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The Observer

The Newsletter of Central Valley Astronomers of Fresno

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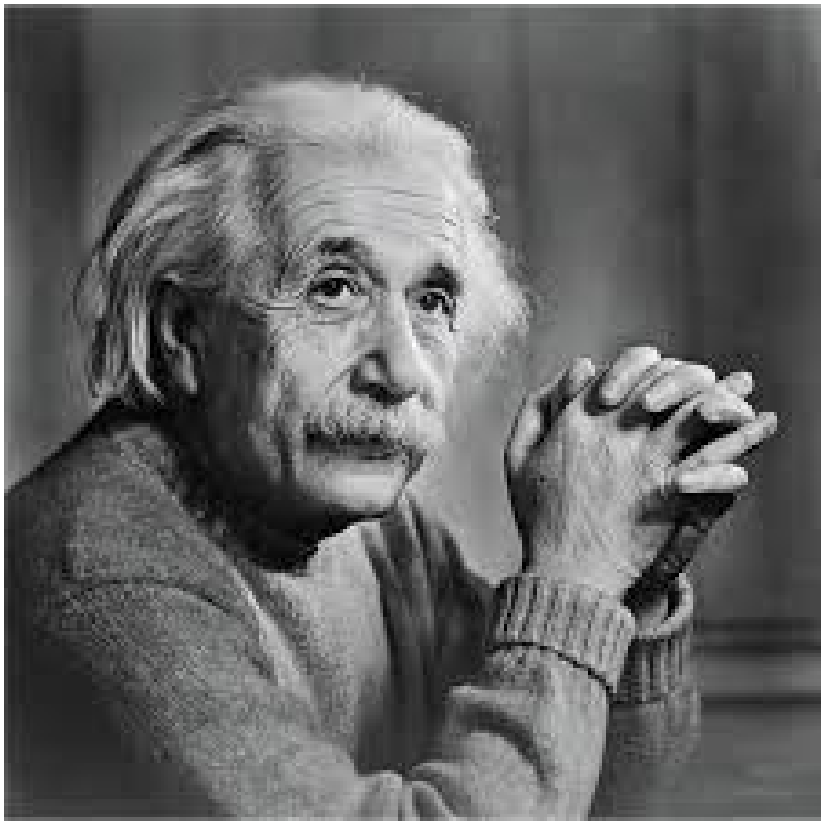

Image of the Month

Why not have a cover picture of the wild-haired one in the wake of his greatest triump. With the LIGO project, scientists found convincing evidence that gravity waves exist, opening a whole new realm of cosmological research. Gravity waves were originally postulated by Einstein over 100 years ago, and researchers have been trying to find them ever since. They stopped looking on September 14, 2015, a day that will surely change physics and astronomy forever. Here's to you, Albert, for making all the efforts worthwhile.
Image from Google Images

"We are all over the Moon and back…"

Gabriella Gonzalez, professor of physics

Louisiana State University, one of the leaders of the LIGO Project

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Front cover in the left corner-M36 in Auriga-image by NASA

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

A Farewell from the President-

Chad Quandt, who has been with CVA for several years, and served as the 2015 president, is moving out of the Fresno area. He sent this letter to express his thanks for his years with the club.

To CVA,

For the last year it has been my pleasure to serve as your club president. It was a good year. True to the club's public focus, we provided numerous observing opportunities to a wide range of audiences and had a great deal of fun along the way.

I'd like to extend my gratitude to those who have volunteered their time and expertise to help make astronomy something everyone can enjoy. As my family and I move east, we carry with us many fond memories from CVA and I will certainly miss observing the sights of the night sky with you. Astronomy is fun, even as a solitary activity, but it is when you are observing with others that you learn the most. Thank you for sharing your knowledge and experiences with me.

I hope that CVA continues to serve the community and provide an invaluable resource for those who seek to be acquainted with the sky. My own modest involvement with CVA has been a rewarding experience and I hope to build upon it in the future. I invite you to visit my astronomy themed website that is in part inspired by involvement with CVA, www.oldestshowonearth.com.

I wish you all the best of luck and clear skies!

Sincerely,
Chad Quandt

Number of extra-solar planets found as of February 2016-2,085
How many more are out there-thousands, tens of thousands?

CVAers-Spring and Summer Activities Coming Up!

Get those telescopes cleaned up, mirrors aligned, tubes polished, eyepieces cleaned-a busy summer awaits Central Valley Astronomers of Fresno.

The 2016 Riverpark season will begin on March 12. It's always fun to be at Riverpark on a Saturday evening-Lots of interested people, wowing children and adults alike with the moon and the planets. Riverpark viewing will go on once a month through November. Also, CVA is looking around for some other possible public viewing sights and times, which will be announced as soon as they are fixed. In addition, a number of schools have asked CVA for spring viewing nights. These will also ve announced as they come up. Vintage Days at Fresno State is as well a good time for viewing , especially daytime solar viewing. This year, it will take place on April 16.

Eastman Lake star parties begin the season on April 9, and will take place every month form then on. Also, Courtright Reservoir star parties will be on summer weekends As well, Millerton Lake public star parties will take place during June, July, and August. The specific dates are posted at the CVA website. And as soon as CVA receives confirmation of the annual Glacier Point weekend, that, too, will go on the calendar.

As always, CVA will conduct monthly meetings, as close as possible to the full Moon. Meetings are scheduled for March, April, May, and June. No meetings will take place during July and August. They will resume in September. Again, check the CVA website for exact dates.

Profiles in Astronomy

Waltraut Sietter 1930-2007

Sietter was born and raised in Zwickau in Germany, the daughter of an engineer who had a strong interest in physics and astronomy. She was educated at local schools, then attended the University of Cologne, where she majored in physics. A Fulbright Scholarship brought her to the United States, where she did graduate work at Smith College. Returning to what was then West Germany, she earned a Ph.D. in astronomy at the University of Bonn, and afterwards taught there, as well as being a staff member at the Holder List Observatory at Bonn. In 1967, Seitter returned to the U.S. to teach, first at Vanderbilt University, and then at Smith College. She eventually went back to Germany to be the chair of the physics and astronomy department at Muenster University, a position she held for over twenty years until her retirement in 1996.

Sietter's specialty was stellar studies; for much of her career, she worked on stellar statistics and spectral classification, eventually writing and publishing the Bonn Spectral Atlas in two volumes. She also organized and led a team that conducted what is today known at the Muenster Redshift Survey Project; using the results, she and her colleagues were the first to determine that Einstein's famous "cosmological constant" was, in fact, valid, and not a mistake as Einstein often claimed. Later studies involving supernova explosions verified both hers and Einstein's conclusions. She also led the Muenster Red Sky survey, which resulted in the first detailed catalogue of galaxies in the Southern skies.

Sietter received numerous honors for her accomplishments, and paved the way for many other modern women to have successful careers in astronomy. The asteroid 4893 Sietter is named for her.

Source- *Wikipedia*

What's New in Space

Another Space Pioneer Passes On: Dr. Edgar Mitchell 1930-1016

Edgar Mitchell, who was one of twelve NASA astronauts to walk on the Moon in the late 1960s and early 70s, died at his home near Palm Beach, Florida, his daughter announced on February 6. His death at age 85 came on the 45th anniversary of his Moon walk as a part of the Apollo 14 mission in January-February 1971. His daughter did not give the cause of death, but it is believed to be from natural causes.

Mitchell was born and raised in Texas, and attended MIT, eventually earning a doctorate in astronautics. A Navy test pilot and instructor, he was a member of the NASA astronaut class of 1966, and served as a support and backup on Apollos 9 and 10, before being named to the prime crew of Apollo 14, along with veteran Alan Shepherd and fellow rookie Stuart Roosa. Apollo 14 was launched on January 31, 1971, and the lunar lander with Shepherd and Mitchell, landed on the Moon on February 5, spending the next two days on the lunar surface. After the flight, Mitchell created controversy by acknowledging that he had a strong interest in ESP and conducted telepathic experiments while in space. After leaving NASA in 1972, he created more discussion by announcing that he believed in UFOs and that they were visiting Earth in order to save humankind from nuclear war. He also stated that the government and the military were covering up UFO visits. Mitchell eventually founded the Institute for Noetic Sciences, whose main focus is research into ESP and paranormal activity. In 2011, he was in the news again, acknowledging that he had kept the camera he used on the Moon as a personal possession. NASA threatened to go to court to have it returned, claiming that it was government property. Eventually it was agreed that Mitchell would donate it to the Smithsonian Institution's manned space exhibit.

With Mitchell's death, only seven of the twelve Apollo Moonwalkers are still alive: Edwin Aldrin, Alan Bean, David Scott, John Young, Charles Duke, Eugene Cernan, and Harrison Schmitt.

North Korean Rocket Launch Sparks Controversy

On February 7, North Korea launched what it described as a peaceful communications satellite into polar orbit, using its newly developed multi-stage rocket. The launch, however, was immediately condemned by the United States, Japan, and European nations as a cover for the test of an ICBM capable of carrying nuclear warheads, something which North Korea is prohibited from doing by the United Nations. North Korea claims that the payload, known as Kwangmysongsong 4, successfully went into space, and is making an orbit every 94 minutes. They said that it is a communications satellite, and will soon start broadcasting radio and TV signals throughout the country. The U.S. and other western nations, however, are convinced that the real purpose for the launch was to test an ICBM capable of carrying a nuclear warhead as far as the west coast of the United States. In January, North Korea claimed that it successfully tested a nuclear device, but intelligence sources say that it was, in fact, not successful at all. This follows several other claims of nuclear bomb tests, all of which are believed to have been unsuccessful as well. In 2012, North Korea claimed to have launched a satellite into space, but space experts believe that if it did happen, the launch was a failure.

VG Unveils Newest Spacecraft

On February 19, Virgin Galactic unveiled its newest spaceship, the USS Unity, at Scaled Composites' facility in Mojave, California. The ship that crashed in October 2014, SS2, was a test craft only, and not capable of carrying passengers into space. But Unity is a full-fledged spaceship which, after undergoing testing, will take paying passengers to the edge of space, possibly by 2017 or 2018.

Virgin Galactic head Richard Branson presented the craft to the news media and various assembled guests, including Star Wars actor Harrison Ford. The gleaming craft is white and silver, and has a boldly painted eye on the nose. Branson explained that it is the eye of renowned physicist Stephan Hawking, who also gave the spacecraft its name. Hawking, in a separate statement, said that he hopes to go on one of the first flights of Unity, but his health may present him from doing so. Unity will now undergo ground and flight testing for the next year to eighteen months, and if all goes well, may carry its first passengers into space at the end of 2017. Reports are that Branson, Scaled Composites head Burt Rutan, and Hawking, if his health permits it, will be among the first passengers.

NASA Receives Record Number of Astronaut Applications

NASA announced on Thursday, February 18, that it had received over 18,300 applications for its next group of astronauts, the "Class of 2017." This is more than double the number of applications for previous classes, and reflects the public's continuing interest in the manned space program. The 18th was the last day for the application window that opened on December 15, 2015. Now, NASA officials will spend the next 18 months winnowing the number down to between twelve and fifteen finalists, who will be announced in July or August of 2017, and start their training shortly afterwards. They will eventually be assigned to either the Orion-MPCV program, or to the International Space Station aboard Space-X's Dragon-V2 or Boeing's CST-100 transport spacecraft.

The Tartu Observatory

Another in a continuing series of lesser known-but still important –astronomical observatories throughout the world

The Tartu Observatory, located at Toravere, in Estonia, has long and illustrious history, It was officially established in 1802 as the Imperial Observatory of Dorpat, and the first buildings were finished and observations begun in 1810. In 1814, the scientist Friedrich von Struve started his research at Dorpat,, and in 1816, began the famous Struve Geodetic Arc, with the front doorstep of the observatory as his first reference point. von Struve would remain associated with the observatory for many years afterwards.

The observatory was closed during World War II, and when it reopened in 1946, a long term program of modernization was begun. Originally, it housed a 9" refractor, which was purchased in 1824, as its sole telescope. In 1950, the observatory was moved to nearby Toravere Hill, and new facilities were built and new instruments were purchased and installed, including a .5m reflector. In 1964, the observatory was renamed the von Struve Observatory, but in 1995, the name was returned to what it had been previously: Tartu Observatory, after the province in which it was located.

Today, the observatory is administered by the Estonian Academy of Sciences and has three operational telescopes. The largest is a 1.5m Cassegrain reflector, which is used for spectroscopic and stellar research; and a .6m reflector, used mostly for photometric observations. The .5m reflector, although still operational, is considered outdated and is rarely used anymore. The observatory has had a long history of stellar research, and has been responsible for the discovery of many variable and double stars. A number of famous astronomers, including Johann von Malder, Ernst Opkip, and Jaan Einasto have worked at Tartu over the years.

Source: Wikipedia

From NASA's Space Place

The Closest New Stars To Earth
By Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.

A Hubble Space Telescope image of the Chaemoleon star cloud with a newly formed star, known as HH909A, within it

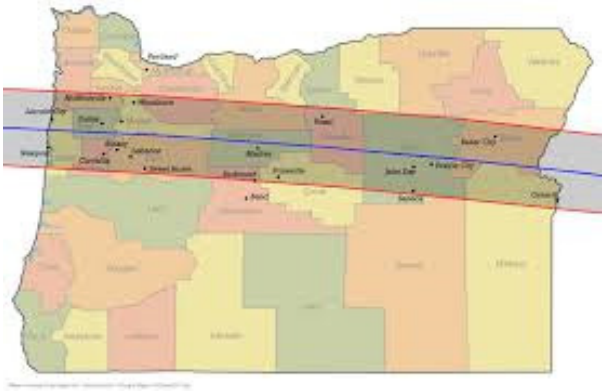
Article and image courtesy of NASA's Space Place

Image-NASA/ESA/HST

Looking Forward to the 2017 Solar Eclipse. Start Making Plans for August 21, 2017 Now!

Even though it's almost eighteen months away, many amateur astronomers are making plans for the first total solar eclipse in the U.S. in fifty years. Some CVA members are talking about heading up to Oregon, where the eclipse will enter the country from the Pacific Ocean. One good place to view it will be south of Portland, while another will be near Bend, in the central interior area of the state. In fact, anywhere along the path of totality throughout the country will afford excellent viewing(yours truly will be heading to Missouri). The best site will be in western Kentucky, which will have the longest totality time. Wherever you go, start making plans now. Motels, resorts, and other lodgings in many prime areas are already taking reservations, and spaces will fill up quickly as solar enthusiasts from all over the world will be flooding in and taking over. Below are a couple of maps of the eclipse route and some favorite areas to see it.

The 2017 eclipse path through the United States



The eclipse path through Oregon, the closest it will come to California

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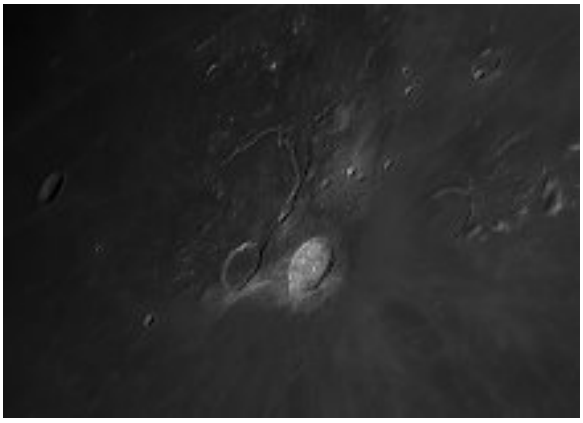
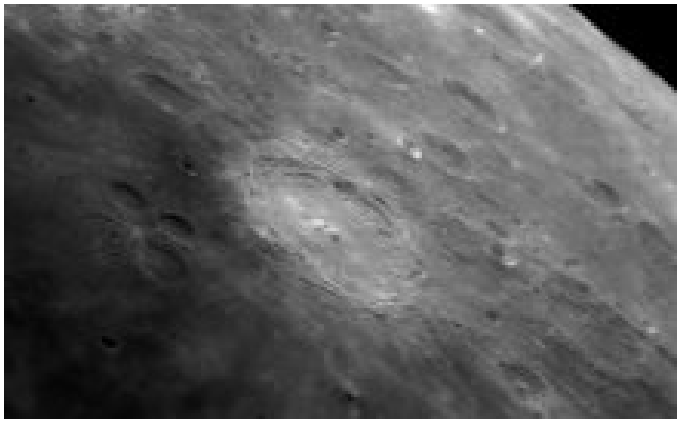
Three Great Images by Chad Quandt

Before leaving, Chad sent these images for The Observer. Many thanks for all the great work.





Top left-the crater Aristarchus on the Moon. Taken with a Celestron 14" tele scope and a Celestron Skyris camera with an IR-742 filer.

Tope right-the crater Langrenus on the Moon-taken with the same telescope and a 1.8x Barlow.

Right-Mars, taken with a Celestron 14", and a Celestron Skyris 618m camera. A 2x Powermate and Astronomik IR, R, G and B filters were used.

Now, It's For Sure-Gravity Waves Detected by LIGO

Two years ago, a group of scientists, using telescopes and detectors at the South Pole, claimed they had found evidence of gravity waves-confirmation of a key part of Einstein's Theory of Relativity. The news set off celebrations in scientific communities throughout the world. Then they took it back, acknowledging that their findings were probably compromised by interstellar dust and other particles. So the world waited some more.

Flash forward to February 2016. Scientists heading up the LIGO(Laser Interferometer Gravitational Wave Observatory) experiment announced that, on September 14, 2015, they saw the first clear signature of gravity waves, not from a chart or image, but a sound, a "chirp," as they called it. Remembering the 2014 flawed announcement, they spent the next four months analyzing the data, ruling out any other possibility to make sure, and when they were sure, they made it public, and in the scientific community, nothing will ever be the same again. They had detected gravity waves spewing from the collision of two black holes a billion years ago, and confirmed Einstein's prediction that gravity would create ripples in the fabric of time-space as a result of such an event. As one of the scientists involved in the LIGO project said "This opens a whole new window of space research. We can learn by hearing the universe, not just seeing it. "

The LIGO Facilities-Two identical facilities, one in Washington, the other in Louisiana. Each has "arms" 2.5 miles long, in which are a series of lasers and ultraprecise mirrors inside tubes of pure vacuum. Gravity waves were detected by them striking the arms and interfering with the beams on the order of changes of one thousandth the size of a proton. The movements and the subsequent changes of the length of the arms created a resonance that sounded like a "chirp." In the September 14 event, the gravity waves hit the Washington laser first, then the Louisiana laser .7 of a second later. After months of checking their data, the LIGO scientists could find no other explanation for the interfering sound. Now that they have "heard" the sounds of gravity waves and know what to listen for, they believe that they will hear many more in the future.

The LIGO facilities were sponsored and paid for by the National Science Foundation and cost $1.1 billion. The LIGO project itself was headed by a consortium of CalTech and MIT scientists, and also a group of scientists from Europe known as the Virgo Collaboration.

Some Facts on the Master Eye

As of April 24, the Hubble Space Telescope will have been in space for 26 years. It was launched aboard the space shuttle Discovery on April 24, 1990, and released two days later. Since then, it has completed 1,606,000 orbits of the Earth. Its total weight at launch was 24,500 Earth pounds. It now weighs 27,000 Earth pounds, due to equipment and instruments added during service missions since launch. It has been serviced five times by space shuttle astronauts, the most recent in May 2009

Hubble's first image was taken on May 20, 1990, of the star cluster NGC 3532. Since then, it has taken over 1.2 million images, and has been used to conduct over 4,000 scientific programs by scientists throughout the world. Over 12,500 scientific papers have been published as a result of research using the Hubble Space Telescope. The Hubble archives of scientific data currently totals over 100 terabytes, and 10 terabytes of new data are added each year.

As to Hubble's estimated lifetime, scientists are hopeful that it will continue to be operational until at least 2020; if so, it will operate in tandem with the James Webb Space Telescope, which is now scheduled for launch in 2018. Originally, it was expected to work only 15 years, and has now outlasted that by over 10 years.