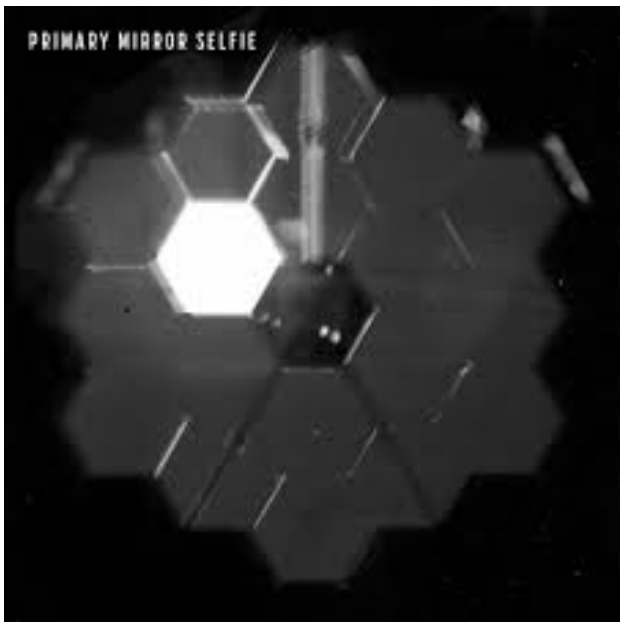
COVID restrictions easing, but see the CVA website for information

THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno March-April 2022

James Webb Telescope at L2, being Readied for Operational Program



Shortly after it reached its destination at the L2 point almost a million miles beyond Earth's orbit in late January, the James Webb Space Telescope took the above low-resolution "selfie" to show scientists and engineers on Earth that it had unfolded correctly and was undergoing its calibration and test programs. JWST will spend the next few months undergoing adjustments, taking test images, and locking on early imaging targets. According to NASA the telescope's first target will be a star known as HD 84406, in Ursa Major, which is similar to our Sun, and may have an Earth-like planet orbiting it. The first scientific operational images will be taken in late May or June and released by NASA sometime afterwards.

Image-NASA/ESA/ JWST

Quote of the month-

" Light travels faster than sound. That's why certain people appear intelligent until they speak."

-Albert Einstein

In this Issue-

Central Valley Astronomers

Web address
www.cvafresno.org

Webmaster-Scott Davis

The Editor's Message

To all CVA members-

Hopefully, we are seeing the end of the Covid Pandemic, at least to the point where it can be controlled and becomes something akin to the common cold or a mild flu. At least this is what many virus experts are now saying. In Fresno County, omicron variant cases are dropping rapidly and some activities can be resumed, abet with precautions. As such, CVA will have its first public activity in two years, at Riverpark, on March 12. Again, hopefully, it will go well, without contagion. It is, of course, completely voluntary. If the Covid threat continues to drop and the new BA.2 variant is shown to be less dangerous, more public events could come open.

In the meantime, Covid or not, spring and summer pose many opportunities for skyviewing. Starwatches will be held monthly at Eastman Lake; Big Stump near Sequoia will also be available, and the summer star parties at Courtright will also be open. In the Fall, the Dark Sky Festival is still being planned at Sequoia Nation Park and other events may be announced as well. So, it's a good time to revel in the wonder of the universe. Be safe, be cautious, by all means, but also be awed. No matter how many times we look into the sky, there's always something new and exciting that brings out the child in all of us.

Clear Skies(actually, we hope for rain in the Valley, but not on nights around the New Moon)

Larry Parmeter–CVA editor

Number of exoplanets found as of February 2022-4,905

How many more are out there?

Tens of thousands? Hundreds of thousands?

Maybe millions?

Larry Parmeter is the editor of *The Observer*

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

Profiles in Astronomy

Anton "Tom" Gehrels 1925-2011

Gehrels was born and raised in The Netherlands. During World War II, he was active in the Dutch resistance, and after the war, attended the University of Leiden, perhaps the leading center for astronomy in Europe. He then came to the United States and did graduate studies at the University of Chicago under Gerrard Kuiper. After receiving his Ph.D. in astronomy in 1956, he moved to the University of Arizona, where he remained until his death.

Gehrels specialized in moving bodies and discovered thousands of them during his lifetime. He is credited with discovering over 4,500 asteroids, including many of the now well-known Trojan Asteroids and the Apollo Asteroids as well. He also discovered over twenty comets. Most of his discoveries came from using the 48" Schmidt camera at Palomar, which proved to be exceptionally good for asteroid and comet hunting.

Gehrels also stoked controversy in the science world by claiming, in a book review, that rocket scientist Werhner von Braun was far more involved with the Nazi concentration camps during World War II than he acknowledged in public. He did, however, also say that von Braun was a great scientist and engineer and should be judged on these achievements as well as his alleged Nazi ties.

Appropriately, since he discovered so many asteroids, one of them, 1777 Gehrels, was named in his honor.

CVA Public Activities Resume-For Now

With the waning of the omicron variant and relaxing of restrictions by the state, CVA will start hosting public events beginning in March(in addition to club starwatches). Nevertheless, caution and safety are still advised, and if virus cases shoot up again, all of this could be called off on a moment's notice. The following, though, is what CVA has planned for the immediate future.

March 5-Club starwatch at Eastman Lake

March 12-Public starwatch at Riverpark shopping center

March 12-Starwatch for the Girl Scouts at Eastman Lake. Contact Steve Harness for details

March 19-CVA monthly meeting

April 2-Club Starwatch at Eastman Lake

April 9-Public starwatch at Riverpark shopping center

April 16-CVA monthly meeting

April 30-Starwatch at Raw Farms in Fresno-contact Steve Harness for details

What's New in Space

ISS to be Occupied Through 2030 and Destroyed in 2031

In January, the Biden Administration approved a spending bill which, among other things, would fund the International Space Station through 2030. Prior to it, the funding for the space station was scheduled to end after 2024. This gives NASA and its private partners building new commercial space stations some breathing space; nevertheless, work goes on for a new generation of space stations which plan to be operational by 2028(see last issue of *The Observer*). Shortly after the announcement, the European Space Agency and the Canadian Space Agency said that they would continue with the ISS partnership as well. In the meantime, the Russians are again talking about leaving the ISS program after 2024. In the summer of 2021, RKA said it would pull out, then took it back in the fall; now it's come up again.

In February 2022, NASA announced that ISS will be abandoned no later than 2030, and in February 3031 will be put into an orbit that will send it plunging into the Earth's atmosphere wherem ost of it will burn up. Those pieces that survive the reentry will fall into the "space graveyard," a spot in the South Pacific Ocean over 1,500 miles from any land, which is the final resting place of the remains of many satellites.

A Solution May Have Been Found for Space Travelers' Vision Problems

This was not so much a problem with the early short-term space flights, but once long duration space flights began, with the Skylab and Salyut missions in the 1970s, many of the astronauts and cosmonauts have had eye troubles; at times, their vision has been profoundly affected. It is reported that several years ago, one astronaut flew to ISS with 20/20 vision, approximately perfect; after a few months on the space station, his vision was almost 20/100. Many astronauts going to ISS now take with them two or three pairs of glasses of different strengths to offset vision problems they might have. This can present serious consequences for long term space travelers and it's something that NASA, RKA, and ESA have been studying for many years. Now, NASA has announced that it believes it has found the cause of the problem and the solution. Experiments aboard ISS sponsored by the University of South Carolina Medical School show that fluids which normally stay in the legs and feet on Earth gravitate to the upper body in zero-g and stay there, causing the vessels around the eye to be continually filled and consequently distorting the spherical shape of the eyeball. This is now known as Fluids Shift. If the fluids are allowed to remain there all the time, the distortion becomes permanent, causing myopia. NASA's solution is to design a kind of pressure sleeping bag which the astronauts and cosmonauts will use; while they're asleep, the bag's mechanisms will force fluids back down into the lower body and alleviate pressure on the eyeballs. REI, the camping/wilderness equipment company, will make the bags, which may be ready for use by this fall. Hopefully, this will solve an otherwise very serious problem.

Spaceflight Short-

In the 1990s, both the European Space Agency and the Japanese Space Agency had plans to build mini-space shuttles, which would carry crews and supplies to and from ISS. Both were eventually abandoned due to costs, but in 2022, Sierra Space Systems will launch its Dreamchaser minishuttle to service the space station. The first launches will be uncrewed, but a crewed version may in fact carry Japanese and European astronauts to ISS by the mid-2020s.

Axiom to Build a Movie Studio in Space

On January 25, Axiom Space Systems announced, as part of its program to add at least three-four modules on to ISS, which will eventually become a free-floating space station in the late 2020s, it will include an inflatable film studio module which can be used by movie and television companies to film episodes in space. This has come about by requests from several film studios to have on-site filming for movies pertaining to space travel. In October 2021, a Russian Soyuz brought to ISS an actress and a movie director, who spent twelve days filming episodes for a movie about a medical emergency in space. The Russian venture came about because of reports that actor Tom Cruise, a movie director, and a cameraman were planning to travel to the space station aboard a Crew Dragon to film episodes for a space movie in 2022. According to the latest reports, the movie is still on, but has been postponed until at least 2024. Anticipating this, the Axiom film studio module may be ready for their project, after which, other film companies will be allowed to use it as well. In their proposals for commercial space stations in the late 2020s, both Blue Origin and Nanoracks have said that their stations will include film studio facilities.

The Polaris Missions

On February 14, internet mogul and space explorer Jerod Isaacman, the commander of Inspiration4, announced that he and Space-X have agreed to three more private spaceflights, with him as the commander of all three. The missions will be known as Polaris, after the north star, and the first will take place as early as November 2022, Issacman said. The Polaris 1, also known as Dawn, mission's main goal will be to study the influence of the Van Allen Radiation Belts on the human body; as such, the Crew Dragon spacecraft the mission will use will orbit as high as 1,000 miles above the Earth, the farthest humans have traveled in space since the Apollo moon missions of the late 1960s and early 1970s. The first Polaris mission will also feature a spacewalk, using a modified version of the Space-X spacesuit. The pilot for the Polaris 1 mission will be Scott Poteet, a former Air Force test pilot and Isaacman's flying partner, and the other two crew members will be Sarah Gillis and Anna Menon, both Space-X engineers, which will mark the first time Space-X will have sent its own people into space. The second Polaris mission will take place "soon after" the first, but it is the third mission which caught peoples' attention. Isaacman said that Polaris-3 will use Space-X's Starship. When the Polaris-Starship mission will take place is still up in the air, since it has yet to make its first orbital flight(it may do so as early as April 2022), and Musk has already committed the giant spacecraft to Japanese billionaire Yusaku Maezawa and eight colleagues for a circumlunar flight as early as the summer of 2023. It may be that Isaacman and his crew will fly aboard the Starship before Maezawa.

Another Spaceflight Short-

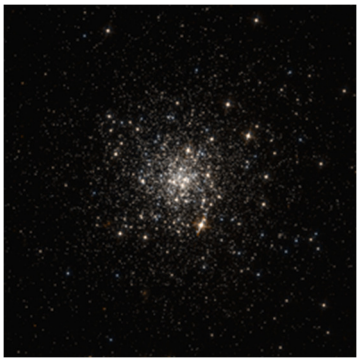
Anna Menon, who was announced on February 14 as the medical officer on Jerod Isaacman's Polaris Dawn mission in November 2022, is married to Anil Menon, an Air Force pilot and flight surgeon who was chosen to be one of NASA's astronaut candidates in the class of 2021.

Five Good and Overlooked Spring Objects

The "Other Triplet" in Leo Major- NGCs 3681, 3684, and 3686

While M65, M66, and NGC 3668 are well known, another triplet in Leo is just as beautiful but far less seen-Galaxies NGC 3686 at magnitude 10.4, 3681 at mag 12.4, and 3684 at mag 12.1 are right on the edge of observing with an 8". All three were found by William Herschel in 1784. Try to find them on a clear dark night. They're worth it. Right-NGC 3686

NGC 4147



Also found by Herschel in 1784 is NGC 4147, a globular cluster in Coma Bernices. It has an apparent magnitude of 10.7 and is approximately 60,000 light years from Earth. It is often passed by in favor of the Messier globulars, but is distinguished by its very bright nucleus. Look for it in the early spring. It was once considered an oddity by scientists because of its isolation from most of the other globulars, but is now believed to be part of the Sagittarius Tidal Stream.

NGC 5053

Another often overlooked globular is NGC 5053, also in Coma Bernices, which is less than one degree away from the far more observed M53. Like the others, 5053 was found by Herschel in 1784 and was originally catalogued as VI-7. It has an apparent magnitude of 9.9 and is about 45,000 light years from Earth. Scientists believe that it, too, is in the Sagittarius Tidal Stream and may have been stripped from the Sagittarius Dwarf Galaxy at some time in the past.

Zavijava

Zavijava is the fifth brightest star in Virgo, and goes by the designation of Beta virginis. It is a beautiful F9 star with a magnitude of 3.6 and a mass of about 1.4 times that of our Sun. It is often overlooked among all of the galaxies in the Virgo galaxy cluster, but is well worth viewing. And the name, which comes from Arabic, sounds awesome as well.

Abell 31, also Sharpness 290, also PK 219+31.1

Abell 31, found by the UCLA astronomer George Abell in 1955, is an old planetary nebula in Cancer. It is fairly close to Earth, only about 2,000 light years away, but has an apparent magnitude of 12.2, making it right on the edge of viewing on a dark night with an 8" scope. Part of this is because it has a very low surface brightness. It'll be a challenge, but see if you can find it!

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

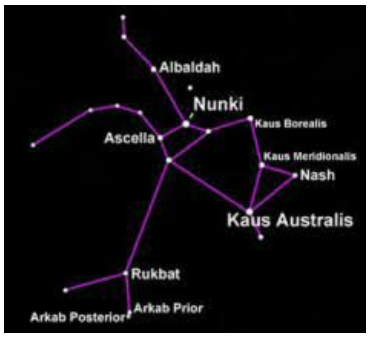
Kodiakanal Solar Observatory

The Kodiakonal Solar Observatory originated for an unusual purpose: to help predict the duration and intensity of the the monsoon rains that yearly scour India. As such, its main goal was to study the sun's heat and intensity on the Earth's surface, which would lead to determining weather patterns and better understanding of both the monsoons and droughts. Over the years, besides this main goal, it has also been involved in many other different kinds of solar research.

The British colonial government established the observatory in 1899 near the town of Kodiakanal in the Dindgul district in the state of Tamil Nadu in southern India. One of its first major discoveries was what is known as the Evershed Effect, after the British astronomer John Evershed. This phenomenon, first observed in 1909, involves the flow of plasma gas in and around sunspots. This led to a major understanding of the nature of sunspots and how they form. Over the years, additional discoveries have been made in the areas of the Earth's magnetic field, its upper atmospheric electric current, the layers of the sun and a better understanding of solar flares, and upper atmospheric research in general to better understand weather and climate patterns.

Today, the observatory uses two telescopes for its studies. A 62cm solar tunnel telescope with a hydrogen alpha filter and a CCD based spectrograph is used for solar observations, and a smaller 20cm refractor telescope is used for comets and asteroids and occasionally for public outreach events. The observatory is currently managed and financed by the Indian Institute for Astrophysics.

Star Stories-Nunki



Nunki, also known as Sigma Sagittari, is the second brightest star in the constellation Sagittarius; it is the upper left star in the handle of the asterism The Teapot. It is classified as a main sequence B2 star, with an apparent magnitude of 2.05, which can be easily seen from Earth, and an absolute magnitude of -2.2. Nunki's mass is 7.8 times that of our Sun and its physical size is 4.5 times that of the sun; the latest parallax measurements put it at 228 light years from Earth. Current research shows that it does not have any companion stars or planets.

Nunki has recently become known for two characteristics. One is that it spins very fast on its axis, almost 165 kilometers per minute, compared to our sun, which spins only about 1.9 kilometers per minute. The other is that scientists have detected x-rays being emitted from it. This may indicate that Nunki is burning hydrogen very rapidly and may live only another ten to twenty million years before turning into a white dwarf.

Scholars believe that the word Nunki comes from ancient Babylonian or Assyrian; its exact meaning is unknown but is thought to relate to an area of the sky associated with water, where the constellations Delphinus, Pisces, Aquarius, and Capricornus now are. One ancient Mesopotamian reference gives its original designation as the "Star of the Announcement of the Sea." In traditional astrology, Nunki is known as *Palagus,* "The Ocean." The Chinese called Nunki *Dou,* meaning "The Fourth Star of the Dipper," again, a reference to water or liquid. On the other hand, the Arabs called Nunki *Sadirah,* which refers to an ostrich.

From the Observer Archives-

"For Those of you who have a computer and a modem, club member Terry Boone has a BBS up and running-the number is….-The name is SOWON. Baud rate 300-2400, protocol ratings are –No Parity-8 bits-1 Stop Bit. He has an Astronomy message section and no one is using it. I have a message waiting for you there."

From the May 1989 Observer

This one caught my attention because, today, who doesn't have a personal computer with a modem? (Actually, I shouldn't be so cavalier. During the Pandemic and subsequent school closures and Zoom learning, some lower-income students didn't have computers or internet access. A 2019 survey showed that 87% of American households have at least one computer with internet service, but that other 13% is still a significant number). But in the late 1980s, not many people had home computers, much less ones that were connected to cyberspace. Until then, being a humanities person, I didn't think I needed a computer and relied on an electric typewriter that I had and used up to just a few years ago. I didn't get my own personal "computer" until about 1988 and bought it second-hand; it was a mid-1980s Commodore(I don't remember which model), essentially a video game console with a keyboard and plug-in cartridges that could do word processing and spreadsheet, along with a cassette tape player to store data, and a printer that worked roughly half the time. I used it sporadically until 1992, when I bought a "real" computer, a Compaq, that came with a 3.5" disc drive, a CD-ROM , a modem, an operating system called GeoWorks, and a much more reliable printer. Several months later, at the advice of a former student who worked for Intel, I switched to Microsoft Windows and have used Windows operated PCs ever since.

-The editor

What was your first home/personal computer?

Dan Montoya-A Commodore 64

Fred Ringwald-An Apple IIe, in 1985

Scott Davis-a Mcintoish LC2 in 1992

Steve Harness– a Texas Instruments 99

Stephan Coole-a homemade 486 XT

Lynn Kleier-an Epson in 1985

Ryan Ledak-a Hewlett-Packard in the 1980s

Richard Lowe-a Commodore 64

Robert Gaia-A Commodore 64 with a VGA monitor 5.25 disc drive, in 1987

Hubert Cecotti-A Compac Pentium 200Mhz with Windows 95, in 1997

Greg Lewis-A Commodore 64 in the 1980s, then a Mac 512 in 1989(but still has three typewriters)

Vasanth Vishwanath-A Dell, in 1996

Astronomy History

As the mystery of Dark Matter is being (slowly) unraveled, arguments have popped up as to who actually found it. History shows that Fritz Zwicky investigated and published scientific papers on the "Missing Mass" as early as 1933. Several other scientists also reported evidence of something like the Missing Mass in the 1950s and 60s, but no one took the idea seriously until Vera Rubin's announcement of Dark Matter in the late 1970s. Some scientists and women's groups say that she should have been given the Nobel Prize for her finding(however, since both Zwicky and Rubin are dead, they won't be recognized; Nobels are not given posthumously). But Zwicky's supporters say that he should be given credit. Apparently, it comes down to semantics and politics, as controversies often do.

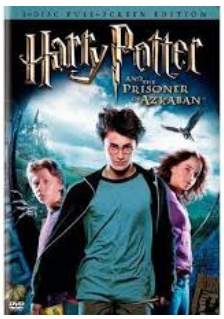
Other Astronomy and Space Shorts

On February 7, NASA announced that a contract has been given to Lockheed-Martin Space Systems of Littleton, Colorado, to build a lightweight rocket, known as MAV, for Mars Assent Vehicle, as the return vehicle for the Mars Soil Return Mission, now scheduled for launch in 2026. The mission, a joint venture between NASA and the European Space Agency, will have the MAV land in Jezero Crater, send out a rover to pick up sample containers deposited by the Perseverance Rover, and load them into the MAV, which will then blast off from the surface and rendezvous with a return vehicle, built by ESA, in Martin orbit, which will deliver them to Earth in 2029.

On February 17, astronomers at the University of Leiden in The Netherlands announced that they had found the largest galaxy yet discovered, which has been given the name of Alcyoneus, after a giant in Greek mythology. It is 16.5 million light years in diameter, and is approximately three billion light years form Earth. It is classified as a giant radio galaxy, with lobes of plasma gas shooting out from a central core which is believed to hold a black hole 400 million times the size of the Sun. And it's not even the largest black hole known.

In the wake of the Russian invasion of the Ukraine on February 24, RKA chief Dmitri Rogozin put out a statement saying that unless the U.S. relaxes sanctions on Russia, the Russians will pull out of the International Space Station program and end all technical support, including the critical issue of keeping the space station stable and in the correct orbit, which is done from the Russian side. NASA dismissed the threat, saying that space cooperation will continue no matter what happens in the Ukraine, and Elon Musk announced that if the Russians do leave ISS, Space-X will take care of the stability and orbital concerns.

Science Trivia



The third *Harry Potter* movie (*The Prisoner of Azkaban*) starts with Harry staying at the wizard inn, the Rusty Cauldron, in London. As he enters it, a customer is shown stirring coffee(magically, of course) and reading a book. What is the title of the book and who is the author?