

January-February
2012
Volume 60
Issue 1

The Observer

The Newsletter of Central Valley Astronomers of Fresno

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New elements, new names

Stratolaunch, the next generation rocket launcher

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CVA Calendar

January 7-CVA meeting
7pm-CSUF in EE191

January 21-Star party at
Eastman Lake

February 11-CVA meeting
at 7pm-CSUF EE191

February 25-Star Party at
Eastman Lake

CVAers-Make sure you pay
your 2012 dues!



Astronomical Object of the Month: The Celestial Rose

With apologies to Dante's *Paradiso*, this object should be nicknamed the Celestial Rose Nebula. It was imaged by NASA's WISE (Wide Field Infrared Survey Explorer) in November 2011. The object lies in the constellation Puppis, its scientific catalogue designation is Puppis A, and it cannot be seen through optical telescopes. It was formed about 3,700 years ago, when a star exploded into a supernova, and was discovered and first imaged in 1971. It is also being called "the cosmic cannonball," because at its heart is a neutron star which scientists have estimated is moving at three million miles per hour. The green material is actually part of the Vela Nebula, which itself is the remains of a supernova which occurred some 12,000 years ago. The object is also a strong x-ray source.

Image-NASA/JPL/UCLA-WISE

Quote of the month-

...-listen, there's a hell of a good universe next door; let's go
-e.e. cummings



Full Moon-Jan 8



New Moon-Jan 22



Full Moon-Feb 7



New Moon-Feb 21



Full Moon-March 8

Happy 2012 Everyone!

Central Valley Astronomers
Web Address:
www.cvfresno.org
Webmaster
Aaron Lusk 559-332-3102
admin@caservers.net

The Observer January-February 2012

The Observer is the newsletter of the Central Valley Astronomers
of Fresno

Officers and Directors for 2012

President

Randy Steiner 559-252-0130
astrigeo@cvip.net

Vice-president

Dale Lohrman 559-260-9992
dlohman@digisolaz.com

Treasurer

Steve Harness 559-292-2753
sharness@sbcglobo.net

Secretary

Casey Chumley

Star Party Coordinator

Brian Bellis 559-264-2645
pandb91@comcast.net

Historian

Larry Parmeter 559-276-8753
lanparmeter3@hotmail.com

Director

Lynn Klierer 559-251-3656
lelliottk@att.net

Director

Steve Britton 559-897-4529
sbritton@cvip.net

Director

Clarence Noell 559-271-9304
xmascnn@sbcglobal.net

Director

Dave Artis 559-658-8016
Dave.artis@direpc.com

Director

Greg Morgan 559-348-1160
gmorgan@oldstarlight.com

Director

Fred Lusk 559-436-1833
Fel3@pacbell.net

Director

Sharon Barrett 559-447-8846
sharonbarrett43@hotmail.com

Director

Warren Maguire 559-294-7444
slicker1948@yahoo.com

The President's Message

Happy 2012 to all CVA members and their families! I hope that all of you had a good 2011, and the coming year will be even better. There are lots of exciting events coming up in 2012—a transit of Venus, a partial solar eclipse, a partial lunar eclipse, monthly star parties, school visits, and many other things. But the biggest event for this year is that CVA will celebrate its 60th anniversary as an organization.

That's right: 60 years. I wonder how many other local groups can say that. CVA got its start in 1952, when almost all amateur telescopes were homemade, Edwin Hubble was still alive, the great Hale Telescope at Palomar had just seen first light, and the idea of humans in space was still a science fiction fantasy. How far CVA has come in all that time, and how much history its members have seen: men walking on the Moon, giant telescopes probing the universe, black holes, dark matter, dark energy, extra-solar planets being found, rovers trundling around the Martian plains like remote control toys. Hubble is long dead, but the orbiting observatory that bears his name is one of the most productive and enlightening instruments in the annals of science. But, along with all that, amateur astronomy is still as it was many years ago: the sense of wonder and awe at things beyond our Earth.

At the December 2011 meeting, Steve Britton told a story that sums up what CVA's mission is all about. In July, he and other CVA members were at Glacier Point, having visitors look through their telescopes. Steve showed Saturn to a family from England that was visiting Yosemite, and the boy in particular was fascinated by what he saw. In December, Steve got a postcard from the boy, still in excitement over seeing the planet, and thanking him for being allowed to view it. In today's world of artificial thrills and techno self-absorption, so few young people, like that English boy, can find enchantment in things beyond themselves. If CVA can reach and instill that feeling of amazement and wonder in others, then lives will be enriched just that much more, and maybe the world will a better place. And at base, that's probably why we all went into astronomy in the first place.

Happy 60th CVA, and may we all have clear skies and wonderful imaginations.

-Randy

Central Valley Astronomers of Fresno
est. 1952

Unfolding the Heavens for All to See

Profiles in Astronomy

Paul Merrill 1887-1961



Merrill was born in Minneapolis, Minnesota, but his family moved to California when he was a young boy, and he subsequently attended Stanford, where he received his B.A. in mathematics in 1908, and then the University of California-Berkeley, where he earned a Ph.D. in astronomy 1913. He worked for a time at Lick Observatory, then taught at the University of Michigan for several years. During World War I, he worked for the National Bureau of Standards, where he developed techniques for aerial photography(which he later used to propose that astronomical photography, especially infrared astronomy, could be done from high altitude planes as well). After the war, Merrill took a position with the Mt. Wilson Observatory, where he would stay for the rest of his career. He retired from Mt. Wilson in 1952, and lived and continued to do research in the LA area until his death.

Merrill's specialty was spectroscopy, which he used to study unusual stars, particularly long period variables. His greatest finding came in 1952, the year of his retirement, when he found emission lines of technetium in the spectra of S-type stars, a class of very cool long-lived red stars. This was unusual because technetium has a half-life of 2.6 million years; therefore Merrill concluded that the element was too new to have gotten there during the star's formation, but was being produced by some unknown, probably nuclear, process within the star. This was the first observational proof that heavy elements are produced inside stars.

Merrill also used the spectroscope in infrared astronomy, and studied the interstellar medium as well. He won many awards for his work, including the Bruce Medal of the Astronomical Society of the Pacific, was President of the ASP in 1927, as well as President of the American Astronomical Society in 1956-57.

Five new Elements Given Names

The Periodical Table of the Elements will have to be updated once more(although I noticed that in my just-arrived January 2012 copy of *Astronomy*, it already has been). In November, the general assembly of the Union of Pure and Applied Physics approved names for five transuranium elements that have been discovered over the last fifteen years or so. These new elements, which are formed from high energy collisions in particle accelerators, are extremely unstable and last only a fraction of a second before they degenerate into more stable particles. Nevertheless, their existence has been proven and confirmed in experiments lasting over several years. Element 110 will now be known as Darmstadtium(Da), after the German city of Darmstadt, where it was first found at the GSI Institute Helmholtz Center for Heavy Ion Research there in 1994. Element 111 is now called Roentgenium(Ro) in honor of Wilhelm Roentgen, the discoverer of x-rays. It was also first found at the GSI Institute in 1994. Element 112 will now be called Copernicium(Co), after Nicholas Copernicus, who first proposed the heliocentric theory of the solar system in the 1400s. It, as well, was first reported at GSI in 1996.

Element 114 will now be known as Flerovium(Fl), after Russian physicist Georgi Flerov, who established the Laboratory for Nuclear Reactions near Moscow, where the element was first produced in 2000. Element 116, which was first found at about the same time at the Lawrence Livermore Laboratory in California, will be given the name of Livermorium(Lv).

Scientists are still undecided on the names for elements 113, 115, 117, and 118. But as they have not yet been found, formal names may not be given to them for many years to come.



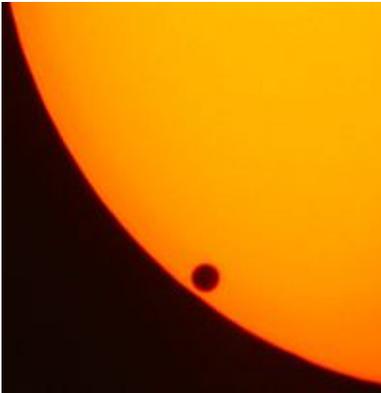
CVA Calendar January-February 2012

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|--|--|--|---|--|--|
| January 1-New Year's Day | 2 | 3 | 4 | 5 | 6 | 7-Christmas in the Eastern Orthodox Churches CVA meeting CSUF 7pm Galileo discovers three of the four large Jovian moons -1610 |
| 8-Full Moon  | 9 | 10 | 11 | 12 | 13 | 14 Huygens lands on Titan, Saturn's largest moon-2005 |
| 15 | 16 Martin Luther King Day | 17 | 18 | 19 | 20 | 21 CVA Star Party at Eastman Lake |
| 22 New Moon  | 23 Chinese New Year-Year of the Dragon | 24 | 25 | 26 | 27 45th anniversary of Apollo 1 fire-1967 | 28 26th anniversary of space shuttle Challenger tragedy-1986 |
| 29 | 30 | 31 | February 1 9th anniversary of space shuttle Columbia tragedy-2003 | 2 Groundhog Day | 3 Luna 9 lands on the Moon, takes first pictures from the surface-1966 | 4 |
| 5 Maarten Schmidt announces redshift of quasars-most distant objects in universe-1963 | 6 | 7 Full Moon  Astronaut Bruce McCandless becomes first human satellite-untethered spacewalk -1984 | 8 | 9 Discovery of active volcanoes on Jupiter's moon Io-1979 | 10 Discovery of rings around Uranus-1977 | 11 CVA monthly meeting CSUF 7pm |
| 12 Lincoln's Birthday NEAR-Shoemaker craft lands on Eros-2001 | 13 | 14 Valentine's Day | 15 | 16 | 17 | 18 Clyde Tombaugh discovers Pluto at Lowell Observatory-1930 |
| 19 | 20 Presidents' Day | 21 Mardi Gras New Moon  | 22 Ash Wednesday | 23 Supernova 1987A first seen in Large Magellenic Cloud | 24 Cambridge University announces the discovery of pulsars-1968 | 25 CVA Star Party at Eastman Lake |
| 26 | 27 | 28 | 29-Yes, this is a Leap Year! | March 1 | 2 | 3 |

Lots of Important Events This Year!

January 4, 2012-Earth is at perihelion(closest approach) to the Sun

May 12, 2012-Partial eclipse of the sun-visible in most of the U.S. and western Canada



June 6, 2012-Transit of Venus. The last took place in 2004. The next will not occur until 2117.

July 3, 2012-Partial eclipse of the moon. It will be visible in western North America



July 4, 2012-Earth is at aphelion(most distant) to the Sun

August 10-24, 2012-the best time all year to view the Milky Way, from 10pm to 1am

December 21, 2012. The winter solstice. Also, according to end-of-the-world conspiracy theorists and crazies, the world will end

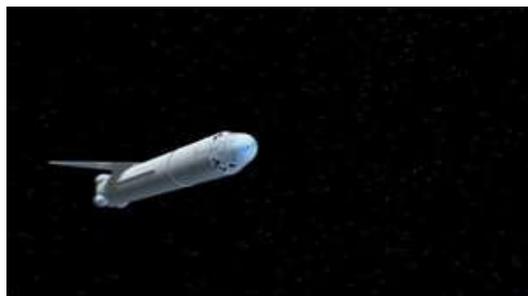
December 22, 2012-Scientists are 99.99999999% certain that the world will be back on again



What's New in Space

Stratolaunch: The Next Commercial Space Launcher

On December 13, 2011, Microsoft billionaire Paul Allen; "retired" aircraft designer and Ansari X-Prize winner Burt Rutan; and former NASA administrator Michael Griffin, who is the leading board member of Allen's Company, Vulcan, Inc, unveiled a massive and revolutionary commercial spacecraft carrier system: Stratolaunch. Put bluntly, it will be the world's largest aircraft, a dual bodied design powered by six 747 engines which will carry at modified Space-X Falcon 9 rocket high into the atmosphere where it will be launched into low Earth orbit. At first the payload will be unmanned cargo and satellites, but later, it could well carry humans into orbit.



Work on the craft has already begun at a specially built hanger at the Mojave Airport in the southern California desert. The timeline currently is that it will have its first test flight in 2015, and will launch its first rocket in 2016. Rutan, whose company, Scaled Composites, is currently working on the Virgin Galactic SS2 program, says that the Stratolaunch project has been in the works for several years; Scaled Composites is not directly involved in it, and Rutan is officially retired from the company, but much of the SS1-SS2 technology and knowhow is going into it. Already, many in the aerospace community are calling it "SpaceShip3," while others are referring to it as the "Space Goose," a reference to the late Howard Hughes' giant flying boat, nicknamed the "Spruce Goose."

At the same time, Space-X is designing a modified version of the Falcon 9 to be carried under its enormous wings. The giant plane and its launcher will lift off from a runway and climb to almost 40,000 feet, where the rocket will be launched. It will be able to deliver almost 12,000 pounds into low Earth orbit. Allen, Rutan, and Griffin see it as taking the place of the Delta II, which is scheduled to be retired next year. They envision it as initially carrying unmanned payloads, such as satellites, but eventually it may well carry Space-X's manned Dragon spacecraft as well.

Attempts to Revive the Shuttle Program

On December 19, 2011, reporter Lance Ulanoff on the web site *Mashable Tech*, reported that over the last two years, efforts have been made to keep the Space shuttle program alive by converting it into a commercial carrier that would be completely independent of NASA or any other government program. According to Ulanoff, starting in 2009, a number of commercial aerospace people were involved in talks with NASA to take over the shuttles and have them flying again, in a private commercial capacity, as early as 2014. According to sources, the talks, which collapsed in December 2011, would have had the shuttle making one flight in 2014, two in 2015, and four in 2016 and beyond. The two newest shuttles: Atlantis and Endeavour, would be used, as would the current Shuttle processing and launching facilities at the Kennedy Space Center. According to the sources, this is also the main reason why the proposal has been rejected by NASA; most of these facilities are already in the process of being converted to support the newly announced SLS (Space Launch System) program, which will have its first launch in 2017. However, the Ulanoff article also hinted that other talks are apparently going on, all of which indicate that the Shuttle may not yet be dead and buried. A NASA spokesperson, commenting on the stories, said that NASA's current plans are still to have the shuttles given to three air museums in Los Angeles, New York, and Houston.



Mars Curiosity Launched; Is Already Providing Data on Space Radiation

NASA's car-sized Curiosity rover has begun monitoring space radiation during its 8-month trip from Earth to Mars. The research will aid in planning for future human missions to the Red Planet. Curiosity launched on November 26 from Cape Canaveral, Fla., aboard the Mars Science Laboratory (MSL). The rover carries an instrument called the Radiation Assessment Detector (RAD) that monitors high-energy atomic and subatomic particles from the sun, distant supernovas and other sources.

These particles constitute radiation that could be harmful to any microbes or astronauts in space or on Mars. The rover also will monitor radiation on the surface of Mars after its August 2012 landing. "RAD is serving as a proxy for an astronaut inside a spacecraft on the way to Mars," said Don Hassler, RAD's principal investigator from the Southwest Research Institute in Boulder, Colorado. "The instrument is deep inside the spacecraft, the way an astronaut would be. Understanding the effects of the spacecraft on the radiation field will be valuable in designing craft for astronauts to travel to Mars."

Previous monitoring of energetic-particle radiation in space has used instruments at or near the surface of various spacecraft. The RAD instrument is on the rover inside the spacecraft and shielded by other components of MSL, including the aeroshell that will protect the rover during descent through the upper atmosphere of Mars. Spacecraft structures, while providing shielding, also can contribute to secondary particles generated when high-energy particles strike the spacecraft. In some circumstances, secondary particles could be more hazardous than primary ones.

These first measurements mark the start of the science return from a mission that will use 10 instruments on Curiosity to assess whether Mars' Gale Crater could be or has been favorable for microbial life. "While Curiosity will not look for signs of life on Mars, what it might find could be a game-changer about the origin and evolution of life on Earth and elsewhere in the universe," said Doug McCuistion, director of the Mars Exploration Program at NASA Headquarters in Washington. One thing is certain: the rover's discoveries will provide critical data that will impact human and robotic planning and research for decades.

As of noon EST on Dec. 14, the spacecraft will have traveled 31.9 million miles (51.3 million kilometers) of its 352-million-mile (567-million-kilometer) flight to Mars. The first trajectory correction maneuver during the trip is being planned for mid-January. The Southwest Research Institute, together with Christian Albrechts University in Kiel, Germany, built RAD with funding from the Human Exploration and Operations Mission Directorate, NASA Headquarters in Washington D.C., and Germany's national aerospace research center, Deutsches Zentrum für Luft- und Raumfahrt. The mission is managed by NASA's Jet Propulsion Laboratory (JPL) for the agency's Science Mission Directorate in Washington. The mission's rover was designed, developed, and assembled at the Jet Propulsion Laboratory in Pasadena, California.

Left-the launch of Mars Science Laboratory-Curiosity aboard an Atlas V rocket from Cape Kenney on November 26



Article and image from nasa.com

Number of extrasolar planets found as of December 2011-716 How many more are out there?

The Music of the Spheres

Sometimes, while we study the planets, we cannot help but notice their sheer beauty, brilliant orbs floating in the blackness of space. Is there any better way to start off the year than with a trip through the solar system to the accompaniment of Gustav Holst's *The Planets*? (All are represented but Pluto. Why? *The Planets* was written in 1916, and Pluto was not discovered until 1930)

Mercury, the Winged Messenger



Venus, the Bringer of Peace



Mars, the Bringer of War



(My own-not part of *The Planets*
Terra-the Guardian of Humanity



Saturn, the Ancient One



Jupiter-the Jovial One



Uranus, the Magician



Neptune-the Mystic



Astronomical Trivia

This issue's astronomical trivia question is-

In 1610, Galileo, using his newly built refractor telescope, first saw the four large moons of Jupiter: Io, Callisto, Europa, and Ganymede. At the same time, he also saw an odd-looking "star," which he recorded in his notebook, but never gave any importance to it. Today, we know that if he had realized it for what it was, his finding would have changed astronomical history. What was this object he found and then dismissed?

Larry Parmeter is the editor of

The Observer

phone # 559-276-8753

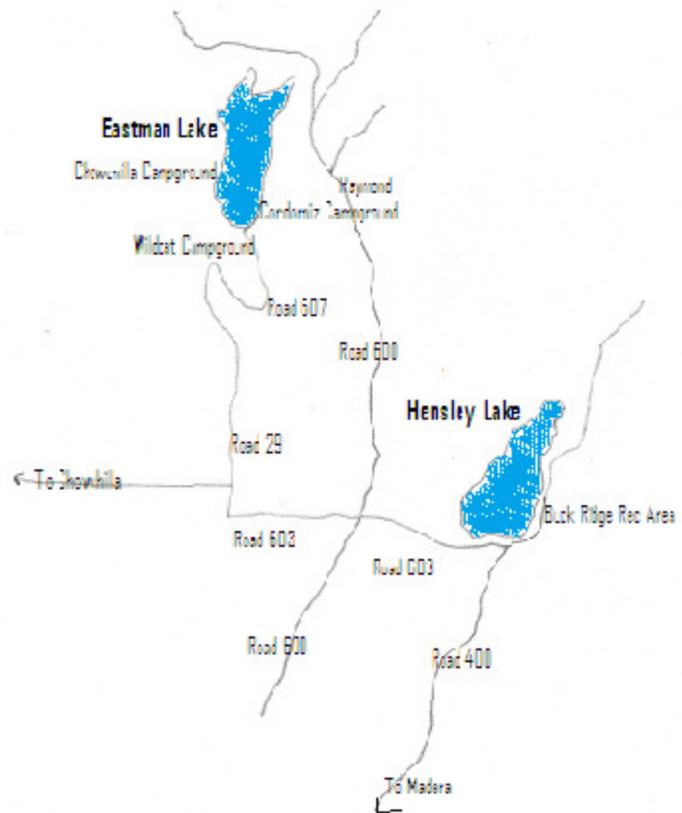
E-mail lanparmeter3@hotmail.com

Deadline for articles submission for the
March-April 2012 issue
February 20

Please submit articles in Microsoft Word format

**CVA Members-Remember to pay
your 2012 dues!**

**Dues can be paid at the January
meeting
or sent to the CVA
Treasurer-
Steve Harness
245 Swift Ave
Clovis, Ca 93612**



To Hensley and Eastman Lakes-Star party sites. The Eastman Lake starwatching site is at the boat ramp at the end of Road 29, just past the Cardinez campground.

Astronomy Short

The famous Danish astronomer Tycho Brahe went without his real nose most of his life. It was cut off during a sword fight with a fellow student while he was studying at the University of Rostock in Germany; they got into an argument over who was the better mathematician. Afterwards, Tycho had a nose made out of gold and wore it for the rest of his life. Also, there are many accounts about how he died. The best known is that during a dinner in Prague, where he was the royal astronomer, Brahe refused to excuse himself to go to the bathroom. As a result, he developed a bladder infection and died from it. This, at least, is the version told by his young assistant Johannes Kepler, who took over his notebooks and observations and eventually formulated the laws of planetary motion. Modern experts, though, believe that he died from mercury poisoning; mercury was commonly used as a medicine at the time. Tycho's body was exhumed in 2010, and traces of mercury were found in his hair and bones. More tests are planned on his remains later this year to definitely determine the cause of death.