September-October
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

A Busy Summer for CVA

Central Valley Astronomers was seemingly everywhere this summer: Glacier Point, Millerton Lake, Eastman Lake, Courtright Reservoir, Riverpark, and on and on. Lots of good times, meeting lots of good people, thrilling children and adults alike-which is what CVA's mission is.
If any of our members have more CVA summer images, send them to Larry Parmeter at lanparmeter3@hotmail.com., and they'll go in the next issue.
Above-CVA at Glacier Point, August 3

CVA Calendar

Sept 7-Star-b-Que and star party at Eastman Lake

Sept 14-Public star party at Riverpark

Sept 21-CVA monthly meeting at FSU 7pm

Oct 5-Star party at Eastman Lake

Oct 12-Public star party at Riverpark

Oct 19-CVA monthly meeting at FSU 7pm

Quote of the Month-

Let not the dark thee cumber,
What though the moon does slumber
The stars of the night
Will lend thee their light
Like tapers clear without number
-Robert Herrick *The Night-piece, To Julia,* c. 1650

September 5-New Moon | September 19-Full Moon | October 4-New Moon | October 18-Full Moon

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

The President's Message-

Summer—the prime observing season in our Mediterranean climate zone—is two-thirds gone. That's the bad news. The good news is that summer still has a month to go and good observing weather will likely extend into October and maybe even November. M31 and the Summer Triangle will not feel ignored.

This summer has been especially busy for CVA, with numerous star parties at Eastman Lake, Millerton Lake, River Park Shopping Center, Courtright Reservoir, and Glacier Point. Unfortunately, your President's schedule this summer did not always align with our star party dates and I missed all three Millerton Lake star parties and all but one at Courtright.

My lone Courtright trip this year (July 5-7) provided excellent skies but produced no other CVA'ers, probably due to falling just after the July 4 holiday. On Friday night, I entertained about a dozen people, including several rock climbers and a small father-daughter backpacking group. By good fortune, one of the rock climbers was an amateur astronomer herself, though she didn't bring a telescope. She helped me explain to the huddled masses what we were looking at. On Saturday, two of our newer members did an up-and-back drive from Fresno to spend about two hours at the site looking at the sights. One of Fresno State's physics professors and his wife also spent much of the evening looking through my telescope. He was actually amazed at how much deep sky is within the grasp of a 5" telescope.

Glacier Point was a success again this year. We had ten telescopes each night, which is the minimum the park likes to see for their public star parties. We have had fewer telescopes some years and we have had more and more is better (up to a point, that is). In the future, I would like to see around 15 telescopes each night, which enables us to better serve the tourists. I think the Glacier Point Star Party is the highlight of our club year and I would like y'all to consider adding it to your 2014 To Do List.

The tourist crowds at Glacier Point were smaller than normal, with only about 75 to 100 people each night. I think there were three main contributing factors: the Aspen Fire north of Huntington Lake, the puny waterfalls due to last winter's 50-percent snowpack, and higher than normal temperatures. Even though the Aspen Fire was a good 40 miles southeast of Glacier Point, it started about a week before our star party and for that week the winds blew mostly to the northwest. There was a heavy layer of smoke as I drove through Coarsegold on the way up, but little evidence of smoke at Glacier Point itself except for a faint smell. There was, however, a thick layer of smoke along the Sierra crest that obscured about 10 degrees above the horizon. One of the rangers told me that smoke from this fire had even made it as far north as Oregon. Fortunately, there was little to no influence from the smoke once you looked about 30 degrees above the horizon.

One interesting side note…Friday afternoon I was at Washburn Point and got into a conversation with a park ranger who turned out to be our ranger at Glacier Point both nights. In the course of our discussion, he told me that the week before, the Sonoma County Astronomical Society had witnessed the same type of event that some of you remember from out Glacier Point Star Party in 2009, the event I have dubbed The Night CVA Saw Two Bares on Half Dome. Apparently, it is more common that we all thought for hikers to celebrate making it to the top

that granite monolith by removing their clothes. Little do they know that there are telescopes at Glacier Point that can see them up close and personal.

Comet ISON is apparently not living up to the hype that it got earlier this year. According to Sky & Telescope, on August 13, "skilled amateur imager Bruce Gary in Arizona has apparently become the first person to pick up Comet ISON after its 2½-month intermission behind the glare of the Sun. He succeeded in recording a fuzzy point with an anti-sunward tail at Comet ISON's exact predicted position among the stars. Measuring the image, Gary comes up with a V magnitude of 14.3 ± 0.2." It is now tracking a little below the previously predicted magnitude curve (see http://aerith.net/comet/catalog/2012S1/2012S1.html). Current predictions indicate ISON may rival Venus and the full Moon as hoped. Even so, ISON will probably still rate a public CVA event.

Our Star-B-Q this year is Saturday, September 7, at the same picnic shelter we used last year, which is on the east side of the lake before you get to our observing site. The shelter is visible from the main road, but is accessed from the spur road to the group camp site. CVA will provide hamburgers, hot dogs, buns, condiments, and sodas. Everyone is asked to bring things to share to round out the meal, such as salads, chips and salsa, chili, deserts, etc. Debi and I will arrive by 5:00 p.m. to set up, with the goal being to start serving hamburgers and hot dogs by 5:30. Sunset is 7:18, so this should provide enough time to eat, socialize, and set up telescopes.

Fred Lusk

The Annual CVA Star-B-Q and Starwatch-Saturday, September 7, 2013

At the day use picnic shelter at Eastman Lake-starting at 5PM

Don't Miss it!

The 2014 CVA calendar is now being put together-anyone with images that they would like to have included-send to Fred Lusk at fel3@att.net

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Number of extrasolar planets found as of August 2013-940

How many more are out there?

Profiles in Astronomy

Johann Galle 1812-1910

Galle was born and raised near the town of Grafenheinchen in Germany, where his parents owned a tavern. He attended school in Wittenburg(the same town where Martin Luther nailed his 95 thesis to the church door and began the Protestant Reformation), and then studied mathematics at Frederich Wilhelm University in Berlin. Afterwards, he taught mathematics and physics at public gymnasiums(high school) in Guben and later Berlin.

In 1835, Galle went to work as an assistant to Johann Encke(of Encke Comet fame) at the newly built Berlin Observatory. He would stay there for the next 16 years, during which time he discovered a moon of Saturn and three comets. He also completed his doctoral thesis in astronomy(concerning planetary orbits) while at the observatory.

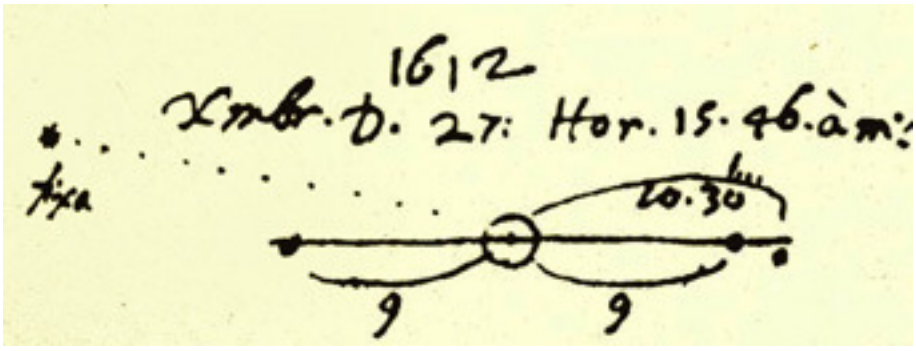
But Galle's most famous sighting came in 1846. In 1845, he sent a copy of his doctoral thesis to the French mathematician and astronomer Urban Leverrier. A year later, Leverrier responded, not with a critique of the thesis, but with calculations and maps giving the possible location of an unknown body that was influencing Uranus, which had been discovered in 1783 by William Herschel. Ever since Herschel's finding, scientists studying Uranus were trying to account for irregularities in its orbit. Both Levierrer in France and John Couch Adams in England independently calculated the orbit, size, and possible location of another planet which was affecting Uranus. Leverrier, in his letter, asked Galle to make observations in the area where the planet should be. On the night of September 23, 1846, Galle and his assistant Heinrich d'Arrest found an unknown "star" less than 1° from Leverrier's calculated position. They followed it over several nights, watching it move through the sky, and concluded that it had to be a planet. It was, and was eventually named Neptune, the second "modern" planet. Ironically, years later, a major error was found in Leverrier's equations, which, if it had been corrected, would have taken Galle to a completely different part of the sky. Leverrier gave Galle credit for finding Neptune, but Galle insisted that the discovery was due to Leverrier instead. Today, all three men: Adams, Leverier, and Galle, are given equal co-credit for the discovery. *

In 1851, Galle moved to Breslau(today Worclaw) to work at the Breslau Observatory. He also became a professor of mathematics and astronomy at the University of Breslau. He would stay there for the next 45 years, where he specialized in planetary orbits and comets. One of his major projects was a huge compendium of data on all of the comets(over 400) that had been discovered up to that time. He also did research on the auroras and meteors, and as well studied the Earth's magnetic field. He wrote and published over 200 books and papers on his researches.

In 1896, Galle moved to Postdam, where he lived his remaining years, dying at the age of 98 in 1910. Craters on both the Moon and Mars are named after him, as well as an asteroid and one of the rings of Neptune.

Source-"Johann Galle," Wikipedia

*Galileo's journal on December 27, 1612 describes and contains a drawing of a "starlike" object that he observed near Jupiter. He saw it again on January 28, 1613. He did not recognize it, gave up on it, and went on to other endeavors. But, based on his accounts and using the laws of orbital mechanics, scientists now strongly believe that he saw Neptune, and simply did not recognize it as a planet. One wonders how the course of planetary astronomy might have changed if he had investigated a bit further.



Left-Galileo's journal depicting the "starlike" object(far left) that he saw near Jupiter in December 1612

CVA Calendar September-October 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
September 1 Pioneer 11 flies by Saturn-1979	2 Labor Day	3	4	5 New Moon  Rosh Hashanah begins	6	7 CVA Star-b-que and star party at Eastman Lake
8 Garndparents' Day	9	10	11	12	13	14 Yom Kippur CVA public star party at Riverpark
15	16	127	18	19 Full Moon 	20	21 CVA meeting CSUF Easat Eng rm 191 7pm
22 Fall Equinox	23 Discovery of Neptune in 1846-see Profiles in Astronomy	24	25	26	27	28
29	30	October 1	2	3	4 Sputnik 1-first artificial satellite launched-1957 New Moon 	5 Edwin Hubble discovers Cepheid Varables in M31-1923 CVA star party at Eastman Lake
6	7 Luna 3 takes first images of the Moon's far side-1959	8	9	10	11	12 CVA public star party at Riverpark International Moon Night Columbus Day
13	14 Columbus Day Observed	15	16	17	18 Full Moon 	19 CVA meeting CSUF East Eng 191-7pm
20	21	22 Vanera 9 takes first images of the surface of Vanus-1975	23	24	25	26
27	28	29	30	31 Halloween	November 1 Day of the Dead	2

What's New in Space

The History of the Saturn Rocket Part 4

Once the flaws of the Apollo 6 mission were found and solved, the U.S. was ready to use the Saturn to go to the Moon. And that is what it did. I am not going to repeat the history of the manned Apollo program here, since it has already been covered in other previous articles. But, starting with Apollo 7, the Saturn 1B/5 series had a perfect record of launches and deployments, sending American astronauts into Earth orbit and to the Moon. Apollo 7 was an Earth orbit mission, and used the 1B; the rest of the Moon missions, from Apollo 8 to 17, all used the Saturn 5, and every one of them performed flawlessly. It was a testament to Wehrner Von Braun's engineering genius and American mechanical knowhow that made it all possible. (Originally, NASA planned nine Moon landing missions. But, by 1970, the government was already cutting back on NASA's budget, and so the space agency cancelled Apollos 19 and 20. NASA hoped to save Apollo 18 by reducing it from a lunar landing to a Lunar mapping mission, so it would not need a lander, but it, too was cancelled in 1971. Apollo 18's crew would have been Deke Slayton, Joe Allen and Joe Engle. The crews for Apollos 19 and 20 were never announced, but their commanders would have been Richard Gordon and Fred Haise).

NASA's Apollo followup program, the Apollo Applications Program, which became known as Skylab, also relied heavily on the Saturn rockets. A Saturn 5 would be used to boost the space station into Earth orbit, and then Saturn 1Bs would be used to launch the Apollo spacecraft to man it. That, too, ran into financial walls. Originally, NASA planned for ten Skylab missions extending from 1972 to 1978, when the Space Shuttle would be launched. But Skylab, too, felt the budget cuts, and the program was scaled back to one Saturn 5 and three Saturn 1Bs. They went off without a hitch as well in 1973 and 1974, adding to a perfect record for manned launches.

The Saturn was saved for one more launch-The joint-ASTP flight between the U.S. and the Soviet Union in 1975. NASA really couldn't afford that either, but it scraped up an Apollo capsule and a Saturn 1B that had originally been intended for Skylab for the July 1975 ASTP mission(in reality, two ASTP missions were originally planned, but NASA simply couldn't come up with the money for a second flight, and, by mutual agreement, it was dropped. The Russians were probably relieved as it was. Many of them felt that they had already given away too many of their space program secrets with just one flight. But then, the ASTP program is a whole separate story in itself.)

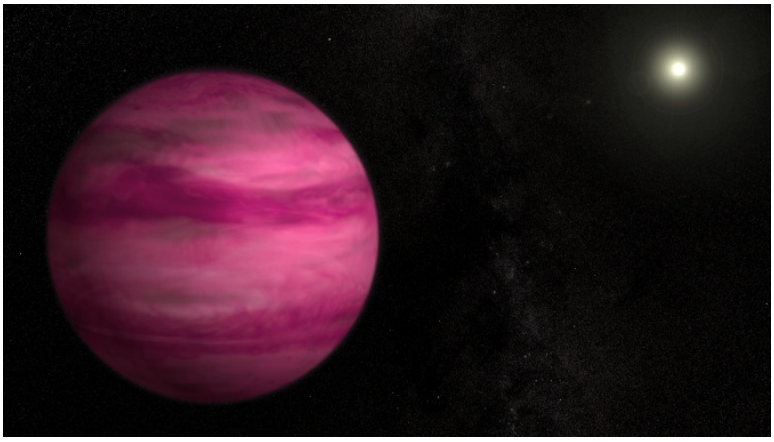
After ASTP, all that was left were two Saturn 5s, one intended for Apollo 18 and the other for Apollo 19. They could not be used for Skylab, since the space station needed a separate "custom made" Saturn 5 to carry it into space. Today, one of them is on display at the Kennedy Space Center; the other is at the Marshall Space Flight Center in Huntsville, Alabama, where it all began. In the end, the Saturn 1 made 15 flights, all successful; the 1B, 8 flights, again all successful; and the Saturn 5, 14 flights with a perfect record.

NASA tried to extend the life of the Saturn. During the planning for the Space Shuttle, one of the proposals for the booster rocket was to use the first and second stages of the Saturn 5 to put the shuttle into orbit. It received some positive support, but the philosophy at the time was to eliminate the "throwaway" booster technology in favor of reusable components. Ironically, given the problems and the expenditures of the solid booster rockets and the external Shuttle fuel tanks, the Saturn 5-Shuttle booster would have come out far cheaper in the long run. But NASA had to put short-sighted immediate financial benefits ahead of long term planning, as it has had to do in so many programs.

More recently, however, the proposal for the "heavy lift" Orion/MPCV system currently being built by NASA for use in the 2020s goes back to the beginnings and utilizes the engines and part of the design from the S-IVB third stage of the Saturn 5, so that the world's most successful rocket may have a renaissance, or at least a partial one, after all.

So, I go back to the original question-why did NASA throw away the most successful rocket ever made? It may have been a combination of cost, compatibility, or timing. Politics probably played a role, as did the philosophy of the time. Many in the aerospace community thought that newer was better and cheaper, and the Saturn wasn't newer nor was it cheap at the time. Of course, we now know that older might be better after all. NASA's going back to the Saturn for the Orion/MPCV program isn't just a recognition that tried and true does work. The final word might also be that it took so long to realize that in the first place.

Astronomers Image Lowest-mass Exoplanet Around a Sun-like Star



Using infrared data from the Subaru Telescope in Hawaii, an international team of astronomers has imaged a giant planet around the bright star GJ 504. Several times the mass of Jupiter and similar in size, the new world, dubbed GJ 504b, is the lowest-mass planet ever detected around a star like the sun using direct imaging techniques.If we could travel to this giant planet, we would see a world still glowing from the heat of its formation with a color reminiscent of a dark cherry blossom, a dull magenta," said Michael McElwain, a member of the discovery team at NASA's Goddard Space Flight Center in Greenbelt, Md. "Our near-infrared camera reveals that its color is much more blue than other imaged planets, which may indicate that its atmosphere has fewer clouds." GJ 504b orbits its star at nearly nine times the distance Jupiter orbits the sun, which poses a challenge to theoretical ideas of how giant planets forAccording to the most widely accepted picture, called the core-accretion model, Jupiter-like planets get their start in the gas-rich debris disk that surrounds a young star. While this model works fine for planets out to where Neptune orbits, about 30 times Earth's average distance from the sun (30 astronomical units, or AU), it's more problematic for worlds located farther from their stars. GJ 504b lies at a projected distance of 43.5 AU from its star; the actual distance depends on how the system tips to our line of sight, which is not precisely known. "This is among the hardest planets to explain in a traditional planet-formation framework," explained team member Markus Janson, a Hubble postdoctoral fellow at Princeton University in New Jersey. "Its discovery implies that we need to seriously consider alternative formation theories, or perhaps to reassess some of the basic assumptions in the core-accretion theory."

The research is part of the Strategic Explorations of Exoplanets and Disks with Subaru (SEEDS), a project to directly image extrasolar planets and protoplanetary disks around several hundred nearby stars using the Subaru Telescope on Mauna Kea, Hawaii. The five-year project began in 2009 and is led by Motohide Tamura at the National Astronomical Observatory of Japan (NAOJ).While direct imaging is arguably the most important technique for observing planets around other stars, it is also the most challenging. "Imaging provides information about the planet's luminosity, temperature, atmosphere and orbit, but because planets are so faint and so close to their host stars, it's like trying to take a picture of a firefly near a searchlight," explained Masayuki Kuzuhara at the Tokyo Institute of Technology, who led the discovery team.

. The researchers find that GJ 504b is about four times more massive than Jupiter and has an effective temperature of about 460 degrees Fahrenheit (237 Celsius).It orbits the G0-type star GJ 504, which is slightly hotter than the sun and is faintly visible to the unaided eye in the constellation Virgo. The star lies 57 light-years away and the team estimates the systems is about 160 million years, based on methods that link the star's color and rotation period to it age. Young star systems are the most attractive targets for direct exoplanet imaging because their planets have not existed long enough to lose much of the heat from their formation, which enhances their infrared brightness.

"Our sun is about halfway through its energy-producing life, but GJ504 is only one-thirtieth its age," added McElwain. "Studying these systems is a little like seeing our own planetary system in its youth."

Text and image from nasa.com

Inventing Astrophotography: Capturing Light Over Time

By Dr. Ethan Siegel

We know that it's a vast Universe out there, with our Milky Way representing just one drop in a cosmic ocean filled with hundreds of billions of galaxies. Yet if you've ever looked through a telescope with your own eyes, unless that telescope was many feet in diameter, you've probably never seen a galaxy's spiral structure for yourself. In fact, the very closest large galaxy to us¾Andromeda, M31¾wasn't discovered to be a spiral until 1888, despite being clearly visible to the naked eye! This crucial discovery wasn't made at one of the world's great observatories, with a world-class telescope, or even by a professional astronomer; it was made by a humble amateur to whom we all owe a great scientific debt.

Beginning in 1845, with the unveiling of Lord Rosse's 6-foot (1.8 m) aperture telescope, several of the nebulae catalogued by Messier, Herschel and others were discovered to contain an internal spiral structure. The extreme light-gathering power afforded by this new telescope allowed us, for the first time, to see these hitherto undiscovered cosmic constructions. But there was another possible path to such a discovery: rather than collecting vast amounts of light through a giant aperture, you could collect it *over time*, through the newly developed technology of photography. During the latter half of the 19th Century, the application of photography to astronomy allowed us to better understand the Sun's corona, the spectra of stars, and to discover stellar and nebulous features too faint to be seen with the human eye.

Working initially with a 7-inch refractor that was later upgraded to a 20-inch reflector, amateur astronomer Isaac Roberts pioneered a number of astrophotography techniques in the early 1880s, including "piggybacking," where his camera/lens system was attached to a larger, equatorially-mounted guide scope, allowing for longer exposure times than ever before. By mounting photographic plates directly at the reflector's prime focus, he was able to completely avoid the light-loss inherent with secondary mirrors. His first photographs were displayed in 1886, showing vast extensions to the known reaches of nebulosity in the Pleiades star cluster and the Orion Nebula.

But his greatest achievement was this 1888 photograph of the Great Nebula in Andromeda, which we now know to be the first-ever photograph of another galaxy, and the first spiral ever discovered that was oriented closer to edge-on (as opposed to face-on) with respect to us. Over a century later, Andromeda looks practically identical, a testament to the tremendous scales involved when considering galaxies. If you can photograph it, you'll see for yourself!

Astrophotography has come a long way, as apparent in the Space Place collection of NASA stars and galaxies posters at http://spaceplace.nasa.gov/posters /#stars.

Article from-NASA Space Place by Dr. Laura Lincoln

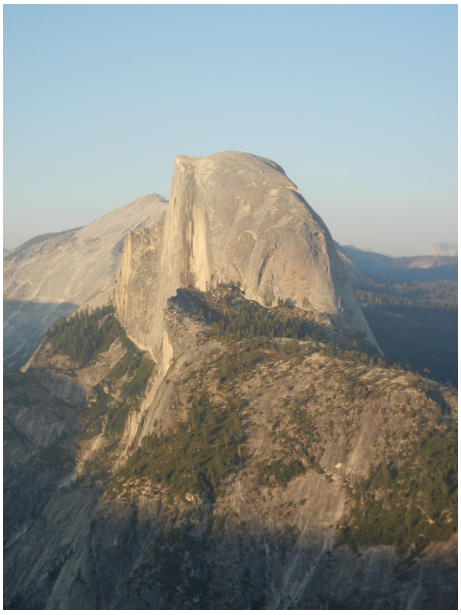
On right-the Andromeda Galaxy, the first astrophotography of a galaxy, Taken by Isaac Roberts in 1888(at that time, it was called the Great Nebula in Andromeda). Image also from NASA Space Place

Right-a more recent astrophoto-the Andromeda Galaxy taken by the Hubble Space Telescope

Image-NASA-HST

What I Did on my Summer Vacation

Images of CVA at Glacier Point and Millerton Lake- Summer 2013-



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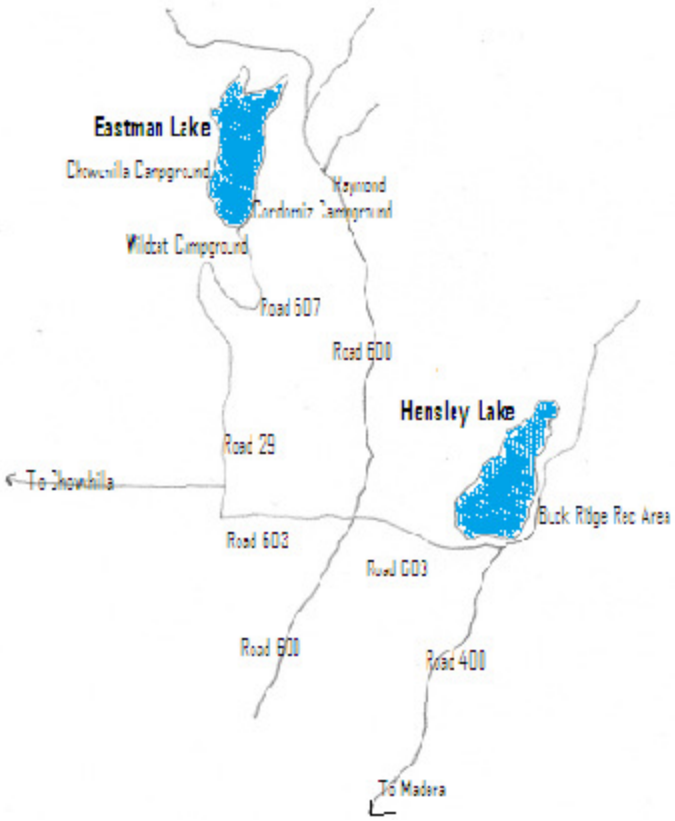
Deadline for articles submission for the November-December Observer October 25

Please submit articles in Microsoft Word format

Astronomy Short

Henrietta Leavitt(1868-1921) was the most famous of the group of female assistants who worked under Edward Pickering at the Harvard University Observatory in the late 1800s and early 1900s. It was known as "Pickering's Harem," and was supervised by his housekeeper-turned-astronomer, Wilhelminia Fleming(1857-1911), who made many important discoveries in her own right.

Leavitt's specialty was variable stars, especially the Cepheid variables, and it was with them that she discovered, in 1912, the period-luminosity relationship, one of the bedrock findings in modern astronomy. With it, scientists could measure the distances to far away stars with great accuracy. So monumental it was that in 1923, the Nobel Committee contacted Harvard to say that she had been nominated for, and would probably be awarded , the Nobel Prize in Physics that year. Only then did the Committee learn that she had died two years earlier.



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.

The Oldest Observatory Still in Use

The Paris Observatory, established in 1667 under the sponsorship of King Louis XIV, is today the oldest regularly operating astronomical facility in the world. Many famous scientists have worked at it, including Ole Romer, Giovanni Cassini, Christian Huygens, Jerome LaLande, Jean Foucault, and Urban Leverrier. The metric system was developed at the observatory in 1789, and the Paris Meridian, which was the prime meridian until 1884, was calculated at it. Today, the observatory has facilities in several locations throughout France, but the original building still stands in Paris.