THE OBSERVER

The Newsletter of Central Valley Astronomers of Fresno May-June 2018

CVA Unveils The Young Astronomer Program

"The universe is under no obligation to make sense to you…"

-Neil deGrasse Tyson

On April 28, CVA President Scott Davis introduced the Young Astronomer Project to CVA members(it is also described in this issue). Young people between the ages of 13 and 23 will apply for it, then go through a series of exercises, skills, and knowledge activities spanning a year or more. At the end of their "schooling," they will give a talk before the CVA membership, and then be presented with a new telescope. CVA is asking all members to help in teaching and training a new generation of amateur(and perhaps eventually professional) astronomers. See the President's Message for more details concerning it.

In this Issue

Central Valley Astronomers

Web address
www.cvafresno.org

Webmaster-Scott Davis

Number of exoplanets found as of April, 2018- 3,824

How many more are out there?

Tens of thousands?
Hundreds of thousands?

Fellow astronomers,
WE NEED MENTORS!

I am really excited to introduce the Young Astronomers Program, produced by Lynn Kliewer, Larry Parmeter, and myself. This exciting, intensive program is designed to bring and retain new, young members and bring better diversity to our club as a whole.

The program is one year long and, when a student finishes, the club will purchase for them their very first telescope – a beautiful 6" Dobsonian from Orion! By the end of this program, students will be able to do the following:

Assemble and use a Dobsonian telescope to find objects in the night sky
Make good decisions about equipment and accessory purchases
At a public-centered star party
Show visitors a variety of objects in the night sky
Explain how their telescope works and what its advantages are
Provide interesting and relevant information to visitors about what they are seeing
Be able to enjoy the process of observing the night sky from a dark, quiet location
Enhance public speaking skills by giving a presentation.

The program comprises minimum attendance standards, knowledge competencies that require the students to do research and learn many different types of information, skill competencies that the students will learn by research and by working with a mentor, and a final presentation on an astronomy topic of their choice.

Students will be given a packet that includes extensive information, including resources on where to find information to complete the competencies. Mentors will be given everything they need to confirm that the students have learned what they need to know and to teach the students the skills they need for their astronomical education.

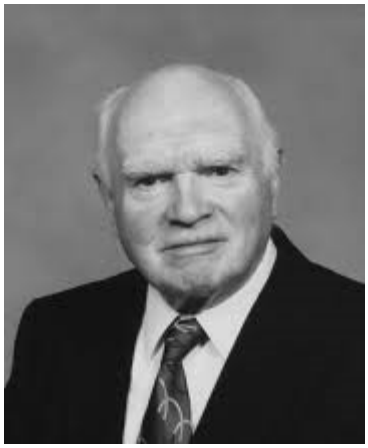
BUT – this program can only thrive with mentor volunteers! We really want to have a one-to-one ratio of mentor and student, so we can accommodate only as many students as we have mentors!

Do you love showing others this wonderful hobby? Would you like to be a part in enriching the life of a young astronomer by being their mentor? Please get in touch with me and let me know!

Thank you! As always, may you have clear skies!
Scott J. Davis
President, Central Valley Astronomers

Profiles in Astronomy

James Cuffey 1911-1999



Cuffey was born and raised in Chicago and educated at Northwestern University. For his graduate studies at Harvard, his thesis advisor was Harlow Shapley. After receiving his doctorate, Cuffey did post-doctoral studies at Indiana University, and then served in the Navy in World War II, where he taught at the U.S. Naval Academy. After the war, Cuffey returned to Indiana University, and after several years there, moved to New Mexico and worked with Clyde Tombaugh at New Mexico State University. Cuffey and Tombaugh worked closely together for many years, until Tombaugh's retirement in 1968. Cuffey stayed at New Mexico State until his own retirement in 1976, then moved back to Indiana and lived quietly there until his death.

Cuffey was a pioneer and expert in astronomical photometry. He invented the Cuffey Iris Photometer in the early 1950s, and used it to study thousands of stars in both visible and non-visible wavelengths. While at Indiana University, Cuffey also helped establish the Indiana Asteroid Project, which, over a period of almost twenty years, identified and accurately described the positions of several hundred asteroids. The asteroid 2334 Cuffey is named in his honor.

Star Stories

Canopus, also known as Alpha Carinae, is the second brightest star in the sky(after Sirius). It has an apparent magnitude of -.74, and an absolute magnitude of -5.7. It is usually classified as an A9 star and has a whitish color. It is approximately 310 light years from Earth.

The origin of the name Canopus is Greek, and is believed to come from the story of the Trojan War; Kanopus was the pilot and navigator on the ship that carried Menaleus, king of Sparta, to Troy. To the scientists at the great library in Alexandria, it was *Kanobos*. Other cultures, though, had varied names for it. Among the Arabs, it was *Suhayl.* The Maori peoples of New Zealand called it *Ariki* or *Atutahi*, the "solitary one." The native peoples of southern Africa knew the star as *Naka*, and it portended the coming of (the southern hemispheric)fall and winter.

Interestingly enough, and perhaps relating back to the navigator myth, during the American space program in the 1960s, the Gemini and Apollo spacecraft had their navigation computers set relative to Canopus. A number of NASA's unmanned planetary missions have used Canopus as the guide star for their navigation systems. The ancient Polynesians, who were known to sail thousands of miles across the Pacific Ocean, also often used Canopus as their main guide star.

What's New in Space

Boeing Commercial Space Vehicle Delayed Again

On April 5, NASA and Boeing announced that the first crewed flight of the Boeing CST-100, which had been scheduled for late this year, will probably not take place until 2019 at the earliest, and perhaps not until 2020. they gave problems with suppliers and parts development for the delays. This puts NASA in a bind of sorts; after 2019, it will have no bookings on Soyuz spacecraft to ISS. As a possible solution to the problem, NASA said that the first flight may be extended from two weeks up to six months, essentially meaning that it will not be a test mission, but a regular operational flight holding up to four crewmembers

In the meantime, Space-X's Dragon V2 is still scheduled to make its first unmanned test flight in August 2018, and, if all goes well, first manned flight in December. However, if the August flight shows problems, its manned schedule could be pushed back to 2019 or 2020 as well.

On the other hand, Jeff Bezos' New Shepard spacecraft successfully completed its latest test flight on April 28, and is gearing up for more unmanned tests later this year. Blue Origin, Bezos' commercial spaceflight company, has hinted that if all goes well, New Shepard may carry its first group of paying passengers on a suborbital flight by the end of this year.

This was submitted by CVA member Alan Birnbaum, MD, a neurologist at St. Agnes Medical Center. We'll start announcing that boxes of dark chocolate will be available at star parties, to test whether amateur astronomers can really see more than usual. Attendance will probably double, or even triple.

Study Shows that Eating Dark Chocolate Improves Vision

A study reported in the Journal of the American Medical Association shows that eating dark chocolate can lead to temporary improvement in vision. According to a study done at the Rosenberg School of Optometry, University of the Incarnate Word in San Antonio, Texas, subjects were given visualization tests both before and after they ate portions of dark chocolate. For up to two hours afterwards, they showed increased contrast sensitivity and visual acuity(then time to have more chocolate!). According to the study, the physiology of the chocolate eating led to higher metabolism and blood flow, which would have an effect on the eye's retina, which is highly vascularized. Earlier studies have shown that eating dark chocolate leads to increased cardiovascular function in general. The researchers stressed that more studies will be done on dark chocolate's influences on the eyes, and are asking for volunteers. No doubt they'll probably get ten times the number that they need.

CVA Members Speak

What was an especially good experience you had while starwatching?

"Back in 1965, my eyes were opened to the night sky due to being in the Boy Scouts. Ever since then I have been starwatching." Joe Griffin

"Seeing the total solar eclipse from Rexburg, Idaho." Fred Lusk

"Summer 1991 and 1992, backpacking in Kings Canyon and Sequoia National Parks, at the Tablelands, 11,500 feet up. I could see M33 naked-eye with no difficulty. Darkest skies I've ever seen." Dan del Campo

"The space shuttle reentering at the end of a dark sky session. It was as if a giant florescent highlighter slowly made a line across the sky. Several minutes alter, a pair of sonic booms." Shawn Clark

"Taking my first DSO image-M42." Larry Schwab

"My first observing session, seeing my first deep sky object-the Double Cluster-through binoculars." Scott Davis

"I like sharing with visitors who have never viewed through a telescope." Warren Macguire

"Surprising people observing outside the visitor center at the McDonald Observatory. It's 80 miles from anything, so they weren't expecting anyone they didn't know emerging from the darkness. They exclaimed, 'Where did you come from?' I answered, 'I walked.' They weren't expecting anyone to walk *down* the mountain." Fred Ringwald

"Being able to spread interest in astronomy through events such as the Dark Sky Festival…" Ian Clark

"After being a Scout mentor for years, I became an amateur astronomer." Louis Mendoza

Hawking to be Laid to Rest at Westminster Abbey

About a week after Stephan Hawking died, the British government and Cambridge University announced that his ashes will be buried at Westminster Abbey, near the tomb of Isaac Newton. Westminster Abbey, in London, is the burial site of some of England's most famous and prestigious people, including several kings and queens, twelve prime ministers, actors, writers, musicians, and scientists. Beside Newton, other notable scientists buried in Westminster Abbey include John Herschel, Charles Lyell, Ernest Rutherford, Lord Kelvin, and Charles Darwin. The government said that Hawking's ashes will be officially interred on June 24, 2018.

Immediate right-Newton's tomb in Westminster Abbey

Far right-outside of Westminster Ab-

What Is the Ionosphere

By Linda Hermans-Killiam

From NASA's Space Place

High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere.

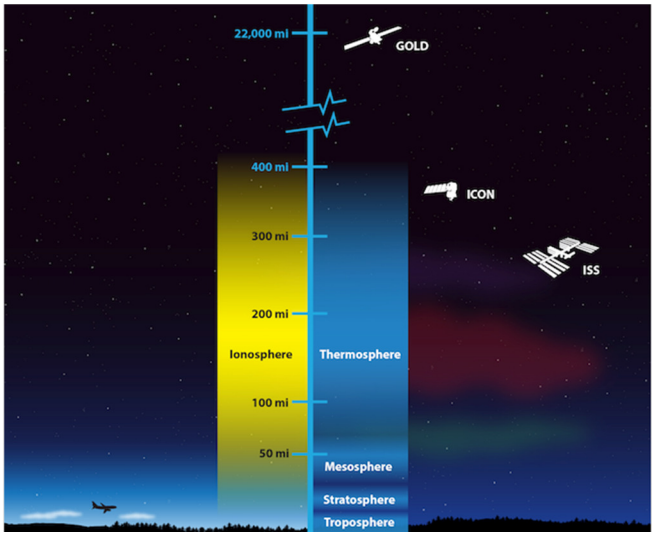
How did all those ions get there? They were made by energy from the Sun! Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms. At the ionosphere, atoms from the Earth's atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What's left is a positively or negatively charged atom, called an ion. The ionosphere is filled with ions. These particles move about in a giant wind. However, conditions in the ionosphere change all the time. Earth's seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas every half hour. It will measure the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD's wider view. ICON will study the forces that shape this part of the upper atmosphere.

Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before.



This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station

Article and chart courtesy of NASA's Space Place

Part of a continuing series on lesser known-but still important-astronomical observatories throughout the world

Mount Laguna Observatory

With the emphasis on the "big" observatories like Palomar, and Mount Wilson, Southern California's many smaller observatories are much less known and often ignored. One of them is the Mount Laguna Observatory, which is a joint venture between San Diego State University and the University of Illinois at Urbana-Champaign. Mount Laguna is located about 50 miles east of San Diego in the Cleveland National Forest. Currently, the observatory hosts four telescopes: the largest is a 1.26m reflector, which is a joint project between San Diego State and the University of Kansas; a 1.1m Cassegrain reflector, which was originally part of the University of Illinois' Prairie Observatory; a .6m Cassegrain reflector; and a .5m reflector, which is used for public viewing and outreach programs.

The observatory was originally established in 1968, and is managed by the astronomy department at San Diego State University. In the semi-desert area at 6,100 feet above sea level, it has proved to be an ideal place for astronomical studies and is often the site of amateur astronomy gatherings as well. The Astronomical Society of the Pacific, among other groups, has held several of its annual conferences and meetings at the Mount Laguna site.

Right-the 1.26m telescope dome at Mount Laguna
Source:Wikipedia Image:Google images

From The Observer Archives

"We all know that Galileo invented the telescope, don't we? Wrong! Ah, but who made the first reflector? There were mirrors made of different materials, each different one working better or worse that others. Metal was used to begin with, and later glass coated with silver was used. But-who made and used the first concave metal reflector? It may have been Archimedes.

The story goes that around 214BC he installed a giant mirror on the shore of the Sicilian port city of Syracuse. Romans had been attacking, and when they came again with their ships, he was ready for them. When they came near to shore, Archimedes had his men focus the mirror on the ships and within minutes they were in flames…"

By Clarence Funk, CVA President and Observer editor
June 1983 issue

In a "Mythbusters" episode several years ago, the two hosts visited the White House, and (then) President Obama challenged them to prove or disprove the story of Archimedes' deadly mirror. After setting up and going through the scenario, they concluded that it was possible, but probably took more than a few minutes to set the ships on fire. As to who made the first operational astronomical reflector telescope, that, of course, was Newton. As for Galileo, he didn't really invent the refractor telescope; he took a spy glass, which had been invented a few years earlier, and adapted it for astronomical viewing. Admittedly, he was the first person to view the heavens with an optical instrument.