

November-December
2010
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

Profiles in Astronomy-Seth
Nicholson

Boeing Enters the commer-
cial spacecraft market

The X-37B-Lost and Found

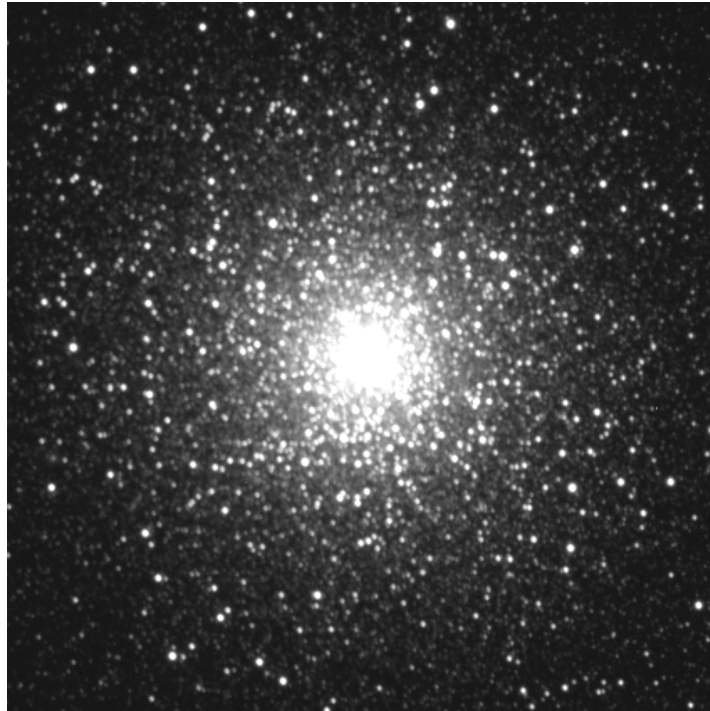
Lick Observatory after 130
years

The Moon's Secrets Slowly
Uncovered

SpaceShip 2 Makes Another
Step

Hubble is 20 years old!

Nov-Dec Activities



CVA Calendar

Nov 6-CVA Star Party at
Hensley Lake

Nov 10-Special starwatch at
Downing Planetarium, FSU

Nov 13-CVA Public Star Party
at RiverPark

Nov 20-CVA Meeting 7pm at
FSU

Dec 4-CVA Star Party, loca-
tion TBA

Dec 11-CVA Meeting at FSU
7pm-Elect officers for 2011

Dec 21-Winter Solistice!

Dec 31-New Year's Eve!

Astronomical Object of the Month-M15

M15, the great globular in Pegasus, is now known to be one of the oldest globulars in the Milky Way galaxy, at 13.4 billion years. It is also one of the most compacted clusters, with over one million stars. It's an awe-inspiring object to view!
Image from NASA

Quote of the Month:

We are living in the universe's prime, long after the most exciting things have happened...

John Barrow, The Origin of the Universe



New Moon Nov 6



Full Moon Nov 26



New Moon Dec 5



Full Moon Dec 21

Wednesday, November-The 10th anniversary of Downing Planetarium at Fresno State! Bring your telescope for a special star party!

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The Observer November-December 2010

President's Message-

As this year begins to come to an end, so will my term at presidency. It has been a fun two years and I've really enjoyed it. When we have such a group of great members, it does make the work easier.

The past two years have seen several accomplishments with our club and the community. The star parties at Riverpark have been a tremendous hit. Literally thousands of people have view the Moon, planets and anything else we can find with all of the light pollution. Thanks to Brian Bellis' investigation and suggestions, we've started having our star parties at Eastman Lake. This is a big improvement in our dark sky viewing. Finally with our connections to the Night Sky Network, I've received several toolkits for doing things with school groups. I hope to get the time to actually look at them. Also the Network has proven to be a resource of material which I have shared with the club members.

My years doing astronomy with the club have really shown me that while I really enjoy the evenings looking at the stellar objects at our dark sky observing sites, we serve as a valuable source of knowledge to the community. There is so much distorted, misinformation about astronomy it staggers the imagination. Remember the Mars hoax every August? It is gratifying that when ever anyone looks through the telescope and asks questions, they are gaining a little more knowledge about the heavens.

As stated earlier, I will be signing off as President this year. The position of President is not a hard one. It doesn't take that much time. You write a President's message every other month, with help of other club members you locate speakers for the meetings, and attend as many meetings as possible. With Dale helping me as VP it makes the job easier. Thanks for being a great group to be with.

Steve

Central Valley Astronomers of Fresno, est. 1952

Our Goals:

- Provide a place for those interested in astronomy to come together and share their hobby
- Share the wonders of astronomy with the public
- Be a source of astronomy education and information for our schools, the public, and the media

Our Interests:

- To learn about astronomy and related topics
 - To enjoy the nights sky with the unaided eye, telescopes, and binoculars
 - To learn from others and share what we know about astronomy from others
-

Profiles in Astronomy

Seth Nicholson 1891-1963

Nicholson was born and raised in Illinois, and did his undergraduate work in physics at Drake University. Afterwards, he went to the University of California at Berkeley to do graduate studies in astronomy. In 1915, while observing the newly found 8th moon of Jupiter, he discovered the 9th, and eventually made it the focus of his doctorate thesis. Upon completion of his graduate program, he took a position with the Mount Wilson Observatory in Pasadena, and would remain there for the rest of his career.

Nicholson's specialty was planetary astronomy. He discovered three more moons of Jupiter, several of the Trojan asteroids, and also computed the orbits of Pluto and several comets. At Mount Wilson, he did solar studies, observing and making regular reports on sunspot activity. He also led several expeditions to study the sun's corona during solar eclipses. As well, Nicholson was the first to realize the possibilities of infrared astronomy. In the 1920's, using a primitive infrared detector, he and another astronomer, Edwin Pettit, measured the heat from the moon, and determined that it was covered by a thin layer of dust, which was not confirmed until the 1960s. They also studied nearby stars with their detector, the first time infrared devices had been used on stellar objects.

Nicholson was twice president of the Astronomical Society of the Pacific, was chief editor of its scientific journal for many years, and was awarded its prestigious Bruce Medal, among his many other honors. He died in Los Angeles in 1963.



Sources-Wikipedia

The Bruce Medal Winners, Astronomical Society of the Pacific





Don't Forget! The CVA Online Store!

On it, we have a wide variety of merchandise with the CVA logo, including shirts, sweatshirts, hats, mugs, magnets, and other mementos. Some of the clothing items come in several colors, but you have to go to the individual product pages to see them.

Each product includes a donation to CVA

The CVA Online Store:
<http://www.cafepress.com/CVAFresno>

CVA Calendar for November and December 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Nov 1	2 Election Day-Vote!	3	4	5	6 New Moon  CVA star party
7 Daylight Savings Time ends	8	9	10 Special star party at Downing Planetarium	11 Veterans' Day	12 Voyager 1 flies past Saturn-1980	13 Mariner 9 orbits Mars-1971 CVA public star party at Riverpark
14	15	16	17 Leonid meteor shower peaks	18	19	20 CVA meeting at CSUF 7pm
21 Full Moon 	22	23	24	25 Thanksgiving Day	26	27
28	29	30	December 1	2 Hannaukh begins	3 Pioneer 10 flies by Jupiter-1973	4 CVA star party
5 New Moon 	6	7 Pearl Harbor Day	8	9	10	11 CVA meeting at CSUF-elect officers for 2011
12	13 Geminid meteor shower peaks	14 Mariner 2 flies by Venus-1962	15 Venera 7 lands on Venus-1970	16	17	18
19	20 Total eclipse of the Moon	21 Full Moon  Winter Solstice	22	23	24 Christmas Eve Apollo 8 orbits the moon-1968	25 Christmas Day
26	27	28	29	30	31 New Year's Eve	January 1, 2011 New Year's Day
2	3	4	5	6	7	8

What's New in Space

Boeing Enters the Commercial Space Market

On September 15, 2010, Boeing, the world's largest aeronautical company, announced that it is developing a manned spacecraft for the commercial space market, an area that expected to explode over the next ten years. Boeing's entry, which is being initially funded with an \$18 million grant from NASA, is called the CTS (for Commercial Transport Spacecraft)-100. It is a cone shaped craft, very similar in both size and design to the CEV Orion, which can hold up to seven astronauts. Boeing will not design a build a new booster rocket to put it into Earth orbit, but instead will use one of the already proven "workhorse" rockets, either the Atlas V or the Delta III. According to Boeing's timeline, if all goes well. The CTS-100 will undergo four test flights in 2014, and be ready for manned operational flights in 2015.



Boeing is the latest entry in the growing commercial tourism space market, which is set to take off with the retirement of the Space Shuttle, which will now probably be in 2012. Space-X, headed by software billionaire Eldon Mott, is already testing its Falcon rocket and Dragon manned spacecraft, which will also hold seven crewmembers, and may be ready for manned flights by 2013. Boeing believes that three to four seats on each CTS-100 flight will be sold to paying space tourists for up to \$30 million each. The company is working on a space tourism program with Space Adventures, Inc. of Virginia (which handled the space tourist astronauts for the Soyuz program from 2000 to 2009). Boeing is talking to Las Vegas entrepreneur Frank Bigelow, who wants to put a space "hotel" that will accommodate up to six people at a time into low Earth orbit by 2015. Boeing is also working to receive a NASA contract that will have the CTS-100 shuttle NASA astronauts to and from the International Space Station starting in 2015. Space-X, though, is also looking at the same contract, and several other commercial space companies will enter the field in the next few years.

All of this, supporters say, reflects the Obama Administration's plan to have NASA focus less on building new rockets and spacecraft, and instead encourage private commercial spacecraft development via the free market. According to the Obama philosophy, NASA would then be able develop long range plans for advanced space exploration, including a possible return to the Moon, manned trips to Mars, and the much heralded landing on an asteroid. Given the budget situation and infighting among supporters and opponents of NASA, whether this will all pan out is anyone's guess.

SpaceShip2 Makes its first Free Flight

On October 9, SpaceShip2, Richard Branson's suborbital commercial spacecraft, made its first free flight and landing in southern California. The craft, with two pilots aboard, was carried to 45,000 feet by the WhiteKnight2 mother ship, and then released. Several minutes later, it glided to a landing at the Mojave airport runway. SS2 is now in the active phase of its test series, and will make several more glide landings by the end of the year. In early 2011, it will make powered test flights, eventually reaching 70 miles above the Earth's surface. If all goes well, it will start carrying commercial paying passengers for 90 minute suborbital flights a year from now. According to Virgin Galactic, Branson's commercial spaceflight company, 320 people are currently signed up, at \$200,000 apiece, to make the flights. Branson plans to be on the first commercial flight, along with Dick Rutan, whose company, Scaled Composites, is building both SS2 and WhiteKnight2. SS2 can accommodate two pilots and up to six passengers per flight.



The X-37B: Lost and Found

On April 22, the Air Force launched its X-37B space plane, after almost 15 years of research and development. It looks vaguely like a miniature unmanned version of the space shuttle, but very little was said about its design and mission. On top of that, once it was launched, the Air Force clamed up on it, saying almost nothing about what it was doing, or where it was in orbit. Now that it has been in space almost six months, a group of amateur spaceflight fans have located the craft in space, and have determined its orbit. It is keeping to a low latitude Earth orbit that often takes it over the Mideast, especially Afghanistan and Iran. This has caused many to believe that it is being used either to test



new spy equipment, or to test the deployment of spy satellites, since it has a small cargo bay that works much like the Space Shuttle's. The Air Force will say only that when its mission is complete it will make a landing at Edwards Air Force Base, and then be refurbished for another space launch within a few weeks. One of its major goals, the Air Force says, is to test turnaround time, and try to make it as short as possible. Indications are that a second X-37B is being built and will fly in space by 2012. There is no evidence that the Air Force is building a manned version of the space plane.

**Central Valley Astronomers
wants to wish all our members
and their families**

**a Merry Christmas 2010
and Happy New Year 2011!**

NASA MISSIONS UNCOVER THE MOON'S BURIED TREASURES

Nearly a year after announcing the discovery of water molecules on the moon, scientists Thursday revealed new data uncovered by NASA's Lunar Crater Observation and Sensing Satellite, or LCROSS, and Lunar Reconnaissance Orbiter, or LRO. The missions found evidence that the lunar soil within shadowy craters rich in useful materials, and the moon is chemically active and has a water cycle. Scientists also confirmed the water was in the form of mostly pure ice crystals in some places. The results are featured in six papers published in the Oct. 22 issue of Science.

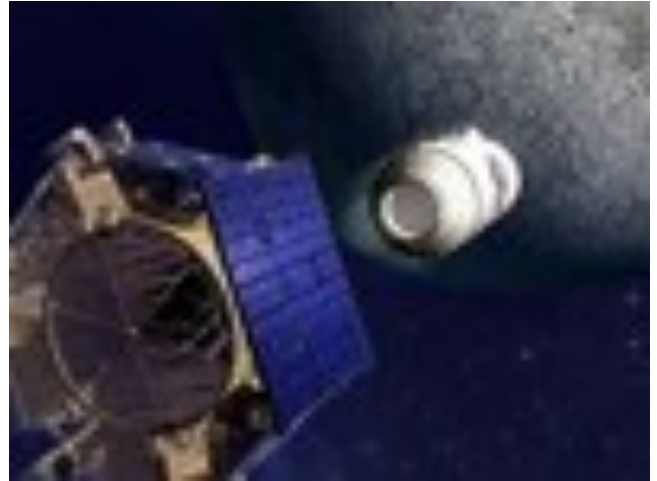
"NASA has convincingly confirmed the presence of water ice and characterized its patchy distribution in permanently shadowed regions of the moon," said Michael Wargo, chief lunar scientist at NASA Headquarters in Washington. "This major undertaking is the one of many steps NASA has taken to better understand our solar system, its resources, and its origin, evolution, and future."

The twin impacts of LCROSS and a companion rocket stage in the moon's Cabeus crater on Oct. 9, 2009, lifted a plume of material that might not have seen direct sunlight for billions of years. As the plume traveled nearly 10 miles above the rim of Cabeus, instruments aboard LCROSS and LRO made observations of the crater and debris and vapor clouds. After the impacts, grains of mostly pure water ice were lofted into the sunlight in the vacuum of space. "Seeing mostly pure water ice grains in the plume means water ice was somehow delivered to the moon in the past, or chemical processes have been causing ice to accumulate in large quantities," said Anthony Colaprete, LCROSS project scientist and principal investigator at NASA's Ames Research Center in Moffett Field, Calif. "Also, the diversity and abundance of certain materials called volatiles in the plume, suggest a variety of sources, like comets and asteroids, and an active water cycle within the lunar shadows."

Volatiles are compounds that freeze and are trapped in the cold lunar craters and vaporize when warmed by the sun. The suite of LCROSS and LRO instruments determined as much as 20 percent of the material kicked up by the LCROSS impact was volatiles, including methane, ammonia, hydrogen gas, carbon dioxide and carbon monoxide. The instruments also discovered relatively large amounts of light metals such as sodium, mercury and possibly even silver. Scientists believe the water and mix of volatiles that LCROSS and LRO detected could be the remnants of a comet impact. According to scientists, these volatile chemical by-products are also evidence of a cycle through which water ice reacts with lunar soil grains.

LRO's Diviner instrument gathered data on water concentration and temperature measurements, and LRO's Lunar Exploration Neutron Detector mapped the distribution of hydrogen. This combined data led the science team to conclude the water is not uniformly distributed within the shadowed cold traps, but rather is in pockets, which may also lie outside the shadowed regions. The proportion of volatiles to water in the lunar soil indicates a process called "cold grain chemistry" is taking place. Scientists also theorize this process could take as long as hundreds of thousands of years and may occur on other frigid, airless bodies, such as asteroids; the moons of Jupiter and Saturn, including Europa and Enceladus; Mars' moons; interstellar dust grains floating around other stars and the polar regions of Mercury.

Source-NASA, Oct 21, 2010



Number of extra-solar planets found as of October 2010-493

How many more are out there?

The Lick Observatory-Over 130 years Old!

California's Lick Observatory, at the summit of Mount Hamilton, east of San Jose, is the oldest observatory in California, starting with the 36" Lick refractor in 1888. Since then, the observatory has grown to seven telescopes, the largest of which is the 120" Shane reflector, which saw first light in 1959. In 1939, the observatory suffered a tragedy: an airplane crashed into the main building on an foggy night, killing the pilot and a passenger. Fortunately, a scientific meeting that was supposed to take place in the building that night was moved due to the weather; the building itself suffered little damage and the Lick telescope was unharmed.

For many years, the observatory was privately run, with funds left by James Lick, whose body is buried underneath the main support mount for the 36". But in the mid 1960s, management of the observatory was transferred to the University of California-Santa Cruz, where its main offices and research facilities are now.

I have visited Lick Observatory many times; it's a wonderful place, and well worth the twisty winding road that leads up to the summit of Mt. Hamilton. Not only are the telescopes and the small museum interesting, but the view from the summit (on a clear day) looks over the entire south bay area, including the Santa Clara Valley.

Right-the main building with the dome of the 36' Lick refractor



Left- the domes of the 120" Shane reflector, and a smaller 36" refractor



Left-the 120" Shane reflector Right-the 36" Lick refractor



Astronomical Trivia

Last issue's trivia question, "What does Triffid mean and how did the Triffid Nebula get its name? had no responses. The correct answer is that the term *Triffid* means "three lobed" and was named because early astronomers detected three distinct parts to it.

This issue's trivia question-

The Hubble Space Telescope is celebrating its 20th anniversary(see below). But, when it was first launched in 1990, it had an inauspicious beginning, with the mirror found to be slightly warped. What was the name of the company that made the mirror, and consequently didn't catch the flaw in it?

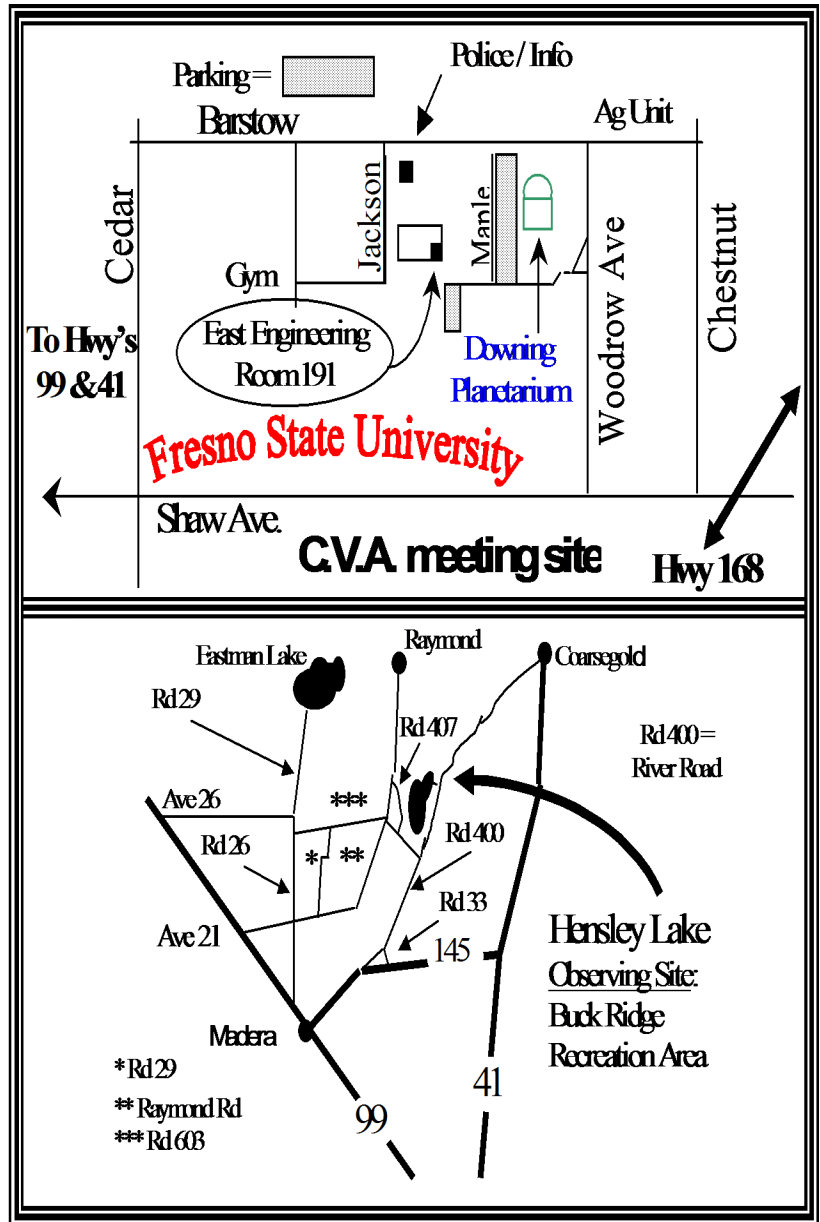
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Deadline for articles submission for the
January-February 2011 issue-
December 15

Please submit articles in Microsoft Word format



Hubble at 20

The Hubble Space Telescope is now 20 years old, Below are two images from Hubble's 20th year collection. HST gets better with age! Images by NASA/HST Left-M81 in Ursa Major Right-the "Mystic Mountain," "gas pillars in the Carina Nebula

