Upcoming Events

April Calendar

Stonelick Stargazing    Apr 1 dusk
Tour of the Universe*   Apr 3 8p*
Thor’s Day Thursdays    Apr 6 8p
Astronomy Friday        Apr 7 8p
History of the Observatory Apr 9 1p
FOTO Member’s Meeting   Apr 10 7:30p
Astro Topics with Dean  Apr 11 8p
Thor’s Day Thursdays    Apr 13 8p
First Light Night!      Apr 14 8pm
Cosmic Kids**           Apr 15 am*
Late Night Date Night   Apr 15 10:30p
Astrophysics 101*       Apr 19 8pm*
FOTO Planning Meeting   Apr 20 7p
Thor’s Day Thursdays    Apr 20 8p
Astronomy Friday        Apr 21 8p
Stonelick Stargazing    Apr 22 dusk
Late Night Date Night   Apr 22 10:30p
History of the Observatory Apr 23 1p
Behind the Scenes       Apr 24 8p*
Constellations*         Apr 26 8p*
Thor’s Day Thursdays    Apr 27 8p
Astronomy Friday        Apr 28 8p
Stonelick Stargazing    Apr 29 dusk
Jupiter Night           May  6 9p
Binocular Astronomy     May 16 8p
Astro Topics with Dean  May 23 8p

* UC Commuversity
**See the Cosmic Kids article for details
Complete Calendar & Events Online

2017 Special Events

Be sure to mark your calendar!

April Thor's Days Thursdays
Apr 14 First Light Night
May  6 Jupiter    Night
June 11 Sunday Sun-day Sundae
July 29 Saturnday
Aug  5 Saturnday
Aug 21 Total Solar Eclipse

Membership News

By Valerie Niemi, FOTO Chair

Hello Fellow Stargazers,

We have some exciting "Save the Date" days for you this year.

First Date: Saturday, May 13 **FOTO field trip to the Lloyd Library and Museum.** Lloyd Library is open especially for us and our friends from the Cincinnati Astronomical Society. We’ll meet at the Library, explore every inch of the museum and then have lunch. Cost is $5/person plus parking and lunch. Be sure to read the Field Trip article in the newsletter for sign-up details.

Second Date: Monday, July 10th. Traditionally this is the annual FOTO picnic. We’ve noticed that attendance has been falling off the past couple of years, so it’s time to shake things up and try an indoor, air-conditioned event.

We’ve made arrangements for a FOTO evening at the **NKU Planetarium.** Details to follow in the next couple of months, but we will be meeting at the Planetarium rather than the Observatory that night.

Third Date: Saturday, Dec. 2. We’re moving the Membership **Holiday Dinner** from our regular meeting night, Monday Dec. 11, to the previous Saturday, Dec. 9, at the Observatory. Same great fun and friends, just now on Saturday.

Don’t forget the next FOTO Planning meeting on Thursday, April 20 at 7pm. Come learn how we make the decisions we do and add your input.

As always, thank you for your continued support of the Cincinnati Observatory. We couldn’t do our work without you!

Did You Know….

There are ultra-luminous infrared galaxies. These galaxies produce about 100 new stars each year compared with just one star in our own galaxy.
Cosmic Kids Youth Astronomy Program

Saturday April 15th
Saturday May 20th

Sold Out!

9:30-10:30am Grades 1-3rd
11:00-12:00pm Grades 4-6th

The Cincinnati Observatory will be hosting classes for the entire family. Explore the cosmos during our new multi-disciplinary class which helps grades 1st-6th learn and discover topics in astronomy and investigate the wonders beyond our world. This astronomy class is open to students with a curiosity about space, and their families.

Cosmic Kids is taking June off (summer camps) and then returns July through November. The response to Cosmic Kids has been tremendous, so be sure to sign up early. Reservations are required and space is limited.

Admission $5/person/class; Observatory members are free. If you have any questions contact Katie at katie@cincinnatiobservatory.org or call 513-321-5186.

ScopeOut 2017

By Dale Zoller

For 2017, we have decided to combine ScopeOut 2017 with the annual “Great Outdoors Weekend” event which the Observatory has participated in for the past several years.

As a result, ScopeOut 2017 will be moved back two weeks from its usual weekend after Labor Day date to Saturday, September 23, 2017. All other aspects of ScopeOut will remain the same as the past several years with an emphasis on STEM-related activities.

The next ScopeOut 2017 planning meeting will be held Thursday, April 6 at 6pm at the Observatory. The meeting is open to anyone who is interested in assisting with the planning of the event.

As always, ScopeOut requires a large number of dedicated volunteers to make it run smoothly. At this time we are looking for people to help coordinate tasks such as registration, raffle table, parking, history tours, Science Tent, and dinner.

We will have a signup sheet available at the April FOTO meeting. If you would like to volunteer and cannot attend the April FOTO meeting, please email me at dale.zoller@fuse.net.

ScopeOut 2017

Thursday Apr. 6, 13, 20, 27
All at 8 pm.

In Norse mythology the god Thor was often associated with the planet Jupiter. Since Jupiter is closest to Earth this April, we’re adding special viewing events on Thor’s day of the week – Thursday.

Learn about the largest planet in the solar system and tour the Observatory. Best of all, Thor's Days include viewing of Jupiter through the telescopes (weather permitting).

For ages 7 and up. $5.00 suggested donation
Space is limited. Reservations are required by calling 513-321-5186.

FOTO Planning Meeting

The next FOTO Planning Meeting is Thursday, April 20th at 7pm at the Observatory. Help plan programs and events for your fellow members. Open to all members.
First Light Night

Friday Apr. 14th 8pm
172 Years of Astronomy

On April 14, 1845, in the gray of a lingering twilight, Observatory founder Ormsby MacKnight Mitchel took his first look through the Great Cincinnati Telescope, the 3rd largest in the World.

He saw the Moon, "her mountain heights, her rocky precipices and her dells", Jupiter, "globe of surpassing splendor", the Saturnian system, "the mind over whelmed in wonder and astonishment."

Learn the fascinating story of the people who made Cincinnati the "Birthplace of American Astronomy". Includes viewing through the 172-year-old telescope (weather permitting). No reservations are needed. All ages welcome.

Cost: $5/person. Free for Observatory Members.
Call the Observatory at 513-321-5186 for more information.

FOTO Field Trip
May 13, 2017

By Valerie Niemi

The Cincinnati Observatory has long been known as one of Cincinnati's hidden gems (although we are rapidly becoming less hidden). Another of the city's hidden gems is the Lloyd Library and Museum located downtown.

It was established by three brothers who operated a pharmacy and manufactured botanical drugs in Cincinnati beginning in the late 19th century. The library features books, manuscripts and original art dating back to the 1400s and covers the topics of pharmacy, botany, scientific history, medicine and the visual arts.

Save the Date: Saturday May 13-FOTO members are invited to join a field trip to the Lloyd Library. We are sharing this trip with our friends at the Cincinnati Astronomical Society. We'll meet at the Library at 9:45am, enjoy a short presentation and then have lots of time to explore the library. We'll see the George Rieveschl, Jr. exhibit as well as the new display of noted botanical illustrator, Maria Sibylla Merian. Maria's paintings and engravings are exquisite and predate John James Audubon works by 125 years.

After we explored the museum, we have time to grab lunch before heading home or you may choose to check out downtown on your own.

Cost is $5/person plus parking and lunch. Space is limited.

If interested, please contact Valerie Niemi at mailto:valerieniemi@gmail.com

You can also register at the next FOTO meeting. I know we'll have a great time!

A Stellar Best Seller!

From Super-Secret Spacecraft to Volcanoes in Outer Space, Extraterrestrial Facts to Blow Your Mind!

Dean Regas's first book will take you from the Earth to the edge of the universe and back. You may not bodily go where no one has gone before, but your imaginations will soar among the stars, see constellations from different perspectives, and fall into a black hole.

It's available in the Observatory Gift Shop.
Beating the Drum of Time

By R. A. Davis, Ph.D., Observatory Curator

You’ve all seen that quaint photograph on the top of the roll-top desk in the Lobby of the Herget Building ----- the image of the same room taken more than a century ago. There hangs the same portrait of John Quincy Adams, the last painting of him done from life. And the gas-lamp fixture. And the gentleman’s hat left on a table-top (for some inexplicable reason).

Through an open doorway on the left is a glimpse of yet another table-top, this one bearing a strange device. That mysterious machine was an integral part of the Observatory’s scientific work in that far-distant day and age.

Called a chronograph, it was used to record the exact timing of the passage of stars across the sky, as viewed through the telescope that once resided in the West Wing of the Herget Building. Said telescope was positioned so as to be aligned exactly on the meridian that runs through the center of that room. Because, as years pass, stars in space move, it is necessary to re-determine the exact position of each star every decade or so. One way to do this is to record the angular elevation of a star at the exact moment it crosses the meridian. (A meridian is an imaginary line on the surface of the Earth that extends from the North Pole to the South Pole through a given point on Earth’s surface. At local noon, the apparent daily path of the Sun reaches its highest point in the sky. [The word “meridian” ultimately was derived from two Latin words, “medius”, meaning “middle”, and “dies”, meaning “day”.]

The brass drum of the chronograph bore a precisely graduated sheet of paper. The drum (and the paper) rotated at a steady rate, and a pen left a line on the moving sheet of paper. At pre-determined intervals (say, every second), the pen diverged from the smooth line to make a tick. The astronomer, peering through the telescope would tap a button at the exact moment a given star crossed the meridian. This, through the “miracle” of electricity, caused the pen to make a special tick, to record, for all time, that exact event. Combining the observed angular elevation of the star with the exact instant of its crossing the meridian allowed the astronomer to determine the current “address” of that star ----- equivalent to its latitude and longitude (although, on the “celestial sphere” that is the sky, these technically are termed “declination” and “right ascension”, respectively).

“So what?!”, I hear you exclaim.

Having the Oh! so precise locations of the background stars allows us to determine precisely the locations and timing of certain celestial and human events, for example, the passage of comets, meteoroids, artificial satellites, and more.

In summary, that mysterious chronograph is no mystery at all. It did exactly what its name announces: “graphein”, Ancient Greek for “to write”, and “chronos”, “time”.

Borrow a Telescope!

By Dean Regas

As a member of the Observatory you can borrow a scope though the FOTO Telescope Loan program. For more info please call Dean at 513-321-5186.
Astronomy Evenings at the Observatory

Thursdays (See Thor’s Days)
Fridays April 7, 21, 28
8:00-9:30pm
Free for Observatory members!

The original home of the 1845 Telescope atop Mt. Adams.

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 visit the web calendar then sign up online.

STEM Education Update

By Katie Vaughn

We’re partnering with the Cincinnati Museum Center again to bring you some out-of-this-world summer camps.

From June 5-9 it’s Space Adventure for grades K-1 and 2-6

Blast off into an awesome camp! Join the Cincinnati Observatory and the Cincinnati Museum Center as we look through telescopes, observe the mysteries of the universe and test our astronaut skills.

Then from June 12-16 for grades K-1 it’s Galaxy Explorers

Travel to galaxies far away and discover the science and technology of living in space. Take a field trip to visit the special exhibit Star Wars and the Power of Costume at Cincinnati Museum Center. This camp is sure to be out of this world!

We will look through our historic telescopes, observe the mysteries of the universe and hopefully inspire a few future astronomers! For more information or to make reservations, call 513-287-7001.

Did You Know...

Magnetars were discovered in 1979. So far only 15 have been catalogued. Their magnetic field is incredibly intense – stronger than anything in the universe...so strong it would pull apart molecules.

Late Night Date Night

Sat. April 15 & 22nd 10:30pm

Can’t sleep? Looking for a romantic Saturday night out under the stars? Come see what the Observatory is like after hours.

You’ll get to use the oldest big telescope in the U.S. to view astronomical objects that are not visible until late at night (weather permitting). Get a sneak preview of the next season’s planets and stars a month or two ahead of everyone else.

For adults only. If the weather does not permit viewing, we’ll have fun showing you around the universe at behind the scenes at the Observatory.

Admission is $25 per person
Space is limited. Sign up by calling 513-321-5186 or Register Online.
Observatory Historical Notes

Nicholas Longworth’s Offer to Sell Land Is Declined

By John Ventre, COC Historian

On January 18, 1844, the Cincinnati Astronomical Society’s (CAS) Board of Control voted to decline the very liberal offer made by Nicholas Longworth. He offered to sell 20 additional acres of land adjoining the four acres that he previously donated for the site of the Observatory on Mt. Adams. The vote to reject his offer was adopted for two reasons: First, it was feared that if the Board accepted Longworth’s offer the citizens would charge that the CAS was engaging in land speculation, an opinion which would be prejudicial to the interest of the Society. Second, because the Board perceived that, under the CAS’s Charter, the contract proposed between Mr. Longworth and the Society would be illegal and void.

Principal Source: Minutes of the Cincinnati Astronomical Society, Board of Control, Jan. 18, 1844.

Did You Know….

Neptune’s moon Triton, at 340 degrees below zero F, has liquid nitrogen and moon features dust volcanoes.

A2Z+ Astronomy

Meton Strikes Again

No class this month

By Dave Bosse

Let’s see,... 2017,... Metonic cycle,... 19 years, that’s the phase of the Moon,... plus 80 days gets me to the Equinox,... not a leap year, but last year was, plus 1,... day of the week, divide by 7, take the remainder,... carry the 1,... add 10 just for good measure,... no, no, wait,... subtract the 10,... and get +16, add it to April 0th (March 31st); =April 16th. The first Sunday after the first Full Moon after the Spring Equinox; That’s Easter! It’s also the third Sunday of the Month, the usual day of the A2Z+ class at the Observatory. Easter trumps A2Z+; so no A2Z+ class this month. The topic would have been something about the date of Easter and predicting the date given nothing but the year in question.

It’s also been 55 weeks since last Easter; can’t be any more than that, ever. Occasionally there can be 54 weeks separating Easters, but not very often, about 4% of the time. Cannot be 53 weeks or 52 weeks separating Easters, either. Ever! Fifty and fifty-one week separations are the most common and never less than 50. Any way one does the calculation, the A2Z+ Astronomy class in April of 2017 lands on the date of Easter. It’s in the cards, I suppose (substitute numbers for cards). See you next month.

The A2Z+ Astronomy class is usually held on the third Sunday of the month at 7:00 P.M in the West Wing of the Herget Building and is free to any member of the Observatory.

Amazon “Smiles” On the Observatory

Lifelong Learning

Tour of the Universe
Mon. April 3rd 8pm

Astrophysics for the Layperson
Wed. April 19th 8pm

Behind the Scenes
Mon. April 24th 8pm

Constellations of the Season
Wed. April 26th 8pm

Binocular Astronomy
Tues. May 16th 8pm

$29 per person. Sign up online.
Welcome New & Renewing Members

Lina Alkamhawi  
Chris Anderson and Mary  
Ellen Finnegan  
Korash Assani  
Sarah Boyer  
Rhoda and John Brooks  
Terry Burns  
James Collins  
Jason Currie and Michelle Kilcoyne  
Anna Deutsch  
Jean Durbin  
Bert & Cheryl Durie  
Larry Gache  
Camille Grizovic  
Donna Wirth and Bob Groszer  
Aaron Herold  
Reda and Jeff Hutton  
Albert Jacobs  
Andrew Jones  
Colleen and Joseph Kaczvinsky  
Kelly Dobos  
Donna and Scott Kimmey  
Erik King  
Joseph and Mary Ann Koehling  
Ashley Koger  
Evelyn Laux  
Sophia McAllister  
Seth and Kristin Medlin  
Ken and Carrie Miller  
Leila Morgan  
Tom Morrison  
Nicole Naporano  
Mike and Cindy Nease  
Philip Nebel and Pamela Nebel-Logsdon  
Aaron Nies  
Michele and Trenton Pettiford  
Dallas Phillips  
Benjamin Price  
Ron and Marilyn Rice  
Charles Sherman  
Jim Sweeney

Chris and Jane Vandegrift  
Kent Wellington  
Murray and Ian Wilson  
Margaret Wolfe

Thanks to all our terrific members, donors and volunteers!

Benefits for New Members

With your membership, you become a Friend of the Observatory (FOTO) and join our family of amateur astronomers, history buffs, donors and volunteers.

FOTO meets on the Second Monday of the month at 7:30 pm at the Observatory. All members and their guests are welcome to attend.

Your benefits include:

- Discounted or free admission to Friends of the Observatory (FOTO) programs
- Member’s only classes and programs
- Loaner telescopes
- Free admission to Astronomy Thu/Fri/Sat.
- Discounts in the Gift Shop
- Free admission to the historic landmark buildings and permanent collections
- One-year subscription to monthly FOTO e-newsletter & use of FOTO library
- Members-Only Facebook Page

For more information, call the Observatory at 513-321-5186.

Craig’s Corner

By Craig Niemi, Executive Director

"The Spy Glass out on the hill Is now entirely finished; 
The distance twixt us and the moon Is sensibly diminished. 
When Mitchel looks, it comes so near He sees the hill and trees 
Which most conclusively doth prove That 'tis not made of cheese."

1845 Cincinnati Enquirer, poet unknown.

First Light is a significant event for astronomers, being the first time they view through their new telescope. For our founder, Ormsby MacKnight Mitchel, that was 172 years ago on April 14, 1845.

Thanks to the continuing efforts of astronomers, historians, science educators, preservationists, and our terrific volunteers, every year tens of thousands of Observatory visitors get to experience their own first light through the same instrument.

We hope you can join us on Friday April 14th for the Observatory’s First Light celebration.

172 years is quite a milestone, but coming up fast is our 175th First Light and 2019 is the 20th anniversary of the non-profit Cincinnati Observatory Center.

Time to start planning how we’re going to celebrate all our successes!
Highlights of the FOTO Meeting of March 13, 2017

By Michelle Gainey

We are looking for volunteers to represent the Observatory at the Kids Outdoor Expo on Friday, July 14 at Winton Woods.

This is a fun event with thousands of children and their families attending: a good chance to spread the word about the Observatory! We will have solar telescopes, a Planet Walk, and some fascinating displays to catch the interest of participants. Please contact Val Niemi if you can help for part or all of the day.

Tom East and the Eclipse Committee are working on arrangement for FOTO members to see the total solar eclipse on August 21, 2017. You will NOT be able to see the total eclipse from Cincinnati, but the eclipse line is within driving distance. Now is the time to make plans for this unique event. See Tom’s announcement in this newsletter for more information.

Our presentation was a History Channel program, “It Fell From Space”; all about meteorites and space junk falling to Earth and the kind of damage this can cause.

August 21 Solar Eclipse Planning

The Cincinnati Observatory Center, Friends of the Observatory, and the Cincinnati Astronomical Society are making plans to travel to the centerline to observe the Total Solar Eclipse. If you are interested in making this trip, now is the time to contact the Cincinnati Observatory to add your name to the list.

At this stage, we are searching out observing sites and lodging near the centerline path in the Illinois, Kentucky, and Tennessee area. This is the closest the path will pass to the Cincinnati area.

From these states, the eclipse will happen during the mid-day hours. Lodging is being considered for Sunday night.

A questionnaire is available from the Cincinnati Observatory Center to gather information on what you would like to do. Please complete this survey promptly and return it to the Observatory.

This is your chance to travel along with your friends to see Natures Greatest Event!

For more information, contact Tom East, Eclipse Chairperson, at animastra@gmail

Topics with Dean Regas

The Inner Planets
Tuesday Apr. 11th 8pm

The Outer Planets
Tuesday May 23rd 8pm

These fun and laid-back single topic classes for beginners focus on a variety of topics and will surely keep you looking up! $15 per person $12 for members. Sign Up Online or call 513-321-5186.

The Observatory by Day

The Observatory is open Noon to 4 pm Monday through Friday! Stop by for a tour!
Observing the Total Phase of the August 21st Solar Eclipse

Last month I discussed what to look for while observing the partial phases of the eclipse from Cincinnati. I included a graphic that shows almost 91% of the Sun being covered by the Moon. If you travel to the path of totality, there is much more to observe. This is where I will start with this column. But first, we need to understand a few terms.

Key Terms

C1 – First Contact. The partial eclipse begins. You will see a tiny notch taken out of the Sun in the upper right side. Use solar filters.

C2 – Second Contact. The start of the total eclipse begins as the Moon covers the last bit of the Sun. Baily’s Beads and the Diamond Ring are finished. No solar filters are needed.

C3 – Third Contact. This starts with the second Diamond Ring and the first bright glints of sunlight. Use solar filters.

C4 – Fourth Contact. The partial eclipse ends with the last little bite of the moon on the Sun. Use solar filters.

Limb – The edge or profile of the Moon seen when the moon is in front of the sun. It may appear rough and rugged in places through a telescope. It can be seen in the partial phases with a telescope and solar filter and at totality with an unfiltered telescope.

Corona – The white atmosphere of the Sun. It can extend 2 or more moon diameters around the Sun. It is made from hot gases and shaped by magnetic fields. It is only seen during the total phase of the eclipse and without a solar filter.

Chromosphere – The pink or red hydrogen line seen just after C2 and just before C3. The inner most part of the Corona. It is seen without a solar filter and signals the end of totality.

Prominences – The red or pink “flames” of hydrogen plasma seen around the edge of the blackened Sun. They can be seen without a solar filter during totality; or during the partial phases with an H-alpha filtered telescope.

Baily’s beads – a string of bright glints of sunlight that shine at the end of the partial eclipse. They quickly go from looking like a string of pearls to just one glint, the Diamond Ring. They are photographed without a solar filter, but do not look at them with optical equipment as they will cause eye damage.

Diamond ring – The last glint of the sun’s light shining through a low point on the moon’s limb. The faint corona creates the ring’s band. It is photographed without a solar filter but do not look at it with optical equipment as it will cause eye damage.

Shadow bands – This is a very hard phenomena to see just as totality begins or ends. It is a diffraction effect caused by turbulence in our atmosphere and the sun’s light reduced to a slit. It is best seen by watching the ground with your back to the sun and looking for faint waves. They are low in contrast, light with shadows that look like smoke, clouds, or reflected pool waves. They will be coming from the northwest. They are best seen on white surfaces and best observed with video cameras. Shadow bands only last for 10 seconds or less. They are not always seen at a total eclipse.

Totality Countdown.

This is a countdown somewhat like a rocket launch countdown. It is a check list of events that will happen and approximately when they will happen. Let’s pick up the countdown at 15 minutes before C2

The sky is now beginning to look different than a normal day. All the shadows of your equipment are becoming very sharp on the ground. The sky is an unusual shade of blue. It is as if the Sun were somehow more distant from the Earth. The Sun will still look bright but the horizon and objects in the shade of trees will be dark. It is somewhat like twilight, but different. The temperature will begin to fall. Pay attention to the sounds around you. Take your sunglasses off and enjoy the
10 minutes before C2
Watch the western sky for signs of the approaching Moon's shadow. You may see something like an approaching thunderstorm on the horizon. To the right of the Sun (west) about 33 degrees away will be Venus. If you are taking pictures, be kind to others around you and please turn the flash off. Plan to go into the total phase with fresh batteries and memory cards. Review your notes on what you want to observe.

5 minutes before C2
You may start to see the sky producing a sunset coloration all around the horizon as the Moon’s shadow advances toward you. Record your thoughts and what you see on your phone voice recorder. Take pictures of everything you see.

2 to 1 minute before C2
Pay attention to the ground or sides of buildings for the shadow bands. They won't last but 10 to 15 seconds.

30 seconds before C2
This is the time when everything happens very quickly. Look at the sky all around you and record what you see on your voice recorder or phone. Keep talking and describing what you see and feel. Look at the ground to see shadow bands. Keep your filters on any optical equipment you are looking through. If you are tracking the sun with a telescope prepare to remove the filters, but don't look through the telescope. Take pictures in rapid succession.

20 seconds before C2
Remove the filters from telescopes or camera lens and start a rapid sequence of exposures. This is when you will get pictures of Baily's Beads and the Diamond Ring phase of the eclipse. Do not look through optical equipment or cameras at this time. Use cameras with “live view” to watch for the diamond ring. If you leave the solar filters on at this time, you will not get an image of the diamond ring, but just a very thin sliver of the partially eclipsed Sun.

10 seconds before C2
Keep your solar filters on any optical equipment for visual use until you see the “black hole” where the Sun was with your unaided eye. If you are using eclipse glasses, now is the time to lower the glasses and watch the Moon’s shadow overtake you. Looking at the eclipsed sun will now show you the famous Diamond Ring. If you are shooting through a telescope, take shots as fast as possible to get the diamond ring to total sequence. Strange landscape daylight transforms into a deep twilight with planets and bright stars shining.

C2 Totality begins
Now observe the Sun without the solar filters and remove your eclipse glasses and observe everything around you. The landscape is now about as bright as a full moon. Regulas, a bright star will be just 1 degree to the left of the Sun. Note the shape of the white corona. Are there any red prominences? Can you see Mars 8 degrees to the right of the Sun? How about Mercury 10 degrees to the lower left of the Sun? How about Jupiter way off in the east? Notice how the horizon looks like sunset all around you. Look at the eclipse with binoculars or a telescope without the filter. Remember to record your voice. Take pictures if your phone or camera will do so in low light conditions without the flash.

C3 Totality ends
When the Sun begins to show a red ring around it and brighter light on the right side, totality will be over in just a few seconds. Look away from the unfiltered optics and watch for the Diamond Ring without optical aid. Once the Diamond Ring appears, the solar filters must be on for the remainder of the eclipse. The sky is brightening quickly and the stars and planets are fading fast.

10 seconds after C3
All filters should be on your optical equipment and cameras. Look to the east and watch the Moon's shadow race away from you. Shadow bands may be visible for a few short seconds. If there were clouds in the sky at totality, they now are almost instantly changing from dark to white again. The eclipse is now playing out in reverse order to what it did at the start of the eclipse.

(Continued on next page)
You have been reading an overview of what to expect if you travel to the path of totality. It will be an exciting and very short lived experience.

I strongly encourage you to make notes or a time line of the events so you will know when to look for certain things. More detailed information like this can be read from the excellent e-book by Alan Dyer titled *How To Photograph The Solar Eclipse A Guide To Capturing the 2017 Total Eclipse of the Sun*.

If this is your first total eclipse, don’t try to photograph more that you can handle. Give yourself the luxury of just looking at it. Then after the eclipse, pick up a copy of Sky & Telescope or Astronomy magazine and look at those shots. You’ll have the best of both worlds: your memories of the eclipse and the photos to remind you of what you saw.

Next month I will talk about camera settings and exposures for partial and total eclipses.

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**Where to View the August, 2017 Total Solar Eclipse**

As the Great American Eclipse draws nearer, many people have asked where they should go to see it. The FOTO Eclipse Committee would like to share with you some opportunities you may want to consider.

First, The Evansville Museum, in Evansville, IN, has put together a program of events including a bus trip from the museum, to Hopkinsville, KY and back, to see the eclipse. For more information about this and other events the museum has planned, use the following web link: https://evansvillemuseum.org/events/2017-solar-eclipse-evansville/

Another opportunity being actively pursued by FOTO members and others, is to reserve lots offered by the City of Dawson Springs, KY, for overnight camping, either by tent or RV. They also offer day visitor opportunities for those who do not want, or are not able, to camp overnight. The lots must be reserved, and paid for, in advance and no refunds will be available. By splitting the lot rental cost among those interested, the cost per person can be reduced to approximately $50 for two nights of camping, which is the minimum rental requirement. If you are interested in this opportunity, now is the time to let the Eclipse Committee know. For more details, email Tom East at animastra@gmail.com.

If you have another location you’d like to check out, there is an excellent web site you can use for any site from Oregon to South Carolina. This web site provides eclipse start and stop times and durations, along with many other details for any point along the umbral path: http://xjubier.free.fr/en/site_pages/solar_eclipses/TSE_2017_GoogleMapFull.html

Lastly, the Eclipse Committee will have several meetings to help people prepare for, and enjoy, the eclipse. Stay tuned for more details.

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**Stargazing at Stonelick**

Saturdays – April 1, 22 & 29th

Best seen under the dark skies at Stonelick!

Need help with your telescope? Get expert tips setting it up and exploring the night sky. Stargazing begins at dusk. Open to all ages. Stargazes are weather permitting.

“Like” Stonelick Stargazers for weather and holiday schedule updates.

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**Did You Know…**

Saturn’s moon Enceladus boasts an icy, ostensibly barren landscape riddled with deep canyons, dubbed “tiger stripes.” Underneath its icy exterior churns a global ocean, heated in part by tidal forces from Saturn and another moon, Dione, with seafloor vents expelling water at least 194 degrees Fahrenheit.
April FOTO Meeting

Planet Formation within Multi-Star Systems: From Conception to Ejection

By Tom East

Please join us on Monday, April 10, 2017 at 7:30 PM for a presentation by Kevin Wagner on some of the latest research on exoplanets and their formation. Kevin is a Cincinnati native who is now a Ph.D. student and NSF Graduate Research Fellow at the University of Arizona.

After volunteering at COC and graduating from UC in 2015, Kevin moved to Arizona to continue his academic and scientific career. He is part of NASA’s Earths in Other Solar Systems (EOS) project, whose primary goal is to establish the frequency of Earth-like planets around nearby stars for future astrobiology missions. In Kevin’s own words: “Two decades of exoplanet science have revealed that planets are just as numerous as stars in the galaxy. Most stars have multiple planets, and some planets even have multiple stars. The observed planet population carries an important message of how planets form and what types of planetary systems exist for future exploration. I will present results from our adaptive optics imaging campaign using the Very Large Telescope in Chile. These observations include hundreds of stars at various stages of their early evolution and highlight the physics of the planet formation process within multi-star systems.”

Blue Dress Shirts

By Frank Huss

A dark blue dress shirt, pictured above, is available to FOTO members at a cost of $30.00. This shirt is a little more formal than the denim shirt. You can order yours by contacting Craig at the observatory. Orders will be taken until after the FOTO meeting on April 10.

Tour the Observatory

April 9 & 23rd
Drop in between 1-4pm

Stop by for the whole story or just the highlights. It’s all fascinating and connects our past with your future. Free for members. Group tours by appointment.

Did You Know....

A large body in the Kuiper Belt called Makemake has a surface like a chemical factory. It slowly changes slabs of methane ice into a stew of exotic ices, some of which had never been seen anywhere outside labs on Earth.
Connect with Your Observatory

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