Welcome the New Year-2026!

THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno January-February 2026

2026-The Year We Go Back to the Moon

53 years ago, humans last viewed the Moon, our one natural satellite, close up. Now, finally, in 2026, they are returning. Artemis II, carrying three Americans and a Canadian, will be launched atop an SLS rocket as early as February 2026 for a ten day mission that will circle the moon and then return to Earth. It's been a long, at times frustrating, journey from LC 39-B at the Kennedy Space Center to Luna, as it's known in Latin. Lunar missions to follow-up the Apollo program were scheduled as early as 1980, but lack of funding and lack of determination kept setting them back. In 2003, in the wake of the Columbia accident, President George W. Bush approved the Constellation Program, which set a goal to put Americans on the Moon as early as 2010. But that was delayed numerous times as the cost grew and various missteps dragged on. In 2009, President Obama cancelled the Constellation program and replaced it with the SLS, Space Launch System, which had the goal of lunar landings by 2017. But that, too, was dogged by both financial and engineering shortfalls. Finally, in late 2022, Artemis I, an uncrewed lunar flyby mission,

(continued on next page)

Astronomy Quote of the Month-

"We will go to the moon not because it is easy, but because it is hard…

President John F. Kennedy, announcing that the U.S. will land on the Moon before 1970, in a speech to Congress in May 1961.

In this Issue-

Central Valley Astronomers

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and successfully returned, with the intention of launching Artemis II a year later, and Artemis III, a lunar landing mission, in 2024. But more technical disputes stalled that schedule as well, stretching out the next launch to over three years. Finally, though, the time has arrived, and Artemis II(the Artemis lunar program being named after the twin sister of Apollo in Greek mythology) will now be launched no later than April 2026. It's been too long, but hopefully, once Artemis II is launched, it will be the beginning of a new era where America and its allies return to the Moon...for good.

Number of exoplanets found as of December 2025-

Confirmed-6,065

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

It is the beginning of 2026, a time to wish all CVA club members and their families a happy new year. Let's wish for a year with many clear skies, especially during new moon weekends, fun star parties, and engaging presentations that attract more members to CVA. The weather has been rather cloudy with heavy rain, suggesting that Santa was generous for many of us, or that there were good deals during the Black Friday/Cyber Monday week. Regular people have celebrated the Winter solstice as a symbol of the rebirth of light, while amateur astronomers fear the short nights and limited observation hours.

We can all get ready for the main astronomical ephemerides for 2026. There are prominent eclipses (solar on February 17 and August 12, lunar on March 3 and August 28). For America, the only main event will be the total lunar eclipse on March 3rd.

During January and February, we can access a particularly rich selection of deep-sky objects, owing to the prominence of the winter constellations and the gradual transition toward the early spring sky. These months offer excellent atmospheric stability, long nights, and many high-altitude targets, all of which facilitate detailed visual and photographic observations.

The Orion Molecular Cloud Complex dominates the January sky, with the Orion Nebula (M42) serving as the primary highlight. As one of the nearest and most studied star-forming regions, M42 presents a unique opportunity to examine large-scale stellar nurseries. Its adjacent objects, including the Running Man Nebula (Sh2-279) and the reflection nebulae surrounding NGC 1977, illustrate complementary processes of illumination and gas dynamics. Southward in Orion's Belt lies the Flame Nebula (NGC 2024), notable for its dark-lane structure, and the Horsehead Nebula (Barnard 33), a photogenic absorption nebula requiring dark skies and specialized filters for optimal contrast. It is worth noting that the Horsehead Nebula can be observed from Big Stump with an 18-inch dob and an H-Beta filter.

To the north of Orion, the constellation Taurus hosts the Pleiades (M45), a benchmark open cluster whose blue reflection nebulae exemplify the phenomenon of dust scattering. Nearby, the Hyades cluster provides a contrasting example of an older, more dispersed stellar association. It has many open clusters that are accessible to small telescopes. The Crab Nebula (M1) in Taurus, the remnant of a historical supernova recorded in 1054 CE, is especially significant for studies of pulsar-driven nebular dynamics. The target is easy to find. However, even with a large telescope, it doesn't have detailed structures when observed visually.

As February progresses, the constellation Gemini reaches its highest elevation, offering access to the open cluster M35 and its compact neighbor NGC 2158. Their contrasting stellar populations highlight evolutionary differences within Galactic disk clusters.

From our dark sky locations, such as Big Stump, we can access the Rosette Nebula (NGC 2237–2246) in Monoceros, a vast H II region surrounding the open cluster NGC 2244. Its large angular size and complex filamentary structure render it particularly suitable for narrowband imaging. In the constellation Canis Major, the open cluster M41 presents a bright and easily resolved stellar field.

Finally, I encourage CVA members, particularly those with experience in astrophotography or electronic-assisted astronomy, to share their results, setups, software, and processes that they use. Astrophotography is becoming increasingly popular with all-in-one telescopes.

Happy New Year 2026 and Clear Skies

-Hubert

Profiles in Astronomy

Vincenzo Cerulli 1859-1927

Cerulli was born and raised in Teramo, Italy, and after primary and secondary schools, attended the Sapienza University in Rome, where he earned a degree in physics, then went to the University of Berlin where he did further studies in astronomy. He also studied in Bonn and for several years did astronomical work at the Gregorian Pontifical Observatory in Rome.

Cerulli came from a wealthy family, and in 1890 established his own observatory in his hometown of Teramo. There, using an 18" Cooke refractor that he bought in England, he studied variable stars and stellar motion. Eventually, he and fellow Italian astronomer Elia Millosevich compiled and published a star catalog which is still used today. He discovered an asteroid, 704 Interemma, which is now known to be the fifth largest in the solar system. He also extensively observed the planet Mars, and concluded that the "lines" on Mars, which many believed were the work of advanced beings, were nothing more than optical illusions.

Cerulli won many honors for his studies and discoveries. A crater on Mars and two asteroids are named for him.

Space Age Archeology

Ohsumi

Ohsumi was Japan's first satellite, the first artificial satellite launched by an Asian country, and the fourth country to launch a satellite, after the Soviet Union, the United States, and France.

The Ohsumi project was the outgrowth of a Japanese rocket program that began in the mid-1950s at the University of Tokyo, where a group of scientists and engineers developed and launched suborbital sounding rockets, which were later used during the International Geophysical Year of 1957-58. This, in turn, led to the building of the Kagoshima Space Launch Center in 1962, and the government's commitment to build and launch an orbital satellite by 1967; however, technical problems delayed it for almost three years. The word "Ohsumi" translated into English literally means Great Corner or Great Sleep, but it also refers to a sense of vastness or a person who is generous and understands and helps others.

The Ohsumi satellite was roughly spherical shaped, about 30 inches in diameter, with a conelike top, making the satellite 40 inches tall. It weighed 53 Earth pounds. Along with solar cells, it carried several batteries for power. Although intended to be a technology demonstrator, it was also a scientific satellite, with several instruments for measuring the upper atmosphere and the near-space environment. The booster rocket was a Lambda-4 rocket, an advanced version of the sounding rockets developed in the 1950s. Both the satellite and the booster were designed and built at the Institute of Space and Aeronautical Sciences at the University of Tokyo.

Ohsumi was launched from the Kagoshima Space Center on February 11, 1970, and went into a highly elliptical orbit of 3,200 by 210 miles. It worked well for several hours, then went dead due to an electrical failure. Nevertheless, during its short lifetime, it relayed back data about the upper atmosphere and showed that the Lambda rocket, which had suffered a series of failures, could be used in putting satellites into orbit. The Japanese science and aerospace community considered it a great success, and it led to the launch of more Japanese spacecraft over the next few years.

Isaacman Confirmed as Next NASA Head

High tech entrepreneur and veteran astronaut Jerod Isaacman was confirmed by the Senate 67-33 on December 17, ending a strange saga that saw him originally nominated a year ago, then President Trump having his name withdrawn in May, then renominated in November, and finally confirmed. The situation apparently arose over dispute between Trump and Elon Musk, causing Isaacman's name to be withdrawn and Transportation Secretary Sean Duffy taking over as interim NASA chief. Since then, Trump and Musk have sort of made amends, clearing Isaacman to be renominated. He will take over a NASA that is facing major budget cuts as well as a major reduction in personnel. Trump, though, would like to see a leaner, more efficient NASA, like it was in the 1960s during the heyday of the Apollo Program. One of the first things Isaacman will oversee is the launch of Artemis II, the first crewed trip to the Moon since Apollo 17 in 1972. If it is successful, Artemis III, a lunar landing, will be launched as early as September 2027. In his confirmation testimony in early December, Isaacman made it clear that the U.S. has to beat China to the moon. However, the moon lander, a modified version of Space-X's Starship, is behind schedule; Space-X swears it will be ready by then, but many are doubtful. In September, NASA reopened bids for a lunar lander to take Starship's place if it doesn't come through. Jeff Bezos's Blue Origin has announced that its lander, Blue Moon, which is already scheduled for Artemises V and VI, can be ready for Artemis III. Given their rivalry, Bezos would like nothing better than to upstage Musk's Space-X with the first lunar landing vehicle. Isaacman will as well have to decide farther into the future concerning the proposed crewed mission to Mars, now envisioned for the late 2030s.

Another major priority for Isaacman is the future of NASA's space station program once ISS is abandoned in 2030. Several companies, with NASA funding grants, are already working on commercial space stations which they say will be ready by 2030. But the timelines for some of them are in doubt as well. NASA has made it very clear to these companies that it does not want to have a gap in low Earth orbit missions. At least one company, Vast Space Systems, aided by Space-X, is planning to put a prototype space station called Haven I in Earth orbit by the end of this year. It will be able to hold up to four people for 40 days at a time. Axiom Space is also planning the first module of its proposed space station to be launched to ISS by the end of this year as well. Eventually, other modules will join it over the next three years, and by 2030(at least according to Axiom), it will separate from ISS to become a free-orbiting space station on its own.

In addition, Isaacman will have to decide what to do about the Mars sample return mission, which is almost five years behind schedule and $5 billion over budget, as well as proposed missions to Saturn's moon Titan and Uranus. To put it mildly, Isaacman has his work cut out for him. On the other hand, he's young, an outsider, and clearly a hard-charger who wants to cut through NASA's entrenched bureaucracy to get things done and set up the space agency for the next twenty to twenty-five years.

Astronomy Short(sort of)

Long before the sailors on Magellan's voyage around the world saw them, the original peoples of the Southern Hemisphere called the Magellanic Clouds by several names. To the Aboriginal tribes of Australia, they were the "Cranes," a large(male) crane and a smaller (female) one. The Polynesians called them the Nga-Patar-Kaihau and used them as navigational markers on long ocean voyages. The Mauchpe of Chile and Argentina knew them as Rvganko(water ponds). Through the 1700s, western sailors called them the "Cape Clouds," because they were used as guides around the Cape Horn in South Africa. The term Magellanic Clouds did not come into popular use until the late 1800s. Today, an effort is underway to rename the two dwarf galaxies the "Milky Clouds" to emphasize their connection to the Milky Way(and remove Magellan's name, which is associated with Spanish colonialism).

Galaxy in the Eyepiece

M60

Messier 60, also catalogued as NGC 4649, and with nearby NGC 4647 known as Arp 116, is one of the brightest ellipticals in the Virgo cluster of galaxies. It was originally discovered, along with M59, by Johann Koehler in April 1779, and independently seen by Charles Messier three days later, Both Koehler and Messier were observing a comet at the time of their discoveries. M60 is now known to be 57 million light years from Earth, has an apparent magnitude of 8.8, and is classified as an E 1.5 elliptical galaxy.

M60 is well-known in astronomical circles for a number of reasons. Even though Arp considered it and 4647 to be in contact, and both are about the same distance from Earth, scientists now believe there is no real connection between the two; the seeming connection may simply be an optical illusion. M60 was also cited by Edwin Hubble in his 1929 paper on the recession-velocity principle; he found it was one of the fastest-moving galaxies in his study. M60 also has a massive black hole at its core, estimated at over one million times the size of the Sun

Top right-M60 left-M60 and NGC4647

Star Stories

Bernard's Star

Bernard's Star, as the name implies, was first found and studied by the American astronomer Edward Emerson Bernard in 1916. The reason it went unnoticed for so long was because it is a dim, low-mass reddish star in Ophiuchus that cannot be seen without a telescope. It has the distinction of being the fourth closest star to Earth, at 5.96 light years away, after the three stars of the Alpha Centauri complex. It is classified as an M4 red dwarf star, has an apparent magnitude of 9.5, an absolute magnitude of 13.2, and has only 16% of the Sun's mass. It is estimated to be ten billion years old, making it one of the oldest stars in the Milky Way. This, along with its close proximity to Earth, makes it one of the most studied stars today.

Bernard's Star also has the highest proper motion of any known star and is heading towards the Earth. Scientists calculate that, in about 9,000 years, it will come within 3.8 light years of our planet, making it the closest star, other than the Sun, to us. It also has a planetary system, which was not found until 2024, consisting of four planets. The largest is only about one-third the mass of the Earth. All four are orbiting the star rapidly; the fastest in a little more than two days, and the slowest in just under seven days. None of them are anywhere near the habitable, or "Goldilocks," zone.

A Little Bit More About the Magellanic Clouds

Some scientists now believe, based on observational and radio telescope findings, that a third dwarf satellite galaxy of the Milky Way is directly behind the Large Magellanic Cloud.

What's New In Space

Starliner to Fly Again-But Uncrewed

On November 24, NASA and Boeing announced that the Starliner spacecraft will be included in NASA's 2026 manifest of launches-but as an uncrewed cargo test mission. The flight is scheduled to be launched in April, and, if it is successful, may be launched again by the end of the year. NASA and Boeing also announced that the original contract for six Starliner crewed launches will be cut back to four, and, depending on the uncrewed cargo flights, crewed missions may resume in 2027 so that the contract can be fulfilled by the time ISS ceases operations in 2030. The Starliner program began in 2014, and the first uncrewed test flight came in 2019; it had problems with the software and never docked with ISS. A second test flight in 2022 was successful, but afterwards, problems were found with the parachutes and possible flammable material in the wiring. Finally, in June, 2024, after several delays, The third Starliner flight, with astronauts Barry Wilmore and Sunita Williams, was launched. They were expected to stay on ISS for only two weeks, but problems with the thrusters popped up during the rendezvous and docking with the space station. NASA eventually decided to return the spacecraft to Earth uncrewed(it returned to Earth, landing at White Sands, New Mexico, with no problems in September) and Wilmore and Williams ended up spending nine months aboard ISS, returning aboard Space-X Crew Dragon in March 2025. Now, Starliner will get another chance to redeem itself.

Chinese Space Agency Conducts a Rescue mission ala Starliner

On November 25, the Chinese Space Agency launched the uncrewed Shenzhou 22 spacecraft to the Tiangong Space Station; it docked with the station later that day. The reason was direct-to give the three crewmembers aboard Tiangong a way to get back to Earth, since they had no spacecraft until then. Early in November, while both the Shenzhou 20 and 21 crews were aboard the space station, orbital debris hit it, causing damage to the windows of the Shenzhou 20 spacecraft. CSA determined that the Shenzhou 20 craft was too unsafe to return its crew safely to Earth, so they returned on November 14 in the Shenzhou 21 craft, and the Shenzhou 20 craft was abandoned in orbit. That meant for eleven days, the Shenzhou 21 crew had no way to return to Earth if an emergency arose; they were stuck on the space station(NASA's safety protocols would forbid any situation like that; the Crew Dragon spacecraft usually holds four people, but can carry up to seven in an emergency). Fortunately, the spacecraft for the Shenzhou 22 crew, not scheduled until the Spring of 2026, was complete, tested and inspected, and ready to be launched, so it was on the 25th. So far, CSA has not said anything public about the crisis, but according to reports, it is investigating it for contingency plans in case it happens again.

Russia's Only Soyuz Launch Pad Severely Damaged

On November 25, the Russian Space Agency, RKA, launched the Soyuz MS28 mission to ISS from its main launch pad at the Baikonur Cosmodrome in what is now central Kazakhstan. However, during the launch, the tremendous pressure and vibration caused a major piece of the rocket support structure to break off and fall into the "fire pit" below. This launch pad has been used for every Soviet-Russian crewed space flight since Yuri Gagarin's Vostok 1 in 1961, as well as many uncrewed launches, and is the only launch pad at Baikonur capable to handling the FG rocket which carries the Soyuzes. Initial estimates are

that repairs will take several months, if RKA even has the funding to make them. In the meantime, at least two Progress spacecraft, which is the uncrewed cargo version of Soyuz, launches will be delayed, for how long, no one knows.

NASA has long worried that the Baikonur infrastructure, which was built in the mid-1950s, is antiquated and falling apart; RKA, though, simply does not have the money for upgrading and modernizing the facilities. RKA has been counting on a new space launch center in southeastern Siberia; it is now operational, but financial concerns have limited its usage. A possibility is the European Space Agency's French Guiana Space Center, which has a launch pad for Soyuz-type rockets and has launched several of them for uncrewed commercial flights over the years, but that, too, would cost RKA millions of extra rubles. So, missions from Baikonur to ISS may be delayed up to a year and possibly longer.

The Other Einstein and The Controversy Over Relativity

In 2016, the author Marie Benedict wrote and published *The Other Einstein*, a fictionalized account of the life of Meliva Maric, Albert Einstein's first wife. One of the main premises in the story is that Meliva played a prominent role in her husband's formulation of the Theory of Relativity, to the point that she deserved as much credit for it as he did. The author acknowledges that there is no conclusive evidence that she played a major role in his research, but many people believe, due to the book and other sources, that she was denied her rightful credit for Relativity. Right-Einstein and Meliva c. 1910

Meliva Maric was born into a wealthy family in what is today Serbia in 1875, and, after primary and secondary schools, attended the Zurich Polytechnic Academy in Switzerland starting in 1896, focusing on mathematics and physics. She also attended the University of Heidelberg for a year. At Zurich, she met young Albert Einstein, who was also majoring in math and physics. They commenced a relationship which lasted for several years and included a daughter who was born in 1902 and died a year later, before they finally married in late1903. They ended up having two more children, both boys, one born in 1904, the other in 1910. They divorced in 1919 after a stormy marriage and six year separation(he left her to marry his cousin Else Lillenthal, who died in 1936).

Science historians consider Meliva exceptionally bright as a mathematician and physicist, even though she never finished her doctoral studies at the Polytechnic due to her pregnancy in 1901. Einstein did, but could not find an academic job right away and took a position in the Swiss Patent Office after he graduated. However, his notebooks say he began working on the idea of Relativity as early as 1899, when he was still at the Polytechnic. Some claim that Meliva collaborated with him from the beginning when they were both students; others give evidence that she was only vaguely aware of his work. Letters written by him from that time distinguish "our work" from "my work," my work being Relativity and also the Photoelectric Effect, two of the four papers from his "Miracle Year" of 1905. Nevertheless, many of Meliva's supporters believe she did as much of the work on Relativity as he did. When the controversy over *The Other Einstein* surfaced in 2017, science historians went back and carefully examined all available evidence of Meliva's contributions and eventually concluded that she proofread and edited his papers and corrected a few of his mathematics errors, but he did probably 95% of the research and work. Meliva, they agree,

was a gifted mathematician and scientist, but Albert was well above her in terms of sheer intellectual brilliance.*

One of the conditions for Albert's and Meliva's divorce was that he promised he would give her his Nobel Prize money if he won it, and he did so after being awarded the Physics Prize(but not for Relativity. He won it for the Photoelectric Effect) in 1922. By then, she had moved back to Zurich from Berlin, where he had become a professor at the University of Berlin in 1913. She lived in Zurich until her death in 1948. Her and Albert's younger son Eduard was diagnosed with schizophrenia in 1930 and lived in a mental institution until his death in 1965. Their older son Hans Albert was a well-known engineer who eventually became a professor at U.C. Berkeley. He died in 1973. His son Bernhard, Einstein's only surviving grandchild, was a physicist like his grandfather. He died in 2008.

***Medical experts now strongly believe that Einstein had Asperger's Syndrome, a type of autism that is distinguished by high intellectual ability but limited social skills. Einstein seems to fit this description, at least as a young man; he was often cold, indifferent, and abusive to Meliva and their sons, and these were factors in their separation and divorce. But people who knew him well say that as he grew older he mellowed a great deal and could be not only friendly but also charming and witty. One of his best-known sayings is "Gravity cannot be held responsible for people falling in love."**

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

The Innsbruck Observatory

Although Innsbruck, Austria, is better known as a major Alpine ski area and the site of two Winter Olympics games(1964 and 1972), it has a long-standing history as an astronomical center as well. The Innsbruck Observatory, established in 1902 and built in 1904, is currently owned and operated by the Astrophysics Institute at the University of Innsbruck.

The observatory had its beginnings in 1892, when Eduard von Haerdtl was appointed to the chair of astronomy at the university. However, he had no equipment, and when Egon von Oppolzer took his place in 1902, he decided that the town needed a formal observatory and began building one on the grounds of his estate, a few miles from the university, with his own money. He paid for the building and much of the equipment, while the Austrian Academy of Sciences financed the actual telescope, a .4m reflector. Von Oppolzer died suddenly in 1907, and the Austrian government bought the observatory from his heirs and made it part of the university. In 1986, the observatory was moved and is now on the grounds of the university itself, while the old site is a museum.

Currently, the observatory has two operational telescopes. One is a .15m Zeiss-Coude refractor, which is used for both research and public outreach. The other is a .6m Ritchey-Chretien reflector, which is used exclusively for scientific research by the professors and students. The original Zeiss .4m reflector was used from 1906 to 1973 and is now on display in the observatory's museum. The observatory is known for its variable and binary star studies.

CVA 2026 Calendar

Monthly meetings at Round Table Pizza-First and Bullard in Fresno-General meetings begin 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