



THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno

January-February 2024

CVA Changes Meeting Site and Dates

At the December 16, 2023, meeting, CVA members voted on and approved major changes in the club's meeting site and dates. Starting in January 2024, the club will meet at Round Table Pizza at Bullard and First Streets in Fresno. Members and guests can come as early as 6pm to order dinner. The regular meeting will start at 7pm. CVA will be using one of Round Table's conference meeting rooms, which are equipped with video monitors for Powerpoint presentations. In addition, the meeting dates will be changed as well. CVA used to have its meetings on the Saturday closest to the full moon each month. Again, starting in January, meetings will be moved to the second Friday of each month, regardless of the moon phase. This means that the January 2024 meeting, which is traditionally Gadget Night, will be held on January 12. The February meeting, which will feature Steve Harness as the main speaker, will be on February 9; and the March meeting, in which Fred Lusk will talk on the annular solar eclipse, will be held on March 8. The other meeting dates will be on will be at the bottom of this article and also inside this issue. In addition, at the December meeting, members voted on and approved officers for 2024. Hubert Cocetti will continue as president and Brain Bellis will be vice-president and field trip chair. Steve Harness will continue as secretary-treasurer, and Larry Parmeter will continue as newsletter editor and historian. Board directors will be Fred Lusk, Warren Maguire, Lynn Kliewer, and Steve Brittan.

2024 CVA Meeting Dates	June 14
January 12	July-no meeting
February 9	August-no meeting
March 8	September 13
April 12	October 11
May 10	November 9 December 14

Astronomy Quote of the Month-

"All science is either physics or stamp-collecting..."

William Thompson, Lord Kelvin

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Central Valley Astronomers

Web address
www.cvafresno.org

Officers and Board- 2024

President-Hubert Cecotti

1st Vice-President-Brian Bellis

2d Vice president-Ryan Ledak

Secretary/Treasurer-Steve Harness

Star Party Coordinator-Brian Bellis

Historian/Observer Editor-Larry Parmeter

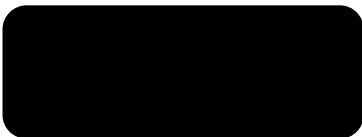
Education Coordinator-Vacant

Director- Warren Maguire

Director-Fred Lusk

Director-Lynn Kleiwer

Director-Steve Brittan



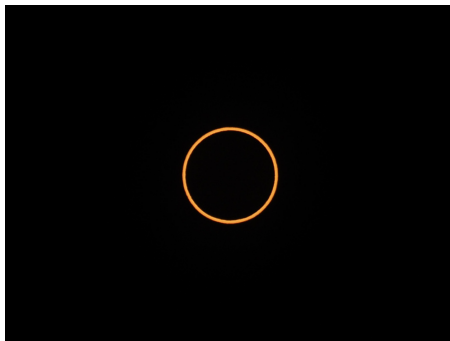
Larry Parmeter is the editor of *The Observer*

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More Images of the October 2023

Annular Eclipse

Taken by Fred Lusk at Sevier, Utah



Number of exoplanets found as of December 2023-

Confirmed-5,566 Possibles-10,059

Confirmed planetary systems-4,278

How many more are out there?

Tens of Thousands? Hundreds of Thousands? Millions?

(From NASA's Exoplanet Exploration Website)

The President's Message

By Hubert Cecotti

2023 has been a busy year with many successful outreach events thanks to the volunteer participation of the CVA members, always eager to share views of the night sky using their personal equipment and driving substantial distances to reach underserved populations in the Central Valley. All these informal learning events are very important for our community, for fostering interest in science, technology, engineering, and mathematics (STEM).

2024 has just started and it will bring a new year of monthly meetings and presentations, and regular observations in our favorite dark sky places. There will be different changes in 2024: a different time and location for the monthly meeting, and a new website coming up. We will also continue the sidewalk astronomy events at River Park on Fridays.

For the new year, it is usual to wish you a healthy new year. It is necessary to bring new young and diverse amateur astronomers to the club, through the young astronomer program, or the regular outreach program organized by CVA. Through the use of technology such as the new ZWO Seestar, it is possible to bring astronomy to more people. CVA needs to attract a more diverse population to the meetings and outreach events. The distribution of the members (race, ethnicity, gender) does not represent the distribution of the population of the Central Valley. It is necessary to continue to reach the local communities and bring the night sky to the youth of the Central Valley.

In January. 3, the Earth will be at its closest point to the sun. This is called the perihelion and occurs each year in the first week of January. On this day, Earth is 1.6 million miles closer to the sun than average, according to the National Oceanic and Atmospheric Administration (NOAA).

The first major meteor shower of 2024 will peak late at night on Jan. 3 and will continue into the early morning hours on Jan. 4. Most meteor showers have a two-day peak. It makes catching sight of these other meteors much more possible. The first full moon of the year arrives at the end of January and it will be the Wolf Moon. The main event of the year will be the solar eclipse. To see the true exceptional spectacle, it is necessary to be within the path of totality. Outside of the path of totality, the sun will still be at a reduced state but is not safe to look at. The eclipse will pass through the states of Texas, Oklahoma, Arkansas, Missouri, Tennessee, Illinois, Kentucky, Indiana, Ohio, Pennsylvania, New York, Vermont, New Hampshire, and Maine. Portions of Mexico and Canada will also be in totality. Finally, besides the usual meteor showers, there will be several comets that can be observable in 2024 (e.g., 62P/Tsuchinshan, Comet 12P/Pons-Brooks).

A spectacular image of M51, the Whirlpool Galaxy, by the James Webb Space Telescope

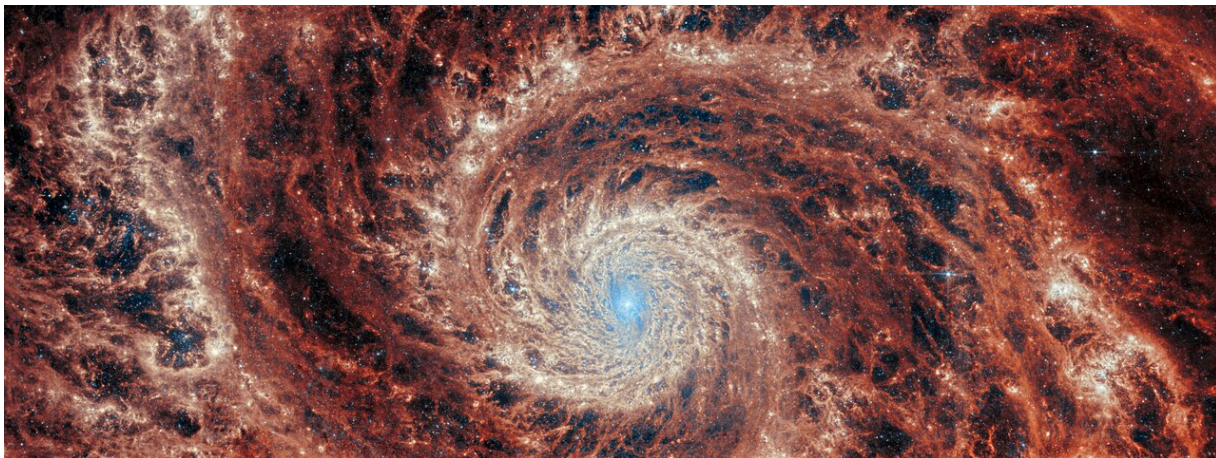


Image by NASA/ESA/STSI/JWST

Profiles in Astronomy

John August Anderson 1876-1959

John Anderson was born and raised in Rollag, Minnesota, attended public schools there, and then attended Valparaiso College in Indiana, where he earned a bachelor's degree. After several years as a public schoolteacher, he enrolled at Johns Hopkins University and earned a Ph.D. in astronomy in 1907. He taught at Johns Hopkins until 1916, when he was asked by George Hale to come and work at the Mt. Wilson Observatory in Pasadena. In 1928, Hale, having received the funding for his huge 200" telescope, appointed Anderson to be the overall director of the project. Anderson did so, overseeing every aspect of it, from the polishing and testing of the 200" mirror to the building of the dome on Palomar Mountain, until the 200" Hale Telescope was officially finished and dedicated in 1948. Afterwards, he retired from Mt. Wilson, and lived in the Pasadena area until his death in 1959.



Anderson is best known for his directorship of the 200" Hale Telescope, but also for his innovations in astronomical technology. While at Johns Hopkins, he developed highly precise diffraction gratings, so good that some are still used today. To go with them, he made many improvements to spectrometers, and modified Albert Michelson's interferometer, which allowed the finding and study of many double and binary stars. Anderson also worked with polarized light and made many contributions to its use as an astronomical tool. A crater on the Moon is named after him.

A Letter from a CVA Member

To All @ CVA,

After belonging to CVA for several years, my wife and I were able to actually make our first event, the Star BBQ at Eastman Lake on October 14th. Over 3 years ago I bought an Orion 10" dobsonian telescope so that I could see the planets way better than my 3" reflector that I have had for 20+ years. When I tried my new one out, I was rather disappointed as it didn't look much different. Maybe my expectations were too high. I figured that it was more likely my ignorance on how to use my new scope.

So, I contacted Brian Bellis about my dilemma and he said to come to the star party and he would show me how to use my equipment. It was a nice drive to the lake and when we got there, we set up. I didn't know any body or who Brian was or looked like and just sort of fumbled around for a bit. Then, Ryan Ledak drove up and parked right next to us! We had gotten to know each other years before on white water rafting trips. I knew he was associated with the club after reading the Observer. Ryan came over and we chatted. I explained my ignorance on how to use my scope and he said he would show me how as he had one like it. Ryan then took over, literally, and showed me how to set it up for the geo tracking, how to sight it in and which eye pieces to use and when. He also showed us which planets were good to look at and a galaxy (can't remember the name) and the Pleiades Star Cluster. Overall, a great learning experience. I would like to say that I am now a pro, but that will only come with practice. Thank you, Ryan, for the lesson. I will probably need another.

Also, there was a gentleman set up on the other side of us that showed my wife several interesting things to look at. Up to that point, she was mildly interested. Now, she is enthusiastic. Thank you, sir, for that. Also, the food was great! Hopefully, we can attend another Star BBQ as we really enjoyed it.

Thank you to all of the member of CVA for being welcoming and friendly. You are a great bunch.

Gordon & Jean Tessman

Space Age Archeology

Mariner 2

Like other early space age craft, the original Mariners are almost forgotten today, but they were humanity's first attempts to go beyond the Earth and reach other planets in the solar system. The first two Mariners were designed and launched to visit Venus, the closest planet to our own. Mariner 1 was a failure, but Mariner 2 was successful, flying by Venus in 1962.



The Mariner program began in 1960 as a result of a series of discussions on planetary probes at the Jet Propulsion Laboratory in Pasadena, California. It was decided to build and launch the probes in pairs; the first two would go to Venus, the next two to Mars, then back to Venus, then to Mars again. Funding was approved in late 1960, and the first two Mariners were designed and built at JPL. They were essentially identical. Each had a central hexagonal-shaped "bus" that held a circular radio antenna, scientific instruments, and power supplies. Rising above the bus was a tower that held more instruments; the spacecraft were powered by solar panels that extended out on either side of the bus. Each craft weighed 446 Earth pounds. Mariner 1, also known as R-1 or P-37, was launched from Cape Canaveral on July 22, 1962, atop an Atlas-Agena rocket for a four-month trip to fly by Venus. Four minutes after liftoff, it had to be destroyed by the launch safety officer due to a malfunctioning thruster rocket. Mariner 2, also known as R-2 and P-38, was launched on August 22, 1962. On the way to Venus, it became the first spacecraft to detect and measure the solar "wind." It successfully flew by Venus on December 14, 1962. As it did, it scanned the planet with infrared, microwave, and magnetic field detectors (because scientists already knew that Venus is completely cloud-covered, it did not carry cameras), revealing that Venus has a cold cloud cover, but is extremely hot on the surface, the first evidence that it has a runaway greenhouse environment. After flying by Venus, Mariner 2 continued to gather data on the solar wind and cosmic rays. It went dead in January 1963 and is now in orbit around the Sun.

Mariner 2 was one of the first spacecraft to visit another planet, and set the stage for planetary exploration that continues to this day.

Galaxy in the Eyepiece-

Arp 299

Arp 299, also catalogued as NGC 3690, actually consists of a pair of colliding galaxies in the constellation Ursa Major, two of several galaxies inside the cup of the Big Dipper. Both galaxies are considered irregular barred spiral galaxies. They are approximately 135 million light years away and have an apparent magnitude of 11, making them visible in a small telescope. Computer modeling shows that the two will eventually merge to form an elliptical galaxy. Arp 299 is also sometimes known as IC 694, although some scientists believe that this designation actually refers to a small elliptical dwarf galaxy near the main double galaxy.



Arp 299 is of interest to scientists due to its large number of observed supernovas over the years, no doubt caused by the interactions of the two colliding galaxies. A total of nine supernovas have been seen and studied in the last thirty years, the most recent being SN 2022gnp.

Speaking of Luna, the Moon, New Findings...Over 50 years Later

In December 1972, Apollo 17 was the last Apollo lunar landing mission; among other things, it brought back almost 200 Earth pounds of rock and soil for scientific study. Knowing that NASA would not return for at least several years, it took about 30 pounds of that material, sealed it, and put it into a special vault, not to be opened for 50 years. By that time, NASA reasoned, science and technology would be much more advanced and possibly more could be learned from them than in the 1970s. In December 2022, the vault was opened, and scientists got their first looks at it; what preliminary experiments showed stunned them. All previous studies had indicated that the Moon had once been hot from formation and asteroid bombardment and then had slowly cooled over the eons. The unsealed rocks, however, showed that Luna, the Moon, was hot early in its history, then it inexplicitly cooled down. While more studies are being done, this is a major upsetting of planetary evolution, causing scientists to rethink their ideas of how our only natural satellite formed.



In all, 842 Earth pounds of lunar rocks and soil were brought back by the Apollo crews; they are currently stored in a bomb-proof "clean room" vault at the Johnson Space Center in Houston. Even today, over 50 years after the last lunar landings, they are still extensively studied; every year, dozens of scientists from all over the world request access to them for various research projects and experiments. About 25 pounds have been deliberately destroyed by experiments, 75 pounds worth are on display in museums and other facilities, and 20 pounds have simply disappeared, most of which were loaned out and never returned. In addition to the samples brought back by the Apollo missions, Roscosmos, the Russian Space Agency, has about three pounds of lunar soil returned by its Luna spacecraft in the 1970s, and the Chinese Space Agency has almost four pounds of lunar material from its Chang'e-5 return mission in 2020.

2024 CVA Calendar

	Riverpark Public Star Parties	May 10
Monthly star parties at Eastman Lake	March 15	June 14
	April 12*	July-no meeting
January 13	May 17	August-no meeting
February 10	June 14	September 13
March 9	July 12	October 11
April 6	August 9	November 9
May 4 Spring Star-B-Que	September 13*	December 14
June 1 and 8	October 11*	Courtright Star Party Weekend
July 6	November 8	June 7,8, 9
August 3 and 31	CVA monthly meetings-Round Table Pizza at Bullard and First-7pm	Millerton Lake Public Star Parties
September 28 Fall Star-B-Que	January 12	June 29
October 26	February 9	July 27
November 2, 23, and 30	March 8	August 24
December 30	April 12	*May be changed

From the CVA Archives

This article originally appeared in the February 1994 issue of *The Observer*. It's worth knowing about CVA's origin and early years, and especially one of its founders, Glynn Revis.

CVA Heritage

By Dave Lehman

In the summer of 1928, a 15 year old high school boy in Fort Smith, Arkansas, spent his summer vacation grinding a 4" mirror and building a telescope. Several years later, he and a classmate ground and built a 7" reflecting telescope. This young astronomy enthusiast was Glynn Revis.

Glynn moved to Fresno in 1942. By this time, he had constructed many telescopes. He made more than just mirrors, he would build the entire telescope, mount, clock drive and all. One of his telescopes, a 6" f/11, which he built during World War II, had a tube made of birch plywood. This telescope, built by Glynn, was featured in an issue of *Scientific American* in the late 1940s.

The First Presbyterian Church in Fresno used to have a Sunday evening forum. One Sunday night in January 1952, a staff member from the Mt. Wilson Observatory, on the Morrison Foundation lecture circuit, spoke at the forum on astronomy. After the lecture ended, someone in the audience mentioned that Fresno did not have an astronomy club. So, a paper was circulated for people to sign who were interested in starting a club.

Three of those attending were Glynn Revis, Jackson Carle, and Professor Morris from Fresno State. This trio then spearheaded the forming of the club now known as Central Valley Astronomers. The first meeting of this new club was held at Glynn's home. On that winter evening in 1952, with a dozen people in attendance, Glynn was elected their first president.

Jackson Carle was also an avid telescope maker. He received much publicity over his 12.5" f/8.6 Newtonian reflector that was homemade and housed in his backyard observatory. Glynn did much of the pattern-work, machining, and assembly for Jackson's telescope.

As the new club grew, Fresno State* soon became their meeting site. Glynn and other early pioneers were active in telescope making, and, of course, enjoyed star parties. A favorite observing site was Mark Wood Meadow south of Shaver Lake on Dinky Creek Road. Perhaps the club's greatest contribution to astronomy and the community was the telescope making class it held for many years. Under Glynn's early command, the club built a strong foundation that still flourishes today.

Glynn is still active in the club he helped found; he attends meetings and star parties as often as possible. At star parties, he brings either a 6.5" or an 8" reflector, both of which are homemade. Glynn is still active making and modifying telescopes in his shop at home. Thanks to him, our club has a rich and proud heritage.

*Editor's note-This was before the "new" Fresno State campus was built at Shaw and Cedar, starting around 1958. From its founding in 1911 to the late 1950s, Fresno State, first called Fresno Normal School, then Fresno State Teachers' College, was located at McKinley and Maroa Avenues, sharing facilities with what is now Fresno City College.

Astronomy (bad) Joke

An astronomer was asked to do a review on a book about spectrographs. After she finished it, she wrote that it was good for light reading.

What's New in Space

Two Spaceflight Pioneers Pass into the Cosmos

Kenneth Mattingly 1936-2023

On November 3, NASA announced that Apollo and Space Shuttle astronaut Ken Mattingly had died at age 87 on October 31. The cause of death was not given. Mattingly is best known for the fact that, as a member of the Apollo 13 crew in 1970, he was exposed to Rubella (German Measles) and had to be replaced. When Apollo 13's radiator exploded halfway to the Moon, Mattingly played a key role in helping to get the disabled spacecraft and its crew back to Earth safely.

Mattingly, the son of an airline pilot, was born in Chicago and raised in Miami, Florida. He attended Auburn University, earning a degree in aeronautical engineering before joining the Navy and becoming a fighter pilot. He was one of Chuck Yeager's students at the Air Force's Aerospace Research Pilot School when NASA chose him as a Group Five astronaut in 1966. He was assigned to the backup crew of Apollo 11, and then to the prime crew of Apollo 14. However, since the Apollo 13 commander, Alan Shepard, needed more training, the Apollo 14 crew, commanded by Jim Lovell, along with Mattingly and Fred Haise, was bumped up to Apollo 13. Then, three days before Apollo 13 was scheduled to be launched, it was revealed that Mattingly, who had never had the disease and had not been vaccinated, had been exposed to Rubella. To avoid the possibility that he might become sick during the flight, NASA replaced Mattingly with his backup, John Swigert. Two days after the launch, Apollo 13 suffered what was technically described as a "B-Bus Interval;" an oxygen tank in the service module exploded due to a heating radiator error made years earlier when it was built. Mattingly, who never did come down with Rubella, played a key role in devising emergency procedures and equipment to bring the crippled craft back to Earth.

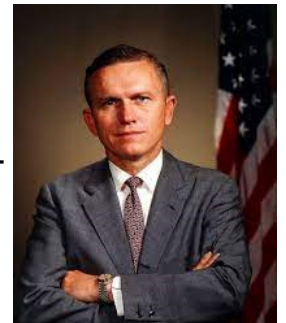
Mattingly eventually went on a lunar mission in 1972 as the command module pilot of Apollo 16. After the Apollo program, he served as a NASA administrator, then as the commander of two space shuttle missions: STS-4, and STS-51C. He left NASA in 1985 and the Navy in 1986, and went into the private sector, working for Grumman, General Dynamics, and Lockheed before retirement.



Frank Borman 1928-2023

Group Two astronaut Frank Borman died at age 95 on November 9, 2023, at his home in Montana, according to his family and a NASA press release. Borman played a pivotal role in the early days of the space program, commanding Gemini and Apollo missions, including the first flight to the Moon.

Borman was born and raised in Gary, Indiana, and attended the U.S. Military Academy at West Point. Afterwards, he went into the Air Force, becoming a pilot, then a test pilot. He was chosen as an astronaut in 1962, along with eight others, including Jim Lovell, who would fly with him on both his space missions. Borman's first space flight came in December 1965, when he commanded the Gemini 7 mission for two weeks in space, then a record. During the same mission, Gemini 6 was launched and rendezvoused with his spacecraft. Borman was then assigned to be commander of the third Apollo mission, which was planned to be an Earth orbital flight that would simulate a lunar trajectory and reentry. But, with the delay of the lunar module, Borman and his crew skipped ahead of the second Apollo flight to become a lunar orbital mission. On December 21, 1968, the Apollo 8 crew of Borman, Lovell, and William Anders was launched to the Moon. They reached the Moon on December 24, and on Christmas Eve, orbited it, did a live television



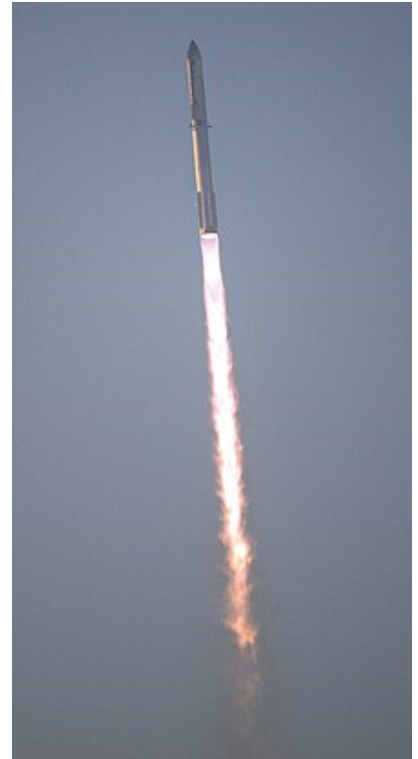
broadcast to a world-wide audience, and early Christmas morning, began the return to Earth, arriving back safely on December 28. The flight electrified a world that was suffering from war, demonstrations, assassinations, and other tragedies.

Borman left NASA and the Air Force in 1970 and became the president of Eastern Airlines. He later headed other companies before retiring. With his death, only two of the nine members of Group Two are still alive: his former crewmate Jim Lovell, also 95, and Tom Stafford, 93.

Second Starship Test Flight a Success, Sort of

The second test flight of Space-X's huge Starship heavy lift vehicle was conducted on November 18, 2023. The 400 foot-tall two stage rocket lifted off the launch pad at Space-X's launch facility on the Texas Gulf Coast with no problems and all engines firing, unlike the first launch, where several first stage engines failed. After three and a half minutes at an altitude of about 50 miles, the first stage separated, and the second stage engines ignited. However, as the spent first stage flipped over to allow a soft landing, it suddenly exploded. The second stage climbed to an altitude of 93 miles when Space-X announced that it had lost contact with it. Afterwards, it was revealed that the second stage was deliberately destroyed by the flight safety officer. Space-X said the flight was a success in proving the main goal, the performance of the first stage with all its 30 engines working as expected.

Space-X has applied for an FAA permit to conduct a third Starship launch as early as January 2024, and is currently testing and preparing the next Starship vehicle. At the moment, NASA has concerns about the Starship, since it has chosen Space-X to provide a modified version of it for the Moon lander for Artemises 3 and 4, the first two landing missions. Artemis 3 is now scheduled for launch in December 2025, although that may be delayed until early or mid-2026.



Astronomy Short

We might not have to go to Saturn to study planetary rings. Mars will have them if we're willing to wait a while. Scientists believe, based on computer simulations, that Mars's two moons, Deimos and Phobos, will eventually collide and destroy each other, creating a ring of debris around the planet. They estimate that this will be about thirty-forty million years from now, give or take a few million. Scientists have already calculated that Saturn's rings are slowly decaying, and, at about the same time that Mars's become prominent, will be pretty much gone, making the once beautiful planet just a bland gas giant. Something for our children to look forward to.



Another in a continuing series on lesser known-but still important-observatories throughout the world

Gaocheng Astronomical Observatory

In the November-December issue of *The Observer*, one of the world's newest observatories, in Iran, was featured. This month's discusses one of the world's oldest that is still standing(although it is no longer in use). It is the Gaocheng Observatory, located Dengfeng, in Hunan Province in China. Records show that it was established by Kublai Khan in 1276, although astronomical observations were being done at the site hundreds of years earlier. According to tradition, the Duke of Zhou set up a gnomon(sun marker) at Gaochang in 1042 BC and considered it the Center of the Earth. In 725 AD, the astronomer-monk Yi Xing(683-727 AD) , in order to measure the circumference of the Earth, placed one of ten gnomons at Gaocheng as part of his studies and also to determine a time scale which was later used to develop the Da Yan Chinese calendar. After him, other Chinese mathematicians and scientists used the site for solar and lunar measurements. In 1276 AD, on orders from the Great Khan, the astronomers Gou Shoujing and Wang Xun established a formal observatory at Gaocheng to track the motions and positions of the Sun with a water-operated device that measured both the sunlight and the shade marks it produced. Using these measurements, in 1281, the observatory developed what is known as the Shoushi Calendar, based on a year that consisted of 364 days, 5 hours, 49 minutes, and 20 seconds. This was by far the most accurate calendar in the world at the time, was used for 360 years, and was not equaled until the Gregorian Calendar of the 1600s.



Today, the Gaocheng Observatory is considered one of the world's great scientific achievements and is a UNESCO World Heritage site. Source for article-Wikipedia

Star Stories Alnilam

Alnilam is the middle star of the three stars in the "belt" of Orion, The Hunter. Also known as Epsilon Orionis, it, along with Alnitak and Mintaka, was familiar to many ancient cultures, and today is one of the best-known star groupings in the sky. Modern scientists know Alnilam as a blue supergiant, classified as a B0 star, almost 65 times the size of our Sun, with over 800,000 times the luminosity, and 35 times the mass. The latest surveying methods show it to be 2,000 light years from Earth, with an apparent magnitude of 1.7 and an absolute magnitude of -6.9. It does not have any companion stars. In the international astronomical community, Alnilam is one of 57 stars that has been chosen for use in celestial navigation.



Alnilam is known to be a variable star and is further classified as an Alpha Cygni variable, one whose variability is irregular. Its spectrum also changes from time to time, for reasons which are still obscure to scientists, although some believe that it has to do with a loss of mass on its surface. It is surrounded by a molecular cloud, which creates a reflection nebula, catalogued as NGC 1990. Alnilam is about 5.7 million years old; it is burning its hydrogen rapidly, and many believe that it will eventually become a supernova.

The name Alnilam comes from the Arabic *al-nizam*, meaning "string of pearls," an apparent reference to all three stars in a row. In Chinese, Alnilam is known as *Shen su er*, "the second of the three stars."