September-October
2014
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

CVA Calendar

September 6-CVA monthly meeting at CSUF-7pm East Engineering Rm 191

September 20-CVA Star-B-Que and Stary party at Eastman Lake

October 4-CVA public star-watch at Riverpark

October 11-CVA monthly meeting at CSUF-7pm East Engeering Rm 191

October 25-CVA starwatch at Eastman Lake

October 31-Starparty for Trick-or-treaters

Observer Image of the Month

This beautiful image of the crescent Moon was taken by CVA member Aaron Lusk, using his Canon DSLR, on June 30, 2014.

CVA members-Have a great astronomical image you'd like to share-send it to the Observor editor

Quote of the Month-

"Thus the explorations of space end on a note of uncertainty. We are, by definition, at the center of the observable region. We know our immediate neighborhood intimately. With increasing distance, our knowledge fades, and fades rapidly. Eventually, we reach a dim boundary -the utmost limits of our telescopes. There, we measure shadows, and we search among ghostly errors of measurements for landmarks that are scarcely more substantial."

-Edwin Hubble, from *The Realm of the Nebulae,* 1936

○ September 8-Full Moon ● September 23-New Moon ○ October 8-New Moon ● October 23-Full Moon

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Autumn is a Time for Two Wonderful Star Clusters

The Double cluster in Perseus(NGC 869 and NGC 884) is one of the most beautiful objects in the fall sky. According to the latest research, the Perseus cluster is about 7,500 light years away, contains almost 20,000 solar masses, and is estimated to be about twelve million years old. Each cluster has about 300 stars in it, and both have been determined to be blueshifted.

And, of course, no autumn or winter viewing is every complete without the Pleiades(M45), also known as the Daughters of Atlas, again, among the most beautiful objects in the sky. According to research, the Pleiades have been found to be about 400 light years away from Earth, are between 75 and 100 million years old, and are moving in the direction of the constellation Orion. It is estimated that in several million years they will disperse, and the cluster will no longer exist.

Profiles in Astronomy

Frederich Wilhelm August Argelander 1799-1875

Argelander was born and raised in Memel, East Prussia, in what is now Lithuania. In 1816, he enrolled at Konigsberg University, where he studied under the well -known astronomer Frederick Bessel. After receiving his doctorate, he became director of the Abo Observatory in Finland. In 1836, at the request of Prussian King Fredrick Wilhelm IV, who was a family friend, Argelander moved to Bonn, where he oversaw the establishment of the Bonn Observatory, and was its director until his death.

Argelander's contributions to astronomy consisted of his many projects in stellar studies. He was one of the first to study and catalogue variable stars. As well, he developed a system for studying and organizing the positions and magnitudes of large numbers of stars. His, and his assistants', great achievement was the *Bonner Durchmusterung*(commonly known as the BD), published in sections between 1852 and 1859, which gave the precise locations and magnitudes of over 324,000 stars, all in the northern hemisphere. It was remarkable that he studied these objects using only a 3" refractor telescope, the best and largest he had available at the time.

Argelander won many awards for his work, including the gold medal of the Royal Society in London, membership in the Swedish Royal Society, and also honorary membership in the American Academy of Arts and Sciences. A crater on the Moon is named for him, and also an asteroid.

Sources-Wikipedia
International Encyclopedia of Astronomy

CVA members-Send your summer astronomical images and information about them for publication in November-December issue of the Observer

(Give date of image, camera/instruments used, and exposure times)

Remember-the annual CVA Fall Star-B-Que and starwatch Will take place on Saturday, September 20 At Eastman Lake!

CVA Calendar September-October 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Labor Day Pioneer 11 flies by Saturn 1979	2	3	4	5	6 CVA monthly meeting 7pm CSUF
7 Grandparents' Day	8	9 Full Moon 	10	11	12	13
14	15	16	17	18	19	20 CVA star-bq and star party
21	22	23 Discovery of Neptune in 1846 by Adams, Le Verrier, and Gall Fall Equinox	24 New Moon 	25 Rosh Hashanah begins	26	27
28	29 Astronomy Week begins	30	October 1	2	3	4 Sputnik 1 is launched - 1957 Yom Kippur CVA public star party at Riverpark Astronomy Day
5	6	7 Luna 3 takes first images of the Moon's far side-1959	8 Full Moon 	9 First Day of Sukkat	10	11 CVA monthly meeting 7pm CSUF
12	13 Columbus Day	14	15	16	17	18
19	20	21	22 Venera 9 lands o Venus-takes first and only images of surface-1975	23 New Moon  Partial Solar Eclipse	24	25 CVA star party at Eastman Lake
26	27	28	29	30	31 Halloween	November 1 All Saints' Day

What's New in Space

The Secrets of Groom Lake, Revisited

Almost twenty years ago, I wrote an article for this column entitled "The Secrets of Groom Lake." It concerned the then classified Air Force facility at Groom Lake, Nevada, and the even more classified aircraft programs there. Reports from aerospace experts and others had Groom Lake as the center of America's "Black" programs; among them were a stealth helicopter, triangular shaped high speed aircraft of various kinds, and the rumored successor to the SR-71 spy plane, the so-call Aurora, which was said to be a mach 5 aircraft that flew at the edge of space. During the late 1980s and early to mid 1990s, there were many reports of mysterious aircraft being seen and heard over the skies of Southern California and Nevada, most of them connected to Groom Lake. But by the late 90s, the reports and sightings had died out. Word was even going around that Aurora was a myth, a fantasy, that it never really existed at all, except in the minds of conspiracy wackos.

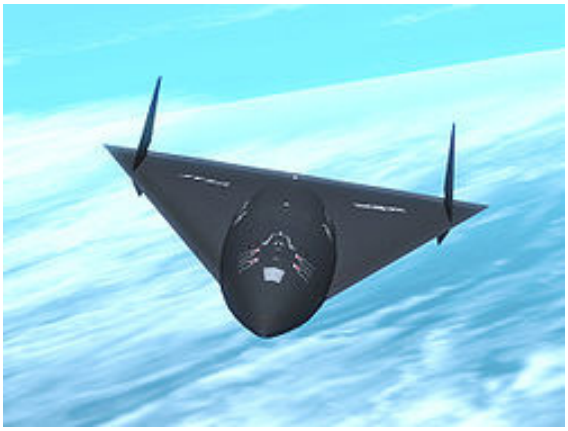
Now, in the last few years, the reports and sightings have come back. People again are seeing mysterious triangular shaped aircraft in the Southwest, and also in Europe. Sonic booms of an unknown nature are again being heard over Southern California. Most of all, thanks to digital technology, some of these sightings have been photographed. Once again, Groom Lake, which now has been acknowledged by the Air Force, has become the focus for perhaps a new generation of classified aircraft. This, then is what is known after all those years since the original article.

In November 2013, Lockheed-Martin announced that it was working on what it called the successor to the fabled SR-71 Blackbird. Known officially as the(what else?) SR-72 Blackbird, it is a very high tech aircraft which will cruise at mach six at altitudes of 120,000 feet or higher, using a unique combined-cycle turbojet/ramjet engine system. L-M says that it hopes to have the first demonstrator-prototype in the air by 2018, and operational vehicles by 2023. Both manned and unmanned versions will be built. The illustration that came with L-M's announcement showed a very stealthy aircraft with a triangular/ delta design flying at the edge of outer space. L-M exhibited confidence that the aircraft will be a success and will ensure America's surveillance superiority well into the 21st century. It is known that Northrop is also building a mach 6 unmanned spy plane designated the RQ-180; eventually the Air Force will decide which to buy and use. Right above-L-M's SR-72

While many applauded this latest entry into the country's spy arsenal, others had strong questions as to exactly how the SR-72 came to be, and why there was such a long gap; almost twenty years between the official retirement of the SR-71 and the advent of the SR-72. The Air Force had long said that the Blackbird was retired because spy satellites could do the job much more efficiently and precisely. This alone raised eyebrows, since satellites were subject to the whims of orbital mechanics and earthly weather patterns, as well as delays in real-time spying. Added to that, though, were all the earlier rumors of classified aircraft, especially the fabled Aurora.

The Aurora story goes back to the late 1980s; an investigator going through the Air Force budget for 1986 came across a classified program labeled "Aurora," which a censor had obviously forgotten to take out. As it was known that, during the early years of the Reagan Administration, the Air Force's "Black" budget increased substantially, especially in aircraft, so the code name "Aurora" was believed to refer to a secret aircraft program. At about the same time, people, both amateurs and professionals, were beginning to see mysterious triangular shaped aircraft in the skies over the U.S., and also Europe. One of the best known sightings was in 1989, when a British oil platform worker in the North Sea, who was also an experienced aircraft spotter, witnessed an unknown triangular shaped aircraft, accompanied by two U.S. Air Force F-111s, being refueled by an Air Force tanker plane. This very credible sighting led to speculation that he had seen the Aurora. In succeeding years, people in Southern California saw similar shaped aircraft at night, and also heard sonic booms from high flying high speed aircraft which were headed for Southern Nevada, the site of Groom Lake. The Groom Lake base itself had been expanded during the 1980s, including an extension

of the main runway to almost six miles long, which indicated that hypersonic type aircraft, which need very long runways, were using it. Furthermore, on September 26, 1994, a mysterious aircraft, described as delta-shaped with twin rear canted vertical fins, crashed during takeoff from RAF Boscombe Downs, a highly secure Royal Air Force Base in Southern England. Boscombe Downs has long been rumored to house classified American aircraft used for high security NATO operations. Witnesses say that almost immediately huge tarps were thrown over the plane, and American, not RAF, security guards were posted all around it. Two days later, a U.S. Air Force C5-A Galaxy arrived, the plane was apparently put into its cargo bay, and flown to an unknown location. According to witnesses, accompanying the Galaxy was a Boeing 737 with markings identical to the so-called "Janet" planes, which are used to carry military and civilian personnel to and from Groom Lake. The incident became known to the British media, but when the British Ministry of Defense was asked about it, it denied any knowledge of classified aircraft at the base.



Above-a conjectural illustration of the Aurora

In addition to the Boscombe Downs incident, witnesses at that facility and also at RAF Machrihanish, another highly secure Royal Air Force base in Northern Scotland, have told of hearing aircraft with extremely loud pulsing sounds; almost identical sounds have been heard coming out of Groom Lake. In addition, a number of civilian radar stations in both England and the U.S. have tracked mysterious aircraft at very high speeds, in their estimation, mach 4 and higher. No known planes or jets can travel that fast.

These stories, and others, convinced many in the aerospace community that the Air Force and/or the American intelligence agencies had a new super fast and super secret spy plane, that, if not already operational, was close to being so. When it was first proposed to end funding for and retire the SR-71s in 1990, It was puzzling to some that the Air Force did not object to it, which it normally would. Their assumption was that something was already taking the SR-71's place, and the Aurora, or whatever it was called, was very likely that something.

The Aurora story was on the front page of the aerospace community's mind for several years in the early and mid 1990s. But by the turn of the millennium, it more or less died out. One reason may be that in 1996, the Air Force reactivated three SR-71s, saying that they were once again "necessary for national security." Maybe they were needed, but some had an idea that it was also done to take discussion away from the Aurora. And for the most part it did. By 2002, when the planes were retired again, it was difficult to find anything about classified planes or secret programs.(The Air Force no longer flies the SR-71, but NASA still uses two of them for high altitude and high speed research). Those who considered the Aurora program believed that it was either scaled back or cancelled outright by the late 1990s-but was it?

End of part 1

Reminder to all CVA members-

Two great astronomical events in October-

A total lunar eclipse on October 8

And a partial solar eclipse on October 23

Don't miss them!

Droughts, Floods and the Earth's Gravity, by the GRACE of NASA
By Dr. Ethan Siegel

When you think about gravitation here on Earth, you very likely think about how constant it is, at 9.8 m/s^2 (32 ft/s^2). Only, that's not quite right. Depending on how thick the Earth's crust is, whether you're slightly closer to or farther from the Earth's center, or what the density of the material beneath you is, you'll experience slight variations in Earth's gravity as large as 0.2%, something you'd need to account for if you were a pendulum-clock-maker.

But surprisingly, the amount of *water content* stored on land in the Earth actually changes the gravity field of where you are by a significant, measurable amount. Over land, water is stored in lakes, rivers, aquifers, soil moisture, snow and glaciers. Even a change of just a few centimeters in the water table of an area can be clearly discerned by our best space-borne mission: NASA's twin Gravity Recovery and Climate Experiment (GRACE) satellites.

Since its 2002 launch, GRACE has seen the water-table-equivalent of the United States (and the rest of the world) change significantly over that time. Groundwater supplies are vital for agriculture and provide half of the world's drinking water. Yet GRACE has seen California's central valley and the southern high plains rapidly deplete their groundwater reserves, endangering a significant portion of the nation's food supply. Meanwhile, the upper Missouri River Basin—recently home to severe flooding—continues to see its water table rise.

NASA's GRACE satellites are the only pieces of equipment currently capable of making these global, precision measurements, providing our best knowledge for mitigating these terrestrial changes. Thanks to GRACE, we've been able to quantify the water loss of the Colorado River Basin (65 cubic kilometers), add months to the lead-time water managers have for flood prediction, and better predict the impacts of droughts worldwide. As NASA scientist Matthew Rodell says, "[W]ithout GRACE we would have no routine, global measurements of changes in groundwater availability. Other satellites can't do it, and ground-based monitoring is inadequate." Even though the GRACE satellites are nearing the end of their lives, the GRACE Follow-On satellites will be launched in 2017, providing us with this valuable data far into the future. Although the climate is surely changing, it's water availability, *not* sea level rise, that's the largest near-term danger, and the most important aspect we can work to understand!

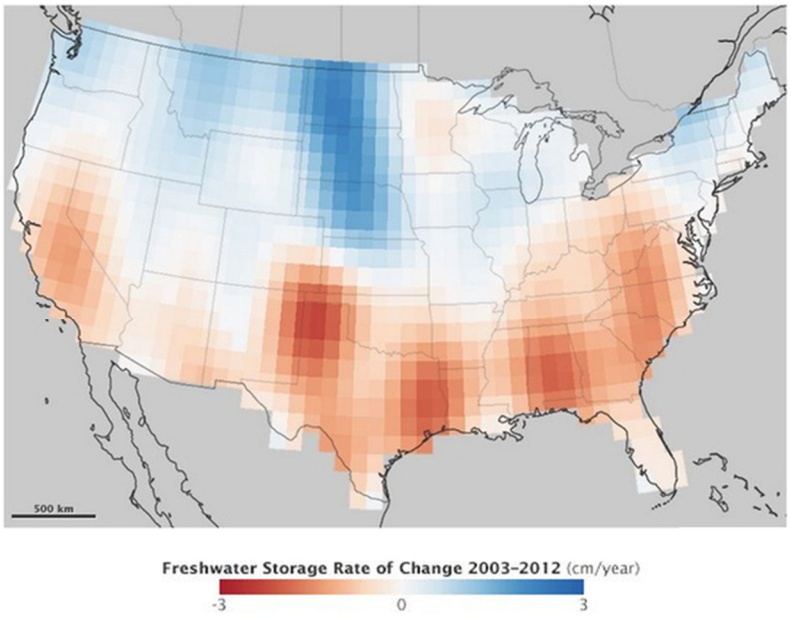


Image credit: NASA Earth Observatory image by Jesse Allen, using GRACE data provide courtesy of Jay Famigleitti, University of California Irvine and Matthew Rodell, NASA Goddard Space Flight Center. Caption by Holli Riebeek.

Article and map courtesy of NASA's Space Place

Number of Extra-Solar Planets Found as of August 2014-1,815
How many more are out there?
Thousands? Tens of thousands? Hundreds of thousands?

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Bosscha Observatory in Indonesia

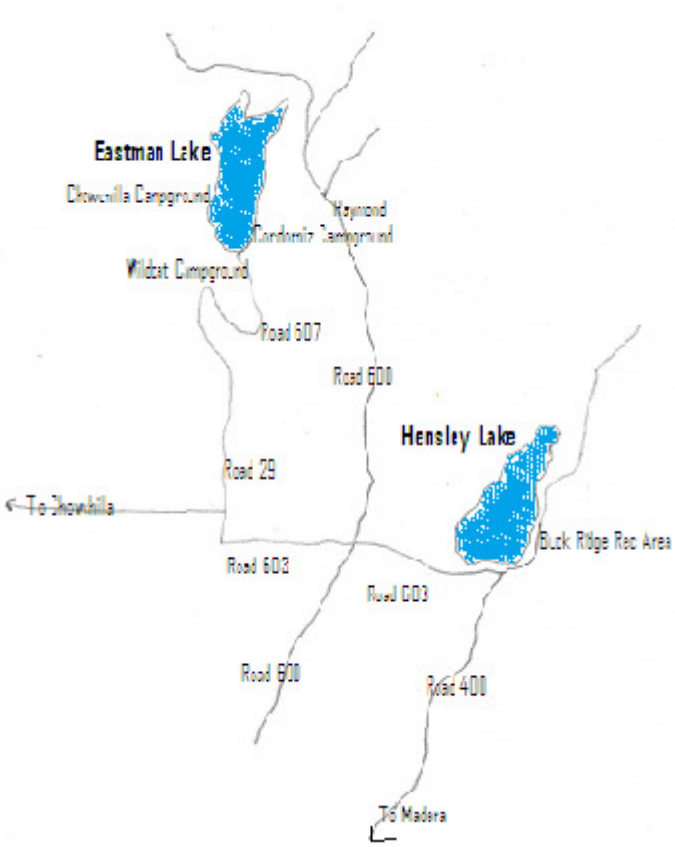
This is one of a continuing series on lesser known-but still important-astronomical observatories throughout the world.

Bosscha Observatory is the oldest and most prominent observatory in Indonesia. It is located on the island of Java, about fifteen miles west of the city of Bandung, at an elevation of 4,300 feet. The observatory has five telescopes all together: three large instruments and two smaller ones

Bosscha was established in 1923, and named after Johannes Bosscha, a well known physicist who was a leading advocate for science and technology in what was then the Dutch East Indies. The first telescope was completed in 1928, and most of the others by the late 1930s. The observatory was severely damaged during World War II, and consequently shut down, but rebuilt and reopened after the war ended. Originally, the observatory was run by the Dutch-Indies Astronomical Society, but in 1951, control was handed over to the government of Indonesia. In 1959, it in turn gave control to the Bandung Technology Institute, which has run it ever since.

The largest telescope at Bosscha is a 24" Zeiss double refractor, which is used to study binary stars, planets, and comets. The observatory also has a 28" Schmidt camera, and another refractor, a 15", which is used for photometry work, and stellar magnitude and distance studies. The two other telescopes include a Cassegrain GOTO telescope, which is used spectroscopic studies, and a small refractor(5.1"), which is used mostly for lunar and solar research.

Along with the professional astronomers at the Technical Institute, students at the major Indonesian universities use the observatory for their researches. It is one of the main scientific institutions in the East Indies, and will no doubt continue to be so for many years to come.



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 main dome at Bosscha, housing the Zeiss double refractor telescope.

Source and image from Wikipedia.com