

**COVID is (hopefully) waning-but CVA  
restrictions still in place**



# THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno

November-December 2021

## Scientists Find Possible Planet in Another Galaxy



On October 25, scientists at NASA announced that the Chandra X-ray Telescope had found evidence of a planet in another galaxy. The planet, designated M51-ULS-1b, was found orbiting a star with an x-ray object in M51, the Whirlpool Galaxy. M51 is approximately 28 million light years from Earth. If this holds up, it will be the first time a planet has been found outside our Milky Way. According to data, the planet is believed to be about the size of Saturn and is orbiting its central star at a distance of 1.7 billion miles from it. The planet was detected during a transit event; that is, it was passing in front of a larger more illuminated object. In this case, scientists believe that the star contained a black hole, since it was giving off vast amounts of x-rays. The find carried some luck with it, since it has been determined that the planet will not make another transit for 75 more years.

### Quote of the Month-

"I cannot believe that people become astronomers to make money or to become well respected. In so many observatories they work alone. In the freezing cold. Everywhere one finds these people studying just one star...One star! What does it mean? It means they are slightly mad." -Maarten Schmitt

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## The Editor's Report:

Dear Fellow Astronomers-

Indications are that the pandemic is slowing down, even though some experts are saying that another surge may come about. Let's hope it's the former and not the latter. Still, until things settle down enough, CVA will be honoring state regulations discouraging outdoor gatherings. So, no public starwatches for the immediate future. Bummer, I know, but it's better than being on a respirator in ICU. CVA, though, will still be having monthly meetings and club starwatches at Eastman Lake.

Lately, I've been hearing that, because of the Pandemic, climate change, political unrest, and various other factors, many people, especially young people, have turned cynical. I read the other night that a growing number of 20somethings have said they will not have children because they're so pessimistic about the future. To paraphrase Ronald Reagan's first inaugural speech, they don't know where to look. Everywhere, great and positive things are happening. Innovations in geology, paleontology, biology, physics, medicine, oceanography, genetics, and a multitude of other fields are taking place every day. CVA's area of astronomy and space sciences is leading the way. Space-X is getting ready to launch the Starship that will take humans to the Moon and Mars. Several new space stations are being planned. The James Webb Telescope will finally be launched. The Vera Rubin Telescope will see first light next year and the Nancy Roman Space Observatory is being assembled for a 2025 launch. All will revolutionize the way humanity looks at the universe, and this is only a tiny percent of the exciting endeavors that are going on.

Yes, there have been some downs over the last few years, but, despite them, extraordinary things are going on right now. Humanity is in so many ways better off than ever today and its accomplishments can only grow. So, here's to the end of the Pandemic and a bright future for everyone in 2022.

Clear skies always.

Larry Parmeter-CVA *Observer* editor

Number of exoplanets found as of October 2021-  
4,843

How many more are out there?

Tens of thousands? Hundreds of thousands?

Maybe millions?

## Profiles in Astronomy

### Joan Feynman 1927-2020

If the name Feynman sounds familiar, it is. Joan Feynman was the younger sister of the legendary Nobel physicist Richard Feynman. But Joan forged her own path, making substantial contributions to astronomy and space sciences.

Joan was born and raised in East Rockaway, New York, a town on Long Island southeast of New York City. Beside her brother, the famous biologist Stephen Jay Gould also came from East Rockaway. She was always interested in science and was encouraged by Richard to pursue a career in physics. After attending Oberlin College in Ohio, she earned masters and doctoral degrees in astrophysics at Syracuse and worked at a variety of academic positions before joining NASA at its Ames Research Center near San Jose in 1971. In 1985, she moved to the Jet Propulsion Laboratory in Pasadena where she was a senior scientist until her retirement in 2003. Even then, she continued to do research almost up until the time of her death in 2020.

Joan made solar physics her specialty; she especially fell in love with the beautiful and enigmatic auroras at about the age of ten when her brother got her out of bed to show them to her over East Rockaway (an often told story is that they snuck out of the house in the middle of the night and walked over to a nearby golf course to view the auroras). For centuries the exact cause of the auroras was a mystery, but in 1973, Feynman discovered that they were created by solar particles; i.e., the solar wind, hitting and interacting with the Earth's magnetic field. It was a major finding in solar physics and brought her renown and honors. She was also the first to realize that solar storms could affect spacecraft and also possibly influence Earth's environment. She found evidence that solar activity may have influenced climate conditions in Earth in the past and possibly continues to do so today, a thesis that is controversial in the era of climate change.

Joan Feynman won many honors for her findings and on her death, only about a year ago, was lauded for her contributions and insights. An asteroid is named for her.



## The Observer's 2021 Predictions-Some Right, Some Wrong

At the beginning of the year, your editor declared that 2021 would be a much better year than 2020, and on the cover page made predictions for major astronomical and space related events. So, here they are-

Perservance landed on Mars on February 18 and is going strong

Likewise, Tianwen 1 also made it to the Red Planet on February 10 and is still operational

However...

Boeing's Starliner is still grounded(see article later in this issue). As of this time, the second uncrewed test flight will not take place until April or May of 2022 and the first crewed mission will not be until at least September or October 2022

The Artemis 1 circumlunar uncrewed mission will now be launched in February 2022

The James Webb Space Telescope will be launched from the French Guiana Space Center on December 18, 2021. But there is controversy over its name(see article later in this issue)

# What's New In Space

## What's Going on with the Bezos-Musk Feud?

The past few months have seen an outpouring of bad blood between Jeff Bezos, the founder and head of Blue Origin and Elon Musk, the founder and head of Space Exploration Technologies, better known as Space-X. About two years ago, NASA chose three spaceflight companies; Blue Origin, Space-X, and Dynetics; to develop plans for lunar lander for the Artemis program and also submit bids for the project. Originally, two of the three would be chosen as finalists for the initial



moon landings, and one would eventually be chosen for the first landing in 2024, with the other for possible subsequent landings later. But earlier this year, NASA chose a modified version of Space-X's Starship as the finalist for the first lunar lander, because it had funding for only one entry instead of two. Bezos immediately filed a complaint with the federal government, claiming that the rules were broken and two companies (one of which he assumed would be his) should have been chosen. The GAO

(Government Accountability Office) studied the complaint, and in August stated that NASA was within its rights to award only one company. At the same time, Bezos announced that he would give NASA \$2 billion if it would also award a finalist contract to Blue Origin for its Blue Moon lander. NASA essentially rejected his offer, and Bezos subsequently sued both NASA and Space-X in federal court, claiming breach of contract. The suit has yet to be heard, and a war of words has ensued between Musk and Bezos, which continues to this day. In the meantime, NASA, because of the lawsuit, has stopped work on the lunar lander project, which sets back Artemis even more. The original 2024 landing goal is now slipping into 2025 or even 2026.



Business experts say that this is nothing new in history; they cite the long-running animosity between the Rockefellers and the Carnegies in the late 1800s, and the 1950s and 60s battles between General Motors and Ford over the American car market. And while the feud has now become sort of personal (In October 2021, Musk overtook Bezos as the world's richest person, and has made sure that he knows it), it is essentially over control and domination of commercial spaceflight, which economists say is going to explode in the next few years and may be a \$1 trillion market

by 2030.

According to many experts, Bezos, even while he was gloating over the success of his New Shepard suborbital flight in July, came to the realization that he was falling way behind in the commercial spaceflight arena, of which the NASA lunar lander was only one part. Even though he founded Blue Origin in 2000, two years ahead of Space-X, Musk's company has outpaced him in virtually every aspect of spaceflight. Space-X now has an operational low earth orbit crewed transportation system, an operational heavy lift rocket that can put 150,000 pounds into low earth orbit, and is ready to launch the world's most powerful rocket with a spacecraft that can hold up to 100 people for trips to the Moon and Mars, possibly by 2025. In comparison, Blue Origin has the New Shepard suborbital tourist spacecraft and that's pretty much it. The highly touted New Glenn heavy lift rocket is years behind



schedule and may not make its first test flight until 2023, the Blue Moon lunar lander is not expected to have its first uncrewed test flight until at 2024 at the earliest (which is why NASA did not choose it for the first Moon landing) and a crewed low earth orbital transportation spacecraft will not be ready until at least 2024 as well. A few years ago, Bezos announced a major spacecraft project that he called New Armstrong, but apparently no one outside of or even in Blue Origin has heard of it since. To put it another

way, while Bezos was constructing space toys for rich people, Musk was building to take humanity to the cosmos. The bottom line is that Musk and Space-X are now positioned to become the dominant force in the commercial spaceflight market in the 2020s, the 2030s, and even 2040s.

This is what aerospace experts say is behind Bezos's bluster and legal actions. He wants to slow down Space-X until Blue Origin can catch up. Many, though, believe that he won't be able to do it. Recent articles and reports about Blue Origin have pointed to major problems. Several top engineers have recently left the company; others claim that Bezos put public relations ahead of safety with his New Shepard flight in July; some employees say that harassment and sexism exists in the company, and that morale is low. Others say that Bezos is not as passionate about space travel as he used to be. On the other hand, most experts see Musk as a true visionary, driven to make space travel affordable to everyone, to go to the Moon and Mars and build permanent communities there, grandiose ideas that he infuses his employees with and that they believe in.

The latest news is that NASA has chosen both Space-X and Blue Origin as finalists for the lander for the second and third moon landings. Space-X and Blue Origin are also two of a dozen companies that are designing space stations to compete for NASA grants to build a possible successor to ISS. But Bezos will probably still pursue his action against NASA and Space-X to try to regain momentum in the coming commercial spaceflight revolution.

## Starliner Crew Assignments Changed Due to Continuing Delays

In the wake of delays in launching Boeing's Starliner spacecraft, NASA has shifted some of the Starliner astronauts to Crew Dragon flights in 2022. As of October 7, NASA took Nicole Mann from the OTF (Orbital Test Flight)-3 mission and Josh Cassada from the the OM(Operational Mission)-1 flight and assigned them to Crew Dragon mission C-5 in August 2022. NASA is also considering reassigning Jeneatte Epps from OM-1 to a Crew Dragon flight. Epps was originally assigned to a Soyuz-ISS flight in 2018, was removed from it, then was assigned to OM-1 in 2020. According to sources, this is because Epps, who is with the astronaut class of 2009, and Cassada and Mann, who are with the class of 2013, are the only ones in their classes who have yet to fly in space. Indications are that spaceflight veterans Barry Wilmore and Michael Finicke will remain as members of the OTF-3 crew, and veteran Sunita Williams will continue as commander of the OM-1 mission.

Boeing's Starliner program has been plagued with problems since it was chosen in 2014. It was originally scheduled to be launched in 2017, then repeatedly delayed. Finally, in December 2019, the uncrewed Starliner OTF-1 mission was launched for a flight to ISS but had to return to Earth after two days due to software errors. Several other problems were found as well, and it was not until mid 2021 that a second test flight was scheduled, but on July 30, a few hours before the launch time, several thruster valves were determined to be stuck; as of this writing the cause has still not been found. Now, the earliest date for OTF-2 is either late this year or more likely in January 2022.\* That means that the first crewed test flight will not come until April or May 2022 and the first operational mission will not be until September or October. All of this is probably making NASA wonder if it made the right decision in choosing Boeing to be part of its commercial crew program.



\*As this is being written, in mid-October, Spaceflight.com reports that OFT-2 might not be launched until the summer of 2022, which delays the crewed flights even further.

## Spaceflight Short-

Actor William Shatner, who is best known for his portrayal of Captain Kirk in the *Star Trek* TV series and movies, became the oldest person, at age 90, to ever fly in space when he participated in Blue Origin's SN-18 suborbital mission on October 13, 2021.

## The Bronx High School of Science

The last issue of *The Observer* highlighted the death of Stephen Weinberg, the famous physicist and Nobel Prize winner. Weinberg graduated from the Bronx High School of Science, as did his Nobel colleague and classmate Sheldon Glashow. In fact, a total of eight Nobel Prize winners, two Turing Award (which is the computer science equivalent of the Nobel Prize) winners, six National Medal of Science winners, and eight Pulitzer Prize winners have come out of this school. So what is the Bronx High School of Science and why has it churned out so many high achievers?

The Bronx High School of Science is a public high school, part of the New York City public school system, which was established in 1938 by Morris Meister, a progressive educator who convinced the NYC school board to start a school specializing in the sciences. Meister was its first principal; he selected the school colors-green for the Earth and gold for the sun and the stars, emphasizing the school's commitment to studying the sciences. At first the school was open only to boys, but in 1946, girls were allowed in as well. Meister was principal for over twenty years; shortly after he left in 1958, the school moved from its original location in an old 1800s school building to a new modern campus next to what was then Hunter(now called Lehman) College in the Bronx. It has been there ever since.

The school is officially a magnet school, and students are accepted on the basis of competitive exams; in 2019, 800 were chosen out of more than 30,000 applicants. As would be expected, the curriculum is heavy in the sciences and mathematics; all students are expected to take classes up to and including AP physics, AP chemistry, and AP biology, as well as specialized classes in subjects like microbiology, biochemistry, physiology, astrophysics, and genetics. They are also expected to take the math sequence up to AP calculus 2; they can also take advanced math classes such as differential equations, linear algebra, and multivariable calculus. However, they must also take a full range of humanities and social sciences classes, including four years of language arts, four years of social science and history, and at least three years of a foreign language, in addition to required fine arts classes, such as drama and music. By the end of their sophomore year, students need to show evidence of mastery in a research topic, either through classes or by submitting a topic thesis that they work on and finish by the end of their senior year. When students at Bronx Science take the SAT, the average score is 2100 out of a possible 2400.

Students graduating from the Bronx School are sought after by the major science-oriented universities like MIT, Caltech, Rice, Harvard, Princeton, Cornell, UC Berkeley, and UCLA. A majority go onto earn doctorates in their chosen fields. The Bronx school has been continuously ranked among the top 50 public high schools in the United States for its overall academic excellence, along with schools such as Stuyvesant High School(in New York City), Thomas Jefferson High School(in Fairfax, Virginia) and Lowell High School (in San Francisco-A note-a few years ago, University High School, on the campus of Fresno State, was ranked 68th among the top 100 high schools in the U.S. in academic excellence). Over the last two years, though, the Bronx science school has been caught up in a controversy that is engulfing the larger New York City school system. Some members of the school system want to end the competitive entrance exams and admit students based more on racial diversity as part of a program to increase Black and Hispanic presence at the system's elite magnet schools. Right now, a major clash is going on between the racial diversity people and the competitive exam advocates. Whatever does happen, hopefully it will not diminish Bronx's role as an academic powerhouse that will produce continuing generations of science leaders.



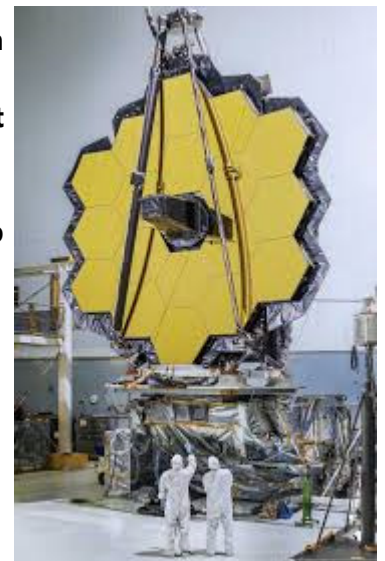
## The Stars in *Harry Potter*-and Not the Actors

Like I'm doing presently, every now and then I pull out the *Harry Potter* stories and reread them. If you're one of about twenty people who haven't read the stories or seen the movie versions, you probably won't realize that they're full of references to astronomy. Harry and his classmates take astronomy as a required subject almost every year of their curriculum at Hogwarts, and one chapter in *Harry Potter and The Order of the Phoenix* depicts them out at night with their telescopes locating and identifying planets and stars. Another episode has the centaur Firenze teaching them about Mars. Even more so are the names of several of the characters. Harry's godfather, who he learns about and meets in the third book, is Sirius Black, named after the brightest star in the sky, and Sirius's younger brother is Regulus Arcturus Black. For that matter, astronomical names seem to run in the Black family. One of Sirius's and Regulus's cousins is named Andromeda, who is also Nymphadora Tonks' mother, and her sister is Bellatrix, who happens to be Lord Voldemort's second-in-command. The third Black sister is Narcissa, not an astronomical name, but her son is Draco Malfoy (and at the end of the series, we learn his son is named Scorpius). And, of course, after Hermione, Ron, and Ginny, Harry's best friend is Luna Lovegood. In my research on the author J.K. Rowling, I have not been able to find any evidence that she has a particular interest in astronomy and space sciences, but something must be there for her to bring up so many references to the heavens and the objects that reside there. Maybe she is an astronomer and just hasn't brought it out yet.



## James Webb Space Telescope Ready to be Launched, But is Dogged by Controversy over its Name

The James Webb Space Telescope, 13 years behind schedule and \$6 billion over budget, is now at the French Guiana Space Center, undergoing final tests and being readied for mating with the Ariane 5 rocket that will launch it on December 18. But a controversy has arisen over its name. It was originally called the Next Generation Space Telescope, but in 2001, then NASA chief administrator Sean O'Keefe decided on his own to rename it the James Webb Telescope, after the second NASA administrator who, from 1961 to 1968, led the space agency through its early years up to the Apollo moon missions. No one said much in opposition until about a year ago, when gay and lesbian groups demanded that Webb's name be dropped. He was, they claim, complicit in a purging of gays from the State Department when he was a deputy Secretary of State in the 1950s. An investigation by current NASA chief Bill Nelson has failed to show any involvement by Webb, but gay rights groups are still pressuring him to change the name. On top of that, a group of scientists say that the naming was wrongly done. The naming of major scientific spacecraft, they say, has always been done by a committee, which traditionally chooses a prominent scientist, not an administrator or politician, to honor. Also, some scientists in the European Space Agency and the Canadian Space Agency, which have a share in the telescope, would like to see a different name as well. They would like to have the naming process reopened. Among the names that have been suggested are Sally Ride, the first American woman in space, and recently deceased Nobel physicist Stephen Weinberg. So far, Nelson has said that the telescope will keep the Webb name.



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

## Monterey Institute for Research in Astronomy

The Monterey Institute for Research in Astronomy, commonly known as MIRA, is a unique institution. It is a private, nonprofit organization not attached to any college or university or other organization, founded by a group of astronomy students and dedicated to astronomical research

The observatory began when several astronomy graduate students from Case Western Reserve University in Cleveland, Ohio, got together and decided to form their own observatory, which was incorporated in 1972 as MIRA (they developed the acronym as a play on the name of the star Mira). They wanted to do pure research without having to worry about teaching classes or constantly publishing to retain academic positions. They started lecturing to raise money and got a boost in 1974 when Princeton University gave them a 36" mirror intended for a telescope that was never built. They also got support from several astronomical notables, including Carl Sagan and Bart Bok. As well in 1974, they were given a \$75,000 grant. In 1976, the National Forest Service approved their request to build an observatory on National Forest Service land in the coastal range of Big Sur. The first portable telescopes were used there in 1975. At the same time, Bernard Oliver, a leading scientist with Hewlett-Packard, gave the group a grant to build the observatory building proper, which was opened in 1982. In 1978 as well, the organization Friends of MIRA was established. The observatory was off and running and has existed to this day.

MIRA consists of two facilities. Its offices, administration center, library, machine shop, and associated buildings are in the town of Marina, just north of Monterey, and adjacent to CSU-Monterey Bay, although the Institute is not connected to the CSU school in any way. The observatory itself, known as the Bernard Oliver Facility, is at Chews Ridge, at 5,100 feet, in the Los Padres National Forest in the coastal range south of Carmel. It houses the 36" telescope (right), the original gift from Princeton. A smaller 14" telescope is on the grounds of the Marina facility and is used for public outreach programs. The observatory's main research area is in stellar studies, especially T-Tauri and carbon stars, among many others.



### From *The Observer* Archives

*"According to the laws of microscopic physics, if you were to shake hands with a being made of antimatter, you would both disappear in a puff resulting in a fiery ball of radioactive gamma rays-high energy particles of light(What a way to get rid of your enemies-extend the hand of 'friendship')"*

*From the July 1983 Observer*

I think we could all make up our lists of people who would never be missed. Now, all we have to do is find an antimatter organism. Probably much easier said than done, so our lists are probably safe.



# Star Stories

## Thuban

Thuban, also known as Alpha Draconis, is the brightest star in the constellation Draco. It is a spectroscopic binary with the primary star having an apparent magnitude of 3.7 and an absolute magnitude of -1.2. The secondary star is very faint and as such, little is known about it; one of the things which has been learned is that it has a rotation period of 51 days around the primary star. The primary star, Alpha Draconis A, is an A1 white giant that has passed its main sequence phase; the secondary star is believed to be a dim A2 star that is still in the main sequence. Together, the two are about 305 light years from our Sun and have a mass of about 2.8 times that of the Sun.



Thuban is noteworthy because at one time it was the Pole Star (and will be again far in the future). From about 4000 BCE to 1800 BCE, it was the star closest to the celestial north pole; in 2830 BCE it was only ten-arc minutes away from the pole. Afterwards, due to the Earth's precession, it drifted away and its place was eventually taken by Beta Urae Minoris (Kochab), and Polaris after that. It will again be the star closest to the celestial north pole in 20,346 CE.

The name Thuban comes from Arabic and means "large snake." The Arabs also referred to it as the "tail of the dragon," hence the long and winding constellation Draco.



## Astronomy Short-

In 1967, Anthony Hewish, a radio astronomy professor at Cambridge University, gave a young Irish graduate student, Jocelyn Bell, a problem dealing with a star that was acting strangely. Bell studied it and realized that the star was "pulsing" through extremely rapid spinning. She had discovered the first pulsar star, of which many others have since been found. Ironically, in 1974, the Nobel committee gave the physics prize to Hewish, not Bell, for the discovery of pulsar stars, a decision that brought major criticism from many other scientists. Today, Bell, who has won many honors, but never the Nobel Prize, is an astronomy professor at Oxford.

## Astro Gear for Sale-

1 1/2 - 2-inch eyepiece adaptor

Celestron tele extender (threaded both ends, female threads are about 34mm dia., the male threads are about 42 mm dia.)

T adaptor fits older Canon

Orion straight-through finder, with bracket

Celestron Nexstar reflector, Bird-Jones type, for parts only

Celestron 25mm eyepiece, unmarked type

And I also have a set of Celestron anti-vibration pads. I'd like \$10 for those.

Contact Greg Lewis at [gregl@mail.fresnostate.edu](mailto:gregl@mail.fresnostate.edu)

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## Astronomy (bad) Joke-

How do you know that the moon is almost broke? When it's down to its last quarter.

From *Astronomytrek.com*