THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno May-June 2017

CVA Glacier Point Weekend

August 18,19, 2017

Contact Dave Dutton at twodocs@sti.net for information and reservations

"The universe is the poor man's particle accelerator."

-David Schramm

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Central Valley Astronomers of Fresno

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www.cvafresno.org

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Remember, summer is coming up.

Lots of CVA activities!

Riverpark-May 6, June 3, July 1 and 29(not a mistake-two dates in July), August 26

Millerton Lake(at the boat ramp at the campground on the west side)-June 17, July 15, August 12

Eastman Lake(at the boat ramp on the east side)-May 27, June 24, July 22, August 19

Courtright Reservoir-June 23-25, July 21-23, August 18-20

CVA general meeting at Fresno State on June 10, but no meeting in July or August

The Dark Sky Festival-July 21,22,23 at Sequoia National Park

Glacier Point-Yosemite Weekend-August 18, 19

And, of course, special solar watching activities on August 21!

Number of exoplanets found as of April 2017-3,608

How many more are out there-tens of thousands? Hundreds of thousands?

Profiles in Astronomy

Eleanor Helin

1932-2009

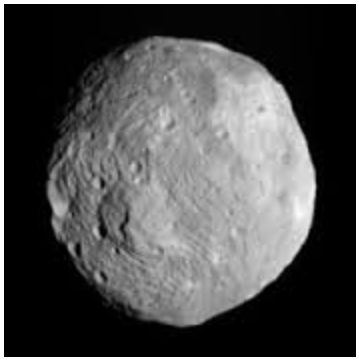
Eleanor Key Francis Helin, who was known to friends and colleagues as "Glo," was born and raised in Pasadena, California. She graduated from nearby Occidental College, and then did graduate work in astrophysics at CalTech. After finishing her studies, she stayed at CalTech, and also worked at the Jet Propulsion Laboratory for over thirty years before her retirement in 2002. Her husband, Ronald Helin, was also a CalTech astronomer who helped her in her research.

Helin's specialty was asteroids. During her career, he discovered over 900 of them, including many near-Earth crossers. As part of her asteroid observations, she also discovered a number of minor planets and several comets as well. She is particularly known for the discovery of the Aten Asteroids, those that come near to Earth on occasions, and she set up the Palomar Planet Crossing Asteroid Survey in the 1970s to observe and track such objects using the 18" Schmidt camera at Palomar. She was also responsible for the International Near-Earth Asteroid Survey in the 1980s. Her work with asteroids brought attention to the fact that Earth as seen some near-misses from them, and made scientists more aware that one or more might hit the planet someday. In her asteroid programs, she collaborated for many years with the husband and wife scientist team of Gene and Carolyn Shoemaker. Gene Shoemaker was the world's foremost expert on meteorites and impact craters, while Carolyn holds the record for the most comets discovered. The three of them made asteroid studies an important part of modern astronomy and Earth sciences.

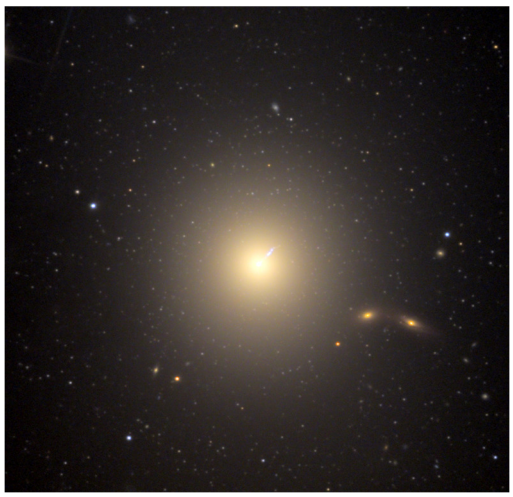
One of Helin's last projects before she retired was to establish NEAT, the Near Earth Asteroid Tracking program, an automated telescopic survey which nightly tracks all known asteroids and other small objects in space. So far, it has discovered and identified over 26,000 objects, including several comets and a number of minor planets.

Helin received many awards for her work with asteroids and other small objects. Three comets and an asteroid are named after her.

Source: Wikipedia, CalTech/JPL



One of the Summer Wonders



M87, the great galaxy in Virgo, is considered by many astronomers to be one of the largest galaxies known so far. About 53 million light years from Earth, it contains an estimated 1 trillion stars and has a supermassive black hole at its center. It has an estimated 10,000 globular clusters orbiting it. It is also believed to have "eaten" another large galaxy about a billion years ago. Look for it this spring and summer!

CVA Members Speak-This issue's question-What telescope do you like to use? Why?

My 10" Meade SCT got to be too heavy, so I like using my 6" f5.9 refractor now-Warren Maguire

10" Dobsonian-Debi Lusk

20" f5, it has the ability to see very faint objects in detail-Shawn Clark

My favorite telescope is the 1.3m at Kitt Peak. I've observed with larger telescopes, but with the 1.3m I get a strong sense of being close to the sky-Fred Ringwald

My LX90 8" ToGo-Clarence Noell

My Celestron EDGE HD 11" because it's the only scope I own. But I love it!-Dan Del Campo

Celestron CPC-800. Big enough to go deep, small enough to be portable-Fred Lusk

Orion 8" Dobsonian. Great views, good versatility, and very little setup-taewkdown time-Scott Davis

My latest pride and joy is an Orion 12" truss tube Dobsonian. This scope gives me some amazing views of the wonders of the night-Brian Bellis

6" Dobsonian-Abi Mikow

My latest telescope is my favorite-the Celestron 9.25 SCT. I especially enjoy planetary views in the 9.25 SCT, and its aperature helps with my favorite deep sky object, M13-Lynn Kliewer

I used the club 20" for 35 years-Louis Mendoza

What's New in Space

NASA buys more Soyuz Seats

NASA announced on March 2 that it will buy up to five more seats aboard Soyuz spacecraft heading to ISS. These will include two seats for 2017 and three more for 2018. NASA has also taken an option for up to three seats for 2019 flights, according to sources. This is partially because RKA, the Russian Space agency, has decided to cut back the number of Russian crew members aboard ISS from three to two over the next two years, due to a new scientific module that will be installed aboard the space station in late 2018. But NASA is also concerned that its contracted commercial spacecraft will not be ready anytime soon. Both Space-X and Boeing have assured the space agency that their manned spacecraft: Space-X's Dragon V2 and Boeing's CST-100 Starliner, will be operational by 2018, but indications are that they are still encountering problems and may not be ready by then. NASA is therefore hedging its bets and hoping that the two companies come through, but if they don't, it will still have transportation for American and ESA astronauts to ISS.

Blue Origin Ready to Take Off

Jeff Bezos's Blue Origin has continued unmanned tests with its New Shepard rocket, and indications are that it will be ready to take private paying passengers on sub-orbital flights as early as March 2018. This is in contrast to Richard Branson's Virgin Galactic/SpaceShip 2, which is still undergoing testing following the fatal crash of a test craft in 2014. Estimates now are that Virgin Galactic will not have its first commercial passenger sub-orbital flight until at least 2019, almost five years behind its original timeline. Blue Origin's New Shephard rocket is not powerful enough to go into orbit, but its New Glenn rocket, which is now undergoing preliminary tests, will be able to do so. New Glenn is expected to be operational for manned flights as early as 2020 or 2021.

Despite Trump's Plans, Orion-MPCV Might Not Be Ready in 2019

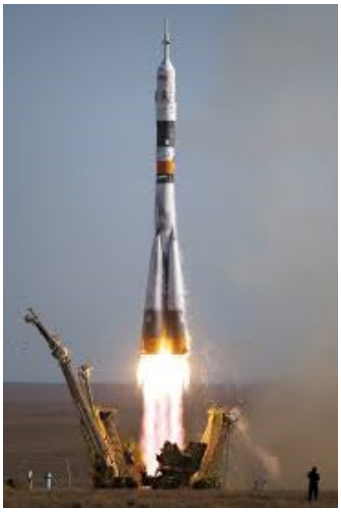
President Donald Trump has called for a manned circumlunar mission using the Orion MPCV by 2019, but ESA, the European Space Agency, which is building the service module for the spacecraft, says that it will probably not be ready by then. The earliest it says the craft can be completed is around 2020 or more likely 2021. In addition, a number of space critics are claiming that the spacecraft is being rushed into operation without any clearly defined goals or programs. In their view, why is it even being built at all? Under Obama, NASA had vague plans to bypass the Moon and land on an asteroid "sometime in the 2020s." Trump, on the other hand, is indicating more and more that he would like to see NASA return to the Moon, with lunar landings in the

early 2020s, then use those as a base to go to Mars by the early 2030s. Some of this controversy may be concerns over the cost and the focus of the program, but some of it is also political grandstanding, with the usual refrain of "the money could be better spent helping people on Earth." Space experts are expecting a major address by the president on America's long term space goals in the next few months; hopefully it will clarify NASA's visions for manned space flight into the 2020s and even 2030s.

Spaceflight Stats-April 2017

Since the first manned spaceflight in April 1961(Vostok 1)-a total of 327 manned space missions: 179 American, 141 Soviet/Russian, 7 Chinese(two failed missions are not counted-Soyuz 18-1, which caught fire and blew up on the launch pad in April, 1976-the two cosmonauts aboard were saved by the emergency escape rockets; and STS-51L-the ill-fated Challenger, in January 1986).

559 people from 36 different nations have gone into space-The United States leads with 341 people in space, followed by Russia with 120, and China is third with 12. Of all the people in space, 497 have been men, and 62 women. Of those 62, 47 have been from the United States. The U.S. has also put 295 men into space. Three people have gone into space a record 7 times: Jerry Ross, Franklin Chang-Diaz, and Michael Foale, all from the United States. The record number of flights for women is 5 times, held by four people: Janice Voss, Shannon Lucid, Marsha Ivins, and Susan Helms, all from the United States.



The youngest person ever to fly in space is Gherman Titov, who was 25 years and 8 months old when he flew aboard Vostok 2 in 1961. the oldest person is space is John Glenn, who, at age 77, flew aboard STS-95 in 1998. The oldest woman in space is Peggy Whitson, who turned 57 in April 2017 while aboard ISS(President Trump phoned her and wished her a happy birthday). The person with the longest solo flight is 5 days by Valeri Bykovsky, aboard Vostok 5 in 1963. Ronald Evans also spent 5 days by himself in the Apollo 17 capsule orbiting the Moon in December 1972, while his colleagues were exploring the lunar surface. The person with the single longest spaceflight is Dr. Valeri Polyakov, who spent 439 consecutive days aboard Mir, from January 1994 to March 1995. The woman with the longest single space mission is Sunita Williams, who spent 195 days aboard ISS, from December 2006 to June 2007. The person with the most spaceflight time is Gennadi Padalka, with 879 days during 5 space missions(Padalka is currently scheduled to fly on Soyuz MS10 in 2018 to spend six months aboard ISS, so he'll add to his record). Finally, the most people in space at one time-13 on at least three different occasions.

From NASA's Space Place

What It's Like on a TRAPPIST-1 Planet

By Marcus Woo

With seven Earth-sized planets that could harbor liquid water on their rocky, solid surfaces, the TRAPPIST-1 planetary system might feel familiar. Yet the system, recently studied by NASA's Spitzer Space Telescope, is unmistakably alien: compact enough to fit inside Mercury's orbit, and surrounds an ultra-cool dwarf star—not much bigger than Jupiter and much cooler than the sun. If you stood on one of these worlds, the sky overhead would look quite different from our own. Depending on which planet you're on, the star would appear several times bigger than the sun. You would feel its warmth, but because it shines stronger in the infrared, it would appear disproportionately dim.

"It would be a sort of an orangish-salmon color—basically close to the color of a low-wattage light bulb," says Robert Hurt, a visualization scientist for Caltech/IPAC, a NASA partner. Due to the lack of blue light from the star, the sky would be bathed in a pastel, orange hue. But that's only if you're on the light side of the planet. Because the worlds are so close to their star, they're tidally locked so that the same side faces the star at all times, like how the Man on the Moon always watches Earth. If you're on the planet's dark side, you'd be enveloped in perpetual darkness—maybe a good thing if you're an avid stargazer.

If you're on some of the farther planets, though, the dark side might be too cold to survive. But on some of the inner planets, the dark side may be the only comfortable place, as the light side might be inhospitably hot. On any of the middle planets, the light side would offer a dramatic view of the inner planets as crescents, appearing even bigger than the moon on closest approach. The planets only take a few days to orbit TRAPPIST-1, so from most planets, you can enjoy eclipses multiple times a week (they'd be more like transits, though, since they wouldn't cover the whole star).

Looking away from the star on the dark side, you would see the outer-most planets in their full illuminated glory. They would be so close—only a few times the Earth-moon distance—that you could see continents, clouds, and other surface features. The constellations in the background would appear as if someone had bumped into them, jostling the stars—a perspective skewed by the 40-light-years between TRAPPIST-1 and Earth. Orion's belt is no longer aligned. One of his shoulders is lowered.

And, with the help of binoculars, you might even spot the sun as an inconspicuous yellow star: far, faint, but familiar.

Right-an artist's depiction of a Trappist-1 planet, with its star in the background

Article and image courtesy of NASA's *Space Place*

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

The Calar-Alto Observatory

The Calar Alto Observatory, officially known as the Centro-Astronico Hispano-Aleman, is in the Almeria Province of Spain, on top of Cela-Alto a 2,170 meter(7,100 foot) mountain in the Sierra de los Filabres range in Spain. It is a joint venture between the Max Planck Institute for Astronomy in Heidelberg, Germany and the Spanish Institute of Astrophysics of Andalusia in Grenada in Spain.

The observatory was established in 1970, and the first telescope, a 1.2m reflector, saw first light in 1975. Since then, four other telescopes have been built and are operational on the mountain. The largest is a 3.5m reflector, the largest on the mainland European continent. The others are a 2.2m reflector, a 1.5 m reflector, and a.8m reflector. A 1m Schmidt Camera, originally at the Hamburg Observatory, operated at Calar-Alto between 1976 and 2000, but is no longer used.

The Calar-Alto Observatory is involved in a wide range of research, ranging from cosmology to deep space objects, supernovas, and faint galaxies, but is best known for its work in minor planets. Over 100 have been discovered at Calar-Alto. The observatory is also known for its planetary studies, and has made a number of discoveries concerning the solar system in recent years.

Image-the 3.5m dome at Celar-Alto

Sources-Wikipedia, Celar-Alto website
Image-Celar-Alto website

Astronomy Short-

Bernhard Schmidt(1879-1935), Estonian-born, who revolutionized astrophotography with his invention of the Schmidt camera in 1931, blew his right arm off while experimenting with explosives when he was eleven. As a young man, he moved to Berlin and took up building telescopes for a living. He never married, was very antisocial, and got into trouble with German authorities for his pacifist stands during World War I. After the war, the Hamburg Observatory hired him as a telescope maker, and he lived the rest of his life in nearby Bergedorf, where the observatory's scientific facilities were located. According to those who knew him, Schmidt actually spent most of his time wandering around the town, and when he did build telescopes, no one is exactly sure how most of them were constructed, since he rarely allowed people into his workshop. In 1935, Schmidt could see another major war coming, and to avoid it, drank himself to death.