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CVA Activities

November 8-CVA Meeting 7PM CSUF

November 22-Star Party at Hensely Lake

December 13-CVA Meeting 7PM-election of officers for 2009 CSUF

December 20-Star Party (weather permitting) at Hensley Lake

Astronomical Object of the Month
M42-The Great Nebula in Orion

M42 glows from the light of hundreds of just-born stars in its interior. NASA image

Quote of the Month:

The universe may be the ultimate free lunch.
-Alan Guth

November 13	November 27	December 12	December 27
Full Moon	New Moon	Full Moon	New Moon

The Observer is the newsletter of Central Valley Astronomers of Fresno
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Profiles in Astronomy

Profiles in Astronomy



Muhammad Abu Al-Wafa Al Buzjani 940-998

Muhammad Abu Al-Wafa Al Buzjani was born and raised in Buzjan(now Quhistan) in what is today Iran, and as a young man, traveled to Baghdad to enter the service of the Caliph, one of the rulers of the Muslim Empire at the time. He would stay there for the rest of his life, working for the government administration, and also doing his own scholarly studies.

Al-Wafa is best known as a mathematician who made substantial contributions to geometry and trigonometry. He translated the works of Euclid into Arabic, and also developed proofs for squares and polyhedrons. He was the first to solve the problem of constructing a parabola by points, and of a square equivalent to other squares. He also did original work on mathematical descriptions of the conic sections. In trigonometry, Al-Wafa developed the sine theorem as it relates to spherical triangles, and developed a new way of constructing sine tables. He also developed the secant and cosecant laws, and constructed the first table of tangents. For these accomplishments, he is considered by many mathematicians to be the Father of Trigonometry. As well, he wrote several books on mathematics, most of which are lost and known only from references in other works.

Al-Wafa used his mathematical abilities to study and calculate the movements of the Moon, and was the first to develop the notion of "variation" in the Moon's orbit. His astronomical tables for the Moon, the planets, and the stars were used for centuries, and had a tremendous influence on astronomers in Renaissance Europe. Western scientists such as Copernicus and Tycho Brahe were said to have been influenced by his findings.

The lunar crater Al-Wafa is named for him.

Sources:
"Legacy of Islam: Muslim Heroes and Personalities" http://www.amaana.org/ISWEB/contents.html#pos3

"Al-Wafa Al-Buzjani, Muhammad," International Encyclopedia of Astronomy, ed Patrick Moore, New York: Orion Books, 1987.

Astronomical Object of the month-The Great Nebula in Orion, M42

CVA Calendar for November and December 2008

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						November 1
2 Daylight Savings Time ends	3	4	5	6	7	8 CVA Meeting-7PM
9	10	11 Veterans' Day	12 ○ Full Moon	13	14	15
16	17 Leonid Meteor shower	18	19	20	21	22 CVA Star Party-Hensley Lake
23	24	25	26	27 ● Thanksgiving Day New Moon	28	29
30	December 1	2	3 First Jupiter flyby by Pioneer 10, 1973	4	5	6
7	8	9	10	11 Moon occults the Pleiades	12 ○ Full Moon	13 CVA Meeting-7PM Geminid Meteor shower
14	15	16	17	18	19	20 CVA Star Party -Hensley Lake
21 Winter Solstice Hanukkah Begins	22 Ursid meteor shower	23	24 Apollo 8, first manned vehicle to orbit the Moon, 1968	25 Christmas Day	26	27 ● New Moon
28	29	30	31 New Year's Eve			

What's New in Space

China's Next Step in Space

The Chinese Space Agency announced on September 27 that Shenzhou 7, with a crew of three, had successfully landed after a three day mission that included a spacewalk. The three astronauts aboard: Zhai Zhingang, Jing Haipeng, and Liu Borning, were each 42 and pilots in the Chinese Air Force. Zhai was the backup astronaut for Shenzhou 5 in 2004, and he made a spacewalk, one of the primary objectives for the flight. The reason for the almost three year delay has not been given, but Western experts have long believed that it had to do with designing and testing a new spacesuit for spacewalks in conjunction with the proposed manned space station. After the success of Shenzhou 6 in October 2005, the space agency announced that Shenzhou 8 will be the first of several flights leading up to a manned space station. Both Shenzhou 8 and Shenzhou 9 will be unmanned, and will carry components for the space station; Shenzhou 10 will launch the crew that will spend time aboard the station. All three flights will be launched within a month of each other.

NASA's Manned Spacecraft Plans

NASA has released the space shuttle schedule through 2010. The shuttle program is scheduled to end with a flight, STS-133, by Endeavour in May 2010, although two contingency flights, STS-134 and STS-135 to ISS may take place in December 2010 and July 2011. The entire shuttle fleet is scheduled to be be retired and decommissioned by the end of 2010(but don't be surprised if this is extended). NASA administrator Michael Griffin has said repeatedly that he never again wants the U.S. to be spaceflight dependent on another country, and may well keep the shuttle program going until the Orion CEV is ready for manned flight. NASA had hoped to have the first manned Orion mission in June 2013, but recently announced that, due to budget cuts, will not launched until at least September 2014.

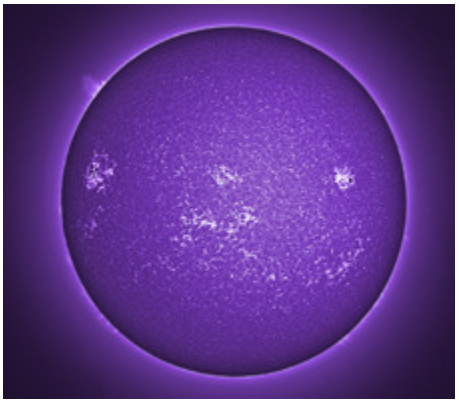
SpaceShip2 Moves Forward

On July 27, 2008, Richard Branson and Dick Rutan unveiled WhiteKnight2-the "mother ship" which will take Branson's paying passenger SpaceShip2 up to 50,000 feet and launch it into space. It is a much larger and more powerful version of the WhiteKnight that Rutan used in 2004 to win the X-Prize with SpaceShip1. Ground tests on WK2 will begin at the end of this year, with flight tests by the spring of 2009. Branson and Rutan hope to get FAA certification by the end of 2009, and start regular passenger flights of WK2/SS2 in 2010. SpaceShipTwo will carry two pilots and up to six passengers, who will pay (initially) $200,000, for a 90 minnute flight going up to 70 miles above the Earth, including about four minutes of weightlessness. Rumor has it that both Branson and Rutan will be on the first commercial flight.

Mars Rovers Keep on Ticking

Even though they've now been eclipsed by the Mars Phoenix Lander and the upcoming Mars Science Laboratory, the two Mars Rovers, Spirit and Opportunity, are still doing well, and doing good science as they move into their fifth year of operation on the Mars. Recently NASA extended their mission for another six months, the sixth extension since they landed in January 2004. NASA's Jet Propulsion Laboratory now projects that the rovers will be operational until at least June 2009 . Opportunity recently made its way out of Victoria Carter and is currently moving towards a much larger crater named Endeavour, and Spirit is in parking mode near a volcanic plateau, waiting out the Martian winter. Together, the two rovers have traveled more than 17 miles across the Martian surface, and have returned over 300,000 images to Earth. Mission scientists say that the two golf cart sized rovers, despite their ages, are still working well, and have plans for them into the summer of next year.

Sun Not a Perfect Sphere, Scientists Find



Scientists using NASA's RHESSI spacecraft have measured the roundness of the sun with unprecedented precision. They find that it is not a perfect sphere. During years of high solar activity the sun develops a thin "cantaloupe skin" that significantly increases its apparent oblateness: the sun's equatorial radius becomes slightly larger than its polar radius. Their results appear the Oct. 2nd edition of Science Express.

" The sun is the biggest and therefore smoothest object in the solar system, perfect at the 0.001% level because of its extremely strong gravity," says study co-author Hugh Hudson of UC Berkeley. "Measuring its exact shape is no easy task."

"Cantaloupe ridges" on the sun. The glowing white magnetic network is what gives the sun its extra oblateness during times of high solar activity. Amateur astronomer Gary Palmer took the picture in July 2005 using a violet calcium-K filter.

The team accomplished the task by analyzing data from the Reuven Ramaty High-Energy Solar Spectroscopic Imager, RHESSI for short, an x-ray/gamma-ray space telescope launched in 2002 on a mission to study solar flares. Although RHESSI was never intended to measure the roundness of the sun, it has turned out ideal for the purpose. RHESSI observes the solar disk through a narrow slit and spins at 15 rpm. The spacecraft's rapid rotation and high data sampling rate (necessary to catch fast solar flares) make it possible for investigators to trace the shape of the sun with systematic errors much less than any previous study. Their technique is particularly sensitive to small differences in polar vs. equatorial radius or "oblateness."

"We have found that the surface of the sun has rough structure: bright ridges arranged in a network pattern, as on the surface of a cantaloupe but much more subtle," describes Hudson. During active phases of the solar cycle, these ridges emerge around the sun's equator, brightening and fattening the "stellar waist." At the time of RHESSI's measurements in 2004, ridges increased the sun's apparent equatorial radius by an angle of 10.77 +- 0.44 milli-arcseconds, or about the same as the width of a human hair viewed one mile away.

"That may sound like a very small angle, but it is in fact significant," says Alexei Pevtsov, RHESSI Program Scientist at NASA Headquarters. Tiny departures from perfect roundness can, for example, affect the sun's gravitational pull on Mercury and skew tests of Einstein's theory of relativity that depend on careful measurements of the inner planet's orbit. Small bulges are also telltale signs of hidden motions inside the sun. For instance, if the sun had a rapidly rotating core left over from early stages of star formation, and if that core were tilted with respect to its outer layers, the result would be surface bulging. "RHESSI's precision measurements place severe constraints on any such models."

The "cantaloupe ridges" are magnetic in nature. They outline giant, bubbling convection cells on the surface of the sun called "supergranules." Supergranules are like bubbles in a pot of boiling water amplified to the scale of a star; on the sun they measure some 30,000 km across (twice as wide as Earth) and are made of seething hot magnetized plasma. Magnetic fields at the center of these bubbles are swept out to the edge where they form ridges of magnetism. The ridges are most prominent during years around Solar Max when the sun's inner dynamo "revs up" to produce the strongest magnetic fields. Solar physicists have known about supergranules and the magnetic network they produce for many years, but only now has RHESSI revealed their unexpected connection to the sun's oblateness.

"When we subtract the effect of the magnetic network, we get a 'true' measure of the sun's shape resulting from gravitational forces and motions alone," says Hudson. "The corrected oblateness of the non-magnetic sun is 8.01 +- 0.14 milli arcseconds, near the value expected from simple rotation."

Further analysis of RHESSI oblateness data may help researchers detect a long-sought type of seismic wave echoing through the interior of the sun: the gravitational oscillation or "g-mode." Detecting g-modes would open a new frontier in solar physics—the study of the sun's internal core.

Source: From NASA http://www.nasa.gov/topics/solarsystem/features/oblate_sun.html

Central Valley Astronomers wishes all our members and their families a Merry Christmas and a Happy 2009

Mars Opportunity Rover looked back and took an image of its own tracks as it made its way out of Victoria Crater in September 2008. The rover used the tracks it made almost a year ago going into the crater to help it get out. Opportunity is now on its way to a larger crater named Endeavour.

Image from JPL/NASA



Astronomical Trivia

Last issue's astronomical trivia question:

What well known stellar object is also known as Inne's Star?

Again, Chris Denny was on the ball. He correctly identified the answer as Alpha Centauri C, more commonly known as Proxima Centauri, the closest star to our Sun at 4.2 light years. Robert Innes discovered it in the early 1900s, and it is sometimes called by his name.

This issue's astronomical trivia question-

Who was the first person to postulate the possible existence of black holes?

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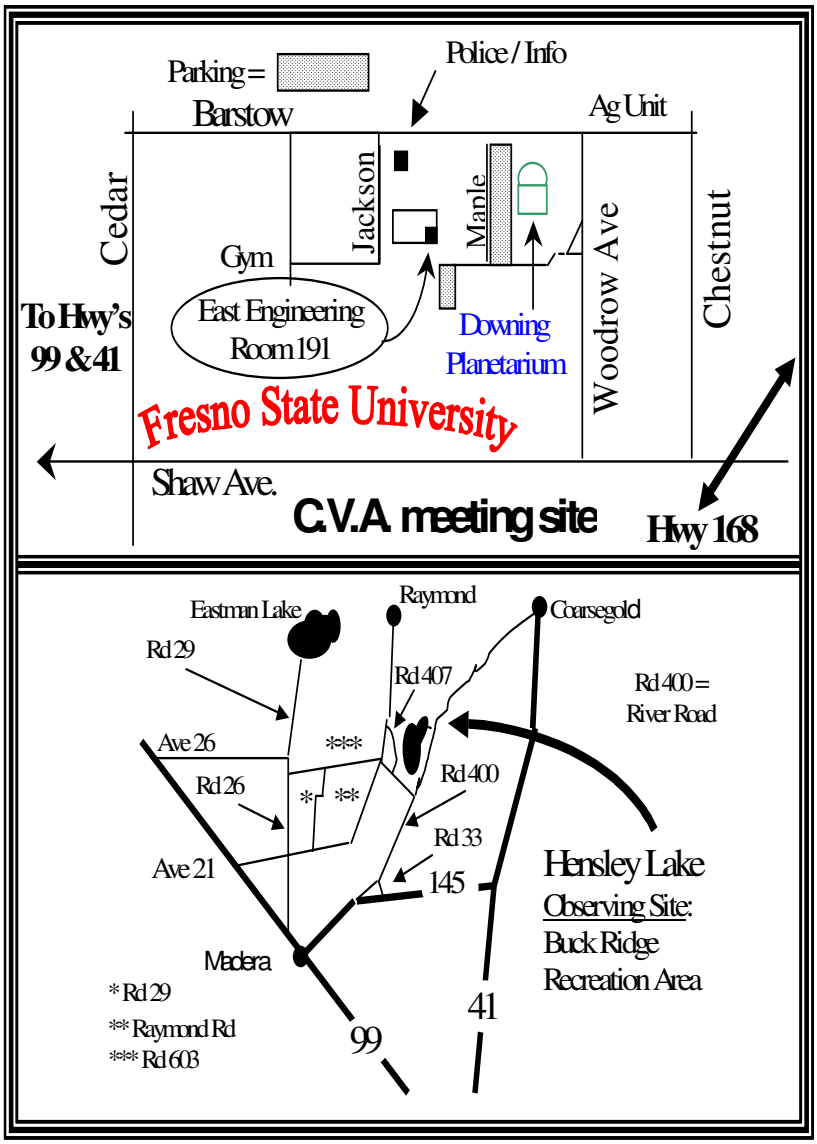
E-mail lanparmeter3@hotmail.com

Deadline for articles submission to The January-February 2009 ***Observer*** will December 15 and the issue will be mailed on December 28

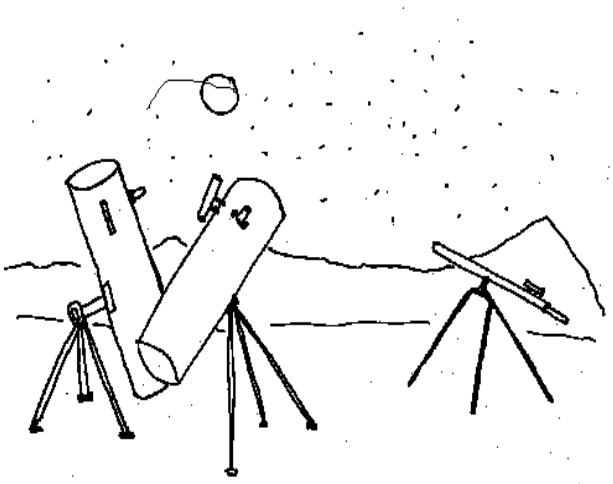
Please submit articles in Microsoft Word format

Astronomical Joke

Did you know that protons have mass?
I wasn't even aware that they were Catholic.



Telescope Talk-by Parmeter



Looks like George has lost some weight since the last star party

Organization

Business Name

Primary Business Address
Your Address Line 2
Your Address Line 3
Your Address Line 4

Phone: 555-555-5555
Fax: 555-555-5555
E-mail: someone@example.com

Your business tag line here.

This would be a good place to insert a short paragraph about your organization. It might include the purpose of the organization, its mission, founding date, and a brief history. You could also include a brief list of the types of products, services, or programs your organization offers, the geographic area covered (for example, western U.S. or European markets), and a profile of the types of customers or members served.

It would also be useful to include a contact name for readers who want more information about the organization.

We're on the Web!
example.com

Back Page Story Headline

This story can fit 175-225 words.

If your newsletter is folded and mailed, this story will appear on the back. So, it's a good idea to make it easy to read at a glance.

A question and answer session is a good way to quickly capture the attention of readers. You can either compile questions that you've received since the last edition or you can summarize some generic questions that are frequently asked about your organization.

A listing of names and titles of managers in your organization is a good way to give your newsletter a personal touch. If your organization is small, you may want to list the names of all employees.

If you have any prices of standard products or services, you can include a listing of those here. You may want to refer your readers to any other forms of communication that you've created for your organization.

You can also use this space to remind readers to mark their calendars for a regular event, such as a breakfast meeting for vendors every third Tuesday of the month, or a biannual charity auction.

If space is available, this is a good place to insert a clip art image or some other graphic.



Caption describing picture or graphic.