Join CVA Events in July and August!

THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno July-August 2025

A Special Visual Treat at CVA's Spring Star-B-Que

Attendees at the Spring Star-B-Que on May 24 at Eastman Lake were able to witness the reentry of Space-X's Dragon cargo spacecraft from ISS as it passed through the atmosphere prior to splashdown off the coast of Southern California. A special touch to a great night of food and stargazing.

In this issue-

Profiles in Astronomy-Hannes Alfven

Space Age Archeology-Explorer 1

Star Stories-Kochab

The Astronauts who Never Were

M51, the Whirlpool Galaxy

Isaacman Dropped as NASA Chief Administrator

The Felix Aguilar Observatory in Argentina

CVA Events Over the Past Two Months

CVA Calendar for July and August

RIP Long-time CVA member Dave Dutton

Central Valley Astronomers

Web address
www.cvafresno.org

Officers and Board- 2025

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*

He can be contacted at 559-276-8753 or at lanpar362@gmail.com

The CVA Calendar:

July 7-Public starwatch at Riverpark

July 19-Public starwatch at Millerton Lake

July 26-CVA starwatch at Big Stump

July 31-CVA starwatch event at Kings River Land Trust

August 1-Public starwatch at Riverpark

August 2-CVA annual board meeting via Zoom

August 16-Public starwatch at Millerton Lake

August 22-24-CVA starwatch at Courtright Reservoir

August 23-CVA starwatch at Big Stump

Remember-no monthly meetings in July and August-
Next monthly meeting September 12 at Round Table Pizza

Number of exoplanets found as of June 2025

5,926*

How many more are out there?

Tens of thousands? Hundreds of thousands?

Maybe millions?

***From NASA's Exoplanet Exploration Site**

Astronomy (very bad) Joke

How do planets keep their pants up? With asteroid belts-

From-funnyjokeshub.com

The President's Message

By Hubert Cecotti

After the Galaxy season in Spring, it is the Globular Cluster and Nebulae season, with all the Globular clusters that can be observed in the region of Sagittarius, Scorpio, and Ophiuchus.

Ophiuchus, the Serpent Bearer, hosts several prominent globular clusters, making it a prosperous region for deep-sky observation. Among the most striking is Messier 10, a compact and bright cluster with a dense core, located about 14,000 light-years away. Nearby, Messier 12 presents a looser, more diffuse structure, offering a contrasting view with its sparser stars. Messier 14 is slightly fainter but notable for its size and the discovery of a nova within it. Further south lies Messier 107, a relatively faint and less densely packed cluster, yet still a rewarding target. Less famous but equally interesting is NGC 6388, which stands out for its unusual brightness and a core possibly harboring an intermediate-mass black hole. These clusters, framed within the Milky Way's bulge, reveal the ancient stellar populations that populate the galaxy's halo. Ophiuchus, though often overshadowed by more famous constellations, rewards patient observers with some of the finest globular clusters in the summer sky.

Among the locations that are used by CVA astronomers, Courtright Reservoir and Big Meadows offer great views towards the south and regions of the sky that cannot be observed from Big Stump as the trees can hide some substantial portions of the sky. For instance, M83 can be a challenging object from Big Stump. M83 (also known as the Southern Pinwheel Galaxy), lies in the constellation Hydra, near its border with Centaurus. It is situated in the southern sky, making it best observed from the Southern Hemisphere or low northern latitudes. This galaxy is located roughly 15 million light-years from Earth and appears face-on, revealing its grand, symmetrical spiral structure. M83 is one of the brightest and closest barred spiral galaxies. It is rich in star-forming regions and dust lanes. It sits in a relatively sparse region of the sky, away from the dense star fields of the Milky Way. Unfortunately, the target is low in the sky from Fresno.

Other challenging objects that are low on the horizon include NGC6541 and NGC6388, which are globular clusters under the tail of Scorpio. NGC 6541 is a bright, compact globular cluster located in the constellation Corona Australis. It lies about 22,000 light-years from Earth and is estimated to be over 13 billion years old, making it one of the oldest known clusters. With a dense core and a rich population of stars, it appears slightly bluish due to its abundance of hot, metal-poor stars. I was able to observe these objects with the Obsession UC 18 from Big Meadow, they are great Globular Clusters to try. They are probably not the best targets to try as the telescope was almost horizontal.

The last star party took place at the Big Stump parking lot on Saturday, June 28, 2025. Despite the increase light pollution at Big Stump and all over the valley, it was a lovely night with great views of the night sky, revisiting the classic target of the season: M13, M57 early the evening before it was too high in the sky, catching M81/82 before it was too low in the sky, checking M51 high in the sky in all its glory, before observing the objects of the season such as M27 and its nearby globular cluster M71 in Sagitta. Other key targets included M8, the lagoon, and the close trifid nebula. The open cluster in M8 is a naked eye object at Big Stump, so are M7, M6, and the Sagittarius star cloud. Not far, M17 and M16, in particular with an Oiii filter are great targets. While keeping the Oiii filter, it was worth checking the Crescent Nebula (NGC6888), easily spotted in a lozenge of bright stars in Cygnus, close to Sadr. The North America (NGC7000) is also a large nebula that benefits from a filter (UHC or Oiii); it is easy to get lost in this large nebula: is it the nebula? Is it the bright background? The dark nebula corresponding to the Gulf of Mexico (LDN 935) provides a starting point for navigating the region. Once Cygnus was high enough, it was possible to observe the Veil Nebula, starting from the giant star 52 Cygni with the Western Veil (NGC6960) continuing on the side with Pickering's triangle, then going to two patches corresponding to NGC6979 and NGC6974, before arriving to the Eastern Veil with NGC6992 and its thicker part NGC6995.

The last party was a success. It was great to share views. Visual observers show what they have in the eyepiece, while astrophotographers and electronic-assisted astronomy enthusiasts share what they have on their computer screen, tablet, or phone. It is a great family-friendly experience where CVA members and visitors can view targets from different vantage points (visual or screen) using various instruments. It is worth noting that an increasing number of club members are now using all-in-one smart telescopes (e.g., ZWO SeeStar 50, Celestron Origin) to capture images. Light pollution is increasing, but technology keeps us connected with the wonder of the night sky.

Clear skies-
Hubert

Images of the Millerton Lake(June 21) and Kerman High School (June 24)star outings by Hubert

More Images of CVA Activities in May and June

Spring Star-B-Que at Eastman Lake May 24

Riverpark Public Starwatch June 6

More images of Millerton Lake June 21

Profiles in Astronomy

Hannes Alfven 1908-1995

Alfven was born and raised in Norrkoping, Sweden, and after public schools, attended Uppsala University, where he earned undergraduate and graduate degrees in engineering. Afterwards, he taught physics at Uppsala and later at the Royal Institute of Technology in Stockholm. In the 1950s, he came to the U.S. and taught, first, at the University of Maryland as a Fulbright Scholar, then at the University of California-San Diego, and later at the University of Southern California. After retiring in 1991, he returned to Sweden, where he lived until his death.

An electrical engineer by training, Alfven was particularly interested in magnetic and plasma physics and applied them to large-scale astronomical events, such as auroras, solar storms, and even the structure of the Milky Way as they related to magnetism. He also made extensive studies of the Van Allen Belts and their relationship to magnetic fields in space. His theories about magnetic fields rather than gravity influencing the universe caused many other scientists to shun him, and he sometimes had trouble getting his papers published. Nevertheless, in 1970, he was awarded the Nobel Prize in Physics for his work in what he called magnetohydrodynamics(MHD), now called Alfven Waves,, which attempts to explain the behavior of magnetic and related plasma fields. Alfven's ideas are still controversial today, and many scientists disagree with them.

In addition to the Nobel Prize, Alfvern was awarded many other honors, including the Gold Medal of the Royal Astronomical Society, the Lomonsov Medal from the Russian Academy of Sciences, and the Bowie Medal from the American Geophysical Union. The European Physical Society annually awards a prize in his name, and an asteroid is named after him.

Issacman Withdrawn as NASA head

On May 31, only a few days before he was scheduled to be be approved by the Seante as NSAS chief administrator, the White house withdrew Jerod Isaacman's name from the position. Although it was widely believe that he would have easily won confirmation, he apparently came into conflict with President Trump and his plans for the space agency. Sources say he conflicted with Trump and Elon Musk over priorities concerning the Artemis Moon landing program. It is also believed that Trump became upset that at times in the past Isaacman gave donations to Democratic candidates for various offices, although he has not done so for the past few years. When notified, Isaacman said he was "honored" to be nominated and will continue to work with Trump, Musk, and the NASA to further the country's space program efforts. He did not say if he would continue with the Polaris missions; at the time of his nomination, four were planned and one had already taken place, in September 2024. As of this writing, a new NASA chief administrator nominee had has not been announced.

Star Stories

Kochab

Kochab, also known as beta Ursa Minoris, is the second brightest star in the Little Dipper after Polaris. It is classified as a K4 red giant, with a diameter 44 times that of our Sun, but its mass is only 1.3 times the Sun. The latest measurements show it to be 131 light years from Earth; its apparent magnitude is 2.08 and its absolute magnitude is -.83. Kochab is not known to have any companion stars, but it does have a planet with an estimated mass of 6.1 times that of Jupiter orbiting it.

Kochab has the distinction of being one of the "pole stars" before Polaris moved into that position due to Earth's axial precession. It is known that the ancient Egyptians used both it and Mizar to align the Great Pyramid of Giza while it was being built around 2500 BC. Later, around 1700 BC, Kochab and Perkad were used by ancient civilizations as references to the celestial north pole, although they came only within about seven degrees of it. This lasted until 300 AD, when Polaris moved closer to the pole than they did.

Scholars are divided as to where the name Kochab originated. It is believed to have come from either Arabic or Hebrew, and means "planet" in both languages. The Chinese called the star *Bai Ji Er,* the "Second Star of the North Pole."

Galaxy in the Eyepiece

M51

M51, commonly called the Whirlpool Galaxy, has been a familiar object to astronomers for over 200 years. Along with its companion galaxy NGC 5195, sometimes referred to as M51-b, it was found in 1773 by Charles Messier, being the first one found with a distinctly spiral shape, due to its face-on appearance relative to Earth. Lord Rosse, the noted English astronomer, made very precise drawings of M51 in the 1840s and 50s, and since then it has served as a model for other spiral galaxies. In terms of specs, it is classified as an SAs spiral (some astronomers classify it as a peculiar galaxy due to NGC 5195), is 31 million light years from Earth, has an apparent magnitude of 8.4, and, at 76,000 light years in diameter, is slightly smaller than the Milky Way. Although it is often associated with the Big Dipper, it is actually in the constellation Canes Venetici.

Even though it has been extensively studied in the past, M51 is still of interest to scientists for many reasons. One is its peculiar interaction with 5195, which is still not completely understood. Another is that it is known to have tidal action, "plumes" coming out of the core, and believed to be caused by 5195. Still another is the fact that it has produced four supernovas in the past twenty years. The most recent discovery comes from the Chandra X-Ray Telescope, which found evidence of an exoplanet, designated M51-ULS-1b, in 2020. This is the first exoplanet found in a galaxy outside the Milky Way.

What's New In Space

The Astronauts who Never Were

Most people who are familiar with the early space program know about the 1960s astronauts, such as John Glenn, Frank Borman, Neil Armstrong, Edwin Aldrin, Harrison Schmitt, and so on. But how many know that John Bull was an astronaut? Or Ted Freeman and Clifton Williams? How about Duane Graveline, John Llewelyn, and Brian O'Leary? They were all astronauts as well; at least they were chosen to be NASA astronauts but never went into space. Here's who they are (or were), and what happened to them.

The first group of astronauts, chosen in 1959, became known as the "Sacred Seven." They are all familiar names, John Glenn, Alan Shepard, Gus Grissom, Gordon Cooper, Scott Carpenter, Wally Schirra, and Deke Slayton. Of them, six flew the Mercury missions. Slayton was originally scheduled to fly MA-7, the fourth Mercury flight, in a capsule he designated Delta 7. But he was grounded due to a heart condition, and Scott Carpenter took his place. Slayton became the director of the astronaut corps, and, after almost ten years, was finally given medical clearance. In 1971, he was assigned to be the command module pilot for Apollo 18, but Apollo 17 was the last moon mission, and 18 was cancelled. He was then assigned to the Apollo-Soyuz Test Project mission, which was launched in 1975, for his only trip into space. He then became director of the Space Shuttle program; after the shuttle became operational in 1983, he left NASA and went into private industry. He died in 1998.

The second group of astronauts, chosen in June 1962, was known as the "Next Nine." It included Neil Armstrong, Frank Borman, Jim Lovell, Ed White, and Tom Stafford, among others. But one of the nine was Eliot See, a former Navy pilot who tested aircraft for General Electric. He was originally assigned to be Armstrong's pilot for Gemini 8 but was replaced by David Scott and made the commander of Gemini 9 along with group three pilot Charles Bassett. On February 28, 1966, See and Bassett flew to St. Louis, where the McDonald-Douglas facility there was building the Gemini spacecraft. It was a cold and foggy day, See apparently misjudged the runway, the T-38 jet came in too low and, ironically, crashed into the building where the Geminis were being built. Both men were killed on impact. (editor's note-I was living in St. Louis at the time and remember the news flashes and front-page stories for the next day or two).

The third group of astronauts, chosen in October 1963, should probably be known as the "Ill-fated Fourteen." Of them, only eleven eventually flew. Among the fourteen were David Scott, Edwin Aldrin, Michael Collins, Donn Eisele, and William Anders. Another, though, was Theodore Freeman, a Navy pilot who was killed in a plane crash about a year after being chosen. Then Roger Chaffee died in the Apollo 1 fire in January 1967. Only a few months later, Clifton Williams, a Marine Corps pilot, also died in a T-38 jet crash before being assigned to a space mission.

The fourth group of astronauts, chosen in 1965, was distinctly different from the previous groups of pilots. All six were physicians or scientists; as such, they were called "The Scientists." The best-known was Harrison Schmidt, a geologist from the U.S. Geological Survey, who went to the moon with Apollo 17. Three others flew Skylab and early Shuttle missions. One of the six, though, was Duane Graveline, a physician, who resigned from the astronaut corps only a few months after being chosen; it was revealed that his wife had filed for divorce on the basis of infidelity. He eventually returned to his home state of Vermont and practiced medicine there. He died in 2016. The other, Curtis Michel, a physicist, left the astronaut program in 1969 and taught at Rice University for many years.

Group Five was chosen in June 1966 and was called "The Original Nineteen." As the nickname implies, nineteen pilots were chosen. However, only a few months after Group 5 was announced, one, John Bull, had to leave the program due to undisclosed medical reasons. He stayed with NASA, though, and worked at Ames Flight Center in California for many years. Another, Ed Givins, was killed in a car accident in 1969 before he was assigned to a flight. Others, like Edgar Mitchell, Stuart Roosa, Ken Mattingly, and John Swickert, flew the later Apollo moon missions and the Skylab missions. Most of them left NASA in the mid-1970s; a few, like Mattingly, stayed for the Space Shuttle Era.

NASA's Group Six was chosen only a year after Group Five but came into the space program under completely different circumstances. After the Apollo 1 fire, Congress cut NASA's budget drastically in 1967. When eleven scientists arrived at the space center, they were known as the "Excess Eleven;" Deke Slayton told them that they really weren't needed and gave them the option to quit or transfer to other NASA positions. Some of them, like Anthony England and Joseph Allen, took leaves of absence, and returned to NASA in the late 1970s. John Llewlyn and Philip Chapman, who were also the first nonborn-Americans to be accepted into the astronaut program(Llewellyn was Welsh and Chapman Australian) left NASA in 1972 and returned to teaching. Donald Holmquist, a physician, left the program in 1973. The most controversial was Brian O'Leary, an astronomer. He quit the program after a year, claiming unsafe training conditions and later wrote a book severely criticizing NASA. In 2001, he went on a TV show and suggested the Apollo moon landings might have been faked. He died in 2015 while living in South America. Seven members of Group 6 eventually flew aboard space shuttle missions. The best known is Story Musgrave, a physician, who made six shuttle flights, his final one in 1993.* With the exception of John Glenn's special flight, he was the last of the 1960s astronauts to fly in space.

NASA's Group 7 was not chosen by NASA, but consisted of seven pilots who had been involved in the Air Force's Manned Orbiting Laboratory(MOL) program, which was cancelled in 1969. When MOL ended, the group, including Robert Crippin, Richard Truly, Gordon Fullerton, and Henry Hartsfield, were transferred to NASA, even though it really didn't need or want them. All seven eventually flew on various space shuttle missions. The best-known were Crippin, who flew four shuttle flights and later became the director of the Kennedy Space Center, and Truly, who, after two shuttle flights, eventually became the first astronaut to be chief administrator of NASA.

After Group Seven, another astronaut class, Group Eight, would not be chosen until 1978: thirty-five pilots and scientists, six of them women, to fly in the then-upcoming Space Shuttle Era. Another class, Group Nine, consisting of twenty-eight pilots and scientists, including five women, would be chosen in 1980. But the pioneers, the 1960s groups, are remembered for the ones who flew, and less so, for the ones who didn't.

***After his sixth flight, Musgrave asked to be put on the schedule for a seventh mission, but was told that, at age 64, he was too old to go into space again. He left NASA shortly afterwards. Ironically, two years later, Glenn was approved for a space shuttle mission and flew in 1998 at age 77.**

Space Age Archeology
Explorer 1

Explorer 1 is well known to space program enthusiasts as the first American satellite to be put into orbit on February 1, 1958, a few months after Sputniks 1 and 2. What is less known, though is the history behind it and the satellites that immediately succeeded it.

The origins of Explorer go back to 1954, as a joint Army-Navy project to put an artificial satellite into Earth orbit during the International Geophysical Year, starting in late 1958. However, in 1955, President Eisenhower rejected the Army part of the proposal in favor of the Navy's Vanguard project, which seemed more promising at the time. At that time, the Army program, which was called Project Orbiter, was dead. However, with the launch of Sputnik 1 on October 4, 1957, Project Orbiter was quickly revived and given the name of Explorer. With the failure of Vanguard 1 on December 6, 1957, the Explorer program gained even more momentum.

Explorer 1 was designed and built at the Jet Propulsion Laboratory in Pasadena, California, which was then managed by Caltech, an outgrowth of Theodore von Karmen's rocket laboratory from the 1930s and 40s(the history of JPL is a whole story in itself and will be reviewed in a future Observer). William Pickering, the senior scientist at JPL, led the team that designed and built the satellite. James Van Allen of the University of Iowa built two Geiger cosmic-ray counters which were installed in the craft. It also carried a micrometeorite detector and thermometers to measure heat and atmospheric resistance. Completed, the satellite looked like a large bullet, was 80 inches in length , 6 inches in diameter, and weighed 31 Earth pounds. It was built and tested in less than three months, between the middle of October 1957 and January 1958. At the same time, engineers at the Army's Redstone Missile facility in Huntsville, Alabama(later NASA's Marshall Space Flight Center), led by Wernher Von Braun, designed and built a modified Jupiter-C ballistic missile, renamed Juno 1, to launch the satellite. It was essentially the rocket's fourth stage. Although there were misgivings about the hurried nature of the program, after the failure of Vanguard, the Eisenhower Administration agreed to give the Explorer-Juno project a try, and in the early morning hours of February 1, 1958, it was successfully launched from Cape Canaveral, Florida.

Explorer 1 went into a 220 by 1,500 mile highly elliptical orbit; one of its first findings and a major success was the discovery of radiation belts surrounding the Earth; these had been theorized since the late 1800s, but there was no real proof until Explorer. They were eventually named the Van Allen Belts, after James Van Allen and even today are considered the single most important finding of the International Geophysical Year. The satellite also fund that the Earth is being bombarded by a steady "drizzle" of micrometeorites and space dust. Overall, the satellite was operational for four months before its batteries died but remained in orbit for the next twelve years before it reentered the atmosphere in March 1970. Following Explorer 1's launch, four more Explorer satellites were launched in 1958, each aboard a Juno-1 rocket; two were successful and two failed before reaching orbit. The backup Explorer 1 (two identical satellites were built at JPL) is now on display in the Smithsonian's Air and Space Museum in Washington, D.C.

Right-William Pickering, James Van Allen, and Wernher von Braun holding aloft a life-size model of Explorer 1 at a press conference a few hours after its launch on February 1, 1957. To their left is a model of the Juno-1 rocket that put it into orbit.

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

Felix Aguilar Observatory

The Felix Aguilar Observatory, also known as Carlos Ulrrico Cesco Astronomical Station, or EACUC, is located in San Juan Province in Argentina, at 8,000 feet in the foothills of the Andes in the north-west part of the country. It is managed and operated by the Physical and Natural Sciences School at the San Juan National University.

The observatory's history began in the early 1950s, when Lick Observatory established a station near San Juan to survey the southern skies. In the late 1950s, it was joined by Yale, and later Columbia Universities in a joint project along with the then-University of Cuyo in San Juan. In 1965, the facility was officially named the Felix Aguilar Observatory in honor of Felix Aguilar, an astronomer and director of the La Plata Observatory for over twenty years. In 1973, in an administrative reshuffling, the University of Cuyo was split into several different institutions, the facilities in San Juan were renamed the National University of San Juan, and in 1990, the observatory itself was renamed the Carlos Uricco Cesco Astronomical Station, after Carlos Uricco Cesco, a well-known Argentinian astronomer who discovered several minor planets and asteroids. Many scientists in South America, however, still refer to it by its original name, the Felix Aguilar Observatory.

Currently, the observatory has five telescopes, which are used by the professors and students at the university. The largest is a .8m(36") reflector telescope; it also has a .5m(20 inch) double astrograph, along with two solar telescopes and a transit meridian telescope. Following the tradition of its namesake, the observatory's strength is in minor planets and asteroids and has discovered several of them, along with solar studies.

Felix Aguilar 1884-1943

The dome for the 36" at the Observatory

The 36" reflector telescope

A Central Valley Astronomers Tribute

Just as this issue was being finished up, The Observer received word that Dave Dutton, a long-time CVA member and contributor, passed away . He is believed to have been 83 years old. His wife Bonnie, who was also active in CVA, died several years ago. Both were professors at Fresno State. Our sympathies to his family, and the hope that he is now resting in peace among the stars that he liked so much.

A Play Review

***Silent Sky* by Laura Gunderson**

On June 22, Aileen and I attended the Second Space Theater in the Tower District to see the play *Silent Sky*, based(very loosely) on the life of Henrietta Leavitt, who discovered and formulated the Period-Luminosity correlation of the Cepheid Variables in the early 1900s at the Harvard Observatory, directed by the autocratic William Pickering. Levitt was one of what was called "Pickering's Harem," a group of female astronomers and mathematicians led by his assistant, the imperious Williamina Fleming. I will say that Fresno is fortunate to have a community theater of high caliber, and, despite the many inaccuracies in the play, gave a performance worthy of Leavitt's accomplishment.

***Silent Sky*, written by Lauren Gunderson and first performed in 2010, takes a number of liberties with Leavitt's life. For one thing, it portrays her as being born and growing up in Wisconsin, when, with the exception of two years at Oberlin College in Ohio, she lived her entire life in the Boston area. The play also gives her a sister as an emotional foil, as well as giving her a romantic interest in the form of one of Pickering's male aides. However, in real life, she had no sister or romantic love while at Harvard; in fact, she never married. In addition, Annie Jump Cannon, who developed the stellar classification system that we use today, is depicted as the supervisor of the women's corps, while Fleming is simply one of the "Harem."**

Nevertheless, the play accurately depicts Leavitt's great achievement: her years of painstakingly studying the Cepheid Variables and eventually discovering that they revealed a pattern. Their variability period is directly related to their light output. Having found this, Leavitt realized, the distance to any Cephid Variable in the universe could be found using the absolute magnitude formula. Towards the end of the play, Leavitt mentions that Ejner Herzsprung used her period-luminosity correlation to find distances far across the Milky Way, and in the 1920s, Edwin Hubble used it to find Cephid Variables in the Andromeda "Nebula," and calculate them to be far beyond our home galaxy. Unfortunately, though, Leavitt did not live to see that; never in good health, she died from stomach cancer in 1921 at age 53. In 1925, the Nobel Committee, not realizing she had already passed, recommended her for the physics prize, then had to rescind it. Perhaps it should have made an exception for the otherwise little-known woman who opened up the universe. The title *Silent Sky* ostensibly refers to Leavitt's deafness, but also as a metaphor of the deafness of the world to her insight for so many years. We saw Second Space's last performance of *Silent Sky*, but if it ever comes back, see it, despite its flaws, for astronomical history and the perseverance of the spirit, if nothing else.

Larry Parmeter-Observer editor

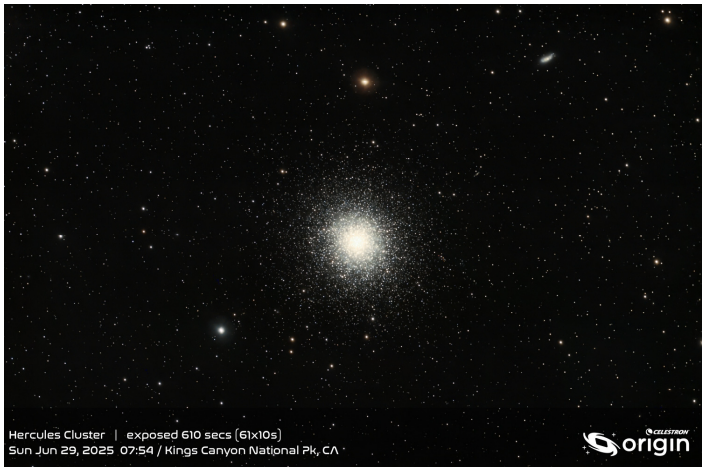
Image above right-Leavitt in 1919, a few years before her death

Some great astro-images by John LeFay

Taken at Big Stump June 28, 2025

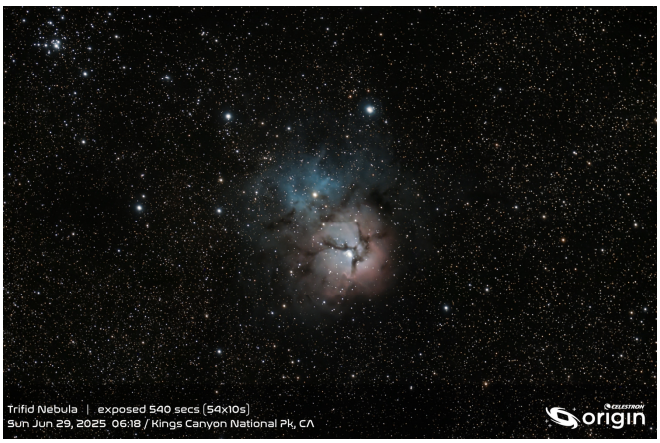
M17-the Omega, or Swan, Nebula

M27-the Dumbbell Nebula

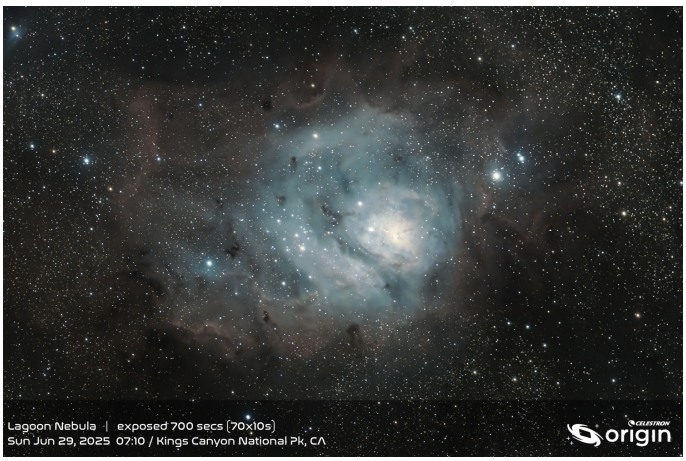


M13-the great globular in Hercules

M104-the Sombrero Galaxy



M20-the Trifid Nebula



M8-the Lagoon Nebula