To all CVA Members-Summer

Starwatching is here!

THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno September-October 2024

Starliner Crew to Return via Space-X Crew Dragon-NASA

On August 24, NASA chief administrator Bill Nelson announced that the Starliner CFT-1 crew of Butch Wilmore and Suni Williams will return to Earth on Crew Dragon C-9, which is scheduled to be launched on September 24. C-9 will launch with two crewmembers, Nicholas Hague and Alexander Gurbonov, instead of four, and will carry two extra spacesuits for Wilmore and Williams(the two other C-9 crewmembers, Zena Cardman and Stephanie Wilson, will be reassigned to a future mission). As such, they will stay aboard the space station for the entire C-9 mission, which is now scheduled to return to Earth in February 2025, meaning they will be on ISS for over eight months. Nelson emphasized that he talked to Boeing's new CEO, Kelly Ortberg, explaining his reasons for the change. Ortberg, he said, was disappointed, but pledged to work with NASA to remedy Starliner's problems and continue the program. The Starliner craft now docked with ISS will be reprogramed for remote operation and will attempt to return to Earth uncrewed on September 6.

(This is a follow-up to the article in this month's issue)

Astronomy Quote of the Month-

The tragedy of Science-The slaying of a beautiful hypothesis by an ugly fact…

-Thomas Huxley

In this Issue-

CVA Events in September and October

September 6-Monthly meeting at Round Table Pizza, First and Bullard, begins at 7pm

September 7-Dark Sky Festival at Big Stump-Grant Grove

September 13-Public starwatch at Riverpark

September 28-Monthly starwatch at Eastman Lake

October 4-Monthly meeting at Round Table Pizza, begin at 7pm

October 11-Public starwatch at Riverpark

October 26-Monthly starwatch at Eastman Lake

Number of exoplanets found as of August 2024-

Confirmed-5,747

How many more are out there?

Tens of Thousands? Hundreds of Thousands?

Millions?

(From NASA's Exoplanet Exploration Website)

[redacted]

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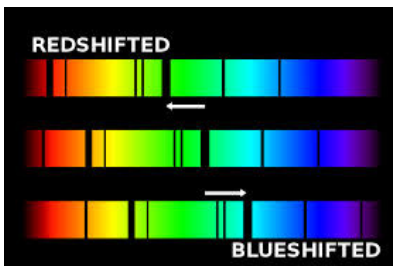
Astronomy Short

Redshift as a way to measure distances to the stars was first described by the French physicist Hippolyte Fizeau in 1848, and was first employed by English astronomer William Huggins in 1868, when he measured the velocity of a star moving away from the Earth. In 1871, optical redshift was observed by noting the shift in spectral lines. In 1912, Vesto Slipher at Lowell Observatory found that "spiral nebulae" were redshifted, indicating that they were moving away from Earth at vast distances. The term "Red-shift" itself was coined by Arthur Eddington in 1924.



CVA Board Meeting August 10

On August 10, the CVA board of directors had its annual meeting to set the next year's calendar and discuss future plans. The group started the meeting at 4:15pm. The time was due to the fact that the club had a starwatch commitment in Chowchilla later that evening. Present were Hubert Cecotti, Brian Bellis, Steve Harness, Warren Macguire, and Larry Parmeter.

The first order of business was to establish the 2025 calendar(tentative calendar is below). The club will also start looking for presenters at 2025 meetings.

The next concern brought up was the ongoing issue of Eastman Lake vs. Big Stump as a starwatch site. Brian related that, as in the past, visitors and guests show up at Eastman Lake, only to learn that no CVA member is there because they're all up at Big Stump. The club has been at Big Stump unofficially for several years and has been hesitant to invite the public because it's inside a national park, which brings up various legal issues. Steve is going to contact the park service about paperwork and documents to get official approval to invite the public at least during summer months when it's too hot to hold starwatches at Eastman.

The other main piece of business had to do with the club telescope, the 20", named "Big Lou." Right now, it's sitting in Brian Bellis's living room, and he'd like to find another place for it. The club will look into moving it to another, possibly more permanent, location.

The meeting adjourned at 5:20pm.

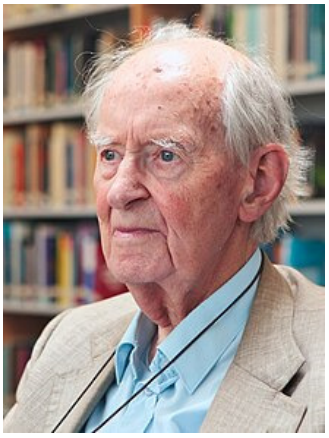
Monthly meeting dates
January 3
February 7
March 14
April 11
May 9
June 13
July-no meeting
August 9-board meeting only
September 12
October 10
November 14
December 12

Monthly starwatches
January-no starwatch
February 1-Eastman Lake
March 1-Eastman Lake,
March 29-Eastman Lake(Messier Marathon)
April 26 -Eastman Lake
May 24-Big Stump(tentative)-spring Star-b-que
June 28-Big Stump(tentative)
July 26-Big Stump(tentative)
August 23-Big Stump(tentative)
September 20-Big Stump(tentative)-fall Star-b-que
October 18-Eastman Lake
November 22-Eastman Lake
December 20-Eastman Lake

Riverpark public starwwatches
March 7
April 4
May 2
June 6
July 11
August 1
September 26
October 3

Millerton Lake public starwatches
June 21
July 19
August 16

Profiles in Astronomy



Adriaan Blaauw 1914-2010

Blaauw was born and raised in Amsterdam, the Netherlands, and, after public schools, attended the Universities of Leiden and Groningen, receiving his doctorate in astronomy at Groningen in 1946(his studies were delayed due to World War II and the German occupation). He taught at both Leiden and Groningen, worked at the Yerkes Observatory and was director of the Southern European Observatory for several years. He was also president of the International Astronomical Union from 1976 to 1979.

Blaauw's major interest was in stellar formation. He studied and formulated how stars form inside gas clouds and why some form in large clusters and others do not. He also studied stellar motion, especially stars that move very rapidly and how their motion affects other stars. He was particularly interested in rapidly moving stars in the Milky Way and how they influenced the shape and evolution of our galaxy.

Blaauw won many honors for his work, including membership in the American Academy of Arts and Sciences and the Netherlands Academy of Arts and Sciences. An asteroid is named for him, and the Blaauw Observatory at the University of Groningen bears his name.

Still another Space Age Pioneer Passes from the Scene: Ed Stone 1936-2024

Ed Stone, the legendary scientist who directed the Voyager program for fifty years, as well being involved in many other spacecraft missions, died at his home in Pasadena on June 9, 2024, at the age of 88. Like so many others who came of age during the 1960s and 70s, his death marks another milestone in the U.S.'s space history.

Sone was born and raised in Iowa, and, after high school and junior college, attended the University of Chicago, where he earned a Ph.D. in physics. He was just finishing his undergraduate studies in college in 1957 when the Soviet Union's Sputnik 1 was launched, igniting his interest in space travel. In 1965, he joined the California Institute of Technology as a physics professor, where he also worked on several spacecraft programs at the nearby Jet Propulsion Laboratory, which is managed by CalTech. By the late 1960s, he was involved in a NASA project to send (then) several spacecraft to the outer planets, the "Grand Tour" of the 1970s and 80s. Based on his involvement in earlier spacecraft missions, in 1972, he accepted the job of chief scientist for what was then called Mariner 12, which would eventually become Voyager. Within a few years, he would become director of the entire Voyager program; he called the two Voyager spacecraft the "Ambassadors to the Cosmos," and was a thrilled as anyone else when they passed the heliopause and flew into interstellar space.

In 1991, Stone was appointed director of JPL, where he oversaw many more space missions, including the Cassini-Saturn project and the Mars Pathfinder-Sojourner spacecraft. He stepped down as director in 2001, but still remained head of the Voyager program until he finally turned it over to another scientist in 2022. In the meantime, he was a project scientist on the twin Keck Telescopes in Hawaii, and more recently, was the director of the committee overseeing the 30-Meter Telescope, also in Hawaii. He won many awards for his activities, including the National Medal of Science and NASA's Distinguished Public Service medal. A minor planet, 5841 Stone, is named after him.

Space Age Archeology

Pioneer 4

Pioneer 4 was the first space probe to leave Earth orbit and go into planetary space and eventually solar orbit. It was a response to the Russians' successful Luna 1 spacecraft, which flew by the moon in January 1959 and sent back images of the far side of our only natural satellite. It was the first successful American launch to the Moon after four failures.

The Pioneer program was begun in 1957, even before Explorer 1 was launched, and the earliest Pioneers were intended only to see if launches beyond Earth orbit were feasible. The first three Pioneers, known as 0,1, and 2, were failures, not even making it to Earth orbit. Pioneer 3, launched on December 6, 1958, was intended to fly by the Moon and take images, but failed to go into lunar trajectory and reached 60,000 miles from Earth before falling back into the atmosphere. Thus, another try was made with Pioneer 4.

Pioneers 3 and 4 were essentially the same. Pioneer 4, the successful one, was cone shaped, approximately twenty-one inches long and ten inches at the base. It had an Earth weight of about fourteen pounds. It carried two instruments, a radiation detector for measuring the Van Allen Belts and lunar radiation, and an imaging camera which would be triggered by a photoelectric sensor once it got close to the Moon. Both Pioneers 3 and 4 were designed and built by Chrysler's Space Systems division(during the 1950s, 60s, and 70s, all three major auto companies: GM, Ford, and Chrysler, had spacecraft divisions which designed and built satellites and related hardware, and also played roles in the manned space program). Pioneer 4 was launched on March 3, 1959, atop a Juno II rocket, an advanced version of Wernher von Braun's Jupiter C rocket which launched Explorer I. On March 5, 1959, it flew past the Moon, but, due to a misfiring thruster, missed its trajectory by several thousand miles and did not come close enough to trigger the sensor to activate the cameras. However, the radiation detector did work, and picked up readings from the moon's surface, which were transmitted back to Earth. The mission was considered successful in the sense that the craft achieved lunar trajectory velocity and navigation goals. After passing the moon, Pioneer 4 flew into solar orbit; mission controllers were able to maintain contact with it for several more days until its batteries went dead. It is still in solar orbit today.

Star Stories

Vindemiatrix

Vindemiatrix, also known as Epsilon Virginis, is the third brightest star in the constellation Virgo. It has an apparent magnitude of +2.8 and an absolute magnitude of .37. According to the latest measurements, it is 108 light years from Earth. Its mass is 2.7 times that of the Sun, and its stellar classification is G8, which puts it in the same class as our Sun. It does not have any companion stars.

Vindemiatrix is estimated to be about 700 million years old, has burned up all of its hydrogen, and is now fusing helium into carbon. As such, it is now being called a Red Clump star. Because of this, its atmosphere has expanded greatly, and it is eleven times the size of the Sun. It is still considered a G star, however, due to its yellowish color and stable temperature, about 5,000 K.

The term Vindemiatrix comes from Greek and originally meant "grape harvestress," a traditional term for Virgo, the maiden who harvested wine grapes for Dionysus, the god of wine. To the Arabs, it was *Al Awwa*, the "Barker," and the Chinese called it *Tai Wei Zhu Yuan si,* the Fourth Star of the Left Wall of the Supreme Palace(the Chinese saw the constellation in the shape of a palace or fortress).

What's New In Space

What Exactly Is Going on with Starliner?

Ever since Boeing's Starliner CFT-1 mission was launched with two NASA astronauts, Suni Williams and Butch Wilmore, aboard, stories and rumors have been flying all over the news media. They're stranded in space! Some articles have tried to accurately report on what is going on while others are, frankly, pushing the limits of sensationalism. Admittedly, with all the other news over the last two months or so; Trump's shooting, Biden's dropping out of the presidential race, Harris's rise, it's been a strange and chaotic news season. But here's what's happening, at least according to this observer.

When Starliner was launched on June 5, there were problems that had to do with the helium used to keep the thruster lines pressurized. This was the same problem that originally kept Starliner from being launched until then. At the time, both NASA and Boeing felt the situation was not serious enough to prevent a launch. However, once in orbit, the thrusters started acting up again, causing trouble during docking with ISS. The original flight plan called for Wilmore and Williams to return to Earth after a week. However, Boeing and NASA engineers decided to keep Starliner at ISS beyond that time to completely analyze and assess the thruster problem. The week turned into two weeks, then three, and then more. The engineers now have a fairly good idea of what the problem is. The main reason Starliner is being kept at ISS is because the problems are not in the crew module but in the service module, which will be jettisoned and burned up when Starliner reenters the atmosphere. Also, there is concern that the service module thrusters are needed to align the spacecraft for reentry, and they might malfunction at a critical moment. While Boeing engineers say this will not happen, NASA is being more conservative and less sure. It's become a kind of "Who is going to blink first?" standoff. Right now, NASA, given Boeing's other problems, especially with its 737 MAX commercial jets and whistleblower testimonies as to alleged coverups, doesn't quite trust the company. In early August, it was revealed that NASA has given Space-X a grant to develop contingency plans to bring home Williams and Wilmore on a Crew Dragon mission, which means that they will probably stay aboard ISS until at least the end of September, when Crew Dragon C-9 is now scheduled to be launched, and maybe until February 2025. Boeing is insisting that this is not necessary, but if it does happen, it would be a huge blow to the Starliner program, and might end it altogether.

The above scenarios have their own complications. Bringing home Williams and Wilmore on Crew Dragon is not like getting a ride home from school. Crew Dragon can hold six people instead of the usual four, but the seating and life support systems would have to be modified. In addition, the spacesuits that Williams and Wilmore wore aboard Starliner do not work with Crew Dragon; Space-X would have to make suits for them on short notice. According to the latest (mid-August) report, NASA is exploring the idea of cutting down the C-9 crew from four to three or even two to accommodate the Starliner duo on the return trip in February. On top of all this, NASA doesn't want the Starliner program to end; it would like to have a reliable second space vehicle in case anything happens to Crew Dragon. The space agency is taking all of this into account, and the final decision will be made by Bill Nelson, the chief administrator.

In the meantime, Williams and Wilmore are taking this in stride. As veteran military pilots, they're used to having assignments changed on a moment's notice, and ending up in faraway places for long periods of time. Aboard ISS they have plenty to do, working on experiments, fixing equipment, and participating in daily space station activities. The other ISS crew members are glad to have two more pairs of hands to help with their already overloaded schedules. Uncrewed supply spacecraft have brought up extra food and clothing for them, and, in some ways, they are not unhappy that they might have to be up there for a while longer. As Williams's husband back on Earth recently commented, "That's really her second home."

Fram 2 Mission will Fly in a Polar Orbit

On August 13, Space-X announced that a privately sponsored and paid for Crew Dragon flight will be launched into a polar orbit, possibly before the end of this year. The Fram-2 mission, as it's being called, will carry an international crew lead by Chinese billionaire Chun Wang, who made his fortune in cryptocurrency. With him will be the spacecraft commander Jannicke Mikkelsen, a pilot and Arctic film director; Eric Phillips, a veteran polar explorer and head of his own exploration company; and Rabea Rogge, an expert in undersea robotics. Wang is Chinese, Mikkelsen is Norwegian; Phillips, American; and Rogge, German. The name *Fram* comes from a Norwegian scientific research ship.

The mission, which will last between five and seven days, will focus on studying both the northern and southern polar regions from space. This will be the first time a crewed spacecraft has been in a true polar orbit, 90 degrees relative to the equator. The craft will be launched from Space-X's launch pad at the Kennedy Space Center in Florida in a southern direction. The Fram 2 mission will be the fourth privately sponsored space mission using the Crew Dragon.

Spaceflight Short(Sort Of)

While surfing the internet one day, I came across a question a viewer had: If America's crewed spacecraft are launched from Cape Canaveral, Florida, then why is the Manned Spacecraft Center, the MSC, also known as the Johnson Space Center, in Houston, Texas(actually, in Clear Lake about ten miles south of Houston), almost a thousand miles away? The answer is simple. The early Mercury flights and the astronauts were trained, directed, and controlled at the Cape using post-World War II era facilities, but with the coming of the Gemini and Apollo programs, NASA realized that it needed a whole new complex for the expanding space race effort. A large urban area with academic institutions, nearby military facilities, and emerging high-tech companies were among the considerations. NASA looked at a number of sites, including Washington, D.C., Baltimore, Atlanta, New Orleans, Jacksonville(Florida), and Houston. But the group making the decision was the President's National Space Council, whose head was then Vice-President Lyndon Johnson. Johnson absolutely demanded Houston in his home state of Texas, and pretty much bullied the others on the committee to agree. Thus, the Manned Spacecraft Center, renamed the Johnson Spacecraft Center after Johnson's death, was built, starting in 1963. The first mission to be controlled from Houston was Gemini 4 in June, 1965, and every American crewed space mission since then has been managed from there(for the Crew Dragon missions, the MSC coordinates management with Space-X's spacecraft control facility in Hawthorne, California). In short, the MSC in Houston had to do with politics, period. So, instead of hearing "Atlanta…", or "Baltimore…", it's "Houston, we have a problem…"

Physics (Bad) Joke

Are you a string theorist? No, I'm a frayed knot.

From astronomy.meta.stackexchange.com

Galaxy in the Eyepiece
NGC 253

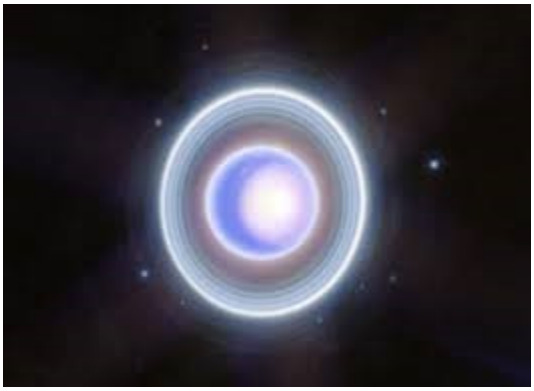
Next to the Great Galaxy in Andromeda(M31), NGC 253 is one of the best-known and most often seen galaxies in the nighttime sky. It goes by a number of different names and designations: The Sculptor Galaxy, the Silver Dollar Galaxy, and Caldwell 65, among others. As one of its names implies, it is the constellation Sculptor; is designated as an SABc galaxy; has an apparent magnitude of 8.0, making it easily viewable through a small telescope or even a pair of binoculars; is slightly larger than the Milky Way ; and, according to the latest measurements, is about eleven million light years from Earth.

NGC 253 was first seen by Caroline Herschel in 1783 and was seen again by her nephew John Herschel in 1834 while he was in South Africa at the Cape of Good Hope. It is at the center of what is known as the Sculptor Group, a cluster of about a dozen large galaxies and some smaller ones and is by far the brightest of the Group. Some observers have claimed that, on clear dark nights, they can see it with their unaided eyes, which would make it, and not the Andromeda Galaxy, the most distant object seen.

NGC 253 is of interest to astronomers because of its massive starburst formation. Scientists have identified several areas in the galaxy which are undergoing star formation. Scientists are also studying a small satellite dwarf galaxy around NGC 253, which they believe will be eventually torn apart by and incorporated into the larger galaxy's mass. The galaxy is thought to have a huge black hole, estimated at five million times the size of our Sun, at its center.

Three Great Recent Images from the James Webb Space Telescope

Saturn



Uranus with several of its moons

The Orion Nebula-M42

All images-

NASA/ESA/CSA/JWST

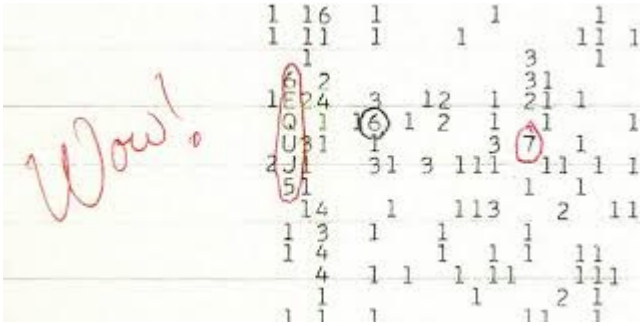
Another in a continuing series on lesser known-but still important-observatories throughout the world

The Blackett Observatory

The Blackett Observatory is on the grounds of Marlborough College in Wiltshire, England. Despite its designation as a college, it is a "public" school, which in England means it is a privately run and financed boarding school for students aged 13-18. The school itself was founded in 1843 for educating the sons of clergymen. For over a hundred years it was a boys-only school, but in 1968 started accepting girls. A number of famous people have graduated from Marlborough, including several members of Parliament and the current British cabinet; Catherine, the Princess of Wales; and Eugenie, the Dutchess of York.

The observatory was established in 1930, when Sir Basil Blackett, an alumnus of the school and the president of its alumni association, raised funding for a 10" refractor telescope, which had originally been at Oxford University and was later moved to South Africa. When it was returned to England, his donation established a facility at Marlborough to house it for the astronomy curriculum, which is part of the physics program. In 1997, the observatory was closed for restoration, which took almost five years. It reopened in 2002, and is now used for student astronomy classes, and also by a local amateur astronomy club.

Astronomers May Have Found an Explanation for the "Wow" Signal



In 1977, scientists at Ohio State University, using OSU's Big-Ear Radio Telescope, detected a signal so long and so powerful that they labeled it the "Wow" signal, and speculated that it might have come from an extra-terrestrial civilization. For years, other scientists have investigated it, without success. But now, a team of astronomers, using similar data from the Arecibo Radio Observatory in Puerto Rico, believe that the signal was caused by a clouds of hydrogen bursting out while being hit by powerful solar flares. In the now-defunct Arecibo data bases, they looked for hydrogen emission lines at 1420 megahertz, which was the same frequency as the "Wow" signal. They found several very close to 1420 mhz, but not as strong as the original signal, and all were traced back to the hydrogen bursts. They now believe the "Wow" signal was probably an extra-strong hydrogen burst, and are currently looking for evidence from other radio telescopes to confirm their hypothesis. So, a natural explanation is probably the answer, and the search for extra-terrestrial life goes on.