

Friends of the Observatory Newsletter

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Bill Cartwright, editor wcartw@aol.com



A Letter from President Hunter

To all volunteers for ScopeOut my thanks. Any ScopeOut cannot occur without volunteer help. Thanks, to everyone for showing up and helping, Especially **Jim Groen**. Jim has been a tireless force when it comes to ScopeOut, arranging for the small tents, setting up and cleaning up. Jim was there Friday, Saturday, and Sunday mornings. From what I understand Jim has been doing this for the entire history of ScopeOut. Once again thanks Jim!

Next big event is the FOTO election on October 5th. Let's have a good showing. After that on November 8th there will be transit of Mercury across the Sun starting about noontime. Those of us with solar filters are requested to help out at the Observatory.

Until next meeting, clear skies.
Rick

FOTOKids Meeting

By Mike Helfen

FOTOKids next meeting will be Friday, October 6th, at 8:30 pm.

For October, we have a special presentation by John Ventre about

Rainbows, how they form, what to look for, etc. John has slides of various types of rainbows he has seen that he will bring to the meeting. I saw this program some years ago and still use tips and tricks he told us about to spot rainbows.

A monthly astronomy club for kids 8-14+ years of age who have a deeper interest in astronomy and are willing to attend monthly meetings.

If you have a kid interested in astronomy between the ages of 8 and 14, find out more about FOTOKids by contacting **Mike Helfen**, fotokids@fuse.net or 513-378-2134

FOTO's Monthly Meeting

Our next club meeting will be held at the Observatory on Thursday, October 5th at 7:30 pm. Our presenter will be **Scott Nutter** from NKU.

Last month we had a bit of a mix up. It seems Terry Flesch had his dates mixed up, but all was well that ended well. There was beautiful full Moon to view and a clear Thursday to see it, which was even more amazing.

FOTO Planning Meeting

Our next planning meeting will be held on Thursday, October 12th at 6 pm at the Hyde Park Grille and Café. It's located on Erie Avenue just east of Marburg Avenue.

The Annual FOTO Elections

Elections for all major offices will be held during the next FOTO monthly meeting Thursday, October 5th at 7:30 pm at the Observatory. Please be sure to come early and vote often.

At press time this was the latest slate of candidates:

President

Dave Bosse
Rick Hunter

Vice President

Scott Naylor
Valerie Niemi
Sue Rismiller

Treasurer

Bill Bachelder
Joanne Pedersen

Secretary

Linda Magee
Sharon Meeker

Craig's Corner

By Craig Niemi
COC Executive Director

Our thanks to the FOTO ScopeOut planning committee, volunteers (including Pack 399 Scouts!), vendors and exhibitors for all their help at ScopeOut last month. Once again FOTO put together a great event.

To prepare for ScopeOut volunteers **Ken Phillips, Denise Mustain and Dale Zoller** did some much needed maintenance including the freshly painted and updated sign out front.

Under the Museum Committee, **John Ventre** has put together a sub committee to oversee repairs and maintenance on the Clark and Mitchel telescopes, dome mechanisms and related equipment. **Paul Nohr** took with him an infinite talent and understanding of the mechanics and optics of our treasured telescopes. The sub committee is made up of individuals with expertise in optics, mechanical engineering and electronics. Already members of the committee have repaired the main coil spring on the Clark telescope drive. It may not sound like a big deal but that little spring controls the motion of the 1-ton telescope. The next steps will be to put together a manual documenting all the systems that make up our 100 and 160 year old telescopes and beginning a preventive maintenance program.

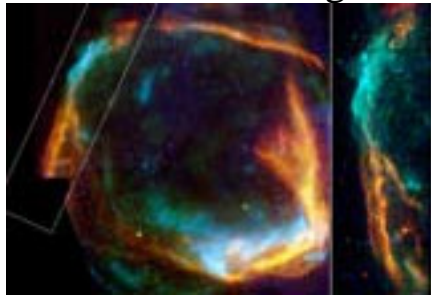
Be sure you check out (pardon the pun) the new FOTO Library. It's located in the Mitchel building under the unique Cone Dome. Under **Valerie's** direction we were able to turn what was a storage closet into a warm and inviting work space. Moving the library into its new home also means that the Mitchel Building now has a dedicated gift shop. And just in time for the holiday season.

Your memberships, donations and contributions are just a part of belonging to the Observatory. Our members have considerable talents and connections within the community through which they can take ownership in their Observatory.

Stellar Astronomy Classes

Taught by the Observatory's staff scientist Richard Hamilton, this next Xavier University class will be on Sunday evenings, October 8th and October 22nd, from 7-9 pm. He'll lead the class in discussing interior of the Sun. It will be in the Mitchel Building.

Supernova First Spotted 2,000 Years Ago



Nearly 2,000 years ago, Chinese astronomers spotted a bright light materializing in the night sky. Turns out the skywatchers had witnessed the spectacular explosion of a dying star.

That was the year 185 AD. Today astronomers said they might have identified the remains from this ancient [stellar explosion](http://www.space.com/scienceastronomy/060926_st_ancient_supernova.html), now considered the oldest [supernova](http://www.space.com/scienceastronomy/060926_st_ancient_supernova.html) on record.

http://www.space.com/scienceastronomy/060926_st_ancient_supernova.html

Stonelick Lake Star Parties

By Scott Naylor

Our next Star Party will be **Friday and Saturday, October 20th and 21st** (Orionids meteor shower), with a cloud date of Saturday, October 28th.

For updates, directions, or information, phone **Scott Naylor** at 513-575-5556.

Did You Know....

It's estimated the total mass of the Kuiper Belt is only 1/10th that of Earth, but the gravitational field is equal to ten Earths! Astronomers don't know where the other 99% of the Kuiper Belt has gone!

New at the Observatory



The New Observatory Gift Shop in the Mitchel Building

Special Event: Shooting Stars At the Observatory

October 20 and 21, from 7-9 pm

By Dean Regas

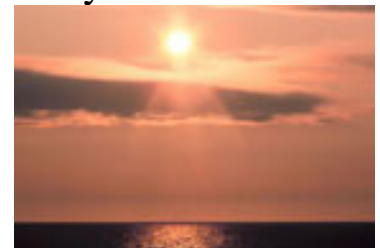
In honor of the Orionid Meteor Shower, the Cincinnati Observatory is hosting two evenings that are literally out of this world. See some of the finest meteorite samples in the tri-state at the Observatory.

The program, called Shooting Stars, includes meteorite displays, meteorites for sale, classes, tours of the buildings, and viewing through our historic telescopes (weather permitting). No reservations required.

Saturday, October 21st is a Stonelick night, so folks who come that night can also go out to Stonelick to view the meteor shower under dark skies (see below).

Cost: \$5 for adults, \$3 for kids.

The Equinox Error: The Fallacy of Fall's Arrival



The equinox is a day when there should be 12 hours of daylight and 12 of night. But it just isn't so.

http://www.space.com/spacewatch/060922_equinox.html

Fall CCD Workshop

Adam Block will once again bring his "Making Every Pixel Count" CCD imaging workshops to the Cincinnati Observatory Center on October 6th, 7th and 8th, 2006.

The fall workshop will start on Friday, October 6, 2006 with a four-plus-hour course that will get you up-to-speed with the fundamental operations of MaxIm DL and Photoshop CS.

Introductions to Photoshop's layers, levels, curves, histogram adjustments and more will also be on tap.

This workshop will be perfect for advanced imagers attending the two-day workshop to brush-up on their basic MaxIm DL and Photoshop skills and beginning imagers using DSLRs.

Please Note: If you are attending the two day workshop and not proficient in using MaxIm DL or bringing images into Photoshop from MaxIm DL, it is highly advised that you attend Friday's 4-plus-hour class also. The two-day advanced workshop will assume you have these skills.

The two-day workshop, Saturday, October 7th and Sunday, October 8th, will spend half of each day covering specific data acquisition and processing techniques using MaxIm DL & Photoshop CS.

The objects that will be covered are Nebulae (and Hydrogen Alpha data blending in Photoshop), Galaxies, Cluster (Open & Globular), and basic planet processing.

The main thrust of the workshop is advanced processing techniques using Photoshop CS.

The cost for the 4-plus-hour workshop on Friday evening (6:00 pm to 10:30 pm) will be \$60.00 (Class limit of 20).

The cost for the two day workshop on Saturday and Sunday (9:00 am to 5:30 pm) will be \$425.00 (There is a class limit of 20).

For information contact Fred Calvert coldspringobservatory@fuse.net.

To register go to: <http://www.caelumobservatory.com/coc/workshop.shtml>

"The Planets"

World Renowned Author Dava Sobel to Speak in Cincinnati

Dava Sobel, known for popularizing science and expanding the genre of non-fiction will speak about her latest book, [The Planets](#). She has written for [Omni](#), [Discover](#), [Audubon](#), [Life](#), and the [New Yorker](#), but is most famous for her books [Longitude](#) and [Galileo's Daughter](#).

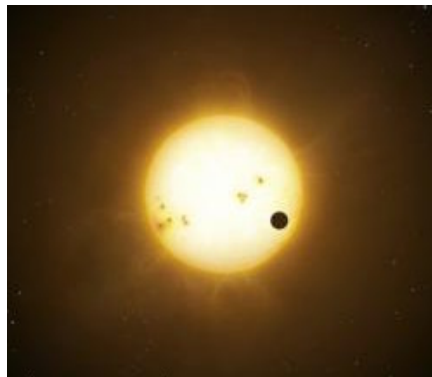
Ms. Sobel will speak at the Clark Montessori School, 3030 Erie Avenue in Hyde Park on Wednesday, November 8th at 7:00 pm. It's just west of the intersection of Delta and Erie. Take a right on Delta from Observatory, turn left on Erie and the driveway is on the right. We'll have signs and people directing visitors where to go from there.

Admission is Free

A reception and book signing will be held at the Observatory following the lecture (8:30-10:00pm), including viewing of the night sky through the Observatory's historic telescopes.

Reservations recommended. For more information or to make reservations, please call 513-321-5186.

Two Hot New Planets Discovered



An international team of astronomers have turned up two new Jupiter-sized planets orbiting distant stars. These planets are incredibly close to their parent stars; just a fraction of the distance from Mercury to the Sun. Astronomers believe these planets are

being eroded by the intense radiation of their stars. The discovery was made using the new SuperWASP program, which looks for stars that dim and brighten on a regular schedule as a planet passes in front of them.

<http://www.universetoday.com/2006/09/27/two-hot-new-planets-discovered/>

New Digs for the FOTO Library

By Valerie Niemi



The new Observatory library in the Mitchel Building

Great News! The FOTO library has moved from its cramped quarters in the gift shop to the round room under the Cone Dome in the Mitchel Building.

Frank Huss will be working on an inventory of the books we have. If you'd like to donate any astronomy-type books, just let Frank know.

The books from the library are available on the honor system to all FOTO/COC members.

The former storage space has been transformed into a cozy, comfortable reading area, so come on in, sit a spell, take your shoes off...oh, wait... I think that's Petticoat Junction.

Did You Know....

There are three types of Kuiper Belt objects:

The "classical objects" which travel in almost circular orbits with orbital periods of 200 and 400 years.

"Resonant objects" which have been pushed by Neptune into a special orbit which move in lockstep with Neptune.

"Scattered objects" with elliptical orbits than can extend beyond the reach of the classical objects. Orbital periods can be longer than 1000 years.

Stargaze in Kenton County Banklick Woods Park

You and your telescope are invited to join the Cincinnati Observatory Center sponsored public star gaze in Banklick Woods Park in Kenton County, Kentucky on Saturday, October 28th.

A short program will be presented in the Public Works Building at 8:00 p.m. regardless of the weather condition. The star gaze, assuming clear skies, will start at 8:45 p.m. Set up your telescopes in Picnic Area #2.

Please let **John Ventre** know if you're planning to bring a telescope. Contact him: jeventre@ix.netcom.com or 513-321-5186, extension 4.

The program "Phases of the Moon" will be presented by John Ventre, the COC Historian.

Directions to Banklick Woods

From the I-275 and Turkeyfoot Road intersection, go south on Turkeyfoot Road for approximately 4 miles. You will come to a 5-way intersection (note: neither a stop sign nor traffic light at the intersection for Turkeyfoot Rd.) with a Sunoco Foodmart on the left. Turn left (east) on Independence-Station Road—immediately past the Sunoco foodmart, and go approximately two miles. Banklick Woods Park will be on your left, after passing the Kenton County Golf Course on your left.

The Kenton County Park Board will advertise this star gaze in the Kentucky Post, their regional newspaper, the park news, and their local cable networks.

Northpole on Mars



Shown above is an overhead view of the Northpole and the the Vastitas Borealis. The large crater at the top is the Korolev Crater. This crater is about 85 km (53 mi) in diameter.

The Schiff Report

By *Charlie Schiff, President*
Cincinnati Observatory Center Board

The Observatory has 160 some odd years of history to it. If you had a high point to choose, which would it be? Mitchel's lectures? The new Samuel Hannaford designed home in Mt. Lookout? The tenure of Dr. Porter that saw his Comet Medal award and the purchase of the Alvin Clark 16-telescope? Herget's Minor Planet Center?

What is startling is the lack of low points. Since 1842 the Observatory has continued to improve its service to the world in one aspect or another. Director Cleveland Abbe, when beset with the problem of the polluted skies around Mt. Adams, set his sights on meteorology and tracking the weather. His work at the Observatory became the basis upon which he later founded the National Weather Service.

Today, we revel in our historic telescopes as much we do in our National Historic Landmarked campus. There are larger telescopes out there, but none as old or as in such exquisite condition as our 11" Merz und Mahler. And the power of the Clark is still as mesmerizing as ever to the average lay astronomer as it ever was.

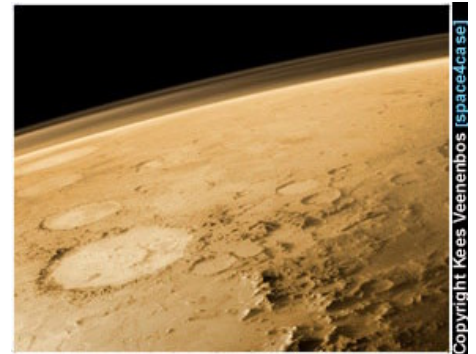
We are turning now in the direction of education. Dean Regas and his Outreach programs continue to reach thousands and thousands of kids every year through school, scout and club programs. Richard Hamilton's Observatory University program for high school and adult students is growing.

Project Astro and Communiversity class remain a strong avenue for our attention. We could not be more proud of our teachers and their efforts in scientific education relating to Astronomy. We will continue to strengthen our programs and increase our offerings.

Again and as always, we cheer our volunteers who, through their diligent commitment, make this possible. We remain an institution founded by the interest of the community and for the interests of the community.

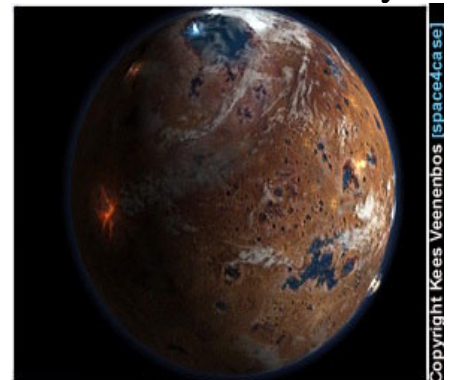
Please share your opinion of the Observatory's high point. Or, better yet, what's your personal favorite moment or aspect? Please e-mail us. We'd love to hear from you. 513-321-5186.

The Galle Crater on Mars



The Galle Crater (about 230 km diameter) on the ridge of the large Agyre Planitia. This photo of the Viking Orbiter (The Viking Orbiter Imaging Team) is a famous one, because it shows a smiley. (Also called The Happy Face Crater) and more important: this is also one of the photo's of Mars which for the first time clearly showed an atmosphere. The photo was made in UV. This photo, along with other images, were an important reference for the Mars images the artist made with an atmosphere.

Mars in its Infancy



Mars is shown above as a young planet with lakes and erupting volcanoes about 4 billion years ago. The Northern hemisphere shows the Vastitas Borealis filled with water and some ice around the North Pole. The large lake at the bottom right is where the Opportunity found evidence of such a lake. At the left large lava fields glow in the dark.

The Observatory Invades the Cincinnati Nature Center



Observatory sign at the Cincinnati Nature Center

FOTO volunteers set up telescopes as part of the Cincinnati Nature Center's "Preparing for Night" program on September 8th. **Dean Regas** gave a presentation in the visitor center and then over 700 guests went on night hikes on the CNC's grounds, all eventually brought past the observing field. **Thanks to Basil, Scott, JoAnne & Poul and Valerie** for staffing the event. People were amazed at the sights including the full moon. One very impressed youngster stargazer announced that if he looked through any more telescopes he was just going to faint.



Scott Gainey setting up



Val staking out her territory

Staggering Distance

By Dr. Tony Phillips

Tonight, when the sun sets and the twilight fades to black, go outside and look southwest. There's mighty Jupiter, gleaming brightly. It looks so nearby, yet Jupiter is 830 million km away. Light from the sun takes 43 minutes to reach the giant planet, and for Earth's fastest spaceship, New Horizons, it's a trip of 13 months.

That's nothing.

Not far to the left of Jupiter is Pluto. Oh, you won't be able to see it. Tiny Pluto is almost 5 billion km away. Sunlight takes more than 4 hours to get there, and New Horizons 9 years. From Pluto, the sun is merely the brightest star in a cold, jet-black sky.

That's nothing.

A smidgeon to the right of Pluto, among the stars of the constellation Ophiuchus, is Voyager 1. Launched from Florida 29 years ago, the spacecraft is a staggering 15 billion km away. It has traveled beyond all the known planets, beyond the warmth of the sun, almost beyond the edge of the solar system itself.

Now that's something.

"On August 15, 2006, Voyager 1 reached the 100 AU mark—in other words, it is 100 times farther from the Sun than Earth," says Ed Stone, Voyager project scientist and the former director of NASA's Jet Propulsion Laboratory. "This is an important milestone in our exploration of the Solar System. No other spacecraft has gone so far."

At 100 AU (astronomical units), Voyager 1 is in a strange realm called "the heliosheath."

As Stone explains, our entire solar system—planets and all—sits inside a

giant bubble of gas called the heliosphere. The sun is responsible; it blows the bubble by means of the solar wind. Voyager 1 has traveled all the way from the bubble's heart to its outer edge, a gassy membrane dividing the solar system from interstellar space. This "membrane" is the heliosheath.

Before Voyager 1 reached its present location, researchers had calculated what the heliosheath might be like. "Many of our predictions were wrong," says Stone. In situ, Voyager 1 has encountered unexpected magnetic anomalies and a surprising increase in low-energy cosmic rays, among other things. It's all very strange—"and we're not even out of the Solar System yet."

Opportunity Peeks into Victoria Crater



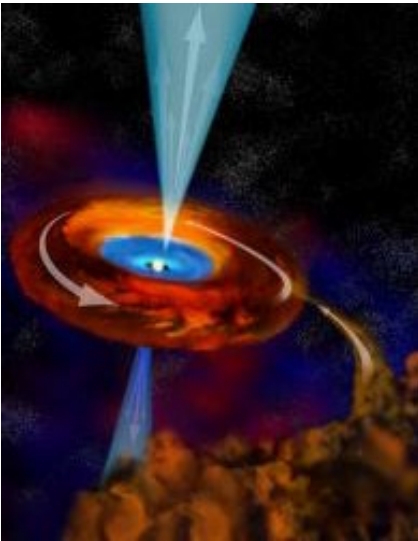
After a journey of 21 months, NASA's Opportunity rover has finally reached its destination: Victoria Crater. Its first photos of the crater's interior show steep walls of exposed rock. Since these rock layers were put down gradually over eons, they'll tell the area's geologic history better than anything Opportunity has seen so far. The rover will now begin searching the crater rim to see if there's any way it can get down into the crater.

<http://www.universetoday.com/2006/09/27/opportunity-peeks-into-victoria-crater/>

Did You Know....

A massive solar flare on Aug. 7, 1972 occurred between Apollo 16 (April) and Apollo 17 (December), mankind's last journeys to the Moon. Scientists calculate that energetic particles from a super flare could sicken or kill astronauts flying on future missions to the Moon or beyond.

How the Really Big Stars Form



Astronomers think they've got a handle on how Sun-sized stars come together. But the formation of the largest stars - more than 10 times the mass of the Sun - still puzzle astronomers. New observations on a 20 solar mass star have revealed that these giant stars maintain a torus of material around themselves. They can continuously feed from this "doughnut" of material, while powerful jets of radiation pour from their poles. The material can continue gathering onto the star while avoiding this radiation, which would normally blast it back into space.

<http://www.universetoday.com/2006/09/27/how-the-really-big-stars-form/>

Did You Know....



Stellar clusters are composed of many stars that develop at the same time. Some contain several dozen stars, and others many million stars. Some star clusters can be seen with the naked eye, such as the famous Pleiades cluster in the constellation Taurus. Stars form in the same region, but why some stay together forming clusters is a mystery.

Orionid Meteor Shower At Stonelick State Park

October 20th and 21st
from dusk til dawn

Amateur astronomers will be conducting a public star gaze and meteor watch at Stonelick State Park from dusk-til-dawn October 20 and 21. These nights at Stonelick are free and open to the public. Show up any time.

For further information or directions: www.cincinnatiobservatory.org or call 513-321-5186.

Pneumonic for Remembering the Names and Sequence of Eight Planets, Without Pluto

By John Ventre

Fred Bowman, one of the Charter FOTO members, has an old basic astronomy book that was previously owned by Dr. Paul Herget. Dr. Herget started working at the Cincinnati Observatory in 1931 and was the Director from 1943-1978. Evidently this book predated the discovery of Pluto (1930) because Paul had handwritten the following pneumonic in the margin of one of the pages to assist him to remember the names and sequence of the planets.

**"Mary Visits Every Morning,
Just Stays Until Noon"**
(Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus & Neptune)

Word of the Month

By Greg Huber

"Osculating orbit"

September's Word

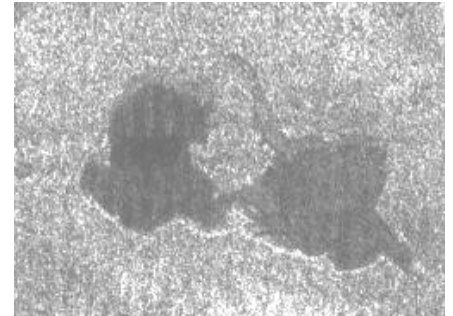
"Greatest Elongation" is the moment when either Mercury or Venus is at its greatest angular separation from the Sun. This is usually the best time to observe the inner planets as they are above the horizon for the longest amount of time.

Mar's Arsia Mons



This Kees Veenbos rendering shows Arsia Mons and the other volcanoes on the Tharsis. This image also shows the haze and dust of the Martian atmosphere. This image is one of the more subtle impressions. A first concept as the atmosphere has yet to be optimized to a better resolution. This volcano stands over 20 km above the surrounding plains, and is approximately 450 km in diameter at its base. The Arsia Mons summit caldera is over 120 km in diameter.

Twin Lakes on Titan



This incredible photograph taken by NASA's Cassini spacecraft shows two lakes on the surface of Saturn's moon Titan, attached by a thin channel. The image was taken during Cassini's most recent flyby, when it passed by on September 23, 2006. On Earth, they'd be filled with water, but it's just too cold on Titan; so these lakes contain a mixture of methane and ethane.

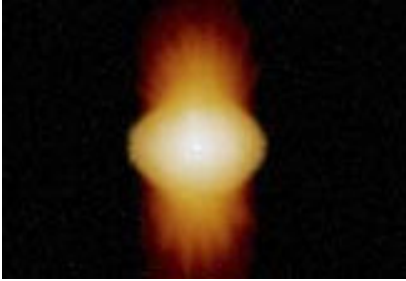
(Did anyone bother to post a "No Smoking" sign by the boat dock?)

<http://www.universetoday.com/2006/09/27/twin-lakes-on-titan/>

Did You Know....

Neptune's winds are the strongest in our solar system, continuously blowing at over 1000 mph!

Fast-Spinning Star on Verge of Breaking Apart



If your idea of fun is whirling around on a dizzying carnival ride, astronomers have found a stellar adventure that would stop you in your tracks. A sizzling-hot star is spinning around at near break-up velocity, according to a new study.

http://www.space.com/scienceastronomy/060925_mm_star_spin.html

Did You Know....

For unknown reasons, unlike Jupiter and Saturn, Uranus's internal heat source has shut down, and it does not radiate more heat than it receives from the Sun.

October's Trivia Question

By Greg Huber

What culture in 5000 BC had a calendar of 360 days spaced evenly in 12 months?

September's Trivia Question

Between 1911-1914 the relationship between a star's temperature and absolute magnitude was discovered and placed into a diagram. Name the scientists who developed the idea and what was the name of the diagram?

The Answer

Between 1911 and 1914 the scientists Hertzsprung and Russell developed a graph of a star's absolute magnitude and its spectral type. Today this graph is called the H-R Diagram.

Did You Know....

JPL plans to use non-powered high altitude hot-air balloons to survey the surface of Mars, Titan and Venus

Transit of Mercury

Rare Alignment of the Sun and Mercury Visible at the Observatory

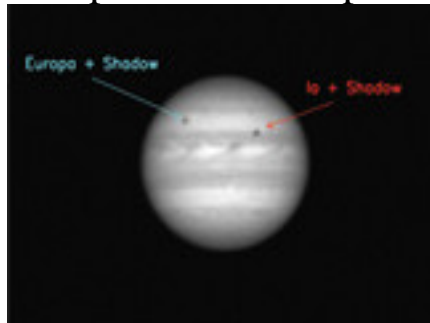
The viewing at the Observatory will be held when planet Mercury crosses in front of the Sun on Wednesday, November 8th from 2 – 5 pm. This rare alignment occurs only 13 times per century and is a unique opportunity to see the elusive planet.

A donation is requested to help cover costs

For more information call 513-321-5186.

Warning: never look directly at the Sun without special filters. The Observatory will provide safe viewing with filters on their historic 1843 telescope. Most people have never seen Mercury and this year is your best chance

Pluto-Bound Probe Snaps Photo Of Jupiter



NASA's [New Horizons](#) probe, bound for [Pluto](#), snapped an [image of Jupiter](#) that astronomers said serves as a promise of what's to come early next year when the craft nears the gas giant planet.

New Horizons won't reach Pluto until 2015. Meantime it is testing out its equipment on a much larger target.

The craft was about 181 million miles (291 million kilometers) away from Jupiter when the image was snapped with the Long Range Reconnaissance Imager (LORRI). http://www.space.com/scienceastronomy/060926_jupiter_image.html

How Old IS Earth Anyway?

Measurements made in the 18th century were based on the rate of the Earth's cooling and vastly underestimated the age of the [Earth](#) to be in the hundreds of thousands of years.

Later guesses by esteemed scientists like [Charles Darwin](#) (who proposed 306.7 million years) and Lord Kelvin (who made several erroneous proposals spanning hundreds of millions of years) were moderate improvements.

The ability to accurately date our planet—which [formed out of debris](#) left behind by the birth of the [sun](#)—developed with the understanding of radioactive decay. Radioactive substances release subatomic particles at a very steady rate.

Sometimes the age of an object can be determined by comparing present amounts of a radioactive substance with the supposed original amount in the object. Uranium is a particularly well-understood, naturally radioactive element.

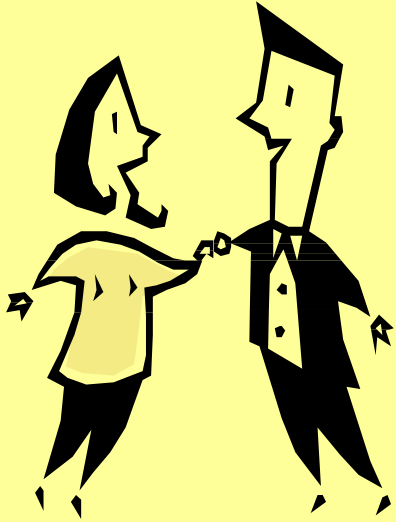
By measuring lead to uranium ratios in ancient rock samples, in 1953 scientists deftly put Earth's age at 4.5 to 4.6 billion years, an estimate that stands today.

N. KY Museum Claims Earth is 6,000 Years Old

Ken Ham of Petersburg, KY has spent 11 years working on a museum that poses the big question -- when and how did life begin? Ham hopes to soon offer an answer to that question in his still-unfinished Creation Museum in northern Kentucky.

The \$25 million monument to creationism offers Ham's view that God created the world in six, 24-hour days on a planet just 6,000 years old. The largest museum of its kind in the world, it hopes to draw 600,000 people from the Midwest and beyond in its first year. http://www.livescience.com/othernews/ap_050523_creation_museum.html

**Welcome New FOTO
and COC Members!**



**Robert Anning
Richard Antoine
Tim Auch
Celeste Baumgartner
Jerry Berman
Nancy Buchman
Jack Bishop
Paul & Karen Callard
Gene Chung
Leslie Demoret & Ralph Perry
Eugene Geier
Lori Graham
Lora Hillerich
Mary Lou Hoffa
Ray Huseman
Dr. Ronald Jandacek
Jim Kite
Robert Kleesattel
Harold Lockett
Megan Lampkin
Emilie Lubis
George Mahama
Kevin Malloy
David J Mason
James & Mary Nordlund
Russ McMahon
Nick Mancini
Rachel Page
Roger Perna
Louis Prince
Shawna Reifel**

**Jeff Rodriguez
Melody Sawyer-Richardson
Christine Schear
Steve Sinden
William Schmidter
Jennifer Strong
Barbara Stough
Joyce Wainscott
Jo Anne Warren
George Warrington
Linda Weber
Pat & Penny Westrick**



This is THE END