COMING UP AT
THE OBSERVATORY....

John Ruthven signing       June 28  1-4p
*Black Holes                July 1   7p
Astronomy Thursday         July 2   8:30p
FOTOKids Youth Program     July 3   7p
Astronomy Friday           July 3   8:30p
*Tides                      July 6   7p
Planet Hunting              July 7   8p
Astronomy Thursday         July 9   8:30p
Astronomy Friday           July 10  8:30p
Stonelick Stargaze         July 11
Sunday Sun-Day Sundae       July 12  1-4p
FOTO Member’s Picnic       July 13  7p
New Horizons @ Pluto       July 14  8p
Astronomy Thursday         July 16  8:30p
Astronomy Friday           July 17  8:30p
Stonelick Stargaze         July 18
A2Z Astro Class            July 19  7p
FOTO Planning Meeting      July 23  7p
Wurst Night                 July 23  8p
Astronomy Friday           July 24  8:30p
FOTO @ NMUSAF               July 25 10:15a
Lincoln Ridge Star Gaze    July 25  8:30p
History of the Observatory July 26  1-4p
*Behind the Scenes         July 27  7p
*Summer Skies               July 28  8p
Astronomy Thursday         July 30  8:30p

Save-The-Dates!
Sunday Sun-Day Sundae       Aug 9   1-4p
Eclipses                    Aug 11  8p
Movie Night                 Aug 22  7p
Lincoln Ridge Stargaze      Aug 22  8:30p
CMC Heritage Tour           Aug 26  7p
Starlit Picnic              Aug 29  7p
ScopeOut                    Sep 12 All Day
* UC Communiversity Class

THE WORD

By Michelle Lierl Gainey

Hello Friends,

The July FOTO meeting will be the annual picnic, on the grounds of the Observatory starting at 7 PM on Monday, July 13. This is a potluck picnic, so please bring your favorite side dish, salad or dessert to share. Each person should bring their own burger or hot dogs, etc; we will have the grill going. Drinks, ice, plates etc will be provided.

This is a great chance to socialize with fellow FOTO members and get to know some new people! If the sky permits, we will have a star gaze after the picnic. As the sun sets, Venus and Jupiter will be side by side in the western sky, and by 9:30 or so we should be seeing nice views of Saturn. Members are invited to bring portable telescopes to share for the star gaze, and also if you are having any technical difficulties with your portable telescope, this is a good opportunity to get some expert help with collimating the optics, making minor repairs, etc. We will have the picnic indoors if it is rainy, so I hope to see you all there on July 13 at 7 PM, rain or shine.

The FOTO mentoring program is off to a good start! We are putting people who need some help getting started with observing or learning to use their telescope in touch with more experienced astronomers who can mentor them. This is a rewarding experience for both parties. If you are willing to be a mentor, or are in need of a mentor, please e-mail me at mlierl@fuse.net.

FOTO is in need of a secretary. Duties of the secretary include documenting the minutes of the monthly FOTO meetings, reading said minutes for approval by the membership, keeping records of the minutes from the Board meetings, and writing any correspondence needed (which does not come up very often). If you would like to try out this role, you can volunteer to serve as Secretary until the October elections. Thanks to Al Scheide.
FOTO Treasurer, for filling in as interim secretary.

ScopeOut 2015 will be held on September 12, noon to 5 PM with dinner and speaker to follow. Dale Zoller and the ScopeOut Committee are working hard to make this the best ScopeOut ever! See Dale’s article later in this newsletter for more information. Many volunteers are needed to make this event a success. You can volunteer to help with ScopeOut by e-mailing me at mlierl@fuse.net. Volunteers get free admission to ScopeOut (although not to the dinner) and the chance to interact with the public to promote enthusiasm for astronomy.

THANK YOU for all you do to keep the Cincinnati Observatory Center thriving and serving our community.

FOTO Planning Meeting

By Michelle Lierl Gainey

The next FOTO Planning Meeting is scheduled for Thursday, July 23 at 7 pm at the Bangkok Bistro restaurant, 3506 Erie Avenue. Note the change in location! The Observatory will be busy with the Wurst Date Night Ever event that night, so we thought this would be a nice chance to have a good Thai dinner in conjunction with the Board meeting. The planning meetings are open to all FOTO members. We encourage your participation in the discussion of future FOTO activities.

Welcome New & Renewing Members!

Martha Bailey
Vedanarayanan Jyotheeswaran
and Hema Balachandran
Robert & Wanda Barger
Gordon Barnes
Jennifer and Conrad Barnes
Jennifer Beach
Hal and Karen Bernstein
Gene and Karen Bertke
Elizabeth Brown
Alexander Bungabong
William and Lesley Bunn
Paul Busker
George and Linda Callard
Kristin Conlin
Bala Corattiyl
Valeria J Freysinger
Brian and Jenny Gardner
James Garvey
Rusty and Jeannie Harp
Erin Hedrick
Robert and Sally Johnson
Nicholas and Jacqueline Kelly
Pat & Sherry Kiernan
David Lynch
Michael Malec
Sophia McAllister
Sarah McDaniel
Janet Ross
Michael and Susan Saracina

Monte and Dan Schellenberger
Elizabeth Stone
Michael & Ann Troyer
Jessica Va
Patricia and Dean Waddell
Elizabeth Wolf
John and Lu Ann Zeszut
Zoe Zeszut

Stargazing at Stonelick State Park

Saturdays – July 11 & 18

The Summer Skies

Need help with your telescope? Bring it for expert tips on setting it up and exploring the night sky. Stargazing begins at dusk. Open to all ages.

Stargazes are weather permitting. “Friend” the Stonelick Lake Stargazers Facebook page for weather and schedule updates.

Meet Me Outdoors

Looking for one site to find this spring’s best outdoor recreation events? Stargazing, hikes, biking, everything outdoors.
http://meetmeoutdoors.com
**John Ruthven Print Signing**

Sunday, June 28th 1 pm

Mr. John Ruthven will be at the Observatory Sunday, June 29th offering signed, limited edition giclee' prints of his "Eyes of the Night" which features the Observatory!

Each signed 14"x 20" print is on sale for $150. The total run will be limited to 250 prints.

Proceeds support the Observatory’s programs.

**FOTO’s July Meeting**

By Michelle Lierl Gainey

Once again our July FOTO meeting will be the annual picnic, at the Observatory starting at 7 pm on Monday, July 13. This is a potluck picnic, so please bring your favorite side dish, salad or dessert to share. Each person should bring their own burger or hot dogs, etc; we will have the grill going. Drinks, ice, plates etc will be provided. This is a great chance to socialize with fellow FOTO members and get to know some new people! If the sky permits, we will have a star gaze after the picnic.

**June FOTO Meeting Highlights**

By Michelle Lierl Gainey

The highlight of the June meeting was the excellent presentation by Dr. Terra Clarke, “Global Climate Change over the Past Quarter Millennium”. Dr. Clarke gave an overview of the factors contributing to oscillations in climate over the history of Earth, and showed how the production of greenhouse gases is causing a much more rapid change in temperature since the Industrial Revolution.

The FOTO Forum is still in the planning stages. We have decided to use vBulletin for our forum site. The purpose of the Forum is to make it easier for FOTO members to share information and ideas, interact on projects, post announcements, and whatever else the members like.

Dave Bosse requested funding for 2 more telescopes for the loaner program. The membership approved funding for two 8” Dobsonian telescopes, which will be purchased through the gift shop.

**5142 is the Kroger Community Rewards Number for the Observatory**

After a quick and easy sign up online, every time you swipe your Kroger Plus Card a donation goes to support the Observatory’s mission. No cost to you; no loss of fuel points.

https://www.kroger.com/account/create

**New Star Gazers**

Star Gazers airs locally on channels 14 and 48 and you can watch each month’s episodes on http://www.cincinnatiobservatory.org/stargazer.html

The Observatory is a proud member of GCEE!
ScopeOut 2015 Update

By Dale Zoller

ScopeOut 2015 will be held Saturday, September 12, 2015. As in the past, the main event will run from 12-5 pm. We will hold the raffle drawing from 5-6 pm and then the dinner and keynote presentation from 6-8:30 pm.

We are pleased to announce that this year’s keynote speaker will be Dr. Bob O’Dell, former Project Scientist for the Hubble Space Telescope and current collaborator with the Hubble Heritage Project. As 2015 is the 25th anniversary of the HST’s launch, Dr. O’Dell’s topic will be “25 Years of the Hubble Space Telescope.” Viewing will follow the keynote presentation from 9-11pm (weather permitting).

Last year’s new "Science Tent" was a big improvement over past years and was well received. Some of the new features were the cloud chamber, "Galileo" experiments (acceleration ramp, pendulum, tennis ball drop, etc.), the prism/spectrum/thermometer demo and the UC Physics Department group. We are looking at additional exhibits to make it even better this year.

The following events/anniversaries take place in 2015: The International Year of Light and Light-Based Technologies; the 50th anniversary of the discovery of the cosmic background radiation by Penzias & Wilson; the 100th anniversary of Einstein’s General Relativity; and the 150th anniversary of Jules Verne’s novel, "From the Earth to the Moon." Also, the spacecraft Dawn has arrived at Ceres and the New Horizons will fly by Pluto in July. Please let us know if you would like to do an exhibit or talk on one of these topics.

ScopeOut requires a large number of dedicated volunteers to make it run smoothly. Please consider volunteering for one of the many different areas (set up, registration, gift shop, dinner helpers, etc.). We will have signup sheets available at the July FOTO meeting. If you would like to volunteer and cannot attend the July FOTO meeting, please email Michelle Gainey at mlierl@fuse.net, or me at dale.zoller@fuse.net. Thanks in advance.

FOTO Field Trip:
National Museum of the United States Air Force

By Aashi Mital

FOTO is headed to the National Museum of the United States Air Force on Saturday, July 25th. We will meet 10:15 a.m. in the atrium of the main building of the museum. The cost is $5 per person and payment is due to Aashi Mital by Friday, July 17th.

We’ll experience 17 acres of exhibits and over 360 aerospace vehicles and missiles as we walk around the world’s largest and oldest military aviation museum. See current aircraft, such as the B-2, F22A and the world’s only XB-70 Valkyrie bomber. Sit in a jet cockpit or check out hands-on educational programs.

Whether you’re an engineer, a pilot or a history buff, this field trip has something for all! You can sign up at the June and July FOTO Membership meetings, but IF you are unable to make it and wish to attend, please email Aashi Mital at aashimital@gmail.com.

Do you need directions or want to learn more? Visit: http://www.nationalmuseum.af.mil/

FOTO Board Members

(Terms expire Oct. 2015, Except as noted)

President: Michelle Gainey
VP: Aashi Mital
Secretary:
Treasurer: Al Scheide

Trustees
John Blasing
Aaron Eiben
Dave Bosse (exp. Oct 2016)
Chris Kean (exp. Oct 2016)
Small Thunderstorms May Add Up To Massive Cyclones on Saturn

New model may predict cyclone activity on other planets

For the last decade, astronomers have observed curious "hotspots" on Saturn's poles. In 2008, NASA's Cassini spacecraft beamed back close-up images of these hotspots, revealing them to be immense cyclones, each as wide as the Earth. Scientists estimate that Saturn's cyclones may whip up 300 mph winds, and likely have been churning for years.

While cyclones on Earth are fueled by the heat and moisture of the oceans, no such bodies of water exist on Saturn. What, then, could be causing such powerful, long-lasting storms?

In a paper published in the journal *Nature Geoscience*, atmospheric scientists at MIT propose a possible mechanism for Saturn's polar cyclones: Over time, small, short-lived thunderstorms across the planet may build up angular momentum, or spin, within the atmosphere -- ultimately stirring up a massive and long-lasting vortex at the poles.

http://www.sciencedaily.com/releases/2015/06/150615152550.htm

Teacher Professional Development

A number of STEM & History PD opportunities are coming up this summer:

**Astronomy: History & Science**

at the Observatory

Tuesday & Thursday
6:00 pm – 10:30 pm
June 30 and July 2

This course is broken up into two sections-the history of astronomy before and after the invention of the telescope. We will discuss and recreate a multitude of the observations of the night and daytime skies that were made by the ancients.

Topics include the cycles and orbits of the Sun, Moon, and Earth, constellations, planets, seasons and eclipses.

In the second half of the course, you will delve into the discoveries made from the simple telescopes of the Renaissance to the Hubble Space telescope including stellar evolution and galaxies.

Wurst” Date Night Ever

With the Wurst Bar and Cincinnati Observatory
Thursday, July 23,
From 8:30-11 pm.

This date night has it all: Food and drink, followed by stars and planets, followed by more food and drink.

Start your evening at the Wurst Bar in Mount Lookout Square at 8:30 pm, then take a complimentary shuttle to the Observatory for a program, starting at 9 pm. Enjoy viewing of Saturn (weather permitting) and a tour of the Observatory. Afterwards, grab the shuttle back to the Wurst Bar to enjoy Happy Hour pricing the rest of the night!

Attendees also receive 20% off coupon for future visit to the Wurst Bar.

Tickets are $30 each and benefit the Cincinnati Observatory education programs.

Must be 21 or over. Reservations required. Space is limited. To RSVP, call 513-321-5186.
Summer Fundraisers Support Observatory’s Programs

By Anna M. Hehman

On Saturday, June 20th, the Observatory hosted over 60 people for its annual Celestial Sips event. Amy DiTravisonno of DEP’s Fine Wine and Spirits was in attendance to present the three biodynamic wines served to guests. Amy suggested biodynamic wines because the grapes are grown and harvested according to the phases of the moon. A good time was had by all guests, as sipping and touring the Observatory made for a wonderful summer evening!

Next up is the Wurst Date Night Ever on July 23rd, a collaborative event with the Wurst Bar in Mt. Lookout Square. Attendees will start at the Wurst Bar then take their shuttle to the Observatory for a program, tour and hopefully some viewing! Afterwards, they’ll be shuttled back down to the Wurst Bar to enjoy Happy Hour pricing the rest of the night.

Tickets are $30 for this fun, social event! Visit the Observatory’s webpage to make reservations!

Also, mark your calendars for the Starlit Picnic event on August 29th at the Observatory – bring a picnic dinner and watch the sunset! Check out www.cincinnatiobservatory.org for more details!

Closest Ever Look at Dwarf Planet Ceres

First images from Dawn spacecraft produce 3-D model of 'mysterious' terrain

A NASA mission led by UCLA professor Christopher Russell has released new images of the dwarf planet Ceres, the largest asteroid between Mars and Jupiter.

The photos were produced by the spacecraft Dawn, which is now observing Ceres from 2,700 miles above its surface; NASA has also produced a one-minute video animation that sheds new light on this mysterious and heavily cratered world.

'Everything we learn from Ceres will be absolutely new,' said Christopher Russell, a UCLA professor of space physics and planetary science, and the Dawn mission’s principal investigator. “We approach it in awe and almost total ignorance.” Dawn’s visit to Ceres, which is scheduled to last more than a year, began on March 6. From July 2011 to September 2012, it observed Vesta, a minor planet that is the second most massive body in the asteroid belt between Mars and Jupiter.

Over the years, scientists have learned about the conditions at the beginning of the solar system by studying meteorites from Vesta that have fallen to Earth. There have been no such meteorites produced by Ceres, an indication that the two bodies are likely very different. For example, Dawn found little evidence to indicate there is water on Vesta. But Russell said Ceres could have a substantial amount of water or ice beneath its rocky crust.

The presence of water, he said, “could affect the time for relaxation of craters and mountains on Ceres and reduce the height of the topography compared to Vesta, and will affect minerals on the surface.” Russell also said Ceres, unlike Vesta, “might have a weak atmosphere and perhaps even life.”

http://www.sciencedaily.com/releases/2015/06/150611161302.htm

Did You Know...?

There is only about one new star being born each year in our galaxy.
**Astro Evenings at the Observatory**

Thursdays, July 2, 9, 16, 30
Fridays, July 3, 10, 17, 24
8:30-10:00 pm

Are you in awe with the beauty of the night sky? Have questions about the Universe? This is where you can get the answers.

Astronomy Evenings include short presentations on a wide variety of topics and plenty of time for your astro-questions. Tour of the Cincinnati Observatory, which as a National Historic Landmark played an important role in the history of Cincinnati and our nation. Once dark, we will view the Moon, planets and deep space treasures through the historic 1845 telescope. (Program is held rain or shine; telescope viewing if clear skies).

The topics and the night sky change week-to-week/month-to-month so you can visit often to hear and see something new!

**Free for Observatory members!**

For the latest schedule see the web calendar then sign up online.

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**Weather in Cincinnati**

By Fred Bowman

Mark Twain said “Everybody talks about the weather, but nobody does anything about it.”

The weather service has kept records for more than 140 years, rounding the average daily highs and lows to the nearest degree. I feel that the daily averages, with over 140 data points, should be expressed at least to the nearest tenth of a degree.

I’ve examined the year-long temperature variations for Cincinnati, the highs and lows follow a sinusoidal path, hot in the summer and cold in the winter. Everyone knows that; however, the particulars require a little math. The atmosphere acts to buffer the temperature extremes. Following the winter solstice it takes the atmosphere a few days to react: 25 days for the high temperatures and 28 days for the lows. The coldest days of the year occur in January and the warmest in July. The yearly average high is 64.72°F with a variation of 24.13°F. The yearly average low is 45.37°F with a variation of 21.57°F. The average daily temperature range varies from 16° in winter to 20° in summer with a yearly average temperature of 55.05°F.

From my investigation I also found a second harmonic for the high temperatures. There is a 2.26°F variation with two high extremes and two low extremes per year. The lows occur in winter and summer, while the highs occur during spring and fall. There is also a 0.52°F variation for the low temperatures following the trend for the high temperatures, but exists in only three seasons, not summer.

This begs the question: Why do caves in the area have a constant temperature of 58°F? The temperatures of caves are regulated by both the atmospheric temperatures and the temperature of the Earth. Two miles below the Earth’s surface the temperature is a constant 120°F.

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**Starlit Picnic at the Observatory**

Saturday, August 29th 7-10 pm

There are few places in the Tri-state as picturesque for a picnic as the Cincinnati Observatory. You’re invited to dine outdoors with us and take in a sunset, listen to heavenly music as the full Moon rises, and then have dessert under the stars.

This is a romantic picnic like no other.

Bring your blankets, food and drinks, and if the weather is clear, we’ll show you the stars. You provide the food, we’ll provide the celestial atmosphere.

$30 per person (which benefits the Cincinnati Observatory’s outreach education programs)

21 and up.

Reservations are required. RSVP at 513-321-5186 or sign up online.

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**Did You Know...**

There are more rogue planets in our galaxy than there are stars.
Craig’s Corner
By Craig Niemi
Executive Director

It’s officially summer; astronomically and meteorologically. April, May and June were full of astronomy programs for schools, scouts, seniors, members and the general public. The last two months saw school bus after school bus dropping off kids eager for the kind of authentic and inspiring STEM experience that a field trip to the Observatory delivers.

Staff & volunteers gave an increasing number of programs offsite too.

Public programs featured:
• 1st Light Night
• Astro Thursday & Fridays
• A2Z+ and other Member Programs
• FOTO Movie Night
• FOTO Field Trips
• FOTOKids Youth Programs
• Valentine’s Night
• Not a UFO Night
• Pi Day!
• SpaceFest in Dayton
• Hubble’s Greatest Hits
• Dr. Amanda Bauer-When Galaxies Collide
• Jupiter Night
• Scout Programs
• AARP Night
• Intro to Astronomy & Special Topic classes given by Dean Regas
• Sunday History Tours
• Several Museum and Programmatic Exhibits
• What’s Up at NASA
• High School Astro Clubs
• Astrophoto Workshops
• Stonelick Stargazes

• UC Communiversity classes
• Late Nights at the Observatory
• SaturnDay
• Weddings and other Life Events
• Astro Saturdays
• Sun Sundays
• Celestial Sips Wine Tasting
• Kid’s Expo@ Paddlefest
• John Ruthven Print Signings

Our thanks to all our wonderful staff for all you’ve done in just the first half of the year. And to all our members and donors who help make it all possible.

And a special thanks to all our volunteers without whom we could not do what we do for the Greater Cincinnati community. Each of you makes a huge impact!

We hope your volunteer experiences have been rewarding, challenging and fun! And know that we want your suggestions on how we can continue to make the experience better and your ideas on new programs.

Now take a well-deserved, but short, break and get ready for the second half of 2015!

Amazon “Smiles” on the Observatory

Amazon will donate 0.5% of the price of your eligible purchases to Cincinnati Observatory Center whenever you shop on AmazonSmile. Next time you shop at Amazon simply start at http://smile.amazon.com/ch/31-1665954

Europe’s Philae Comet Lander Phones Home

The E.S.A. reports it has received signals from the Philae lander on the surface of comet 67P/Churyumov–Gerasimenko.

The signals were received via the lander’s Rosetta mothership by ground controllers at ESA’s European Space Operations Centre in Darmstadt on Saturday, June 13.

“Philae is doing very well: It has an operating temperature of -35ºC and has 24 Watts available,” DLR Philae Project Manager Dr. Stephan Ulamec told the European Space Agency’s Rosetta Blog. “The lander is ready for operations.”

The space agency said 300 packets of housekeeping data were received in the first transmission but the lander had obviously emerged from hibernation earlier as there are more than 8000 more data packets stored in memory awaiting transmission. http://astromonynow.com/2015/06/14/philae-lander-phones-home/
August Movie Night
By Aashi Mital

It’s summer and we’re mixing things up for our next FOTO Movie Night! Join us for a showing of the science fiction film *Europa Report* on Saturday, August 22nd at 7 pm in the Herget Building.

It’s going to be an excellent thriller as we watch the fictional journeys of the first crewed mission to Europa, one of Jupiter’s most famous moons. Want to learn more about this movie? Visit: [http://www.imdb.com/title/tt2051879/](http://www.imdb.com/title/tt2051879/)

As always, we will have some snacks and drinks to munch on, but feel free to bring in something for this event. If you have any questions, please email Aashi Mital at aashimital@gmail.com.

Kids Outdoor Adventure Expo
By Michelle Lierl Gainey

As part of the annual Paddlefest event, the Green Umbrella Organization sponsors the Kids Outdoor Adventure Expo at Coney Island. This event is attended by thousands of children from various schools, youth groups, summer camps, as well as family groups. COC was represented this year by Terry Powell, Frank Huss, Scott Gainey, Aaron Eiben, Alex Trunnell (our very bright, personable and knowledgeable summer intern!) and me. We had sunshine for most of the morning and early afternoon, so about 700 children and adults had the chance to see the sun through the white-light filters and an H-alpha filter, as well as participate in the Planet Walk!

Thank you to these members who valiantly withstood the very hot, humid weather to provide this interesting learning experience to the children and their parents and teachers.

Alex guides the Planet Walk

Dean’s Astronomy Classes

All Dean’s classes are on Tuesdays at 8 pm

Led by astronomer and co-host of PBS’ *Star Gazer*, Dean Regas will be teaching on Tuesdays at 8 pm.

July 7 – Planet Hunting. How we detect planets around other stars that are trillions of miles away. Includes class participation.

August 11 – Eclipse Chasing. Stories of astronomical travel plus upcoming excuses for you to see the universe while seeing the world.

Cost $15 per person, $12 per member. RSVP by calling Dean at 513-321-5186.

Museums and Historic Sites of Greater Cincinnati

MHS is comprised of over 30 participating sites across Greater Cincinnati. Each site offers a unique perspective on local history and culture through public programs, exhibits, lectures, and tours.

Many sites are seasonal and have reopened after the long winter. [www.historicgreatercincinnati.org](http://www.historicgreatercincinnati.org)
The Lord of the Rings

By Aashi Mital

Saturn, the jewel of our solar system, has been gracing the night skies and the Observatory. Learn more about Saturn's rings, crazy storms and amazing moons.

The exhibit will be located in the rotunda and open to the public from April 17 - July 29. Throughout its time on display, the Saturn Exhibit will be full of upgrades and new information.

And don’t forget that this would make for an excellent resource! Between incorporating it into our programming to being an added intrigue for walk-ins and tour groups or even if it’s just learning more about something of personal interest, it’s sure to turn a few heads.

The Greater Cincinnati STEM Collaborative (GCSC) impacts STEM (Science, Technology, Engineering, and Mathematics) learning and career readiness through active, engaged, data-driven partnerships between business, educational (Cincinnati Observatory), and community partners.

Check out the new website!
www.greatercincystem.org

Twenty years ago, astronomers had’t confirmed a single planet outside our solar system. In the past six years, NASA’s Kepler mission—a space-based telescope that orbits our Sun, looking at over 100 thousand stars simultaneously—has uncovered over 4100 planetary candidates and 1000 confirmed planets.

We have learned most stars have planets, that Earth sized planets are common, and a good fraction are in the habitable zone of their star. And when you put the numbers together: 100 billion stars, 10 percent with Earth-sized planets, 10 percent stars like the sun, that’s a billion Earth-sized planets in the habitable zone of stars like the Sun."

Let me repeat that last bit. There may be a billion Earth-sized planets in the habitable zone of a sun-like star. Thirty years ago, astronomers weren’t sure of any.

The technology behind this incredible discovery is in principle quite simple. Most exoplanets to date have been detected via transit—a slight dip in the light emitted from a star as a planet crosses its path within the line of sight of a telescope.

http://gizmodo.com/heres-how-planet-hunters-are-going-to-find-the-next-earth-1703491062
Lonely Galaxy
'Lost In Space'

This NASA/ESA Hubble Space Telescope image shows galaxy NGC 6503. The galaxy is at the edge of a strangely empty patch of space called the Local Void.

NGC 6503 is only some 18 million light-years away from us in the constellation of Draco (The Dragon), making it one of the closest neighbors from our Local Group. It spans some 30,000 light-years, about a third of the size of the Milky Way. The galaxy's lonely location led stargazer Stephen James O'Meara to dub it the "Lost-In-Space galaxy" in his 2007 book Hidden Treasures.

The Hubble Legacy ExtraGalactic UV Survey (LEGUS) is exploring a sample of nearby galaxies, including NGC 6503, to study their shape, internal structure, and the properties and behavior of their stars. This survey uses 154 orbits of time on Hubble; by contrast, a typical Hubble observing program lasts from a few to a few tens of orbits.

The Local Void is a patch of space thought to be about 150 million light-years across that seems to be curiously devoid of galaxies. Astronomers using Hubble discovered that the emptiness of this region has quite an effect on the space around us -- the Milky Way is being strongly pulled away from it by the gentle but relentless tug of other nearby galaxies.

NGC 6503 lies right on the edge of this void. It has an almost non-existent central bulge surrounded by a massive halo of gas. The galaxy's central region is a good example of something known as a "low ionization nuclear emission region," or LINER. These are less luminous than some of the brightest galaxies. Emission from NGC 6503's heart is believed to be the result of a starved black hole that is only just being kept active, receiving a very small amount of infalling gas to keep its large appetite at bay.

http://www.sciencedaily.com/releases/2015/06/150610111137.htm

History of the Observatory

July 26th
Drop in anytime between 1-4 pm

A Weather Observatory?

Stop by for the whole story or just the highlights. It's all fascinating and connects our past with your future.

$5 per person suggested donation. Free for members. Group tours by appointment.

Sunday Sun-Day Sundae

Sunday, July 12
1-4 pm

What do astronomers do during the daytime? They stare at the Sun... safely.

The Sun is the star attraction on this Sunday and you can learn all about our nearest stellar neighbor. Sunday Sun-day Sundae includes hourly programs about the Sun, tours of our historic buildings, and safe viewing of sunspots and solar flares out of our 1845 telescope (weather permitting).

As a special treat we will also have free sundaes for those in attendance.

$7 per person. No RSVP needed.

The GOW website is up all-year around as a link to informal education providers like the Observatory.

www.cincygreatoutdoorweekend.org
A2Z+ Astronomy for Members

Sunday, July 19th 7-8 pm

The A2Z Astronomy classes will be held the third Sunday of each month at 7:00 pm in the West Wing of the Herget Building. The discussion group will meet for about an hour or so and the best part is that attendance is free to any COC member. The only pre-requisites are the desire to learn.

FOTO Kids and Teens

By Aashi Mital

One word. Rockets. They’re fast. They’re furious. While most think of people think of the rockets' red glare and the bombs bursting in air this close to Independence Day weekend, rockets are also key to exploring the rest of the universe. Get ready to prep and launch rockets of your very own at the next FOTO Kids meeting on July 3rd at 7 p.m. in the Herget Building.

Remember to dress for the weather! If you have any questions, please don’t hesitate to email Aashi Mital at aashimital@gmail.com or Aaron Eiben at aaron@cincinnatiobservatory.org

What Is It Like To Be a Non-Profit Organization in Today's Economy?

By Jenny O’Donnell

For all of our hard work and time, it is important also to understand the role played by those who are raising money and constantly asking for money.

Did you know there are over 1.5 million nonprofit organizations in the United States alone? Over 500,000 of those nonprofits, like the Observatory, have less than $1,000,000 in revenue per year. These same 1.5 million organizations gather over 335 billion dollars in contributions per year and about 72% of that comes from individual donors.

Only 15% of the nonprofit income comes from foundations and only a meager 5% comes from corporate donors.

Sure, those big checks get all the publicity, and everyone spends a lot of time and energy to get them...but slow and steady, dripping in at the $40 and $60 level is what is actually funding the world of nonprofits.

So where do folks give their money? Most people give money to between 3 and 5 charities. 31% give to religious institutions. Only 16% go to educational institutions, and less to health related charities. After the economy crash in 2008, there were increases in giving to religious charities, but not other institutions until starting in 2013. A significant proportion of giving happens online, and that is why you have seen the Observatory really step up its social media presence, and revamp our webpage.

Projections are that a strong social media campaign and online presence can increase individual donations by about 7%. Getting our members to "share" their passion about the Observatory is a fantastic multiplier for our ability to reach a larger audience and is not seen by most recipients as intrusive or pushy, but rather as informative and supportive.

The hard part is keeping those first-time donors, once they have "clicked." The O does a particularly good job of retention compared to industry standards and that's in a large part because of the incredibly passionate volunteers. If we can get someone to the O, we can keep them for a long time to come. That's a reflection on you.

Facts gathered from: "50 Fascinating Nonprofit Statistics: Fundraising, Marketing and More!"

Gravity -- "The Clue to the Dark, Quantum World of Our Universe"

Posted: 16 Jun 2015 07:29 AM PDT

In 1915 Albert Einstein formulated the theory of general relativity which fundamentally changed our understanding of gravity. He explained gravity as
the manifestation of the curvature of space and time. Einstein's theory predicts that the flow of time is altered by mass. This effect, known as "gravitational time dilation", causes time to be slowed down near a massive object. It affects everything and everybody; in fact, people working on the ground floor will age slower than their colleagues a floor above, by about 10 nanoseconds in one year. This tiny effect has actually been confirmed in many experiments with very precise clocks.

Supermassive black holes lurk at the center of every large galaxy. These cosmic behemoths can be millions to billions of times more massive than the Sun. Determining just how massive, however, has been daunting, especially for spiral galaxies and their closely related cousins barred spirals.

"The Cosmos Five-Billion Years in the Future"

"In 5 billion years, the expansion of the universe will have progressed to the point where all other galaxies will have receded beyond detection. Indeed, they will be receding faster than the speed of light, so detection will be impossible. Future civilizations will discover science and all its laws, and never know about other galaxies or the cosmic background radiation. They will inevitably come to the wrong conclusion about the universe......We live in a special time, the only time, where we can observationally verify that we live in a special time."

Lawrence M. Krauss, A Universe from Nothing: Why There Is Something Rather Than Nothing

This thought is completely obtuse.

There will still be the Local Group.
We will still be heading for an even larger galaxy cluster. The Perseus Cluster and the Virgo Cluster are approaching, not escaping.

Did You Know. . .

Jupiter’s red clouds hide a dense, rocky core that’s about 20 times as massive as Earth.