November-December
2011
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

CVA Calendar

Nov 5-Public star party at Riverpark

Nov 12-Monthly meeting at CUSF-Rm EE191-7pm

Nov 19-Star party at Eastman Lake

Dec 3-Star party at Eastman Lake

Dec 10-Monthly meeting at CSUF-Rm EE191-7pm. Business and elect officers for 2012

Astronomical Object of the Month

Instead of flying off to some faraway place, let's honor our own home galaxy-The Milky Way. This image of the Milky Way was taken in southern Arizona, with the Kafa Mountains in the foreground. 50,000 light years in diameter, and believed to contain more than 100,000,000,000 stars, the Milky Way is, nevertheless, not a large galaxy compared to some others. It and the Andromeda Galaxy(M31), are the two largest in the local group of galaxies.

Image-NASA

Quote of the month

We are stardust, we are golden...

Crosby, Stills, and Nash, from the song "Woodstock"

Full Moon Nov 10 | New Moon Nov 24 | Full Moon Dec 10 | New Moon Dec 24 | New Moon Jan 10

Merry Christmas and Happy New Year 2012!

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The Observer is the newsletter of the Central Valley Astronomers of Fresno- Established 1952

The President's Message-

Hi Everyone!

Unfortunately I missed the last Eastman Lake star party. I had hoped to be there to see the last of the fair weather meteor showers, the Orionids. It seemed like a perfect opportunity to catch any meteorite strikes on the Moon's dark side. Did any of those attending the star party catch anything unusual when the Moon was visible? How was the shower? Were there any OOHS and OOOHAWWS seen that night? Good color mix?

Steve came by my place on Friday night and showed me the meteorite samples and the incredible Lunar Rocks and Soil disks. He showed these at the last CVA meeting in October. There will be fewer and fewer events when these disks will be displayed.

I remember back in 1991 when Dr. Ron Nelson, a longtime CVA member, flew me to Rancho Cucamonga to pick up a rock sample from Apollo 16 to show on Earth Day at the Discovery Center. I had to get special permission from NASA to borrow these for the weekend The rock was to be kept in a bank vault when not displayed, and armed protection available nearby. I got a local bank and Fresno police to handle these requirements. This was the first time a Lunar Rock was displayed in Fresno. Over 800 guests visited TDC that day, and the club and TDC received extensive media coverage on television and the Fresno Bee.

I took out my binocular microscope and set it up for recording images with the digital camera. I recorded all of the specimens with my new HD digital camera and a SteadyPix Deluxe Camera Mount from Orion. This was the same kind that Fred Lusk showed the members during last year's Gadget Night.

On the disk sample display for meteorites were a carbonaceous chondrite, two other examples of chondrites, a stony-iron, and an achondrite. I took 10x, 30x, and camera zooms of each.sample. I've included a picture of the stony-iron meteorite. The carbonaceous chondrite is an Allende, seen to fall in 1969. What's interesting is that these types of carb-chon meteorites have been shown to contain amino acids, part of the fundamental building blocks for life. Some planetary scientists even believe that carb-chon's may have originated as comet cores, or that comets may have collided with other stony meteorites to form carb-chons

The Lunar Sample disk contained both rocks and soils. On display was a breccia; a basalt; and an unusual orange soil (found by the only astronaut-geologist, Dr. Harrison Schmidt, on the last Lunar mission, Apollo 17). Included was Highland soil, and Mare soil. What was interesting about this sample was the tiny micro-meteorite visible on a small anorthosite grain.

Last, but certainly not least, November will see the launch of the Mars Science Laboratory rover *Curiosity* to Mars for a springtime landing next year. *Curiosity* will be deployed for a wheels-down landing and autonomous travel capability while it explores Gale Crater for signs of water in the continuing exploration for life on Mars.

See you at the November meeting when I give a presentation on the MSL *Curiosity* and the science mission planned.

Randy

Profiles in Astronomy

Madame Lepaute, 1723-1788

Madame Lepaute, whose real name was Nicole-Reine Estable de la Briere, was born in Paris in 1723, to a wealthy bourgiosie(middle class) family She was an avid reader, was educated by her parents and private tutors, and showed an early interest in mathematics and science. In 1748, she married Jean-Andre Lepaute, a well known clockmaker in Paris, who was also the royal timekeeper. Through her husband, she met Joseph Jerome Lalande, the director of the Paris Observatory and a noted mathematician. She continued her scientific studies under Lalande, and while working with him in 1757, she calculated the orbit of the Great Comet, now known as Halley's Comet, and predicted that it would return to the inner solar system and be seen from Earth in 1758, all of which happened. As a result, her name became well known in European scientific circles. Afterwards, at the Paris Observatory, she continued her research and calculations in celestial mechanics(which was still a new field at the time). Lalande said of her that "she was the only woman in France who had a true knowledge of astronomy."

Starting in 1759, Madame Lepaute participated in a multi-year program to predict and map solar and lunar eclipses. Although she worked on several eclipse events, her primary contribution to the project was predicting the solar eclipse of 1774, which she calculated with a great degree of precision. This feat won her even greater acclaim. At about the same time, she also calculated and published a table of the lengths of pendulums, as part of her husband's work in clocks.

During the last few years of her life she slowly went blind, and abandoned science not only because of her eyesight, but also to care for her husband, who was in poor health as well. She died in 1788, only a few months before he did.

FermiLab's Tevatron Shut Down

On September 30, the Tevatron at FermiLab,was stopped and shut down, a victim of budget cutbacks and advancing technology. First turned on in 1983, it was for many years the world's most powerful particle accelerator, and made a host of discoveries in particle physics, most notably the top quark, which was found in 1995, and won its discoverers the Nobel Prize.

The main reason for the demise of the Tevatron was CERN's Large Hadron Collider, which was finished in 2010, and, after some early problems, began operational research in early 2011. Tevatron's 3.8 mile ring was no match for the LHC's 17 mile ring around Geneva, Switzerland. For years, American scientists had hoped that the Superconducting SuperCollider, whose 200 mile circumference ring had been planned for central Texas, would be built, but that, too fell to budget cutbacks, as well as red fire ants, in the late 1990s. Tevatron slugged on, though, and made important discoveries through the early 2000s. Once the reality of the LHC became clear, however, its death was all but assured. Illinios state and national officials tried to convince the Department of energy to keep it alive, but, in the era of budget deficits and cost spending, its funding was ended as of September 30. Many of the Tevatron experiments are being transferred to other facilities, and particle research will continue with other smaller accelerators at FermiLab, but the Tevatron is dead and gone.

CVA Calendar November-December 2011

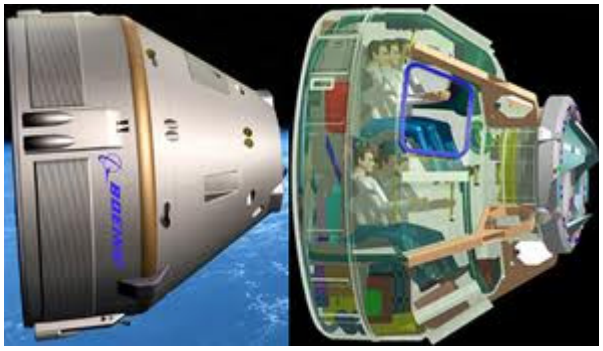
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 All Saints Day	2 Day of the Dead-Mexico	3	4	5 CVA public starparty at Riverpark
6 Daylight Savings time ends	7	8 Election Day in several states	9	10 Full Moon 	11 Veteran's Day	12 Voyager 1 flies past Jupiter-1980 CVA meeting 7am-CUSF
13 Mariner 9 orbits Mars 1971	14	15	16 Luna 17-Frist Moon rover	17	18	19 CVA star party at Eastman Lake
20	21`	22	23	24 Thanksgiving Day New Moon  Partial solar Eclipse-Antarctica	25	26
27	28	29	30	December 1	2	3 Pioneer 10 flies past Jupiter-1973 CVA Star Party-Eastman Lake
4	5	6	7 Pearl Harbor Day	8	9	10 Full Moon  Lunar Eclipse-seen in N. America CVA meeting CSUF-7am
11	12	13 Geminid meteor shower	14 Mariner 2 flies past Venus-1962	15 Venera 7 lands on Venus-1970	16	17
18	129	20	21 First day of Hanukkah	22 Winter solstice	23	24 New Moon  Apollo 8 orbits the moon-1968
25 Christmas Day	26 Kwanzza Boxing Day in Canada and England	27	28	29	30	31 New Year's Eve

What's New in Space

NASA Announces the SLS(Space Launch System)

On September 14, NASA finally announced its new heavy lift booster, known as the SLA(Space Launch System), which is intended to carry astronauts to an asteroid, Mars, and possibly the Moon. The new rocket will combine features of the Space Shuttle solid rocket boosters, external fuel tank, and liquid fueled engines, and will be able to put almost 300,000 pounds into Earth orbit, more than any other American rocket. If all goes well and funding is assured, it will make its first unmanned flight in 2017, and its first manned mission in 2020. The overall cost of the program is estimated to be $30 billion through 2021. Many in the aerospace community say, though, that those are big "ifs," considering that funding for NASA will probably be cut by 10% as part of the overall federal deficit reduction program.

Boeing Gears up for Manned Spaceflight



In August, Boeing announced that its CTS-100 manned spacecraft will make at least three flights in 2015, in preparation for operational missions in 2016. Boeing said that the CTS-100 will be launched by the Atlas 5 rocket, which is currently being manned rated. This was not a surprise, since Boing is a part owner of ATK Systems, which owns and manages the Atlas system. Boeing also announced that the first two flights of the CTS-100 will be unmanned and will test its abort system and orbital capabilities. The third flight, it said, will be manned; the CTS system with two Boeing (not NASA) astronaut pilots aboard will be launched into orbit, then rendezvous and dock with ISS. Boeing says it is now accepting applications for astronaut pilots for the CTS-100; it will choose at least eight in 2012, who will begin training for 2015 and subsequent flights shortly afterwards. It is said that several former NASA astronauts have already applied; whether they will be given first priority or not is not known.

NASA Still Plans to hire Astronauts

Even with the end of the shuttle era, NASA is still planning to hire 8-12 new astronaut candidates in 2012. Currently, there are about 50 people in the astronaut corps. Normally, every year, five to eight leave NASA for other ventures, even more so with the end of shuttle flights, NASA still needs to have a minimum of 50-60 trained astronauts to fill ISS primary and backup slots over the next several years. The astronaut corps was at a high of almost 150 people in 2002; its numbers were strongly criticized by the Columbia accident investigation report as a waste of resources and talent. Since then, it has been steadily dwindling; in the past two years, almost 50 astronauts, realizing that they probably would not get another space mission, have left the space agency. NASA last hired a new astronaut group in 2008.

Number of extrasolar planets found as of November 2011-694
How many more are out there?

What's New in Space Con't

NASA buys Virgin Galactic Flights

On October 12, NASA and Virgin Galactic announced that NASA has bought passenger and cargo space for one SpaceShip 2 suborbital flight in 2012, and holds an option for two more in 2013. The reason for the mission was not given, but indications are that it will be used for testing components and materials during the brief period of weightlessness when the craft reaches its high point of 70+ miles during the flight. NASA also did not say who would participate in the flight(s), but most likely the people involved will come from the astronaut corps ranks. As of now, SpaceShip 2 is undergoing FAA testing and certification, and VG plans to have the first commercial space flights in May 2012. On October 18, Richard Branson officially christened Virgin Galactic's new spaceflight facility and headquarters in New Mexico, where it will be moved to after certification is complete. Currently, it is in Mojave, in the Southern California desert.

Chinese Launch First Space Station module

On September 29, China launched the first module of its long-awaited space station. Designated Tiangong-1, it was put into at 217 mile high orbit, and, according to sources, is waiting for a visit from the unmanned Shenzhou-8 spacecraft, which will probably be launched in November. If all goes well, Shenzhou-9, with two or three astronauts aboard, will visit the module and prepare it for manned habitation. The launch of Shenzhou-9 is now expected to be in January or February 2012. Once docked, the Shenzhou-9 crew will spend up to a month aboard the module. It was revealed that the module's launch had been delayed for a year due to technical problems.

Tiangong-1 is expected to stay in orbit for two years, and will test equipment and logistics for China's permanently manned space station, which is now planned for 2018. This will be a modular station, and look similar to Russia's Mir Space Station.

An Earth with Two Moons?

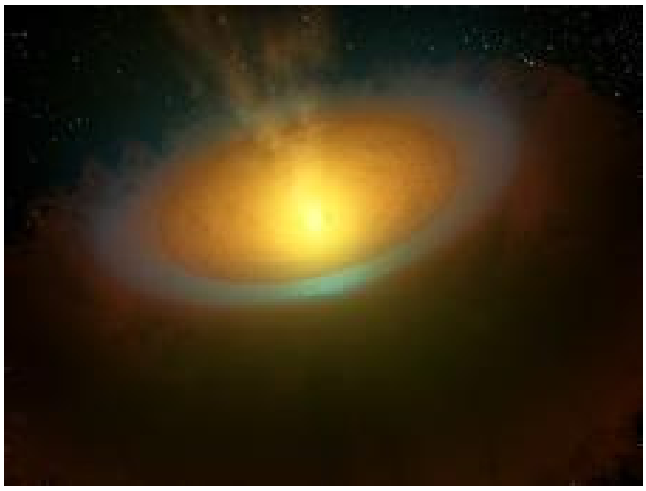
Some scientists believe that the Earth at one time had two moons, not one, according to an article in the August 2011 issue of Nature. Astronomers at the University of California-Santa Cruz, who did the study, have always been puzzled by its apparent lopsided shape and mass; recently, they ran a series of computer simulations to determine why. The results pointed to an era, 4.3 billion years ago, when the Earth was still in its infancy, and two moons orbited it. One was very small, only a couple of hundred miles in diameter, while the other was at least eight to ten times its size. Both were formed when a giant planetary body smashed into the newly formed Earth and threw off millions of tons of rock and other debris. According to the computer models, two, not one, lunar bodies formed, and orbited the Earth in tandem. Eventually, the smaller one caught up with the larger due to its more massive gravity, and collided with it, forming one large body, which reformed and settled into the moon that we know today.

Or a Planet with Two(or more) Suns?

In September, NASA scientists announced that the Kepler spacecraft had found a planet orbiting in tandem with two stars, and gave it the name of Tatooine, after the planet with two suns in the "Star Wars" movies(the official scientific name is Kepler 16B). Although such circumbinary planets, as they are called, had long been speculated, this was the first physical evidence that they do in fact exist, and that many more are probably out in the galaxy and other parts of the universe. Kepler found the double stellar system by focusing on eclipsing stars; the 16B results showed that not one, but two objects were passing in front of the main star. Indeed, scientists believe that, due to anomalies in the eclipse, a third star may be part of the 16B system. According to scientists, this discovery opens up a whole new class of objects, and they look forward to finding more of them .

Herschel Finds Oceans of Water in Disk of Nearby Star

Using data from the Herschel Space Observatory, astronomers have detected for the first time cold water vapor enveloping a dusty disk around a young star. The findings suggest that this disk, which is poised to develop into a solar system, contains great quantities of water, suggesting that water-covered planets like Earth may be common in the universe. Herschel is a European Space Agency mission with important NASA contributions.



Scientists previously found warm water vapor in planet-forming disks close to a central star. Evidence for vast quantities of water extending out into the cooler, far reaches of disks where comets take shape had not been seen until now. The more water available in disks for icy comets to form, the greater the chances that large amounts eventually will reach new planets through impacts

"Our observations of this cold vapor indicate enough water exists in the disk to fill thousands of Earth oceans," said astronomer Michiel Hogerheijde of Leiden Observatory in The Netherlands. Hogerheijde is the lead author of a paper describing these findings in the Oct. 21 issue of the journal Science.

The star with this waterlogged disk, called TW Hydrae, is 10 million years old and located about 175 light-years away from Earth, in the constellation Hydra. The frigid, watery haze detected by Hogerheijde and his team is thought to originate from ice-coated grains of dust near the disk's surface. Ultraviolet light from the star causes some water molecules to break free of this ice, creating a thin layer of gas with a light signature detected by Herschel's Heterodyne Instrument for the Far-Infrared, or HIFI.

These are the most sensitive HIFI observations to date," said Paul Goldsmith, NASA project scientist for the Herschel Space Observatory at the agency's Jet Propulsion Laboratory in Pasadena, Calif. "It is a testament to the instrument builders that such weak signals can be detected."

TW Hydrae is an orange dwarf star, somewhat smaller and cooler than our yellow-white sun. The giant disk of material that encircles the star has a size nearly 200 times the distance between Earth and the sun. Over the next few million years, astronomers believe matter within the disk will collide and grow into planets, asteroids and other cosmic bodies. Dust and ice particles will assemble as comets.

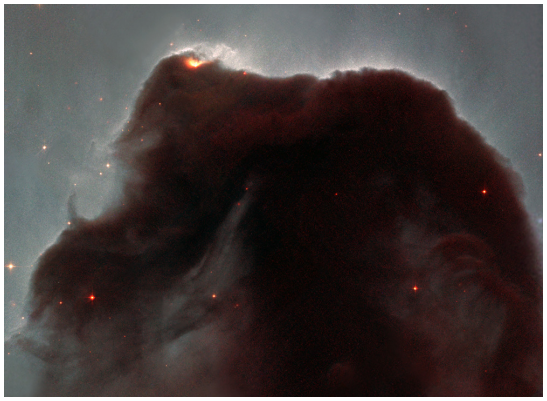
As the new solar system evolves, icy comets are likely to deposit much of the water they contain on freshly created worlds through impacts, giving rise to oceans. Astronomers believe TW Hydrae and its icy disk may be representative of many other young star systems, providing new insights on how planets with abundant water could form throughout the universe.

Article and image from NASA.com

Reminder-December is Membership Month!
Come to the December 2011 meeting-December 10 at CSU Fresno, Room EE191-7PM
CVA will elect officers for 2012, and also take 2012 memberships! Don't miss it!

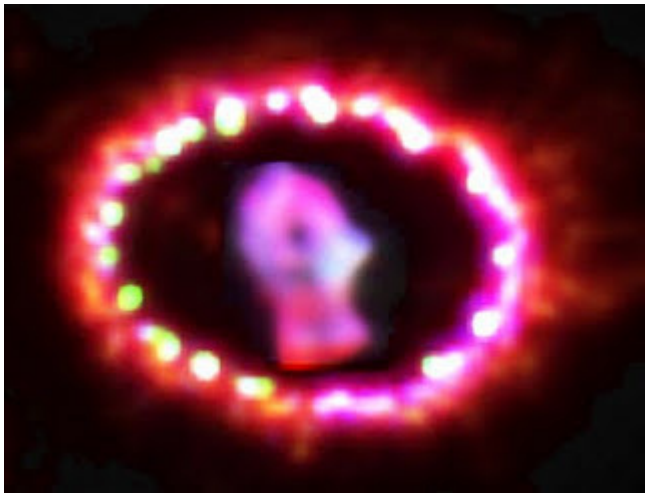
2011 Hubble Space Telescope Images

Hubble has been going strong for 21 years now, and how much longer it'll perform is anyone's guess. Scientists hope to see it operational until at least 2015, and possibly linger. With the seeming cancellation of the James Webb Space Telescope, Hubble will remain the only larger space-based telescope facility. In the meaning, it continues to do awe-inspiring work. A sampling of HST images from 2011.



A closeup of the familiar and famous Horsehead Nebula in Orion

The galaxy NGC 2841 in Ursa Major



Supernova 1987A in the Large Magellanic Cloud

Mars, as imaged by Hubble, in 2011

Astronomical Trivia

This month's question-

Where did we get the term *Galaxy* to describe the "island universes" in the nighttime sky?

Originally, scientists used the term "nebulae" to describe those fuzzy smears of light that they kept coming across in their nighttime surveys. Up until the 1900s, they did not know that galaxies other than our own existed. It was Edwin Hubble's announcement in 1929 that the universe was made up of many such objects that the term "galaxy" came into its own.

The word "galaxy" comes from the Greek word "galaxos," which means "milk." The ancients, referring to our own galaxy, saw this great band of light stretching across the night sky(probably a lot more clearly than we do now, with our light polluted skies), and thought it was milk squirted from the breasts of Hera, the queen of the Greek gods. This is also where we get the name for our own galaxy, the Milky Way.

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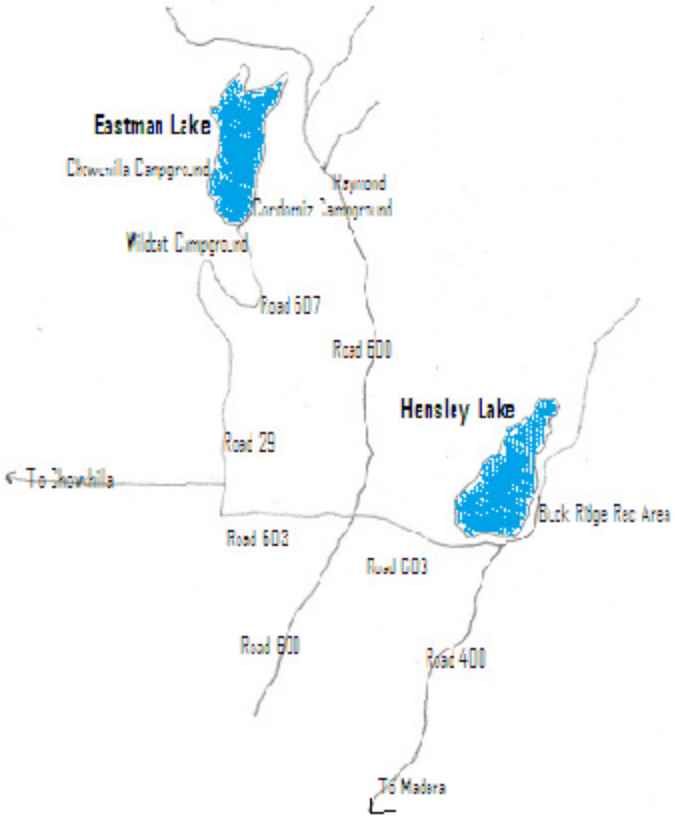
Deadline for articles submission for the January-February 2012 issue- December 20

Please submit articles in Microsoft Word format



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

One of the best known stories about Albert Einstein is that he quit high school at age 15 after being told by his teachers that he would never amount to anything. This, though, is not true. Einstein did indeed drop out of school at age 15(with his parents' permission), because he had repeated arguments with his teachers at the school he attended in Munich, Germany. He was frustrated and upset at their teaching style based on rote memorization, when he felt students' (and his)creativity should be acknowledged. After dropping out, Einstein wandered around Europe for a time, then joined his family in Zurich, Switzerland, where they had relocated. There, he went back to school, got his diploma, and enrolled at the Zurich Polytechnic Institute, where he majored in physics and education, planning on a career as a teacher. And the rest, as the saying goes, is history.