

**COVID restrictions still in place-See the  
CVA website for information**



# THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno

May-June 2021

## **Another Spaceflight Pioneer Slips Away: Michael Collins Dies**

## **Mars Ingenuity Copter Passes its Tests with Literally Flying Colors**



The Mars Ingenuity helicopter made history by becoming the first object to fly on another planet. Its first flight, on April 23, lasted only about 30 seconds and got only about ten feet above the Martian surface, but was enough to show that it can fly in the rarified Martian atmosphere. Later flights, including one which took a panoramic image of Perservance and its landing site show it capable of performing more complex tasks. Several more flights are scheduled before Perservance moves on, leaving the copter at its position, dubbed Wright Brothers Field. The Ingenuity copter is only a technology demonstrator, but it does show that such flights are feasible, and more copters will be sent to Mars to assist rovers and probably human astronauts as well in the future. NASA has revealed that aboard Ingenuity is a small piece of fabric, about two inches square, from the wing of the original Wright Brothers Flyer of 1903.

Images from NASA

**Quote of the month-**

**"Nature offers alibis to no one..."**

**From *First Light* by Richard Preston**

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**CVA member Contributions**

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editor of *The Observer*****He can be contacted at  
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lanpar362@gmail.com****The President's Report:****Greetings fellow astronomers!**

The summer is about to be upon us. With the weather warming up, observing is about to get a bit more comfortable. And with covid hopefully coming to an end, or at least being brought under control, we will be able to get back to something resembling normal. The board is watching the state restrictions and recommendations with baited breath of being able to safely engage in our outreach operations.

Speaking of resembling normal, it has been refreshing to attend the last two star parties at Eastman Lake. There were eight astronomers at both the March and April events and it was great to see familiar faces as well as some new ones in person (some people are taller in person than they look on the computer). With the next star watch date approaching fast(May 8), I look forward to seeing club members again. Maybe it will be warm enough to head up to Big Stump. \*

Our virtual meetings continue to be well attended and the most recent one was, in my opinion, the best one yet. Not only did we have several good discussions about various topics club business, but the presentation by Larry Parmeter was second to none. If you missed it, you missed out. Make sure to attend the next one on May 22!

**Stay safe and clear skies-  
Ryan**

**\*But first we need to check if it's open. Last fall the parking lot was closed and locked for renovations**

**Number of exoplanets found as of April 2021-  
4,704**

**How many more are out there?**

**Tens of thousands? Hundreds of thousands?**

**Maybe millions?**

## Profiles in Astronomy

### Norio Kaifu 1943-2019

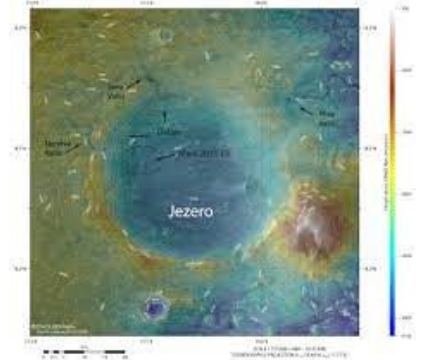
Kaifu was born and raised in Niigata, in the northwestern part of Japan, and was educated at the University of Tokyo, receiving his doctorate in astronomy in 1972. During the 1970s and early 80s, he made a name for himself as a radio astronomer, working with the Tokyo Astronomical Observatory and later with the National Astronomical Observatory of Mitaka. He eventually became associate director of the Mitaka observatory. In 1990, he led the planning group, and eventually became the driving force for the ten meter Subaru Telescope, now at Mauna Kea. He was also responsible for the establishment of the Nobeyama Radio Observatory and served as the director of the National Astronomical Observatory of Japan from 2000-to 2004. In 2012, he became the president of the International Astronomical Union, which he held until 2015.



As a radio astronomer, Kaifu developed the radio spectrometer and used it to do pioneering research in the discovery of organic molecules in Earth's upper atmosphere. He also was one of the first to show evidence that the Milky Way has a supermassive black hole at its center. In addition, he did research into star formation and as an offshoot developed methods for finding exoplanets and protoplanetary discs. The asteroid 6412 Kaifu is named in his honor.

## What's in a Name-Actually Quite a Bit

The Perseverance rover landed on Mars in February in Jezero Crater, named after a town in Bosnia in the southeastern European Balkans. Everywhere I hear on television and the internet and even on the NASA website and channel, people refer to it as Jezero (as in J-hard J, E-long A, Zero-hard Z, short-a, ro- r and long-o as in row) This is not the correct pronunciation. At the adult continuing education program that I work with at Fresno State, the supervisor is a young man who was born and raised in Croatia and speaks fluent Croatian, which is very similar to Bosnian and Serbian. According to him, the word Jezero, which means "lake," is pronounced Ye-zer-o; the J is pronounced like a Y, Zer is pronounced with a short E, and the O at the end is long, which is the proper pronunciation of the water body, the town, and the Martian crater. Americans need to improve their linguistic abilities.



## Astronomy Short-

William Herschel, who made so many contributions to science, also believed that intelligent beings lived on the Sun. Even the best sometimes get things wrong.

By the way, Herschel's primary profession was music: he made musical instruments and gave music lessons to support himself and his family. It was not until after his discovery of Uranus in 1781 that the British government awarded him a salary to do astronomy full time. Also, he was not British by birth; he was born and raised in Hanover, Germany, and immigrated to England when he was 19. His first language was always German, although he learned to speak, read, and write fluent English.



## Star Stories

### More About Porrima



Porrima, as mentioned in the March-April edition of *The Observer*, is the Gamma star in Virgo, officially known as Gamma Virginis. It is often overlooked among the literally thousands of galaxies that make up the Virgo galaxy cluster. Porrima is actually a binary star system, made up of two F stars, each about thirty-eight light years from our Sun. The main star, Gamma Virginis A, is classified as an F0V, a main sequence F0 star with an apparent magnitude of 3.65. Its companion, Gamma Virginis B, also an F0V star, is almost the same as the main star, with a slightly lower absolute magnitude of 3.56; together, the two have an

apparent magnitude of 2.7. Also, together, the Porrima system is about twice the size of the Sun, and its mass is 1.5 times that of the Sun. As in a true binary system, the two stars orbit around a common center of gravity once every 168 years. Based on studies of its magnetic field, Porrima is estimated to be about 1.4 billion years old.

The name Porrima comes from Latin and refers to one of the goddesses of prophecy in Roman mythology. To the Arabs, the star was known as *Laouiyet al Aoua*, which means, "the Angle of the Barker;" Arab astronomers saw Porrima, along with Beta Virginis, Eta Virginis, Delta Virginis, and Epsilon Virginis making up an asterism of a barking dog. Over the centuries, Porrima has also been known as Antevorta, Arich, and several other names. It also goes by a number of different catalogue designations.



## CVA Member Contributions

Two great images of the Orion Nebula, M42, and one of the Leo Triplet, by Kane Sjöberg





# What's New in Space

## Michael Collins, Pilot of Apollo 11, Dies

Michael Collins, often called the “forgotten” crew member of Apollo 11, died at his home in Washington, D.C., on April 28, 2021 at the age of 90. According to family members, he died from complications of the cancer he was diagnosed with a few years ago.

Collins was born in 1930 in Rome, Italy, where his father was an Army officer stationed at the U.S. embassy. Eventually, his father would become an Army general, as would his uncle and his older brother. After attending private schools, he went to the U.S. Military Academy at West Point but, deciding to follow his own path, joined the Air Force instead of the Army after graduation. He became a pilot, and eventually a test pilot, and also graduated from the Advanced Research Pilot's School at Edwards Air Force Base, a training ground for future astronauts run by legendary pilot Chuck Yeager. After being rejected for the 1962 astronaut class, he applied again the next year and became a member of Astronaut Group 3; one of his classmates was Edwin “Buzz” Aldrin. Collins flew his first space mission in 1966 as the pilot of Gemini 10, with John Young. He was originally assigned to the second Apollo mission, which would become Apollo 8, with Frank Borman as his commander, but had to undergo back surgery, due to a flying injury, in the summer of 1968. He was then reassigned to Neil Armstrong's crew, which would eventually become Apollo 11. As command module pilot, he stayed in the Apollo capsule while Armstrong and Aldrin walked on the moon. As a result, he was known as the “forgotten” crew member while his two colleagues shared the spotlight. Over the years, he was often asked if he had any regrets about not walking on the moon, and always replied, “None at all. I had an important job, too.” (Shortly before Apollo 11, chief astronaut Deke Slayton offered Collins the commander's seat on one of the later moon landing missions, probably Apollo 16 or 17, but he turned it down, feeling that two space flights was enough for him and his family.)

After Apollo 11, Collins left NASA and the Air Force and worked for the State Department, then in 1973 became the Director of the Air and Space Museum in Washington, D.C., which he held until 1978. Afterwards, he established an engineering consulting firm, Michael Collins and Associates, which became extremely successful. All the time, he attended astronaut reunions and showed up at Apollo 11 anniversaries along with his two fellow space travelers. Armstrong died in 2012, and with Collins' death Aldrin, at age 89, is the last of the Apollo 11 crew.



## Former Senator and Astronaut Bill Nelson Nominated to Be New NASA Chief

On March 19, President Biden nominated Bill Nelson, the former senator from Florida and space shuttle astronaut, to be the new chief administrator of NASA. Nelson has had a long career in politics, serving in the Florida state legislature, the U.S. House of Representatives, and the U.S. Senate before being defeated in a reelection bid in 2018. In the House, he was the head of the House Space Committee, which led to him taking a space shuttle flight, STS-61C in January 1986; he

spent six days in space. Former NASA head Jim Brindenstein endorsed Nelson as a highly capable and qualified leader. Brindenstein himself, when he was nominated, was also on the House Space Committee, and was criticized for being too close to politics, but apparently Biden has no such qualms about Nelson.

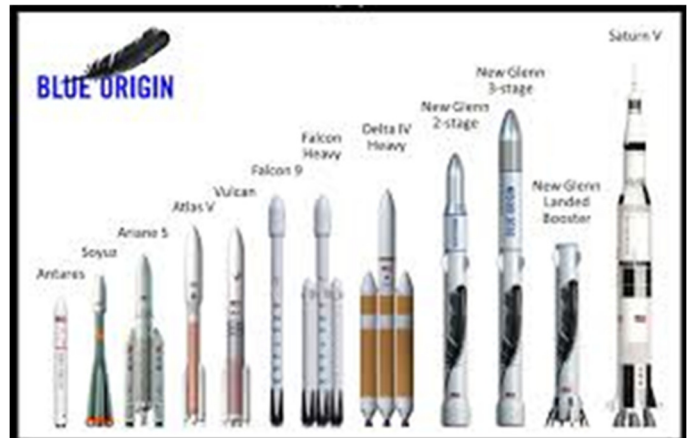


## Blue Origin's New Glenn Almost Ready; SLS Under Fire

Jeff Bezos' Blue Origin's New Glenn heavy launch rocket has been under development since 2013, is now expected to make its first test launch in early 2022, and be operational by 2023. The New Glenn rocket has over four million pounds of thrust in its main engines and will be able to put over 100,000 pounds into low Earth orbit. Like the Space X Falcon, its first stage booster will be reusable.

With the addition of the New Glenn, the U.S. will have a number of heavy lift boosters to use during the 2020s. This is fortunate, since this decade will probably see several privately built and owned space stations in Earth orbit, trips to the moon by both NASA and commercial companies, and preparations for eventual journeys to Mars. (Some space experts are asking, with the new generation of commercial heavy lift boosters like New Glenn, Falcon Heavy, Vulcan, and Delta IV Heavy, why does NASA even need the SLS? The answer is very straightforward. Richard Shelby, the senator from Alabama who, until recently was the head of the Senate Space Committee, essentially blackmailed NASA into using the SLS, even though it's four years behind schedule and almost \$10 billion over budget, because it's being built in his home state. It's called bringing home the pork. However, things may change soon. Shelby, who is 82, and is no longer the Space Committee chairman, has announced that he'll retire at the end of his term in 2022.).

An update to this article- On March 14, NASA announced that, at the request of the Biden Administration, it is conducting a full review of the SLS program to determine whether or not the rocket is still economically feasible, in light of the fact that commercial heavy lift boosters cost one-tenth of it. Boeing, the prime contractor for the SLS, will be heavily scrutinized for the delays and cost overruns.



## Space-X Awarded Contract for Lunar Lander

On April 16, NASA announced that Elon Musk's Space-X had been awarded the contract to build the lander for the Artemis moon landing missions. It was another major victory for Space-X, which is already transporting astronauts to and from ISS via its Crew Dragon spacecraft. It was also a blow to Jeff Bezos' Blue Moon lander, which was one of the three finalists, also with Dynetics of Huntsville, Alabama, for the moon lander competition. Space-X's lunar lander proposal is a modified version of the Starship, which has been undergoing testing at the company's launch facility in Texas. All the flight tests so far have been failures, but Space-X's reputation as an upstart "Can Do" operation which stunned the aerospace world with the Crew Dragon spacecraft has impressed NASA. The Trump Administration originally gave NASA a goal to land Americans on the moon by the end of 2024, but the Biden Administration is now thinking of 2025 or 2026 as a more realistic target date.

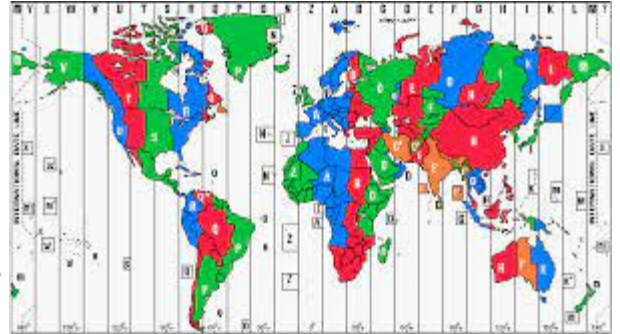


## Spaceflight Short-

India's crewed spacecraft, which will make its first flight with a crew of three in early 2022, is named *Ganganyaan*, which means "Sky Vehicle" in Sanskrit.

## Astronomy and Navigation-Part 2

In the 1800s, another innovation, the railroad, led to further advances in timekeeping. Before the railroad, most people rarely traveled more than fifty miles from their place of birth. Their local time was based on the zenith of the sun in their hometown and that was good enough. But the advent of the railroad meant that people could travel as much as 400 miles in a single day. Hundreds of local times, each slightly different, would not do; the railroads needed regular and accurate timekeeping for their schedules. So, in 1884, the International Timekeeping Conference met in Washington, D.C. to hash out a standardized time system for the entire world. It eventually agreed to divide the world into twenty-four time zones, each about fifteen degrees of longitude. A starting point was needed, and the Royal Observatory at Greenwich, England, just outside of London, was chosen as the Prime Meridian, longitude line zero degrees (The French were furious at this decision. They considered the Paris Meridian, the "Rose Line," which started at the Paris Observatory, to be the world's original prime meridian-and there is some evidence to show they were right-and refused to sign the ITC treaty until 1911). The Prime Meridian at Greenwich would be the world's official time standard, known as GMT, or Greenwich Mean Time (for example, Fresno is in the Pacific Standard Time zone, known as GMT-8, that is eight time zones west of the Prime Meridian. On the other side, the time zone for central Europe, which includes Berlin, is GMT+2, two time zones east of GMT. New York City is GMT-5, and so on). This twenty-four zone time system is still in effect today, and almost all the world's times are based on it, beginning at Greenwich.



These systems of both navigation and timekeeping lasted up until the 1960s. With the advent of the Space Age, new technology took the place of old technology. Greenwich is still the beginning of the world's time zones, but it no longer provides the master clock for the globe. That is now at the U.S. Naval Observatory in Washington, D.C. An atomic clock there counts atoms of cesium, which are known to decay at a very precise and regular rate. As such, the master atomic clock is accurate to .00000000000000001 of a second. This doesn't mean much to the average person, but is crucial to scientists and engineers, who often need very precise time measurements. Likewise, sextants and compasses are almost never used anymore for determining longitude and latitude. Since the late 1960s, navigation satellites in orbit, which also use atomic clocks, have provided extremely accurate locations for both military and civilian uses. These satellites have grown increasingly sophisticated over the years. The most recent, the Global Positioning System, or GPS, was begun by the U.S. Air Force in the 1980s for military purposes and was eventually made available for civilian use as well. The GPS system consists of thirty-two navigation satellites in various Earth orbits; a device on the ground contacts three or more of them and triangulates their signals to give a location within a couple of feet. The GPS system has been available to the public since the mid-1990s and is updated with new satellites every four or five years. It is now used throughout the world (Russia also has a satellite navigation system similar to GPS, but it is considered inferior and imprecise by Western experts, and is rarely used outside its home country).



### The three major timekeeping-calendar systems

**The Sidereal Calendar**-this is based on the movement of the stars and has been around for literally thousands of years. It is still widely used today by astronomers and at most observatories.

**The Lunar Calendar**-This is a calendar-year timekeeping system based on the Moon phases, which go



through a complete cycle every 29.25 days. The lunar calendar is still used today by many cultures, including the Hebrews, the Arabs, and the Chinese.

**The Solar Calendar**-this system is used by much of the world today and is based on the revolution of the Earth around the Sun, which takes place once every 265.24(this is why we have a leap day every four years) Earth days. It was developed in 1584 AD under the direction of Pope Gregory XIII of the Roman Catholic Church, hence called the Gregorian Calendar. It replaced the earlier Julian Calendar in Western Europe. Several Eastern European countries which are Orthodox Christian, like Russia, still use the Julian Calendar, which is eleven days behind the Gregorian Calendar. This is why, among other things, they celebrate Christmas on January 7(officially known as the Feast of the Epiphany), not December 25.

**Below-the Prime Meridian line at the Royal Observatory at Greenwich, England. Below it is an LED readout of the world's official time. I'm reflected in the glass door, taking the image.**



## More CVA Member News and Interests

George Silva has a request-He has a Meade XL85 equatorial mount and needs help in getting it set up and operating. If you can assist, contact him at [sportsterman@hotmail.com](mailto:sportsterman@hotmail.com)

Also, when I first joined CVA around 1990, Louis Mendoza transported and took care of Big Bertha, the club's 20" Dobsonian reflector. Then Steve Harness took it over and handled it for many years. Now, Steve no longer has the truck that he used to transport the big blue telescope. At the April 24 Zoom meeting, members and officers had a long discussion on what to do with it; Ryan Ledak has tentatively offered to take care of it, citing the big van that he already uses to haul around his 18" scope.

(And unfortunately, I don't have an image of Big Bertha, which I should and which is something that I'll do as soon things get back to "normal," whatever that means and whenever it occurs).

One last thing-Start thinking about the solar eclipses of 2023 and especially of 2024; they'll arrive sooner than we think.



## The Barcus Avenue Observatory

When Parmeter left the high school classroom in 2015, he decided to use some of his retirement money to buy a new telescope. For over 30 years, he used an 8" reflector made out of pine wood and plumber's pipe that he built in the living room of his apartment in Santa Clara in 1983. It served him well, but the time came to have something more advanced. Eventually, he purchased a 12" Meade XL65, computerized, GPS, everything. Great scope. But it was heavy: the scope and the horseshoe mount weighed over 50 pounds and the tripod weighed another 20 (and why can't telescope makers use lighter materials?). But he managed for a few years using a foldable two wheeled dolly. Then came 2019. First, in March, Parmeter injured his left leg during martial arts practice. Then in August, while stopping for gas, he stepped over the gas pump hose and felt a ting in his left knee, which turned into horribly painful inflammation to the point where he could barely walk. Eventually, with medication and physical therapy, he was able to get around again, but on legs too weak to pick up the Meade. So, he bought a smaller (and far lighter) 8" Meade, and started thinking of a permanent site for the 12." He staked out a corner of his backyard, found just the right metal shed on the internet: double doors, tall, lots of space inside; laid a foundation, assembled the shed over them and ran an electrical line from the house to it. He then built a three legged wheeled dolly that fit the shed just right and mounted the 12" on it. Now, whenever he wants to starwatch, he opens up the doors, rolls out the telescope, and views away. He's since put in a fold-down desk and shelves in the shed and a permanent red light provides night vision. His wife Aileen calls it The Clubhouse. The light pollution over northwest Fresno and the trees in his neighbors' yards inhibit viewing somewhat, but there's still lots to see. Life is pretty good.



### From the *Observer* Archives-

An observation which is just as true today as it was over thirty years ago-

"Half the people in Washington, D.C. are hoping to be discovered and the other half are afraid they will be."

From the June 1989 *Observer*



### Astronomy (Bad) Joke

A neutron goes into a bar and asks the bartender, "How much for a glass of beer?" The man replies, "For you, no charge."

-From Astro Bob

