Opportunity reaches the rim of Endeavour crater

## "Out the Window on Your Left"

**I**T'S BEEN 39 YEARS SINCE we left the last foot print on the dusty lunar surface. Sadly, as a nation founded on exploration and the conquest of new frontiers, we appear to have lost our will to lead as a space-faring nation. But, what if the average citizen had the means to visit our only natural satellite; what would they see out the window of their spacecraft as they entered orbit around the Moon? This column may provide some thoughts to ponder when planning your visit (if only in your imagination).



Lunar "seas" and "lakes" are actually expansive low-lying plains formed by ancient lava flows

The view this month is of the fractured-floor impact crater Posidonius. Named after Posidonius of Apameia (135 BC - 51 BC), a Greek philosopher, astronomer, historian, and teacher, the crater is located on the northeastern shore of Mare Serenitatis (Sea of Serenity) and just south of Lacus Somniorum (Lake of Dreams).

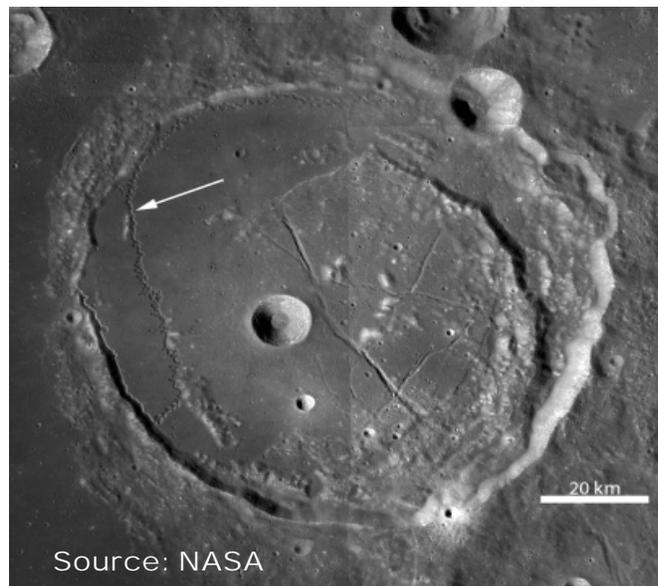
As seen in the photos above and on the following page, the lava plain east of Posidonius is most notable for its system of wrinkle ridges that parallel the shore. The ridge opposite Posidonius is designated Dorsa Smirnov while the ridge along the shore and just south of Le Monnier crater is Dorsa Aldrovandi. Wrinkle ridges are believed to be shallow faults that formed when solidified lavas collapsed into an impact basin.

The crater's rim is broken and battered by secondary impacts. The floor of this 62-mile diameter crater has been flooded by lava flows that have buried remnants from the original impact. Like many large impact craters, Posidonius has been modified by volcanic-related activity. The network of sinuous rilles (channels) visible on the crater's floor and

the uplift of the surface are indications that a pool of magma formed underneath the crater and pushed the floor up.

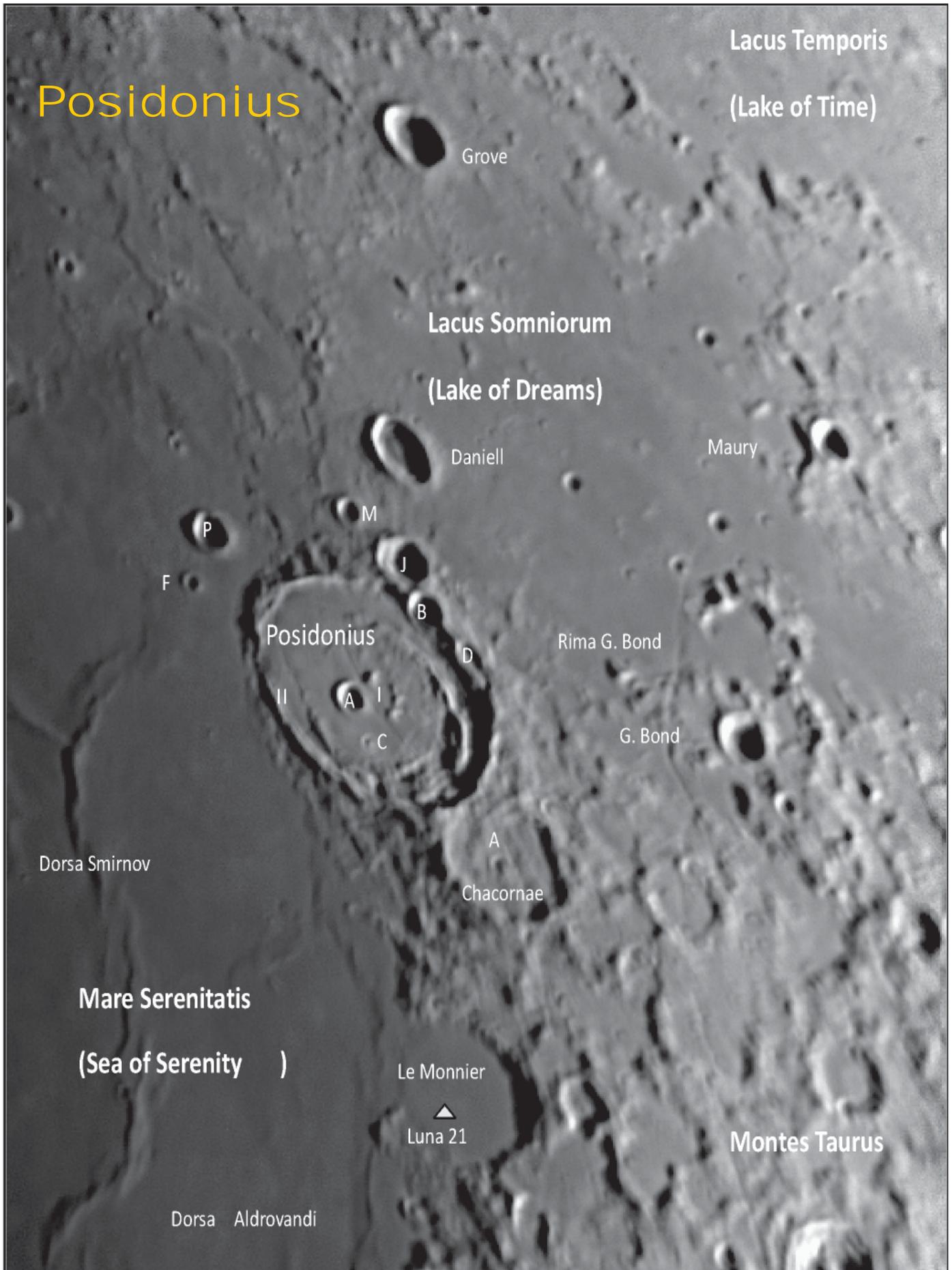


The floor lies approximately 2,000 feet below the surrounding lava plain. Sections of the crater wall rise up to 6,000 feet above the floor. Inside the wall is the remnant of a second impact ring. Adjacent to the impact crater "A," near the center of Posidonius, is one of several sinuous rilles (labeled "T") or lava channels.



Posidonius Crater, with arrow marking a sinuous rill

The Luna 21 spacecraft landed on the southern plains of Le Monnier crater in January 1973. It deployed the second Soviet lunar rover (Lunokhod 2). The rover operated for four months, sending back over 800,000 high resolution images from its television cameras. Hibernating at night, the rover covered 37 km during its daylight travels. The retroreflector on the rover is still used today for laser ranging.



Posidonius

Lacus Temporis  
(Lake of Time)

Lacus Somniorum  
(Lake of Dreams)

Dorsa Smirnov

Mare Serenitatis  
(Sea of Serenity )

Montes Taurus

Grove

Daniell

Maury

F

P

M

J

B

D

Rima G. Bond

Posidonius

G. Bond

II

A

I

C

A

Chacornae

Le Monnier

Luna 21

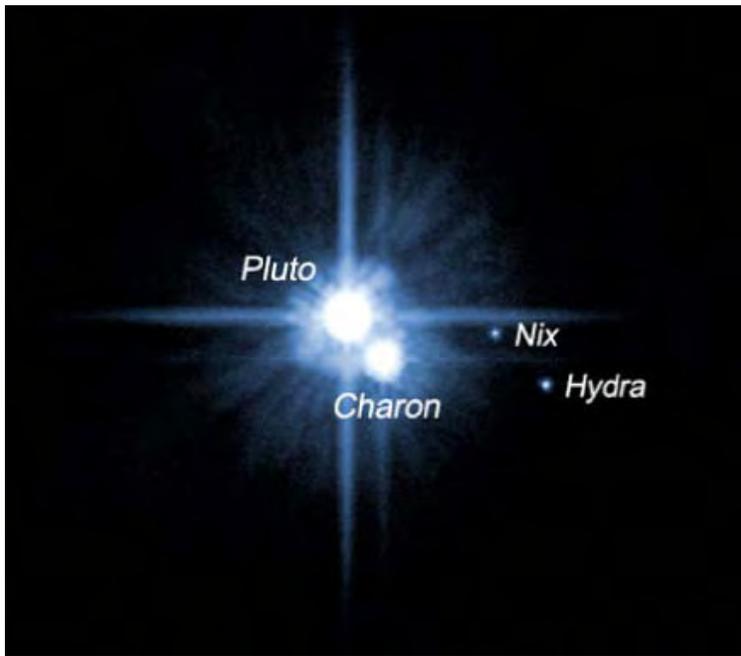
Dorsa Aldrovandi

## Nix and Hydra

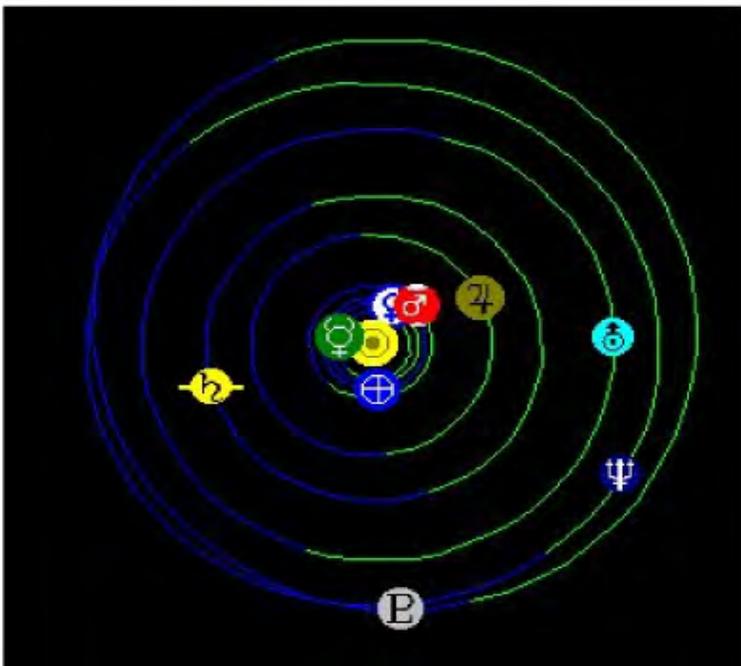
SIX YEARS AGO (2005), the number of moons orbiting Pluto increased by two as two small moons were discovered by the Hubble Space Telescope.

A year later the moons were designated Hydra and Nix by the International Astronomical Union (IAU).

Hydra, the outer moon, was named for a nine-headed serpent that guarded the waters and entrance to the underworld in Greek mythology.



Credit: NASA, ESA, H. Weaver (JHU/APL), A. Stern (SwRI), and the HST Pluto Companion Search Team



**Solar System Live** on June 28<sup>th</sup> by John Walker



Earth



Pluto

Nyx was the Greek goddess of darkness and night and mother of Charon (who ferried the dead across the river Styx). Since there was an asteroid already called Nyx, the IAU used the Egyptian version for the moon (Nix).

Pluto and its moons will be visited by the New Horizons spacecraft on July 14, 2015. The spacecraft passed the halfway point of its journey in February 2010. Moving along at more than 36,600 miles per hour, New Horizons crossed the orbit of Uranus in March 2011.

Pluto reaches opposition on June 28<sup>th</sup>, rising in the evening sky opposite the setting Sun. At almost 32 times further from the Sun than the Earth, you will need a moderate sized telescope to spot the 14<sup>th</sup> magnitude Pluto.

You can find Pluto in the constellation Sagittarius.

## Lunar Reconnaissance Orbiter

On the evening of June 18, 2009, an Atlas V 401 rocket lifted off from Cape Canaveral carrying NASA's Lunar Reconnaissance Orbiter (LRO). In the two years since entering polar orbit the spacecraft has been mapping the Moon from as close as 30 miles above the lunar surface.

In its survey, the LRO revisited sites where manned and robotic spacecraft had landed. Its high resolution cameras are able to image the soil disturbed by the Apollo astronauts as they performed their tasks, as well as the equipment left behind.

The LRO cameras have also found spacecraft, such as the first Soviet Lunokhod rover, that had lost contact and whose final location was uncertain. The LRO images are also useful in determining the extent that the lunar surface has changed over the past 40 years (due to meteoroid impacts), and if those changes pose a hazard to future lunar colonists.

In the image of the Apollo 15 landing site on the next page, the descent stage of the Lunar Module (Falcon) can be seen near the center of the photo. The Lunar Rover Vehicle (LRV) is parked off to the right and the Apollo Lunar Surface Experiments Package (ALSEP) and Lunar Ranging Retro-Reflector (LRRR) can be seen off to the left.

The Apollo 15 retro-reflector is still being used to acquire precise measurements of the Moon's distance from the Earth. The Apache Point Observatory in southern New Mexico uses its large 3.5 meter telescope to send pulses of laser light to the retro-reflector left by astronaut David Scott at Hadley Rille. The round trip distance can be calculated by measuring the round trip time of the laser photons. Scientists are using the information to test gravitational and general

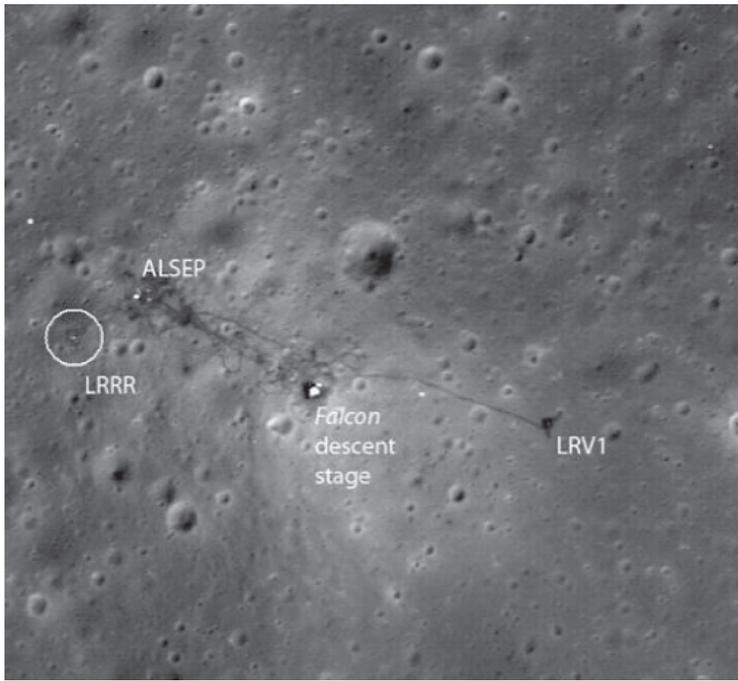


Photo Credit: NASA/Goddard Space Flight Center/Arizona State

relativity theories, measure tidal forces, as well as the rate that the Moon is moving away from the Earth. Thanks to the LRO, scientists now have access to the previously missing Lunokhod 1 retro-reflector for additional measurements. LRO instrument images can be found at [http://www.nasa.gov/mission\\_pages/LRO/multimedia/index.html](http://www.nasa.gov/mission_pages/LRO/multimedia/index.html).

### Summer Solstice

On the morning of June 21<sup>st</sup> the Sun will rise over a prehistoric structure on the Salisbury Plain in southern England as it has for the last 4,000 years. For those individuals standing within the 100 foot diameter circle of 30 sandstone or sarsen-stones (weighing up to 50 tons each), the Sun will appear over a large naturally shaped stone (Heel Stone) located outside and to the northeast of the circle. The alignment signals the start of the longest day, midsummer, or the summer solstice.

The photo at right shows the current state of the stone circle. Many of the original stones are missing or damaged. Over time, they were taken to build houses and roads, chipped away by visitors and taken as souvenirs. What remains represents the last in a progressive sequence of monuments erected at the site between 3000 and 1600 B.C. The Heel Stone (photo top right) is adjacent to the access road to the site. The ancient people who constructed this monument left no written record of their accomplishments or the intended use of the stone circle. Its purpose has been widely debated and many groups have attempted to claim ownership.



However, archeologists have clearly shown that the construction of Stonehenge predates the appearance of most modern cultures in Britain.

In the 1960s, Gerald Hawkins, an astronomer at the Smithsonian Astrophysical Observatory, found that each significant stone aligns with at least one other to point to an extreme position of the sun or moon (“Stonehenge Decoded,” Doubleday & Company). That Stonehenge is an astronomical observatory or celestial calendar is intriguing, as the precision and architectural refinement by which it was constructed certainly suggests a significant purpose for this megalithic monument.



## June History Women in Space

On June 16, 1963, Valentina Tereshkova became the first woman in space. Shortly after Yuri Gagarin's flight, the Soviets began a search for suitable female candidates for spaceflight. With few female pilots, the majority of the candidates were women parachutists (Valentina had joined an amateur parachuting club at the age of 18). Control of the



Vostok spacecraft was completely automatic, so piloting experience was not required. However, since the Vostok was not designed to return its occupant safely to Earth, the cosmonaut was required to eject from the spacecraft after re-entry and parachute to the landing site.

The selection of Valentina Tereshkova for the flight was made by Premier Khrushchev. In addition to experience and fitness, qualifications included being an ideal Soviet citizen and model Communist Party member. On June 16<sup>th</sup>, Valentina rode Vostok 6 into orbit with the call sign "Chaika" (Seagull). The mission was not without incident and included space-sickness, leg cramps and other discomforts from being strapped into the capsule for three days. More importantly, the capsule ended up in the wrong orientation and, had it not been corrected, would not have allowed her to return to Earth.

Valentina's three days in space was more flight time than all the American astronauts combined (at that time). After fulfilling her duties to her country, Tereshkova retired to a small house on the outskirts of Star City. The house was topped with a seagull weathervane, the call sign of her flight.

Twenty years later on June 18<sup>th</sup>, Sally Ride became the first American woman in space. Launched aboard the space shuttle Challenger, Sally served as the mission specialist on the five person crew.

### An Extraordinary Feat

If you have ever seen a Gemini space capsule (there is one on display at the Air and Space Museum in Washington, D.C.) it is difficult to comprehend how two people could have spent any length of time inside its cramped interior (Frank Borman and Jim Lovell spent 14 days orbiting the Earth in Gemini 7). The reentry module, where the two astronauts sat, is approximately 11 feet long with a maximum diameter of 7½ feet and filled with instrumentation and controls.



On June 3, 1965, Gemini 4 lifted off on a four day mission. The highlight of the mission was to be a spacewalk by Ed White. NASA was very concerned with "putting guys in vacuums with nothing between them but that little old lady from Worcester, Massachusetts [the seamstress at the David Clark Company], and her glue pot and that suit." However, the Soviets had challenged the United States with a spacewalk by Cosmonaut Alexei Leonov in March during a Voskhod II mission and the United States did not want to appear to be falling behind its adversary.

After struggling with a faulty hatch, Ed White finally exited the spacecraft as it passed over the Pacific Ocean. Using a gun powered by compressed oxygen he was able to maneuver outside the cap-



sule, just avoiding the flaming thrusters of the Gemini capsule. After a 23 minute spacewalk, Jim McDivitt struggled to get the six foot tall Ed White back inside the capsule and close the balky door.

Unfortunately, after making history as the first American to walk in space, Ed White died during a test of the Apollo 1 spacecraft when the pure oxygen atmosphere exploded, killing all three astronauts.

### Galaxy Check

For those hockey enthusiasts, June signals the end of a long season, culminating in the award of Lord Stanley's Cup to the league's best team. As a fitting tribute, the CCD camera on the 16-inch telescope at the McCarthy Observatory was used to acquire an image of the "Hockey Stick" galaxy (NGC 4656). The



galaxy is located 30 million light years away in the constellation Canes Venatici and is so named because of its peculiar shape. The distorted shape appears to have resulted from an unfortunate encounter with another nearby galaxy (NGC 4631).

### Sunrise and Sunset

<u>Sun</u>	<u>Sunrise</u>	<u>Sunset</u>
June 1 <sup>st</sup> (EDT)	05:22	20:21
June 15 <sup>th</sup>	05:19	20:29
June 30 <sup>th</sup>	05:23	20:32

### Summer Nights

For the more adventurous and sleep deprived individuals, the summer sky sparkles as twilight deepens and the summer Milky Way rises. The Milky Way is heralded by the three stars of the summer triangle Vega, Deneb and Altair. Appearing like a gossamer stream of stars, it flows across the night sky, emptying into the constellation Sagittarius. In our light-polluted skies, it may be easier to see on nights when the Moon is absent (around the New Moon on the 1<sup>st</sup> or Last Quarter on the 23<sup>rd</sup>).

High in the June sky is the constellation Hercules. Shaped like a keystone or trapezoid, Hercules is home to one of the finest globular star clusters in the northern hemisphere. The Great Hercules Cluster (M13) is a collection of several hundred thousand suns located near the galactic core of the Milky Way Galaxy at a distance of approximately 25,000 light years. Hercules rises in the evening after the constellation Boötes with its bright star Arcturus and before the constellation Lyra with its bright star Vega. The cluster can be found on the side of the keystone asterism facing Boötes.

## Astronomical and Historical Events

- 1<sup>st</sup> New Moon
- 1<sup>st</sup> Partial solar eclipse visible from high latitudes in the Northern Hemisphere (Asia, Alaska, Canada, and Iceland)
- 1<sup>st</sup> History: launch of the ROSAT (Röntgen) X-ray observatory; cooperative program between Germany, the United States, and United Kingdom; among its many discoveries was the detection of X-ray emissions from Comet Hyakutake (1990)
- 2<sup>nd</sup> History: launch of the Mars Express spacecraft and ill-fated Beagle 2 lander (2003)
- 2<sup>nd</sup> History: launch of the Space Shuttle Discovery (STS-91); ninth and final Mir docking (1998)
- 2<sup>nd</sup> History: launch of Soviet Venus orbiter Venera 15; side-looking radar provided high resolution mapping of surface in tandem with Venera 16 (1983)
- 3<sup>rd</sup> History: launch of Gemini 4; Ed White becomes first American to walk in space (1965)
- 3<sup>rd</sup> History: launch of Gemini 9 with astronauts Thomas Stafford and Eugene Cernan (1966)
- 3<sup>rd</sup> History: dedication of the 200-inch Hale Telescope at Palomar Mountain (1948)
- 4<sup>th</sup> StarConn 2011 astronomy convention at Wesleyan University in Middletown, CT (see: <http://www.asgh.org/starconn/StarConnSchedule.htm>)

### Astronomical and Historical Events (continued)

- 4<sup>th</sup> History: maiden flight of Space X's Falcon 9 rocket; launched from Cape Canaveral, Florida (2010)
- 6<sup>th</sup> History: launch of Soviet Venus orbiter Venera 16; side-looking radar provided high resolution mapping of surface in tandem with Venera 15 (1983)
- 7<sup>th</sup> Scheduled launch of a Russian Soyuz spacecraft from the Baikonur Cosmodrome in Kazakhstan to the International Space Station with members of the next Expedition crew
- 8<sup>th</sup> First Quarter Moon
- 8<sup>th</sup> History: New Horizons spacecraft, on its way to Pluto, crosses the orbit of Saturn (2008)
- 8<sup>th</sup> History: launch of Soviet Venus orbiter/lander Venera 9; transmitted the first black and white images of the surface of Venus (1975)
- 8<sup>th</sup> History: Giovanni Cassini born, observer of Mars, Jupiter and Saturn (1625)
- 8<sup>th</sup> Kuiper Belt Object 28978 Ixion at Opposition (40.116 AU)
- 10<sup>th</sup> History: launch of Mars Exploration Rover A (Spirit) in 2003
- 10<sup>th</sup> History: launch of Explorer 49, Moon orbiter and radio astronomy explorer (1973)
- 11<sup>th</sup> **Second Saturday Stars/Open House at the McCarthy Observatory 8:00 to 10:00 pm**
- 11<sup>th</sup> Moon at perigee (closest distance from Earth)
- 11<sup>th</sup> History: flyby of Venus by Soviet spacecraft Vega 1 on its way to Comet Halley; dropped off lander and a balloon to study middle cloud layers (1985)
- 12<sup>th</sup> History: launch of Venera 4, Soviet Venus lander; first to enter atmosphere of another planet (1967)
- 13<sup>th</sup> Kuiper Belt Object 50000 Quaoar at Opposition (42.119 AU)
- 13<sup>th</sup> History: return of the sample capsule from the Hayabusa (MUSES-C) spacecraft (2010)
- 14<sup>th</sup> History: launch of Mariner 5; Venus flyby mission (1967)
- 14<sup>th</sup> History: launch of Venera 10; Soviet Venus orbiter/lander (1975)
- 15<sup>th</sup> Full Moon (Strawberry Moon)
- 15<sup>th</sup> Total Lunar Eclipse (visible from the eastern half of Africa, the Middle East, central Asia and western Australia)
- 15<sup>th</sup> History: flyby of Venus by Soviet spacecraft Vega 2 on its way to Comet Halley; dropped off lander and a balloon to study middle cloud layers (1985)
- 16<sup>th</sup> History: Valentina Tereshkova; first woman in space aboard Soviet Vostok 6 (1963)
- 17<sup>th</sup> History: discovery of the Dhofar 378 Mars Meteorite (2000)
- 18<sup>th</sup> Distant flyby of Saturn's moons Helene and Telesto by the Cassini spacecraft
- 18<sup>th</sup> History: launch of the Lunar Reconnaissance Orbiter (LRO) and Lunar CRater Observation and Sensing Satellite (LCROSS) to the Moon (2009)
- 18<sup>th</sup> History: Sally Ride becomes the first American woman in space aboard the Space Shuttle Challenger (1983)
- 19<sup>th</sup> History: flyby of Earth by the ill-fated Nozomi spacecraft on its way to Mars (2003)
- 20<sup>th</sup> Flyby of Saturn's largest moon Titan by the Cassini spacecraft
- 20<sup>th</sup> History: discovery of Nova 1670 in Vulpeculae (1670)
- 21<sup>st</sup> Summer Solstice at 17:16 UT (1:16 pm EDT)
- 21<sup>st</sup> Launch of a Russian Progress cargo-carrying spacecraft from the Baikonur Cosmodrome in Kazakhstan to the International Space Station
- 22<sup>nd</sup> History: launch of Soviet space station Salyut 5 (1976)
- 22<sup>nd</sup> History: founding of the Royal Greenwich Observatory (1675)
- 22<sup>nd</sup> History: discovery of Pluto's largest moon Charon by Jim Christy (1978)
- 23<sup>rd</sup> Last Quarter Moon
- 24<sup>th</sup> Moon at apogee (furthest distance from Earth)
- 24<sup>th</sup> History: launch of the Salyut 3 Soviet space station (1974)
- 24<sup>th</sup> History: Fred Hoyle born; British astronomer and proponent of nucleosynthesis (1915)
- 24<sup>th</sup> History: Sir William Huggins makes first photographic spectrum of a comet (1881)
- 25<sup>th</sup> Kuiper Belt Object 2002 MS<sub>4</sub> at Opposition; a Trans-Neptunian object discovered in 2002 by Chad Trujillo and Michael E. Brown (46.139 AU)
- 25<sup>th</sup> History: Rupert Wildt born, German-American astronomer and first to hypothesize that the CO<sub>2</sub> in the Venusian atmosphere was responsible for the trapped heat (1905)
- 25<sup>th</sup> History: Hermann Oberth born, father of modern rocketry and space travel (1894)
- 26<sup>th</sup> Dwarf Planet 134340 Pluto closest approach to Earth (31.062 AU)
- 26<sup>th</sup> History: Charles Messier born, famed comet hunter (1730)
- 27<sup>th</sup> History: discovery of the Mars meteorite SAU 060, a small 42.28 g partially crusted grey-greenish stone found near Sayh al Uhaymir in Oman (2001)
- 27<sup>th</sup> History: flyby of the asteroid Mathilde by the NEAR spacecraft (1997)

### Astronomical and Historical Events (continued)

- 27<sup>th</sup> History: Alexis Bouvard born, French astronomer, director of Paris Observatory, postulated existence of eighth planet from discrepancies in his astronomical tables for Saturn and Uranus. Neptune was subsequently discovered by John Couch Adams and Urbain Le Verrier after his death where he had predicted (1767)
- 28<sup>th</sup> Dwarf Planet 134340 Pluto at Opposition, rising opposite the setting Sun and visible all night (31.038 AU)
- 28<sup>th</sup> History: Nakhla meteorite fall in Egypt (Mars meteorite), a piece of which is said to have hit a dog (1911)
- 28<sup>th</sup> History: launch of SEASAT 1, first Earth-orbiting satellite designed for remote sensing of Earth's oceans (1978)
- 29<sup>th</sup> History: George Ellery Hale born, founding father of the Mt. Wilson Observatory (1868)
- 30<sup>th</sup> History: death of 3 cosmonauts in Soyuz 11 when capsule depressurizes on reentry – capsule was too cramped for cosmonauts to wear spacesuits (1971)
- 30<sup>th</sup> History: Tunguska Explosion Event (1908)

### References on Distances

- The apparent width of the moon (and Sun) is approximately one-half a degree ( $\frac{1}{2}^\circ$ ), less than the width of your little finger at arm's length which covers approximately one degree ( $1^\circ$ ); three fingers span approximately five degrees ( $5^\circ$ )
- One astronomical unit (AU) is the distance from the Sun to the Earth or approximately 93 million miles

### International Space Station/Space Shuttle/Iridium Satellites

Visit [www.heavens-above.com](http://www.heavens-above.com) for the times of visibility and detailed star charts for viewing the International Space Station, the Space Shuttle and the bright flares from Iridium satellites.

### Solar Activity

For the latest on what's happening on the Sun and the current forecast for flares and aurora, check out [www.spaceweather.com](http://www.spaceweather.com).

### Image Credits

**Page 3:** One of the five trilithons from the inner group of sarsen stones at Stonehenge. The stones, possibly from Marlborough Downs twenty miles north of Stonehenge, weigh up to 50 tons each.

Image by Bill Cloutier

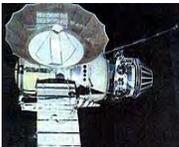
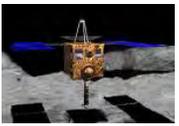
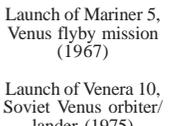
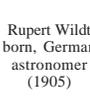
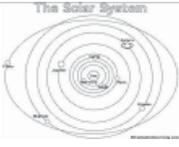
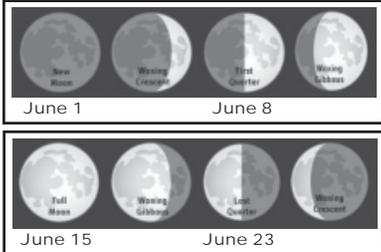
**Cover page layout and graphic calendar:** Allan Ostergren

**Poster art and design:** Sean Ross

All other non-credited photos were taken by the author: Bill Cloutier

# June 2011

## Celestial Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																																																										
<p>May 2011</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td></tr> <tr><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td></tr> <tr><td>29</td><td>30</td><td>31</td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					<p>Jul 2011</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							<p>1</p>  <p>Partial solar eclipse in high northern latitudes</p>  <p>Launch of ROSAT (Röntgen) X-ray observatory (1990)</p>	<p>2</p>  <p>Launch of Soviet Venus Orbiter, Venera 15 to map surface of Venus, in tandem Venera 16 (1983)</p>  <p>Launch of Mars Express spacecraft and ill-fated Beagle 2 lander. (2003)</p>	<p>3</p>  <p>200-inch Hale Telescope dedication (1948)</p>  <p>Gemini 9 launch, Thomas Stafford, Eugene Cernan. (1966)</p>  <p>Launch of Gemini 4; Ed White 1<sup>st</sup> American to walk in space (1965)</p>	<p>4</p>  <p>StarConn 2011 astronomy convention, Wesleyan University, Middletown, CT</p>  <p>Maiden flight of Space X Falcon 9 rocket (2010)</p>
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<p>5</p> 	<p>6</p>  <p>Venera 16 - last of Soviet Venus orbiter/lander missions to map Venusian landscape (1983)</p>	<p>7</p>  <p>Scheduled launch of a Russian Soyuz spacecraft in Kazakhstan to the International Space Station with members of next space station crew</p>	<p>8</p>  <p>Giovanni Cassini born, observer of Mars, Jupiter and Saturn (1625)</p>  <p>Launch of Venera 9, - 1<sup>st</sup> black/white images of surface of Venus (1975)</p>	<p>9</p> 	<p>10</p>  <p>Launch of Explorer 49 - moon orbiter and radio astronomy explorer (1973)</p>  <p>Launch of Mars Exploration Rover A Spirit (2003)</p>	<p>11</p>  <p>Flyby of Venus by Soviet spacecraft Vega 1 on its way to Comet Halley - dropped off a balloon and a lander to study middle cloud layers (1985)</p>  <p>2nd Saturday Stars Open House McCarthy Observatory</p>																																																																																										
<p>12</p>  <p>Launch of Venera 4, Soviet Venus lander, first to enter orbit of another planet (1967)</p>	<p>13</p>  <p>Return of sample capsule from the Hayabusa (MUSES-C) spacecraft, taken from near-Earth asteroid Itokawa (2010)</p>	<p>14</p>  <p>Launch of Mariner 5, Venus flyby mission (1967)</p>  <p>Launch of Venera 10, Soviet Venus orbiter/lander (1975)</p>	<p>15</p>  <p>flyby of Venus by Soviet spacecraft Vega 2 on its way to Comet Halley; dropped off lander and a balloon to study middle cloud layers (1985)</p>	<p>16</p>  <p>Valentina Tereshkova, 1<sup>st</sup> woman in space 1963</p>	<p>17</p>  <p>Discovery of the Dhofar 378 Mars meteorite (2000)</p>	<p>18</p>  <p>Sally Ride, 1<sup>st</sup> U.S. woman in space (1983)</p>  <p>Launch of Lunar Reconnaissance Orbiter and LCROSS satellite to Moon (2009)</p>																																																																																										
<p>19</p>  <p>Flyby of Earth by the ill-fated Nozomi spacecraft on its way to Mars (2003)</p>	<p>20</p>  <p>Discovery of Nova 1670 in Vulpeculae by Pere Dom Voiture Anthelme, a Carthusian monk in Dijon, France (1670)</p>	<p>21</p>  <p>Summer Solstice 1:16 EDT</p>  <p>Launch of a Russian Progress cargo-carrying spacecraft from the Baikour Cosmodrome in Kazakhstan to the International Space Station</p>	<p>22</p>  <p>Royal Greenwich Observatory founded (1675)</p>  <p>Discovery of Pluto's largest moon Charon by Jim Christy (1978)</p>  <p>Launch of Soviet space station Salyut 5 (1976)</p>	<p>23</p>  <p>Fred Hoyle born, British astronomer and proponent of nucleosynthesis (1915)</p>  <p>Sir William Huggins makes 1st photographic spectrum of a comet (1881)</p>	<p>24</p>  <p>Rupert Wildt born, German astronomer (1905)</p>  <p>Hermann Oberth born, father of modern rocketry and space travel (1894)</p>																																																																																											
<p>26</p>  <p>Charles Messier born, famed comet hunter (1730)</p>  <p>Dwarf Planet 134340 Pluto closest approach to Earth (31.062 AU)</p>	<p>27</p>  <p>Alexis Bouvard born, postulated existence of 8th planet - later identified as Neptune (1767)</p>  <p>Flyby of the asteroid Mathiele by the NEAR spacecraft (1997)</p>	<p>28</p>  <p>Dwarf Planet 134340 Pluto at Opposition, rising opposite the setting Sun and visible all night (31.038 AU)</p>  <p>Nakhlha meteorite fall in Egypt - A piece of Mars object fabled to have hit dog (1911)</p>  <p>launch of SEASAT 1, first Earth-orbiting satellite designed for remote sensing of Earth's oceans (1978)</p>	<p>29</p>  <p>George Ellery Hale born, founding father of Mt. Wilson Observatory (1868)</p>	<p>30</p>  <p>Death of 3 cosmonauts in Soyuz 11 when capsule depressurizes in reentry (1971)</p>  <p>Tunguska explosion event (1908)</p>	<p>Phases of the Moon</p>  <p>June 1, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent, June 8, June 15, June 23</p>																																																																																											

# Second Saturday Stars

**FREE EVENT**

Every Month at the  
**John J. McCarthy Observatory**  
Behind the New Milford High School  
860.946.0312  
[www.mccarthyobservatory.org](http://www.mccarthyobservatory.org)

**June 11th**  
**8:00 - 10:00 pm**

# Star NURSERIES



S.Ross

Refreshments

Family Entertainment

Activity Center

Stars & Planets

Rain or shine

Map



art & design • sean ross • [rossdesign@charter.net](mailto:rossdesign@charter.net)