March-April
2011
Volume 59
Issue 2

The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

CVA Calendar

March 4-Special starwatch at Harvest School

March 5-Messier Marathon #1 at Hensley Lake

March 12-Public starwatch at RiverPark

March 19-Monthly meeting at CSUF 7pm

April 2-Messier Marathon #2 at Hensley Lake

April 7-Special starwatch at Lemoore NAS

April 9-Public starwatch at RiverPark

April 23-Monthly meeting at CSUF 7pm

Astronomical Object of the Month-M51

M51, also known as NGC 5194, is one of the most recognizable galaxies in the sky. Although catalogued by Charles Messier, it became popularized by the Earl of Rosse, who outlined its distinctive spiral shape.. See it, along with its companion galaxy, NGC 5195, during Messier Marathon month. Image by NASA/HST

Quote of the Month:

I want to know how God created this world. I want to know His thoughts. The rest are just details.

-Albert Einstein

New Moon March 4 | Full Moon March 19 | New Moon April 3 | Full Moon April 17

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The Observer is the newsletter of 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 known about astronomy from others

The President's Message

This is a new year with a lot of exciting things coming up. Because of the Moon, we have two Messier Marathons this year, one on March 5, and the other on April 2. I hope that everyone can come to one or the other, or even both. Also the Riverpark public starwatch program begins in March; it has always been popular, and is a good outreach to the public. In addition, we'll have several special starwatches, like the ones at Harvest School and Lemoore NAS, the annual Glacier Point outing in the summer, the Courtright weekend excursions, and many others.

All these things are good, but this year, I want to go beyond what we usually do, get into something that' will attract more people and and make them aware of the stars and others. In the past, we've had high powered guest speakers like John Dobson, Don Mackholtz, and Kelly Beatty. This may be the year to get another high profile speaker. At the February meeting, I suggested perhaps contacting one of the astronauts with a connection to Fresno, like Barbara Morgan or Jose Hernandez, to see if they can come and speak. If that's not possible, maybe someone else who is prominent in the space sciences/astronomy community, perhaps from the Bay Area or Southern Califonria. We're going to see what we can do. Too many people in see Fresno as a backwater town when it comes to science and culture. We can do our part to prove them wrong.

I want to thank everyone who has worked hard over the past few years to make CVA a great organization: Steve Harness, Dale Lohrman, Brian Bellis, Fred Lusk, Clarence Noell, Brian Spicci, and many others. CVA has been going for 59 years now, and it's the people who do the work to keep it that way. We all owe them a round of applause.

Spring is coming up and the weather is improving. Time to get the telescopes ready for Viewing, with all those great spring and summer objects. Let's all go into the year with our heads held high and our eyes at the stars.

Good viewing always-
Randy

Profiles in Astronomy

John Huchra 1948-2010

John Huchra, one of the world's foremost experts on galaxy formation and structure, died suddenly on October 8, 2010. He was 61 years old.

Huchra was born and raised in New Jersey, and received his undergraduate degree in physics at MIT. He then went to CalTech, where he worked on his doctorate in astronomy under James Gunn, one of the leading astrophysicists of the 1960s and 70s. Afterwards, Huchra returned to the Boston area as a post-doctorate fellow at the Harvard-Smithsonian Center for Astrophysics. When his fellowship was up, he was offered, and took, a permanent position at the Center. He would stay there for the rest of his career.

In the 1970s, Huchra teamed up with Marc Aaronson and Jeremy Mould to study the rotation rate of galaxies using newly developed infrared technology. Their research led them to conclude that the universe was far younger than accepted age values of the time: only about nine to ten billion years old. This put them into conflict with the older generation of astronomers, who kept insisting that the universe was twelve to fifteen billion years old. The age controversy extended into the 1990s, when the Hubble Space Telescope, measuring Cepheid variables in far distant galaxies, showed that the universe began about thirteen billion years ago.

In the 1980s, Huchra and Margaret Geller of Harvard undertook a large scale redshift survey of the universe, and produced a map that showed the galaxies in clusters on the edges of huge spherical shaped voids, This so-called "bubble universe" was symbolized by the "Coma Man," a cluster of galaxies with the appearance of a stick figure, that became recognized through the world and made Huchra and Geller household names. They later went on to discover the "Great Wall," a huge cluster of galaxies that stretched 700 million light years in length and 250 million light years in width. Both findings stunned the astronomical world, and forced scientist to ponder the processes that formed the universe.

Huchra also did important work in globular clusters, and also the formation and evolution of galactic nebulas. He won many awards for his studies, and was eulogized as one of the great personages of late 20th century astronomy.

Source: John Huchra, Wikipedia

Two Special Star Watch Events!

March 4-Harvest Elementary School, on Bryan just south of Shaw, west of 99
Contact Brian Bellis at 559-264-2645 for more information

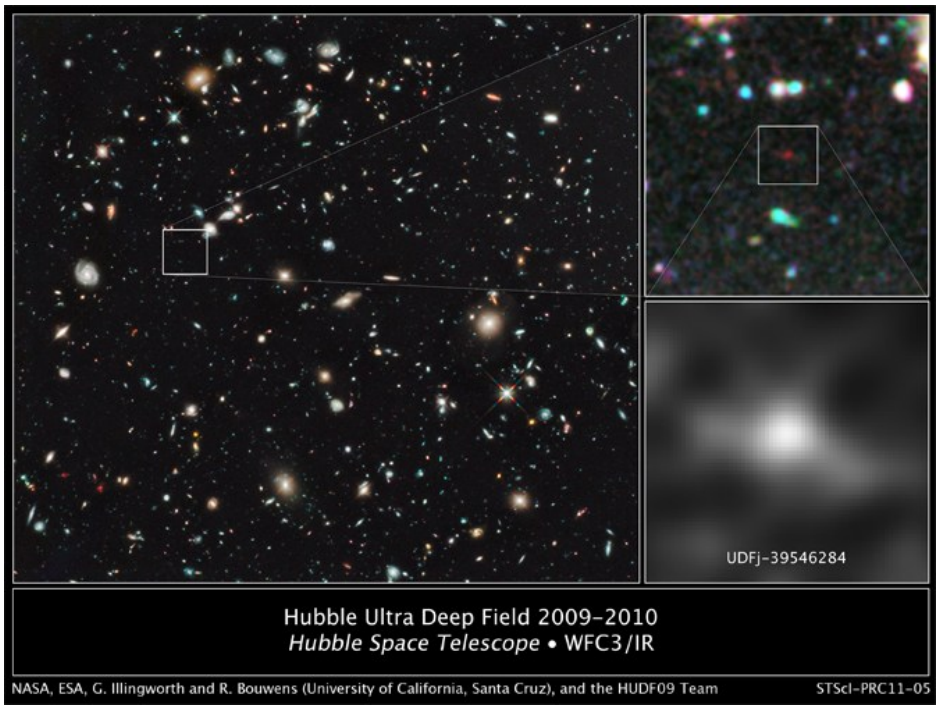
April 7-Special starwatch at Lemoore Naval Air Station
Contact Clarence Noell at 559-271-9304 for more information

Also-the 2011 public starwatch events at RiverPark Shopping Center will begin on March 11

The Observer March-April 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		March 1	2	3	4 New Moon ●	5 Voyager 1 flies past Jupiter 1979 Messier Marathon #1 Hensley Lake
6	7	8 Mardi Gras Day	9 Discovery of active volcanoes on Jupiter's moon Io-1979 Ash Wednesday	10 Ring of Uranus discovered 1977	11	12 Public star party at Riverpark
13 William Herschel discovers Uranus 1781 Daylight Savings Time begins	14 Pi Day	15 The Ides of March	16	17 St. Patrick's Day	18 First spacewalk by Alexi Leonov in Voskhod 2 1965	19Full Moon ○ CVA monthly meeting CSUF 7pm
20 Spring Equinox Purim	21	22	23 Comet Shoemaker-Levy 9 discovered	24	25 Titan, Saturn's largest moon discovered by Christian Huygens 1655	26
27	28	29 Mariner 10 flies by Mercury 1974	30	31	April 1 April Fool's Day	2 Messier Marathon #2 Hensley Lake
3 New Moon ●	4	5	6	7	8	9 Public star party at Riverpark
10	11	12 50th anniversary of first manned space flight-Vostok 1 -1961 First space chuttle flight 1981	13	14	15 Tax Day	16 CVA solar viewing at Downing Planetarium CSUF
17 Full Moon ○ Palm Sunday	18	19 First day of Passover	20	21	22 Good Friday Earth Day	23 Monthly meeting at CSUF 7pm
24 Easter Sunday	25 Hubble Space Telescope deployed in orbit 1990	26	27	28	29	30 CVA star party at Hensley Lake
May 1 May Day	2	3	4	5 First American man in space-Freedom 7	6	7

Hubble Images the Most Distant Object Yet Found in the Universe



Astronomers have pushed NASA's Hubble Space Telescope to its limits by finding what is likely to be the most distant object ever seen in the universe. The object's light traveled 13.2 billion years to reach Hubble, roughly 150 million years longer than the previous record holder. The age of the universe is approximately 13.7 billion years.

The tiny, dim object is a compact galaxy of blue stars that existed 480 million years after the big bang. More than 100 such mini-galaxies would be needed to make up our Milky Way. The new research offers surprising evidence that the rate of star birth in the early universe grew dramatically, increasing by about a factor of 10 from 480 million years to 650 million years after the big bang.

Astronomers don't know exactly when the first stars appeared in the universe, but every step farther from Earth takes them deeper into the early formative years when stars and galaxies began to emerge in the aftermath of the big bang.

"These observations provide us with our best insights yet into the earlier primeval objects that have yet to be found," said Rychard Bouwens of the University of Leiden in the Netherlands. Bouwens and Illingworth report the discovery in the Jan. 27 issue of the British science journal Nature.

This observation was made with the Wide Field Camera 3 starting just a few months after it was installed in the observatory in May 2009, during the last NASA space shuttle servicing mission to Hubble. After more than a year of detailed observations and analysis, the object was positively identified in the camera's Hubble Ultra Deep Field-Infrared data taken in the late summers of 2009 and 2010.

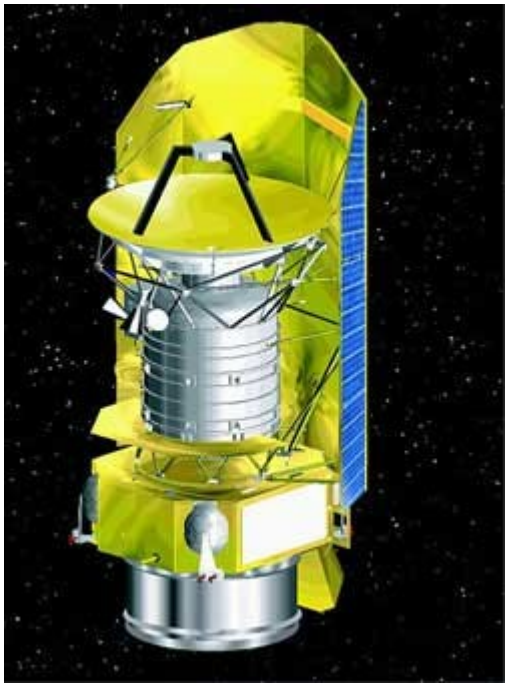
The object appears as a faint dot of starlight in the Hubble exposures. It is too young and too small to have the familiar spiral shape that is characteristic of galaxies in the local universe. Although its individual stars can't be resolved by Hubble, the evidence suggests this is a compact galaxy of hot stars formed more than 100-to-200 million years earlier from gas trapped in a pocket of dark matter. The proto-galaxy is only visible at the farthest infrared wavelengths observable by Hubble. Observations of earlier times, when the first stars and galaxies were forming, will require Hubble's successor, the James Webb Space Telescope (JWST).

"After 20 years of opening our eyes to the universe around us, Hubble continues to awe and surprise astronomers," said Jon Morse, NASA's Astrophysics Division director at the agency's headquarters in Washington. "It now offers a tantalizing look at the very edge of the known universe -- a frontier NASA strives to explore."

From NASA.com, 2011

Images by NASA/HST

Herschel Measures Dark Matter Required for Star-Forming Galaxies



The Herschel Space Observatory has revealed how much dark matter it takes to form a new galaxy bursting with stars. Herschel is a European Space Agency cornerstone mission supported with important NASA contributions.

The findings are a key step in understanding how dark matter, an invisible substance permeating our universe, contributed to the birth of massive galaxies in the early universe.

"If you start with too little dark matter, then a developing galaxy would peter out," said astronomer Asantha Cooray of the University of California, Irvine. He is the principal investigator of new research appearing in the journal Nature, online on Feb. 16 and in the Feb. 24 print edition. "If you have too much, then gas doesn't cool efficiently to form one large galaxy, and you end up with lots of smaller galaxies. But if you have the just the right amount of dark matter, then a galaxy bursting with stars will pop out." This right amount of dark matter turns out to be a mass equivalent to 300 billion of our suns.

Herschel launched into space in May 2009. The mission's large, 3.5-meter telescope detects longer-wavelength infrared light from a host of objects, ranging from asteroids and planets in our own solar system to faraway galaxies.

"This remarkable discovery shows that early galaxies go through periods of star formation much more vigorous than in our present-day Milky Way," said William Danchi, Herschel program scientist at NASA Headquarters in Washington. "It showcases the importance of infrared astronomy, enabling us to peer behind veils of interstellar dust to see stars in their infancy."

Cooray and colleagues used the telescope to measure infrared light from massive, star-forming galaxies located 10 to 11 billion light-years away. Astronomers think these and other galaxies formed inside clumps of dark matter, similar to chicks incubating in eggs.

Giant clumps of dark matter act like gravitational wells that collect the gas and dust needed for making galaxies. When a mixture of gas and dust falls into a well, it condenses and cools, allowing new stars to form. Eventually enough stars form, and a galaxy is born.

Herschel was able to uncover more about how this galaxy-making process works by mapping the infrared light from collections of very distant, massive star-forming galaxies. This pattern of light, called the cosmic infrared background, is like a web that spreads across the sky. Because Herschel can survey large areas quickly with high resolution, it was able to create the first detailed maps of the cosmic infrared background.

The maps showed the galaxies are more clustered into groups than previously believed. The amount of galaxy clustering depends on the amount of dark matter. After a series of complicated numerical simulations, the astronomers were able to determine exactly how much dark matter is needed to form a single star-forming galaxy.

"This measurement is important, because we are homing in on the very basic ingredients in galaxy formation," said Alexandre Amblard, also of UC Irvine, first author of the Nature paper. "In this case, the ingredient, dark matter, happens to be an exotic substance that we still have much to learn about."

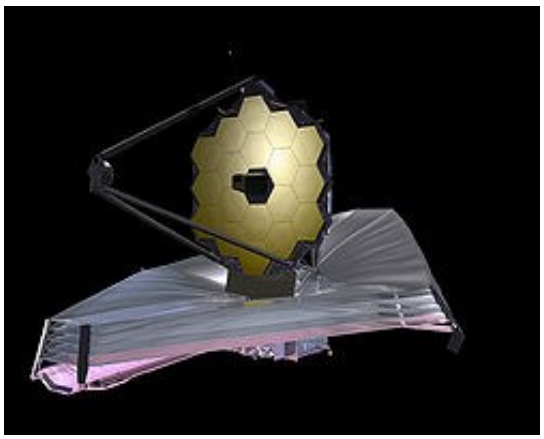
From NASA.com

The Number of Extra-Solar Planets Found as of February 2011-527
How Many More are out There?

What's New in Space

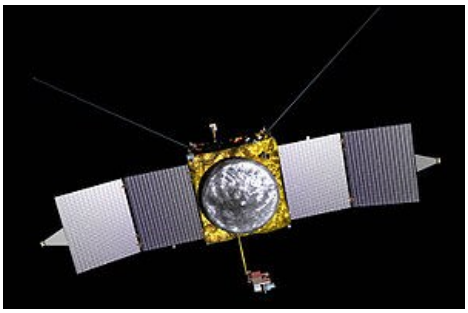
Web Space Telescope Delayed-*Really Delayed*-Again

The launch of NASA's James Webb Space Telescope, the long expected successor to Hubble, has been pushed back again, this time by over six years. The WST, named after NASA's second chief administrator, James Webb, will not be launched until at least 2020, and maybe as late as 2022. In addition, the cost of the telescope will be almost $2 billion over budget by the time it is finally in space. Sources say that the delay and the cost overruns are due to the complexity of the segmented mirrors and the advanced software and electronics that will be used. In addition, the telescope is being built with far more redundancies and backups due to the fact that it cannot be serviced by astronauts the way that Hubble has been over the past twenty years. WST will not be in Earth orbit, but instead will be put into a solar orbit at one of the "L" points, a position along the orbit of Jupiter that is highly stable. These requirement have made the design and construction far more involved than what was originally planned. The Webb space Telescope was originally planned to take over from Hubble in 2006, then was pushed back to 2012, then to 2014, now to at least 2020.



MAVEN-The Next Mars Spacecraft

NASA has approved and given funding to the next American orbiter to Mars. It is MAVEN, the Mars Atmosphere and Volatile Evolution Mission. It is now scheduled to be launched in November 2013, and will arrive at the Red Planet in September 2014 for a two year mission. MAVEN's main goal will be to study the atmosphere of Mars and create a timeline of its history and development. Many scientists believe that the Martian atmosphere was at one time much thicker and contained gasses more conducive to life on the surface. Their premise is that, even though the Martian atmosphere is now 99% carbon dioxide, traces of these early gasses still exist, and MAVEN will carry instruments to detect them. MAVEN was first proposed in 2008 as part of the next spacecraft for the Mars Scout program; it will have a highly inclined orbit around Mars, approximately 250 miles by over 3,000 miles above the surface.



In the meantime, NASA is getting ready for the next Mars rover, Mars Curiosity, which will be launched in November. It is a SUV sized craft which will be able to travel up to 25 miles from its landing place, and will do advanced studies of the Martian surface, and in particular, look for evidence of life on the Red Planet. And a reminder: overshadowed by all the excitement over Curiosity, the Mars Spirit and Opportunity rovers, which landed in 2004, are still working hard on the surface, and are expected to last at least another year.

The Shuttle Program Winding Down

NASA has made it clear, that, despite the delays in launches, this will probably be the last year for the Space shuttle program. STS-134 is now scheduled to be launched on April 1 with a crew of six. The commander will be Scott Kelly, who was undecided after the shooting of his wife, Congresswoman, Gabrielle Griffins, who was severely wounded in the Tucson shootings on January 12. Griffins, however, has progressed remarkably in her recovery, and Kelly will remain in the commander's seat, although veteran shuttle pilot Rick Sturckow will continue training as backup commander in the event of a reversal in Griffin's health.

In early February, NASA chief administrator Charles Bolden announced that STS-135 will be launched as the last shuttle mission in late June or early July, and the space agency will find the money for it somehow. Steven Lindsay will be the commander of a four person crew, the smallest since the first operational missions in 1982. The smaller crew will save money, and also weight. STS 135 will visit the International Space Station with one final module and extra supplies.

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

Telescopes for Sale and Use!

A person has a 125mm Meade telescope to sell-it has never been used. The original price was $900; she is asking $700 for it. For more information, call Dale Lohrman at 559-260-9992

Also, CVA has club telescopes for members' use-Contact club president Randy Steiner 559-252-0130

CVA 2011 Calendars

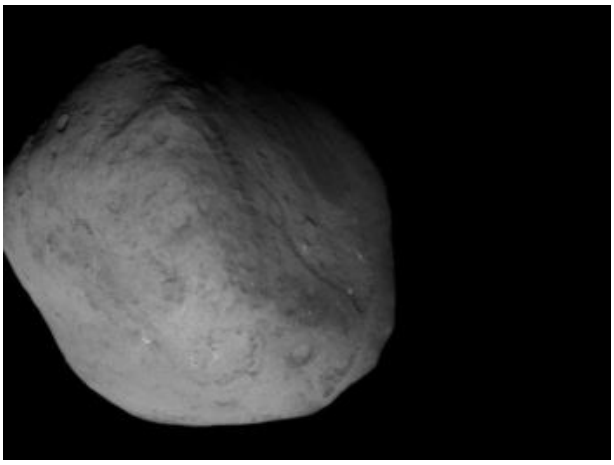
CVA still has a number of 2011 club calendars for sale. These are beautiful calendars, with all astronomical activities for the year, and images of astronomical and space related events taken by club members. They're a bargain at $20 each! Contact Fred Lusk at 559-436-1833

CVA Starwatch Information

Due to a rockslide that has partially blocked the road, as well as the cleanup efforts to remove it, starwatches which were scheduled to take place at Eastman Lake in March and April will not be possible. Instead, the starwatches will be at the old site, Buck Ridge, at Hensley Lake. The Eastman site for the May starwatch is iffy as well.

Stardust's Valentine's Day Encounter

On February 14, 2011, the Stardust spacecraft successfully flew by Comet Tempel 1, and took a number of images of the surface of the nucleus, including the area that was struck by the Deep Impact probe in 2005. this was Stardust's second encounter with a comet; the first was Comet Wild 2 in 2004. During thatm ission, the spacecraft gathered up dust and other materials from the comet and returned it to Earth. This second mission was generated by Stardust's solar orbit and the opportunity to follow up on Deep Impact. Stardust will now go into a "parking" orbit around the sun until it dies, or NASA scientists find another job for it. Below left-Tempel's nucleus. The bright spot at lower left is the Deep Impact site. Below right –another views of the nucleus close up



Astronomical Trivia

Last issue's astronomical trivia question:

What was the original name for the two Voyager spacecraft that were ultimately sent to the outer planets and beyond in the 1970s and 80s?

The original name for them was Pioneer, an extension of the 1960s Pioneer series that went to the planets, then Nomad. It was not until late in the program, only a few years before their launch date, that the name was changed to Voyager. Originally four Voyager spacecraft were planned, but funding cuts eliminated two of them.

This issue's trivia question-

Vera Rubin of the Carnegie Institute popularized "Dark Matter" in the late 1970s, but who was the person who first proposed that much of the mass of the universe was actually unseen and undetected?

Larry Parmeter is the editor of *The Observer*

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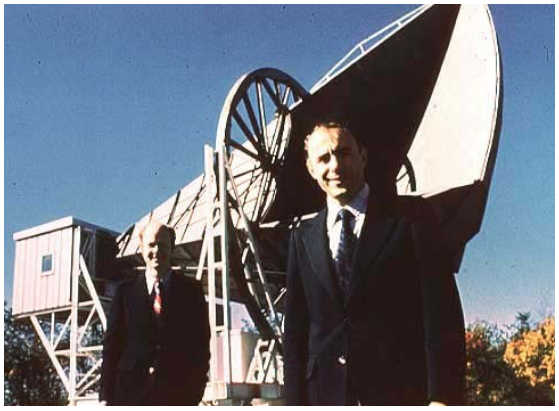
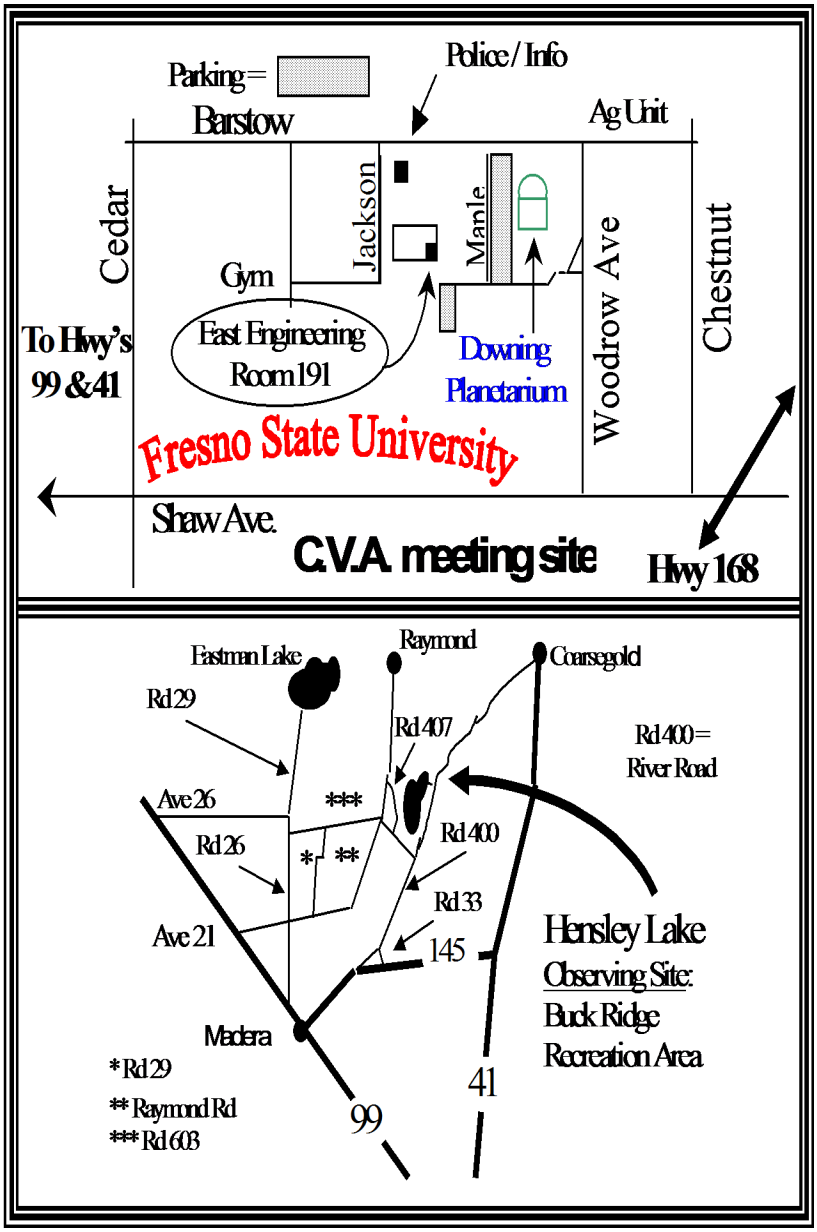
The May-June issue will come out on April 28, 2011



Penzias and Wilson in front of the horn antenna that they used to discover the cosmic microwave background radiation



Astronomy Short

In 1964, two Bell Laboratory radio physicists, Robert Wilson and Arno Penzias were tinkering with the horn receiver/transmitter in Holmdel, New Jersey, that they set up to communicate with the Telstar satellites. They kept hearing continuous static in the 4080 mhz range. They couldn't figure out what it was; it wasn't interference from nearby radio stations, it wasn't pigeon droppings in the horn, it wasn't loose rivets. They finally gave up, after briefly mentioning it in a paper they wrote on the antenna's operation. The whole thing would have been forgotten except that the paper was read by James Pebbles and Robert Dicke, two Princeton astronomers who were investigating the Big Bang. They realized that Wilson and Penzias' static was the frequency and temperature of the remnants of the Big Bang explosion. Ironically, neither Wilson nor Penzias cared much about the Big Bang; Penzias was, in fact, a supporter of the Steady State theory. But they won the Nobel Prize in 1978 for discovering the cosmic microwave background.