July-August
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Issue 5

The Observer

The Newsletter of Central Valley Astronomers of Fresno

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CVA Calendar

July 13-14 Star party at Courtright Lake

July 14-Star party at Millerton Lake

July 20-21-Star party at Courtright Lake

July 21-Star party at Eastman Lake

July 28-Star party at RiverPark

August 11-Star party at Millerton Lake

August 17-18-Star party ar Courtright Lake

Aug 18-Star Party at Eastman Lake

Astronomical Image of the Month:

Three major astronomical events rolled through Fresno in late May and early June. The annular solar eclipse occurred on May 20, captured above by one of our CVA members. On June 4, a Lunar eclipse was seen, and the next day, June 5, was the last Venus transit in over 100 years. CVA was active with all three. More about the three events inside, and many thanks to all those who submitted images to the *Observer.*

Image by CVA member Greg Morgan

Quote of the month-

We are all travelers in time and space, and our journeys take us to the most distant realms of our imaginations.

-Anonymous

Full Moon-July 3 | New Moon-July 18 | Full Moon-August 1 | New Moon-August 17 | Full Moon– August 31

Remember-CVA fundraiser raffle at River Park August 25, starting at 7PM!

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The Observer is the newsletter of the Central Valley Astronomers of Fresno

The President's Message

I would like to report to the members that our viewing events for the annular eclipse and Venus transit were hugely successful! We were able to have astronomers at different sites in Fresno and the Valley. Those that stayed in town were able to show an almost 90 % eclipse to the public at River Park and The Discovery Center (TDC). The media covered Garrett and Joe on TV news and the Fresno Bee at TDC.

I was told that Fred Lusk and Fred Ringwald and others went to Redding and Lassen Park (?) to show the eclipse to thousands of visitors. Dave Dutton and Marty Roberts went to centerline north of Fernley, Nevada to view the Ring of Fire. I hope one of them will write a story for the newsletter about their adventure and escapades during that time.

I visited my brother and nephews in Nevada and watched it from Reno-Stead. Everything was going well until moments before maximum, when a large series of thick clouds obscured most of the prime time event. And wouldn't you know it, right after max, the clouds thinned out and parted. Are you kidding me?

For the Venus Transit at TDC, I was able to look through Garrett Wimer's scopes, with help from his wife Jane, for a magnified look at the start of the transit. Also at TDC, John and his incredible Coronado binocular view in H Alpha of Sun during transit. Wow! Ian from TDC had the Sunspotter set up, which made it easy to image the transit on my smartphone and see all the sunspots. Yes, it was pretty easy to see the transit with the solar glasses. About a hundred guests, students and family members looked through the many instruments and devices set up at TDC.

I saw the first visible signs of Venus crossing at 3:13, just a few minutes after contact I. Scott set up and showed a solar viewer he made from parts like clear plastic rulers, a funnel, and a plastic shopping bag! It worked great on his Orion 8" Dob.

The Venus transit at Downing Planetarium had hundreds in attendance. Most of the local news stations gave us extensive coverage of this rare event. Be sure to check out the Venus Transit video posted on our web site. Dr. Fred Ringwald imaged it with a Calcium filter, Fred and Warren and others supplied solar scopes. Many viewed it with solar glasses, some of which were purchased in the gift shop. Steve Harness and Steve Britton had Kingsburg Observatory open for about 80 visitors from their local area.

The fundraising efforts by the club are going great. We are completely sold out of our solar glasses by the time of the solar events. We have also sold over 300 tickets so far for the raffle on August 25th. Everything is now completely paid for, we have made hundreds for our bank account, and still have two months left to go.

Thanks again to Casey, who had the foresight to ask if we could do a raffle at River Park. After five years, we have shown the Moon, planets, stars and bright Deep Sky to many thousands of people at River Park. This major venue makes the success of our fundraising on our 60th year as a club guaranteed.

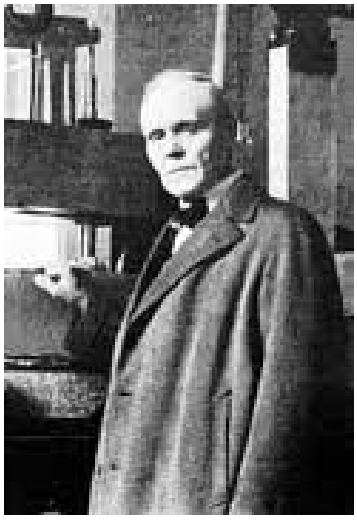
Please join other members at River Park on Saturday, August 25th, between 7:00 and 11:00 PM, when we have the drawing for the 8" Orion Dobsonsian and other prizes. If you would like to contribute a raffle prize, please contact one of our board members before the raffle night.

See you there!

Randy

Profiles in Astronomy

George Willis Ritchey 1864-1945.



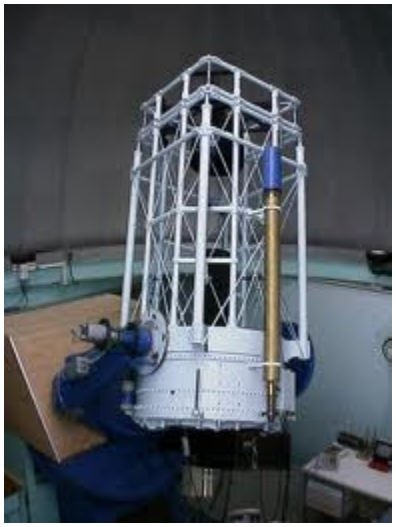
Ritchey was born and raised in Ohio. He was educated at the University of Cincinnati, and later taught practical engineering at the Chicago Manual Training School. He was a natural born engineer and craftsman, and, as such, took up furniture and cabinet making as a career. Also, as a young man, he had an early interest in astronomy, and in telescope making in particular. In the late 1800s, he designed and built a number of small reflector telescopes.

In 1896, Ritchey met George Ellery Hale, who hired him to convert the 40" refractor at Yerkes Observatory in Wisconsin to take photographs. Then Ritchey moved to Southern California to help build the newly established Mt. Wilson Observatory in Pasadena, California. There, he played a major role in the construction of the 60", and later the 100" reflector telescopes. He designed the mountings and tubes for them, and as chief optician for the observatory, supervised the grinding and polishing of the mirrors. Much of Mt. Wilson's early success in astronomy was based on Ritchey's craftsmanship. At the same time he was working at Mt. Wilson, he was also a professor of astronomy at the University of Chicago

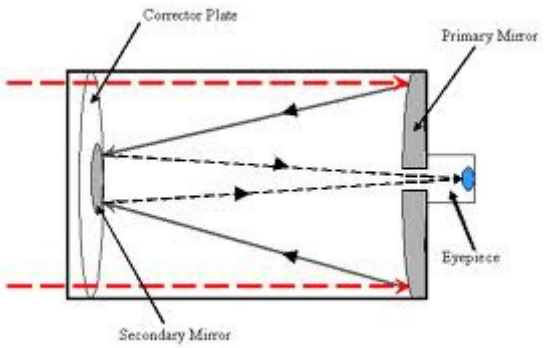
Ritchey left Mt. Wilson and Chicago in 1918, after disputes over management, and began thinking of a new type of telescope, one that would reduce many of the optical problems that came with the newly developed tool of photography. In 1923, he went to France to work at the Paris Observatory, and, in collaboration with French astronomer Henri Chreitien, came up with a mirror design, now called the Ritchey-Chrietien telescope, that greatly reduced chromatic aberration and allowed for faster and sharper images for astrophotography. Ritchey designed and built the first R-C telescope, as it was called, a 24" reflector, in 1927. His second R-C telescope was a 40" reflector, built in 1930, which is still in use at the U.S. Naval Observatory in Flagstaff, Arizona.

Ritchey eventually returned to Southern California and established his own company to build R-C telescopes. For a long time, they were restricted to large, expensive designs, but technical innovations in recent years have made them more affordable to amateur astronomers. Today, many major telescopes are of the R-C design, and Ritchey's place as a major force in modern astronomy is assured.

Left-Ritchey's first R-C 24" telescope



Right-the 40" R-C telescope at the U.S. Naval Observatory



Left-The R-C design, developed by Ritchey and Henri Chrietien in 1923

CVA Calendar July-August 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 July Cassini orbits Saturn 2004	2	3 Full Moon Partial eclipse of the Moon	4 Independence Day Pathfinder with Sur-journer rover lands on Mars 1997	5	6	7
8	9	10	11	12	13 Courtright Lake Star Party-Fri-Sat	14 Millerton Lake Star Party Comet Shoemaker-Levy 9 crashes into Jupiter-1994
15	16	17	18 New Moon	19	20 Courtright Lake Star Party Fri-Sat 43d anniversary of First Moon landing – Apollo 11 1969	21 Eastman Lake Star Party
22	23	24	25	26	27	28 Riverpark Public Star Party
29	30	31	1 August Full Moon	2	3	4
5	6	7	8	9	10	11 Millerton Lake star party
12 Perseid Meteor shower peaks	13	14	15	16	17 New Moon The two moons of Mars, Deimos and Phobos, discovered in 1877	18 Eastman Lake star party
19	20	21	22	23	24 Glacier Point Weekend Voyager 2 flies by Neptune-1989	25 Glacier Point Weekend Riverpark public star party
26	27	28	29	30	31	1 September

What's New in Space

China Launches Space Station mission

On June 17, the Shenzhou-9 mission, with three astronauts, was successfully launched, China's first manned space flighti n almost four years. Its mission is to dock with the Tangong-1 module, which was launched last fall; once there, the three, including one woman, will spend two weeks aboard it testing its systems and doing experiments. The Shenzhou-Tangong mission is a precursor to an attempt to put a permanent manned space station into orbit, possibly as early as 2016.

What's Next for Space-X?

In the wake of the successful Dragon-ISS mission, Space-X is gearing up for regular unmanned supply flights to the International Space Station, starting as early as September, with an estimated four a year after that. In addition, Space-X head Elon Mosk says that the manned version of Dragon will be ready as early as 2014, and he is betting on a NASA contract to taxi astronauts to and from ISS starting in 2015. In addition, Space-X is working on the heavy lift version of its Falcon 9 rocket; it is designed to put 125,000 Earth pounds into orbit, and may be ready for missions by 2015 as well.

The Dragon-ISS mission was launched, after several delays, on May 22; it rendezvoused and docked with ISS on the 24th. The unmanned capsule carried about 1,000 pounds of supplies; the ISS crew unloaded them, and then replaced them with no longer needed equipment to be returned to Earth. After undocking on May 30, the capsule made a pinpoint landing in the Pacific Ocean a few miles off the coast of Southern California on May 31.

NASA Gets a Big Present, Courtesy of the NRO

On June 1, NASA announced that the National Reconnaissance Office, the government's main spy agency, had given it a huge gift: two Hubble-sized satellites, originally intended for high resolution spy imaging, which will now be used for deep space astronomical research. According to NASA's information, each satellite has a 94" main mirror and a secondary mirror that swivels for pinpoint imaging of a target. Scientists who have been briefed on the telescopes say that their resolution is 100 times better than Hubble's. NASA did not come right out and say what it would do with the two satellites, but sources say that one will most likely be used to explore the nature and reach of dark energy, which is now estimated to make up over 60% of the universe.

The two satellites could not come at a better time for NASA, which is reeling from budget cuts and huge overruns of the James Webb Space Telescope, which is now costing almost three times its original price. The space agency had hoped to launch a dark energy explorer by 2018; it was delayed indefinitely in the wake of the JWST financial black hole(it is now estimated that the JWST will not be launched until at least 2022). Now, NASA hopes to launch one of the NRO telescopes, with advanced scientific components and cameras, by 2020. It has given no hint of what it will do with the second one.

The nature and purpose of the donation, which originally took place in February 2011, and was not revealed until now, leaves many in the scientific and aerospace community wondering why it was done in the first place. According to those familiar with the two satellites, which are currently in the clean room at ITT's Advanced Projects facility in upstate New York, they were built around 2005, and have late 1990s to early 2000s technology. All indications are that they are part of the KH(Keyhole) series of imaging spy satellites, which have been used by both the military and the government spy agencies since the 1970s(it is now

known that the Hubble Space Telescope design was based on the KH satellites). The current KH satellites, known as the KH-12s, are estimated to cost close to $2 billion each, so why were these two mothballed and then given away? Many are speculating that some major(and obviously classified) advance in technology made them obsolete as far as the NRO was concerned. At any rate, NASA is grateful for its two "presents," and plans to put them to good use spying on the universe instead of the Earth.

Right-an artist's conception of the KH-12 imaging spy satellite. The two satellites that have been given to NASA are believed to look very similar.

Even more Secret Space Satellite News

On June 17, the Air Force announced that the second X-37B mission had ended , and that the unmanned mini-shuttle craft had landed safely at Vandenberg Air Force Base in southern California. The craft had been aloft for almost fifteen months after being launched from Cape Kennedy on March 5, 2011. According to the Air Force, it made an almost perfect landing just before sunrise on the morning of the 16th. At the same time, the Air Force announced that the first X-37B, known as OV-1, is being readied for its second flight, and will be launched in the fall, probably in September. When the flights began, the Air Force said that the two vehicles were being used to test new technologies for future satellites, but now many in the aerospace community believe that they are fully operational spacecraft which are carrying on extensive orbital spying missions. The military is saying nothing about rumors that Boeing's Phantom Works, which built the X-37B, is working on a manned version of the craft.

CVA Members not Going to Glacier Point-

Be at River Park on August 25 for the drawing for the Dobsonian telescope and other prizes. Starting at 7PM!

Number of extra-solar planets found as of June 2012-778
How many more are out three?

NASA's Spitzer Finds First Objects Burned Furiously

The faint, lumpy glow given off by the very first objects in the universe may have been detected with the best precision yet, using NASA's Spitzer Space Telescope. These faint objects might be wildly massive stars or voracious black holes. They are too far away to be seen individually, but Spitzer has captured new, convincing evidence of what appears to be the collective pattern of their infrared light. The observations help confirm the first objects were numerous in quantity and furiously burned cosmic fuel.

"These objects would have been tremendously bright," said Alexander "Sasha" Kashlinsky of NASA's Goddard Space Flight Center in Greenbelt, Md., lead author of a new paper appearing in The Astrophysical Journal. "We can't yet directly rule out mysterious sources for this light that could be coming from our nearby universe, but it is now becoming increasingly likely that we are catching a glimpse of an ancient epoch. Spitzer is laying down a roadmap for NASA's upcoming James Webb Telescope, which will tell us exactly what and where these first objects were."

Spitzer first caught hints of this remote pattern of light, known as the cosmic infrared background, in 2005, and again with more precision in 2007. Now, Spitzer is in the extended phase of its mission, during which it performs more in-depth studies on specific patches of the sky. Kashlinsky and his colleagues used Spitzer to look at two patches of sky for more than 400 hours each.

The team then carefully subtracted all the known stars and galaxies in the images. Rather than being left with a black, empty patch of sky, they found faint patterns of light with several telltale characteristics of the cosmic infrared background. The lumps in the pattern observed are consistent with the way the very distant objects are thought to be clustered together.

Kashlinsky likens the observations to looking for Fourth of July fireworks in New York City from Los Angeles. First, you would have to remove all the foreground lights between the two cities, as well as the blazing lights of New York City itself. You ultimately would be left with a fuzzy map of how the fireworks are distributed, but they would still be too distant to make out individually.

"We can gather clues from the light of the universe's first fireworks," said Kashlinsky. "This is teaching us that the sources, or the "sparks," are intensely burning their nuclear fuel."

The universe formed roughly 13.7 billion years ago in a fiery, explosive Big Bang. With time, it cooled and, by around 500 million years later, the first stars, galaxies and black holes began to take shape. Astronomers say some of that "first light" might have traveled billions of years to reach the Spitzer Space Telescope. The light would have originated at visible or even ultraviolet wavelengths and then, because of the expansion of the universe, stretched out to the longer, infrared wavelengths observed by Spitzer.

Likewise, astronomers using Spitzer have increased the amount of sky examined to obtain more definitive evidence of the cosmic infrared background. The researchers plan to explore more patches of sky in the future to gather more clues hidden in the light of this ancient era.

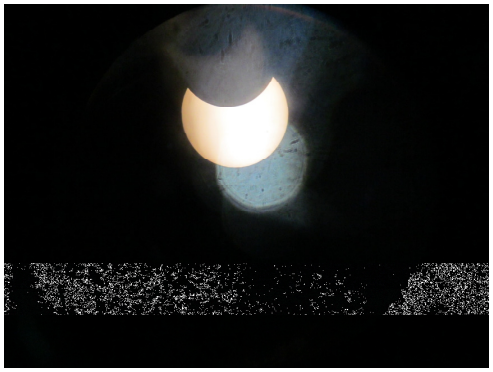
"This is one of the reasons we are building the James Webb Space Telescope," said Glenn Wahlgren, Spitzer program scientist at NASA Headquarters in Washington. "Spitzer is giving us tantalizing clues, but James Webb will tell us what really lies at the era where stars first ignited."

Text and images from nasa.gov

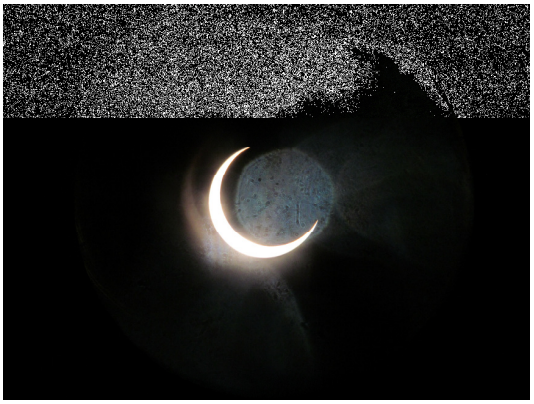
The Solar-Lunar-Venus Spectacle of 2012

Images by CVA members

The annular solar eclipse on May 20, 2012, taken by Fred Ringwald and his student Dillon Trelawny at Whiskeytown Lake near Redding. Fred wrote, "This is series of exposures through an Orion 90mm f/10 refractor and Thousand Oaks Type 2+ white light solar filter with a Canon EOS 60Da camera at ISO 100, each image being a single 1/13 to 1/80-s exposure." Below right-the crowd at Whiskeytown Lake-estimated at over 1,000 people-again from Fred Ringwald.

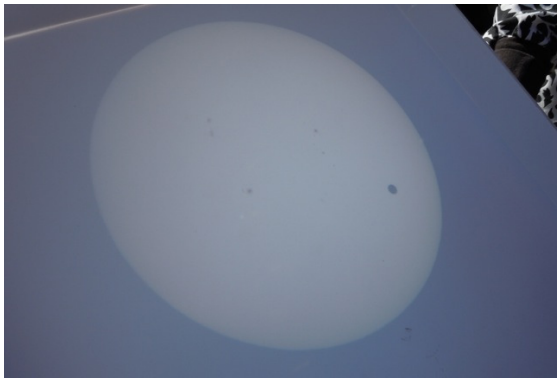


Left and below left- taken by Nathan Parmeter at the Discovery Center in Fresno. He put his digital point-and-shoot camera up against the eyepiece.of the telescope

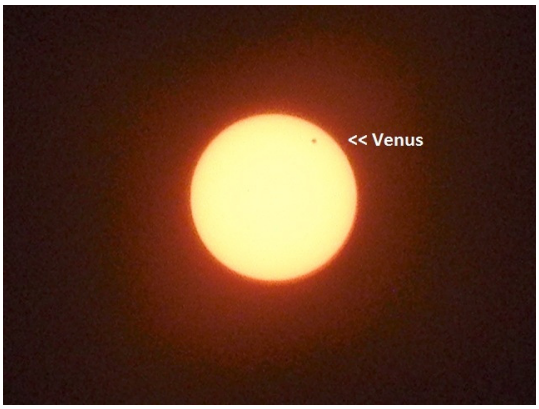


Above center-the lunar eclipse on June 4, 2012, taken by Fred Ringwald with a Canon EOS-60d and a 400 mm lens from the McLane building at Fresno State. Fred was one of the hardy souls to stay up until almost dawn to watch the lunar eclipse

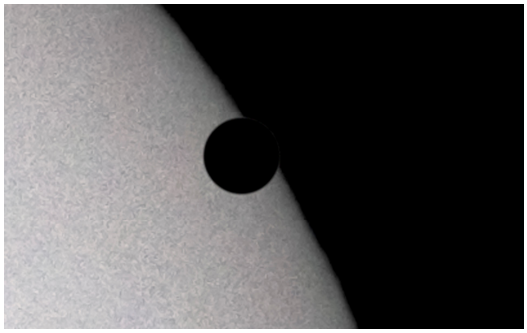
The Transit of Venus, June 5, 2012

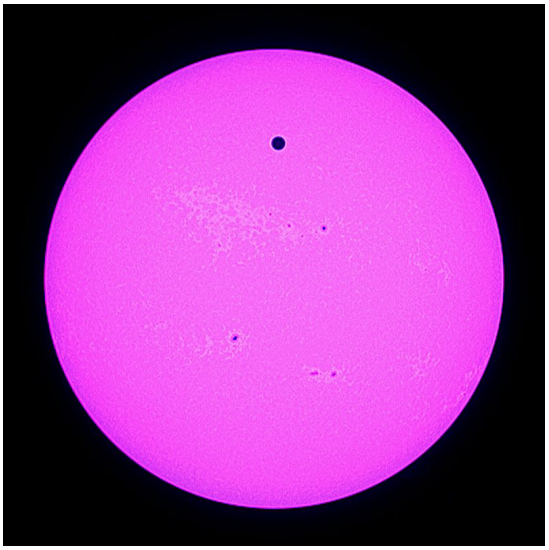


Left-the CVA tent at Fresno State at the Venus transit, June 5; right-the transit projected on to white posterboard. Below right-the crowd at Fresno State viewing the transit. Images by Carol Fry Bohlin, mathematics professor at CSUF.



Left-the transit of Venus, taken by Aaron Lusk using a point-and-shoot camera and a welder's lens





Above left and right-Images of the Venus transit taken by Greg Morgan

Right-by Fred Ringwald. According to Fred, "I only got one good image of the transit. I took it through a Coronado SolarMax 70mm Ca K telescope and an Orion Starshoot III webcam. It shows the Sun's lower chromosphere in the near -ultraviolet light of the Calcium K line, one of the strongest absorption lines in the Sun's spectrum. As you can see, it traces sunspots with more contrast than in visible light. It also shows bright, magnetically active regions around the spots. These are called plages, pronounced "plahzh," which means "beach," because solar astronomer Bernard Lyot thought they looked like beach sand with footprints in it."

More images of the June 5 Venus transit-from the CVA center at Fresno State.

Left-a German visitor to Fresno State has the transit on his back; right-viewing the transit through one of several telescopes. Both images by Carol Fry Bohlin

Left-the transit in the imaging screen of a digital camera; right-another view of the crowd at Fresno State lining up to see the transit. . Images by Aaron Lusk.

Glacier Point 2012
August 24 and 25, 2012
Sign Up Now!

Contact Dave Dutton at 658-7642
Or at twodocs@sierratel.com

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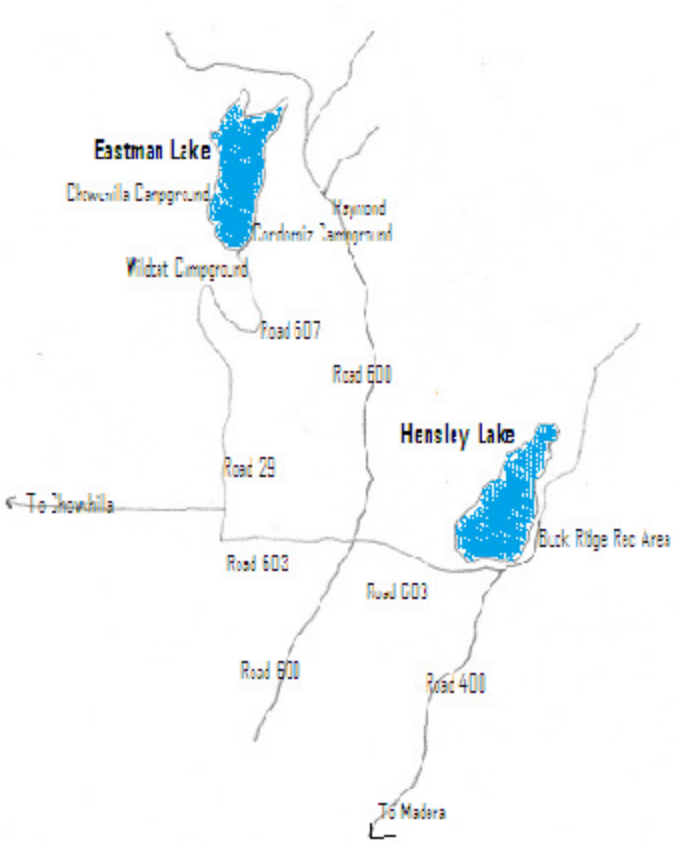
Deadline for articles submission for the September-October 2012 issue

August 20

Please submit articles in Microsoft Word format



To Hensley and Eastman Lakes-Star party sites. The Eastman Lake starwatching site is at the boat ramp at the end of Road 29, just past the Cardinez campground.

Astronomy Short-

In December 1962, a young Caltech astronomer from Holland named Maartin Schmidt, took several spectrographic images of a strange looking "radio star" named 3C 273 with the 200" Hale telescope at Palomar. Studying them over the next few months, he could make no sense of the bizarre emission line patterns. His senior colleague, Jesse Greenspan, had been trying to figure out the same series of lines on another strange object, 3C 48, and concluded that they were indicative of a star's naked core burning hot white. He briefly considered the idea that they were normal hydrogen lines that were redshifted, but disgarded it; stars didn't have redshifts. Schmidt, however, kept studying the lines, and then suddenly one day realized that they were in fact hydrogen lines that were redshifted. He quickly calculated them using a slide rule; they were shifted by 16%; the "star" was 1.5 billion light years away and was probably the brightest object in the universe. Just as he finished, Greenstein walked into his office, and Schmidt told him what he had found. Greenstein quickly did his own calculations with 3C 48, and found a 37% redshift. Both men were blown away over what they had discovered; a whole new class of very distant and extremely bright objects. That night, Schmidt went home and told his wife, "something terrible happened today," when, in his not yet fluent English, he meant to say "wonderful."

Schmidt's finding elevated him from an obscure junior professor to one of the best known scientists in the world; quasars, as the name the "radio stars" were eventually given, were the first of a whole series of objects; pulsars, neutron stars, black holes, and so on, that revolutionized astronomy and forever changed the way that scientists thought about the origin and nature of the universe.

from Dennis Overbye, *Lonely Hearts of the Cosmos*

Time magazine, March 11, 1966, with Maartin Schmidt's discovery of quasars on its cover