Fall Star-B-Que at Big Stump September 20!

THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno September-October 2025

Space-X's Starship Mission 10 a Success after Three Failures

On August 26, Space-X launched the tenth Starship flight from its StarBase on the Texas coast, one filled with drama and concern after the failures of Starship launches seven, eight, and nine. Following a two day delay due to weather and ground control issues, the flight, the flight achieved every goal before splashing down in the Indian Ocean about an hour after launch. Unlike the first six launches, the latest series is a newer somewhat more sophisticated version of the world's most powerful rocket. The successful mission reassured both Space-X personal and NASA, which is counting on Space-X to provide a modified Starship for the first lunar landings starting in 2028. Space-X has assured the space agency that the craft will be ready by then. Several more launches this year and next will test Starship's full orbital capabilities as well as refueling in Earth orbit, a necessary requirement for going to the moon. Also, Space-X would still like to send at least two and possibly as many as four unmanned Starships to Mars by the end of 2026. The August 26 mission has given them the confidence that they can actually do it.

Astronomy Quote of the Month-

What is research but a blind date with knowledge…

Will Henry, American author

In this Issue-

Central Valley Astronomers

Web address www.cvafresno.org

Officers and Board- 2025

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Upcoming CVA Events

September 12-Monthly meeting at Round Table Pizza

September 13-Dark Sky Festival at Big Stump

September 20-Fall Star-B-Que at Big Stump

September 26-Riverpark public starwatch

October 10-Monthly meeting at Round Table Pizza

October 18-Club starwatch at Eastman Lake

October 24-Riverpark public starwatch

Number of exoplanets found as of August 2025-

Confirmed-5,983

How many more are out there?

Tens of Thousands? Hundreds of Thousands?

Millions?

(From NASA's Exoplanet Exploration Website)

Astronomy Short

Edwin Hubble was, among many other things, a man of contradictions. He was born and raised in southern Missouri, but as an adult. reinvented himself as an English upper-class gentleman; he even affected an Oxford English accent for the last thirty years of his life. Part of the English influence came from his education. After excelling at the University of Chicago, he attended Oxford University as a Rhodes Scholar. He majored in physics at Chicago and his main interest was always astronomy, but at Oxford, he studied jurisprudence and returned to the U.S. with a law degree, which he never used. When he came to the Mt. Wilson Observatory in 1920, he paired up with Milton Humason as his assistant; an odder couple could not be found. Hubble was the very proper and aloof scientist who had no real friends other than his wife. Humason was the hand-shaking, back-slapping, joke telling good-old-boy, pal to everyone. Still, the two rewrote the book on understanding the universe. How they managed to keep their partnership going, no one really knew.

The President's Message

The Dark Sky Festival is now one of the most significant events of the year for the Central Valley Astronomers, as it allows club members to meet each other and interact with a large crowd gathered to observe the wonders of the night sky. The event will take place this year on Saturday night, September 13, 2025, at the Big Stump parking lot. It is not the best night for club members to observe, as it is mainly for service. It is an opportunity to recall how it felt the first time we observed M27 or some other well-known target. The Big Stump parking lot is a familiar spot for many club members, as it serves as the primary location for CVA's dark sky activities. Despite the altitude of the area, the increase in light pollution has severely degraded the quality of the location over the past years. Driving through the 180 on the way back to Fresno, it is astonishing to see all the lights emanating from urban areas in the valley.

The Central Valley Astronomers conduct numerous outreach activities throughout the year, serving the local community. Let's not forget the active Central Valley Astronomer members. It is crucial that CVA serves its members and addresses the needs and concerns of club members. CVA members are welcome to contact the president and other board members to suggest activities and identify any necessary expenditures to enhance the attractiveness and retention of club members. Beyond the social activities of CVA, amateur astronomy encompasses a wide range of topics and potential activities. Visual astronomy, electronically assisted astronomy, astrophotography, and spectroscopy all have their place in the club. Some people may focus on deep-sky objects, while others focus on stars; there are many possibilities. Most club members use their own equipment; however, the club had a large 20-inch Dobsonian telescope that has since been retired. If there is a need to purchase specific equipment that club members can genuinely use, please do not hesitate to make suggestions at the club meeting. Before making a purchase, don't hesitate to seek feedback from other members and verify if someone is selling the equipment.

As the hobby evolves over the decades, some of its aspects can change, such as making telescopes or mirror-making. We are currently in a situation where visual astronomy may disappear in the near future due to issues with light pollution.

CVA members should ensure their voices are heard and that the CVA is moving in a direction that welcomes and retains new members, particularly young members with interests in a career in STEM. For the following issues of The Observer, members engaged in astrophotography should not hesitate to send their images to Larry Parmeter so that they can be shared.

Clear skies always-

Hubert Cecotti

Following up on Hubert's message and the importance of the Dark Sky Festival-this is California at night, 2025

Profiles in Astronomy

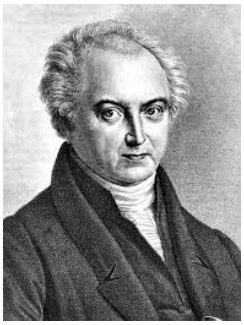
Anthony Hewish 1924-2021

Hewish was born and raised in Cornwall, England, and attended Caius College, Cambridge University. His undergraduate studies were interrupted by World War II, when he served in the Royal Air Force, working on wireless communications devices. After the war, he returned to Cambridge, finished his undergraduate degree, then worked on his doctorate under Martin Ryle at the Cavendish Laboratory at Cambridge, where his thesis focused on the emerging field of radio astronomy, an outgrowth of wartime advances in radar and telecommunications. Afterwards, he stayed at Cambridge for the rest of his career.

Hewish was one of the pioneers in radio astronomy, and one of the first to track and identify radio sources beyond Earth. He designed and helped build the first phased array radio telescope in the 1950s and used it to locate a number of radio sources. Eventually, they were compiled in what is now known as the third Cambridge Catalogue of Radio Objects; many of them were eventually identified as quasars, including the now-famous 3C 273, first identified as a quasar in 1963, which introduced the astronomical world to a whole new class of celestial objects. In 1967, one of his graduate students, Jocelyn Bell, studied a puzzling radio object with a regular pulsing pattern, which she eventually identified as the first pulsar, another new class of celestial objects. A controversy erupted in 1974 when Hewish and Ryle were given the Nobel Physics Prize for their roles in the discovery of pulsars, but Bell, who actually found and identified the object, was not mentioned. Many scientists protested the award as a result. However, Bell, who was by then well-known in her own right, said that, as a graduate student and not a full researcher, she did not expect to receive the prize and was not upset that her advisor did. Nevertheless, many in the scientific community felt that Bell was excluded because of her graduate student status and also because she was a woman.

Besides the Nobel Prize, Hewish won many other awards, including the Eddington Medal from the Royal Astronomical Society, the Hughes Medal from the prestigious Royal Society, and the Michelson Medal from the Franklin Institute, which he shared with Bell.

The Celestial Police



In 1800, the German astronomer Johann Shroter established an observing group officially known as the *Vereingtwe Astronomische Gesellschaft*(United Astronomical Society) for the purpose, in the wake of William Herschel's discovery of Uranus, of trying to find one or more planets between the orbits of Mars and Jupiter. Initially, the group was made up of Shroter and five fellow astronomers: Adolf von Ende, Wilhelm Olbers, Johann Gildemeister, Karl Harding, and Franz von Zach, but eventually it numbered over twenty and came to be called the Celestial Police. For the next several years, members scanned the heavens looking for the elusive trans-Martian planets. In 1801, the Italian priest and astronomer Giuseppe Piazzi, working independently of Shroter's group, found the first minor planet between Mars and Jupiter, which he called Ceres. In 1802, Olbers found another minor planet, which he named Pallas. In 1804, Harding found a minor planet, Vesta, and in 1807, Olbers found still another minor planet, which today is called Juno. Olbers' discovery of Juno was the last major finding by the Celestial Police. It never formally disbanded, but by 1815, a couple of its members had died and most of the others had moved on to other projects. Olbers, a physician as well as astronomer, became the best known of the group and, in addition to his minor planet findings, is famous for Olbers' Paradox: If the sky is full of stars, then why is it so dark at night? a question which still puzzles scientists today. Top right-Wilhelm Olbers 1758-1840

Galaxy in the Eyepiece

M104

M104, commonly called the Sombrero Galaxy, was not included in Charles Messier's list of objects found in the late 1700s. His list before his death went up only to 103. The galaxy was first observed and described by Messier's assistant Pierre Mechain in 1781; Messier himself never saw it and gave it only a passing reference in his notebook. In 1784, William Herschel independently rediscovered the galaxy and put it on the list of objects in his catalogue. However, in 1921, the astronomer and science writer Camille Flammarion reviewed Messier's notes, came across the galaxy, realized that it and Herschel's object, now known as NGC 4594, were the same, and listed it as 104 in Messier's list, the first of the "modern" Messier objects.

Today, M104 is known to be about 31 million light years from Earth, at the border between Virgo and Corvus; it is usually classified as one of the Virgo II Cluster of galaxies. It has an apparent magnitude of 8.0, making it easily seen in a small telescope, and has a diameter of about 105,000 light years, slightly larger than the Milky Way. Scientists are divided over its classification; at one time it was thought to be a spiral galaxy, but more recent studies show it has qualities of a giant elliptical galaxy. Some scientists have suggested that it might be the result of a merger between a spiral and an elliptical and call it a peculiar lenticular galaxy. It stands out for the prominent dust lane which encircles its equator.

M104 is known to have a giant black hole, which is close to one billion times the size of our Sun, at its nucleus, and which is also spewing out vast amounts of synchrotron radiation, created when elections pass through pockets of strong magnetic fields. This radiation can usually be found only with x-ray or radio telescopes .M104 is also known to have between 1,200 and 2,000 globular clusters, compared to the Milky Way's 300 globulars(however, it is not anywhere close to M87's 5,000+ globular clusters).

Star Stories

Rastaban

Rastaban, also known as beta Draconis, is the third brightest star in the constellation Draco, which snakes across the northern skies near the celestial pole. Although it is in the same class as our sun, a G2Ib, it has six times the mass of the Sun and is almost forty times the size. According to the most recent studies, it is 380 light years from Earth, and has an apparent magnitude of 2.8 and an absolute magnitude of -2.4.

Rastaban is known to have a binary companion, a tiny dwarf star known as B Draconis b. It is so small and dim that very little is known about it, other than it orbits the main star at almost 400 astronomical unts over a period of almost 4,000 years.

Scientists know that, even though Rastaban is still fairly young, about 65 million years old, it is burning through its hydrogen very rapidly. They speculate that only a million years ago, it was a blue B star, is now towards the end of its main sequence, and will soon(relatively speaking) turn into a red giant and eventually a giant dwarf star(and in astronomy, that is not an oxymoron).

The name Rastaban comes from the Arabic and means "the head of the dragon." The Arabs also called it Alwaid, "the old mother camel," as part of the asterism of the five camels taken from Arab mythology.

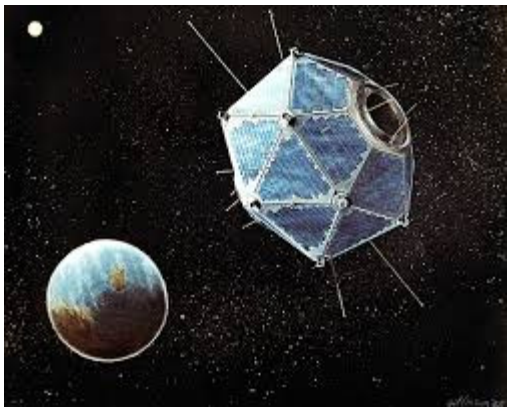
Space Age Archeology

Vela

The Vela satellites, the first of which was launched in 1963, had a single purpose: to monitor compliance of the nuclear Test Ban Treaty, which was signed by the U.S. and the Soviet Union in early 1963. They were always launched in pairs, and each pair communicated and exchanged data with the other.

The Vela Hotel program, as it was called, began in 1959 as a military surveillance program, to monitor Soviet nuclear test explosions. The original Velas(which means "watchman" in Spanish) were conceived and designed by the Defense Department's Advanced Research Projects Agency (DARPA) and built by TRW in Southern California. Although aspects of the original satellites are still classified today, it is known that they carried several x-ray, neutron, and gamma ray detectors. Both Vela 1s were identical, about the size of beach balls and weighing 330 Earth pounds at launch. Vela 1, which refers to both satellites with the designations 1A and 1B, was launched atop an Atlas-Agena rocket on October 17, 1963, and put into a highly elliptical orbit which extended almost a third of the way to the moon. The two satellites were expected to last only about six months, but instead were operational for almost five years. The second set, Vela 2A and 2B, was launched on July 17, 1964, and the third, Vela 3A and 3B, on July 20, 1965.

No violations of the test ban treaty were ever found; however, on July 2, 1967, the Vela 3 satellites detected a flash of gamma radiation of unknown origin. Over the next several years, with the more advanced Velas, starting with Vela 5, more gamma ray events were found, leading scientists on the Vela program to conclude that a new class of celestial objects, gamma ray bursters, had been discovered. Vela 5 also found the first X-ray burster, coming from the area of Centarus. The most controversial detection came in 1979, when an advanced Vela 5 picked up a double gamma ray burst event coming from a remote island in the South Atlantic about a hundred miles off South Africa. Although they were never satisfactorily explained, it is now believed the bursts were from a secret nuclear test explosion conducted either by South Africa or Israel. In the popular press, this was known as the "Vela Incident."



Twelve Vela satellites in all were launched, the last with Vela 6A and 6B in 1970; they were operational until 1985, when the Air Force shut down Vela, and replaced it with a more advanced particle detection program.

Astronomy (Bad) Pun

Sirius, the dog star, is moving closer to Earth at a rate of nine miles per second. This means someday we could be in Sirius trouble.

From astronomytrek.com

What's New In Space

The Passing of Another Space Pioneer: Jim Lovell 1928-2025

Jim Lovell, one of the original 1960s astronauts, who flew to the Moon twice and is remembered for the Apollo 13 mishap that almost turned tragic, died at his home near Chicago on August 7, 2025, at the age of 97. The cause of death was not given but it is believed to have been from natural causes.

Lovell was born in Cleveland, Ohio, raised in Milwaukee, Wisconsin, attended the University of Wisconsin for two years, then was admitted to the U.S. Naval Academy. After graduation, he went through pilot training, became a Navy fighter pilot and then a test pilot. In 1959, when NASA went looking for astronauts to fly the Mercury spacecraft, Lovell was among the thirty-two finalists but was not chosen for the first group, the "Sacred Seven." He applied again in 1962 and was selected for the second astronaut group, the "Next Nine." In December 1965, he flew aboard Gemini 7 with Frank Borman, at that time the longest spaceflight, fourteen days, in which his craft and Gemini 6 rendezvoused and flew in formation for several hours. In November 1966, he commanded Gemini 12 with Edwin Aldrin as his crewmate. Afterwards, Lovell was assigned to the Apollo program and in December 1968, he, Borman, and William Anders, flew Apollo 8 in humanity's first lunar orbit mission on Christmas Eve of that year. Originally, Lovell was assigned to command Apollo 14, but switched places with Alan Shepard, the commander of Apollo 13, who needed more training. In addition, Ken Mattingly, Apollo 13's lunar module pilot, was exposed to measles five days before the launch, and NASA, to avoid the possibility him getting sick in space, replaced him with his backup, John Swigert. Apollo 13 was launched on April 11, 1970, for a lunar landing mission, but two days later, halfway to the moon, suffered an explosion in the service module that crippled the craft. Both the crew and NASA decided to use the lunar lander as a "lifeboat," and the three astronauts lived in it as it swept around the moon and returned to Earth. The Apollo 13 crisis captured the world's attention, and the movie *Apollo 13*, with Tom Hanks as Lovell, made the crew even more famous. After the spacecraft returned safely to Earth, Lovell, who went to the Moon twice but never landed on it, was offered another try as commander of a later Apollo mission, but later said he turned it down after seeing his wife shake her head "no."

Lovell left NASA and the Navy in 1973; he moved to Chicago to be an executive for a telecommunications company and later the head of his own consulting firm. Over the years, he remained a strong advocate for space exploration and won many honors for his space-related activities.

NASA at a Crossroads With its Budget

If the Trump Administration's current budget holds, NASA's share over the next few years will be cut by as much as 25%. Already, some both in and outside of the space agency are predicting what might be on the chopping block. According to stories, the International Space Station program will probably be scaled back, with NASA crews staying as long as nine months instead of six and possibly being reduced to three instead of the usual four. ISS itself, they say, will stay in operation until at least 2030, which was the date set for its tentative abandonment a few years ago, but the program meant to replace it is being accelerated so a new space station can take its place almost immediately. Several aerospace companies are currently designing space stations for possible use by NASA, among them Blue Origin, Voyager, Axiom, and Vast. A directive signed by Sean Duffy, NASA's interim director, on August 4, 2025, simplifies several

of the requirements for the new space station, among them designating that a crew of four be able to live and work in it for up to a month at a time. Many believe this is focused on Vast Space, which, in partnership with Space-X, plans to have a prototype space station, called Haven-2, capable of housing four crewmembers for up to two weeks at a time, in orbit and operational by the end of 2026, and a much larger version operational by 2029. Much of the urgency is due to the fear that, despite their claims, most of the commercial companies may not have their space stations ready by the time ISS is deorbited, leaving China the only country with a continuously inhabited space station in Earth orbit, a situation that NASA see as untenable. Top right-artist's illustration of a Space-X Crew Dragon approaching Vast's Haven-2 space station

Speaking of China, it's looking for a Partner for its Mars Soil Sample Return Mission

Much like NASA and ESA have learned over the past few years, a soil sample return mission to Mars is not easy or cheap. Stories are that the Chinese Space Agency is quietly asking other space-faring nations if they'd like to join in on its sample return mission, which they originally planned to launch in 2030. Little is known about the Chinese mission, except that it will probably be similar to the NASA-ESA proposal, which would involve four separate spacecraft, which was originally scheduled to be launched in 2026, and whose budget has ballooned from $2 billion to almost $8 billion in recent years. Now, in 2025, the only part of the MSSR mission still going forward is the Perseverance rover, which has been collecting samples in pencil-like tubes at Jezero Crater and depositing them in carefully marked caches. The original plan called for a second rover to land, collect them, and deliver them to an ascent rocket which would go into Martian orbit and dock with still another craft to return them to Earth. Due to the complexity and ever-escalating costs, NASA has all but given up on this scenario and asked private aerospace companies to come up with a cheaper and more direct method. As it is, with the proposed budget cutbacks, the entire program may be cancelled. Could NASA and the Chinese Space Agency team up on a soil sample return mission? Not likely, but stranger things have happened in the spaceflight world. In the 1970s and 80s, if anyone thought the U.S. and Russia would be partners in a space station program, they would have been considered prime candidates for a mental institution (NASA, though, is hesitant to have China as a space partner, due to past incidents when the Chinese were alleged to have used the relationship to spy and steal sensitive technology). Right-the proposed NASA-ESA soil sample return ascent rocket

Spaceflight Short

When the space shuttle program was conceived in the early 1970s, NASA originally envisioned having five operational space shuttle craft. The then-Nixon Administration, in 1973, approved funding for only four, which eventually became *Columbia, Challenger, Discovery,* and *Atlantis.* However, once *Atlantis* was completed in 1983, Rockwell, the prime contractor, had enough funding left over to build the framework for another orbiter, which it then put in storage against the day it might be needed. With the destruction of *Challenger* in 1986, it was needed, and became *Endeavour,* the fifth shuttle.

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

The Fred Whipple Observatory

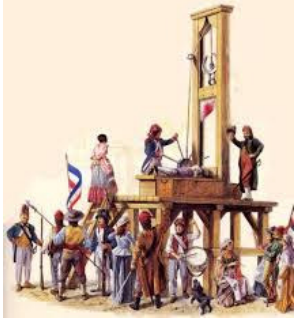
The Whipple Observatory, also known as the Mount Hopkins Observatory, is located on Mount Hopkins in southeast Arizona at an elevation of 8,500 feet and is managed by the Smithsonian Astrophysical Institution. It was originally established in 1968, and was renamed in 1981 to honor Fred Whipple, its first director and a pioneer in planetary astronomy.

In the 1970s, the observatory became well known for the MMT, the Multiple Mirror Telescope, in which six 1.8 m mirrors were connected with fiber optics cables to produce the resolving power of a 4.5m mirror. In the 1990s, the six smaller mirrors* were replaced with a single 6.5m mirror, which saw first light in 2000. In addition to the MMT, as it is still called, the observatory has several smaller telescopes, including 1.5m, 1.3m, and 1.2 m reflectors, all of which are involved in galaxy, stellars, and planetary research. It also has what is known as the Vertias array, four 12m segmented telescopes, to study high energy particles like gamma rays. Above right-the 6.5 meter telescope at the Whipple Observatory

***The six smaller mirrors are now being used in other telescopes**

From the Editor-

During talks to different groups, I often mention Charles Messier(right-1730-1817) and his famous catalogue of objects, almost all of which were found between 1765 and 1784. I relate that Messier kept a low profile during the French Revolution and the Reign of Terror in the 1790s, and as a result, kept his head as well. Unfortunately, several of his scientific colleagues were not as lucky. One of the most famous scientists of the era, the chemist Antoine Lavoisier,(below-1744-1794) the discoverer of oxygen among many other achievements, was falsely accused by the revolutionaries and went to the guillotine in 1794. After the Revolution was over, he was posthumously exonerated, the government issued an apology to his family, and his wife was awarded a pension(one story about Lavoisier, which may be apocryphal, goes that knowing he was to be executed, he asked his assistant to be near the guillotine, and when his severed head was shown to the crowd, to shout out, "Can you hear me?" Lavoisier said if he could, he would blink his eyes. When the time came, the assistant did call out, and according to him, Lavoisier's eyes did blink). Lavoisier, though, was not the only French scientist to lose his head. An astronomer, Jean Bailly, was executed in 1791, and a second astronomer, Jean Baptiste de Saron, was put to death in 1794. A well-known mineralogist and geologist, Philippe -Frédéric de Dietrich, was put to death in 1793, and a notable botanist, Chrétien Guillaume de Lamoignon de Malesherbes, was executed in 1794. Another chemist and physician, Louis-Guillaume Le Veillard, was also executed in 1794, at the height of the Reign of Terror. Historians have established that probably 85-90% of the people executed, an estimated 16,000, during the Reign of Terror were innocent of the charges against them; they were mostly scapegoats who were caught up in financial and property disputes, family squabbles, personal grudges, and simply being in the wrong place at the wrong time.



CVA 2026 Tentative Calendar

Monthly meetings at Round Table Pizza-First and Bullard in Fresno-General meeting begins at 7pm

January 9
February 6
March 6
April 3
May 1
June 5
July-no meeting
August-no meeting
September 4
October 2
November 6
December 4

Club starwatches

January 17-Eastman Lake
February 21-Eastman Lake
March 21-Eastman Lake-Messier Marathon
April 18-Eastman Lake
May 16-Big Stump-Spring Star-B-Que
June 13-Big Stump-Courtright weekend
July 18-Big Stump-Courtright weekend
August 15-Big Stump-Courtright weekend
September 12-Big Stump-Fall Star-B-Que
October 10-Eastman Lake
November 7-Eastman Lake
December 12-Eastman Lake

RiverPark public starwatching events

February 26
March 26
April 24
May 22
June 26
July 24
August 21
September 18
October 16