



THE STAR

THE NEWSLETTER OF THE
MOUNT CUBA ASTRONOMICAL GROUP

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OUR PROGRAMS ARE HELD THE SECOND TUESDAY OF EACH
MONTH AT 7:30 P.M. UNLESS INDICATED OTHERWISE

MOUNT CUBA ASTRONOMICAL OBSERVATORY

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GREENVILLE DE.

FOR DIRECTION PLEASE VISIT

www.mountcuba.org

PLEASE SEND ALL PHOTOS AND ARTICLES TO

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JUNE'S MEETING

TUESDAY JUNE 10 AT 7:30 p.m.

Scott Jackson will use the Planetarium to present a program on Galileo's discovery of Neptune. If you have not seen a Planetarium show before, you don't want to miss this one. Scott does a wonderful job with all of his presentations.

MAY'S MEETING REVIEW



The MCAG May meeting was a near sell out. Only a few chairs were remained. I think we are on to something good especially having added the teacher certification programs through the Delaware Department of Education as well as the interest being developed through the Telescope Workshop.

Lynn King gave a short talk and slide presentation on the Philadelphia Science Festival. Below and to the left is a picture of Lynn portraying Caroline Hershel an 18th century Astronomer talking to her Robot friend. More on Caroline later. To the right is a young man getting his first look at the moon. When he stepped away he was heard to say "It doesn't look like cheese to me." Education at it's finest.



Carolyn Stankiewicz pictured in the top right photos above presented a program on her trip to Australia which included the viewing conditions and various constellations in the Southern Hemisphere. The talk also covered some very interesting myths as well as folk

lore. Have you ever heard about Emu in the sky? Did you know the story about the three stars aligned in Orion? You have all heard about the Man in the Moon but what about the Moon Man?

In Aboriginal culture in Australia, a constellation used in myths is the "Emu in the sky", defined by dark nebulas (opaque clouds of dust and gas in outer space) that are visible against the Milky Way background, rather than by stars. The Emu's head is located in a very dark nebula, around the Southern Cross and its body trail out along the Milky Way towards Scorpius. The creator-hero Daramulan and his emu-wife are depicted in engravings in local caves. On autumn evenings, the emu in the sky stands directly over her portrait, just at the time when it's time to gather emu eggs.

Another myths tells of the constellation of Orion, which they call Julpan, is a canoe. Three brothers went fishing, and one of them ate a fish that was forbidden under their law. The Sun, who was considered a great god, carried the two brothers and their canoe up into the sky. The three stars in the constellation form Orion's Belt in Western mythology, are the three brothers.

When someone dies, they are taken by a mystical canoe into the spirit-islands in the sky. The canoe carrying their soul is sent back to earth as a shooting star, letting their family on earth know that they have safely arrived in the spirit land.

Many traditions have stories of a female Sun and a male Moon.

Another myth tells of the Moon-man, once young and slim (the waxing Moon), but grew fat and lazy (the full Moon). His wives used axes to cut him up into smaller pieces (the waning Moon). The moon man dies and remains so for three days and rises again to complete another cycle (new moon to first quarter). He continues doing this cycle forever.

Compliments to Carol Stankiewicz

MORE ON CAROLINE HERSHEL

Caroline Lucretia Herschel (16 March 1750 – 9 January 1848) was a German astronomer and the sister of astronomer Sir William Herschel with whom she worked throughout both of their careers. Her most significant contributions to astronomy were the discoveries of several comets and in particular the periodic comet 35P/Herschel-Rigollet, which bears her name.^[1]

She was the first woman to be paid for her contribution to science, to be awarded a Gold Medal of the Royal Astronomical Society (1828), and to be named an Honorary Member of the Royal Astronomical Society (1835, with Mary Somerville). She was also named a honorary member of the Royal Irish Academy (1838). The King of Prussia presented her with a Gold Medal for Science, on the occasion of her 96th birthday (1846).

EDITOR'S NOTE:

It is my guess that when most people hear the word Astronomer, they visualize an old man pondering the mysteries of the Universe while smoking a pipe and a telescope in the background. To some extent that may be true, but all too often people either don't know or forget the contributions the ladies have made to Astronomy and other aspects of the science. Lynn and Carolyn are just two examples of ladies we have as active members of the MCAG. Let us not forget the excellent program Mary Webb and Robert Stack presented this past January on Mary Jump Cannon. All three have a wealth of knowledge of Astronomy. It is quite a pleasure to have such wonderful and dedicated members in the MCAG. Thank you ladies for all you have done.

This past year has been a great one, with increasing numbers of guests and visitors. I feel we have hit upon a real need and are meeting the challenge. It shall be our mission to continue to do so.

We are pleased to see a growing relationships with the Delaware Department of Education, UDel, area libraries, and a contribution to a planetarium in the Red Clay School District.

The MCAG has opened many eyes of our guests and those who attend the star parties at the Creamery. We are planning an even better year in 2014-2015.

OBSERVATIONS FROM THE COMFORTABLE CHAIR

Hank Bouchelle Co-Chair MCAG

Our June 10, 2014 meeting marks the successful conclusion of the *Mount Cuba Astronomy Group's* second year! In that time we have doubled our membership twice.

The MCAG began as a small group with the common interest of expanding the public's knowledge of astronomy and increasing the region's astronomy education resources. Toward that end, in addition to our meeting programs, David Groski hosts monthly telescope meetings for those interested in the construction, restoration, tune-up, and/or care of telescopes. He can take pride in the results of his work on the Alexis I. duPont High School Observatory.

Looking back, our programs included a travel agent who sells tickets to space! We encountered sub-equatorial constellations and their lore. We were introduced to aspects of the Moon that were at best wildly inaccurate, or at least apocryphal. We heard details of the life and accomplishments of Annie Jump Canon. (MCAO created a professorship at the University in honor of her contributions to astronomy.) And we have a better understanding of Delaware's Science Olympiad.

Please stand by!! And with us!

MCAG PUBLIC OUTREACH:
SCHOOLS:

Over the past few months MCAG Co-Chair Dave Groski has been involved with the students and advisor at A. I. DuPont High School Astronomy Club in the restoration of their observatory and 10" Cave Cassegrain telescope. The unveiling of this scope and restored observatory took place on May 29th at the A. I. DuPont High School.

They totally rebuilt the mechanism to rotate the dome and to open and close the shutters. We had new red lighting on a dimmer and high intensity work lights installed in the observatory along with the inside of the observatory being completely painted. The students designed and painted the walls showing the daytime sky with the Sun, that fades into twilight and then into the night sky with the stars and Moon. The school also purchased a Lunt H-alpha solar telescope and Celestron GOTO mount along with a video camera so the live image can be displayed in the classrooms.

Here are a couple of pictures of the telescope mount Dave restored.



Here are a few pictures of the finished project. Dave Groski is to the left. Vic Leonard, Astronomy Club Advisor is to the right with Ed McGrath, Supervisor of Science for the Red Clay District, in the center.



It was Mr. McGrath who got a \$35,000 Grant to restore the observatory. Since Dave and crew did the work they were able to saved \$17,000 of that, which was going to be used to replace the dome. The dome was in pretty good shape and just needed some repairs to shutters and wheels that it rotates on. So the money saved was used to purchase a Lunt H-alpha solar telescope and mount, CCD video camera, eyepieces, computers and other accessories for the scope along with repairs and upgrades to the school's greenhouse and pond used to study aquatic life. Also part of that grant was used to restore the planetarium at A.I Dupont Middle School. So Vic Leonard, George Lacsny, and Dave; who did the restoration work feel pretty good that they saved a bunch of money that is being used to enhance other areas in the schools and got the observatory and telescope back into great shape.

Great job guys and I'm sure you all have something to be very proud of for many years to come. Ed.

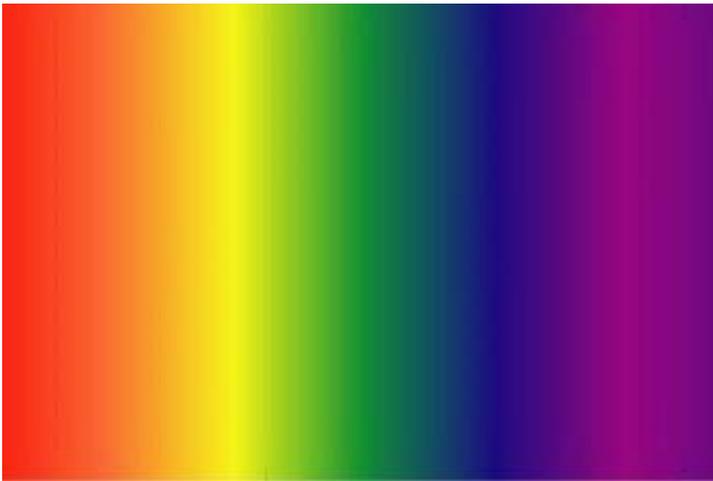
LIBRARIES:

The MCAG has much in store for next year at local Libraries. Final dates, times and places are yet to be confirmed.

NEWS FROM THE WORLD OF ASTRONOMY:

What Are Redshift and Blueshift?

By Elizabeth Howell, Space.com Contributor



The visible light spectrum.
Credit: NASA.

Redshift and blueshift describe how light changes as objects in space (such as stars or galaxies) move closer or farther away from us. The concept is the key to charting the universe's expansion.

Visible light is a spectrum of colors, which is clear to anyone who has looked at a rainbow. When an object moves away from us, the light is shifted to the red end of the spectrum, as its wavelengths get longer. If an object moves closer, the light moves to the blue end of the spectrum, as its wavelengths get shorter.

To think of this more clearly, the European Space Agency suggests, imagine yourself listening to a police siren as the car rushes by you on the road.

"Everyone has heard the increased pitch of an approaching police siren and the sharp decrease in pitch as the siren passes by and recedes. The effect arises because the sound waves arrive at the listener's ear closer together as the source approaches, and further apart as it recedes,"

Sound and light

This sound effect was first described by Christian Andreas Doppler and is called the Doppler effect. Since light also emanates in wavelengths, this means that the wavelengths can stretch or crunch together depending on the relative position of objects. That said, we don't notice it on daily-life-sized scale because light travels so much faster than the speed of sound — a million times faster, ESA noted.

American astronomer Edwin Hubble (who the Hubble Space Telescope is named after) was the first to describe the redshift phenomenon and tie it to an expanding universe. His observations, revealed in 1929, showed that nearly all galaxies he observed are moving away, NASA said.

"This phenomenon was observed as a redshift of a galaxy's spectrum," NASA wrote. "This redshift appeared to be larger for faint, presumably further, galaxies. Hence, the farther a galaxy, the faster it is receding from Earth."

The galaxies are moving away from Earth because the fabric of space itself is expanding. While galaxies themselves are on the move — the Andromeda Galaxy and the Milky Way, for example, are on a collision course — there is an overall phenomenon of redshift happening as the universe gets bigger.

The terms redshift and blueshift apply to any part of the electromagnetic spectrum, including radio waves, infrared, ultraviolet, X-rays and gamma rays. So, if radio waves are shifted into the ultraviolet part of the spectrum, they are said to be redshifted — shifted toward the lower frequencies.

The redshift of an object is measured by examining the absorption or emission lines in its spectrum. These lines are unique for each element and always have the same spacing.

When an object in space moves toward or away from us, the lines can be found at different wavelengths than where they would be if the object were not moving (relative to us). [Related: Make Your Own Spectroscope]

Redshift is defined as the change in the wavelength of the light divided by the wavelength that the light would have if the source was not moving — called the rest wavelength:

$$\text{Redshift} = (\text{Observed wavelength} - \text{Rest wavelength}) / (\text{Rest wavelength})$$

Three types of redshift

At least three types of redshift occur in the universe — from the universe's expansion, from the movement of galaxies relative to each other and from "gravitational redshift," which happens when light is shifted due to the massive amount of matter inside of a galaxy.

This latter redshift is the subtlest of the three, but in 2011 scientists were able to identify it on a universe-size scale. Astronomers did a statistical analysis of a large catalog known as the Sloan Digital Sky Survey, and found that gravitational redshift does happen — exactly in line with Einstein's theory of general relativity. This work was published in a Nature paper.

"We have independent measurements of the cluster masses, so we can calculate what the expectation for gravitational redshift based on general relativity is," said University of Copenhagen astrophysicist Radek Wojtak at the time. "It agrees exactly with the measurements of this effect."

The first detection of gravitational redshift came in 1959, after scientists detected it occurring in gamma-ray light emanating from an Earth-based lab. Previous to 2011, it also was found in the sun and in nearby white dwarfs, or the dead stars that remain after sun-sized stars cease nuclear fusion late in their lives.

OUR SUNS LONG LOST SIBLING:



The star HD 162826 is probably a "solar sibling," that is, a star born in the same star cluster as the sun. It was identified by University of Texas at Austin astronomer Ivan Ramirez, in the process of honing a technique to find more solar siblings in the future, and eventually to determine how and where in the Milky Way galaxy the sun formed. Ivan Ramirez/Tim Jones/McDonald Observatory

It turns out that the sun has a long-lost brother -- and now astronomers are racing to map a solar family tree.

A new study from researchers at the University of Texas provides clues as to how our sun was formed, whether there are other "solar siblings" in our universe and, perhaps, a better understanding of how life in the universe was formed billions of years ago.

The finding, which will be published next month in The Astrophysical Journal, identifies a star that was almost certainly born from the same cloud of gas and dust as the sun. Located 110 light years away in the constellation Hercules, the star, called HD 162826, is 15 percent more massive than our sun, and can be seen with low-power binoculars.

"We want to know where we were born," University of Texas at Austin astronomer Ivan Ramirez said in a news release from McDonald Observatory. "If we can figure out in what part of the galaxy the sun formed, we can constrain conditions on the early solar system. That could help us understand why we are here."

Ramirez and his eight-person team discovered HD 162826's relation to the sun by following up on 30 possible candidates found by several groups around the world looking for solar siblings. Ramirez's team studied 23 stars in-depth at McDonald Observatory and several stars, visible only from the southern hemisphere, using the Clay Magellan Telescope at Las Campanas Observatory in Chile. Both observations required the use of high-resolution spectroscopy to understand the stars' chemical makeup.

There's even a small chance these solar siblings could host life-sustaining planets. When these stars were born, collisions could have knocked chunks off planets, and these fragments could have traveled between solar systems -- perhaps bringing primitive life to Earth. Conversely, fragments from Earth could have sent life to planets orbiting other stars.

"It could be argued that solar siblings are the key candidates in the search for extraterrestrial life," Ramirez said.

Next, Ramirez's team wants to create a road map for how to identify solar siblings, operating on the theory that the sun was born in a cluster with up to 100,000 stars. That cluster, however, formed more than 4.5 billion years ago, and has long since broken up, spreading the stars out to different parts of the Milky Way galaxy. Finding more solar siblings will provide the best clues toward discovering our sun's origin, and Ramirez's discovery is an important step in streamlining the identification process when it comes to tracking down stars with the same galactic DNA, he told FoxNews.com on Friday.

“Already, we’re getting a lot of data from a number of surveys,” Ramirez told FoxNews.com on Friday. “In five to 10 years from now, we’re going to be able to analyze 10,000 times more stars than what we’re able to do right now.”

TELESCOPE WORKSHOP:

Pictured below is a recent donation made to the Mt. Cuba Astronomical Observatory by the family of Al Webber. Al was a long time member of MCAO and a very active armature Astronomer as well as a very interesting person to talk with for he had some fascinating stories and information stored away.





At the very top is a photo of David Webber, Helga Testorf and Andy Wythe. Below that are two photos of the restored telescope. Helga Testorf was the model Andy Wythe used in a series of over 240 paintings and drawings he did between 1971 and 1985.

For more on this topic go to http://en.wikipedia.org/wiki/The_Helga_Pictures

As the story goes, Andy spent many hours observing with Al's telescope and painted much of what he saw. Great examples of this can be seen in A Polar Bears Tail and Full Moon.

Now, the restoration.

As you follow the photo's down, you will see five photo's of the restored telescope and one of the drive prior to the restoration. If you study the very top photo which shows Helga looking through the scope, you will be able to pick out additional restoration work. A great example being the mounting bracket to hold the Slo-Syn.

Over a period of about 9 months Dave Groski completely restored the scope. Al's observatory was in bad shape for water had got on the scope, it also had mice living in the tube for the 3" refractor used as a guide scope. Unfortunately the lens was damaged beyond repair but Dave found a replacement and was able to put the guide scope back on the main scope. The tube was sealed with tight fitting plastic caps so the optics were in great shape. The biggest issue with the main telescope was the clock drive motor. Due to serious water damage, Dave wasn't able to fix it. About 15 years ago Dave helped Al's get a replacement motor of the same type since the original one had also been destroyed by water. The original style motor which was made by Bristol is no longer available. It is a 1 rpm motor and that speed is very common but has a unique shape so the more common pear shape motors are not a direct replacement. It took Dave awhile to engineer and fabricate a new mounting bracket to hold a common Slo-Syn 1rpm. He also had to get a new pier since he could not get the old one unbolted in Al's observatory. The bolts were under the wooden floor and very rusted so he left it. A piece of tubing the same size needed was found on Ebay and fortunately family still had the original legs from the mount. The mount was stripped of paint and all the bearing re-greased. Dave then primed and painted it the original gloss gray. All new wiring was added and also installed a red LED on a push button in the hand paddle to be a red flash light.

In light of the work done by Dave, MCAO is now the proud owner of a telescope that will always be cherished for it is now in it's rightful place.

I have seen the scope. As someone who spent 40 years in mechanical manufacturing, I can attest that this is not only one very impressive example of craftsmanship but dedication to that craftsmanship.

When you make your next trip to the Observatory, walk around the Pier room to the office door. You can't miss it.

OTHER MCAG ACTIVITIES:

MCAG will once again be at the Creamery on June 7. Additional dates are July 5, August 2, and Sept 6. All are all Saturdays with the 1st Quarter Moon well placed in the sky. We will start around 7:30pm and go until Woodside closes at 9:00pm.

JUNES SKY:

5 Bright Planets Visible in June Night Sky

June 7 — Mars and the moon. June 10 — Saturn and the moon. June 19 — Mercury.

June 24 — Venus and the Pleiades. June 28 — Jupiter and the moon.

On June 7th the MCAG will be at the Creamery so don't miss the chance to see Mars.

SPACE.COM has a video on how to find and see each of them.

PUBLIC NIGHTS AT MCAO:

There are two more public nights schedule for the Mt. Cuba Astronomical Observatory. They are as follows.

9 June 2014 Greg Weaver The Southern skies-stars we can't see from Delaware.

23 June 2014 James Dalessio TBA

If you know of anyone who is interested in Astronomy or someone who would like to learn more, please do not hesitate to extend and invitation to them to attend our meetings. If they have an interest in joining, our application is below.

Mt. Cuba Astronomy Group

Membership Form

The Mt. Cuba Astronomy Group is a tax-exempt organization dedicated to astronomy education and public outreach. Benefits of membership include:

- Monthly newsletter that includes details about the Group’s activities and much astronomical information
- Monthly programs on subjects and topics of astronomical interest
- Free or discounted subscriptions to astronomy-related publications
- Free registration for MCAG workshops and classes
- Mention Mt. Cuba Astronomy Group and receive a 5% discount at Manor Books in New Castle (<http://www.yelp.com/biz/manor-used-books-New Castle>)



Mail to:

Ms. Carolyn Stankiewicz
1001 Woodstream Dr.
Wilmington, DE 19810

Name _____

Name(s) (children, if any, and age): _____

E-mail address: _____

Home address: _____

Phone (optional): _____