

Newsletter of  
The Black River Astronomical Society

# Guidescope

Lorain County, Ohio

Website: [blackriverastro.org](http://blackriverastro.org)

September 2016

Newsletter submissions: [Editor](#)

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- Saturday, September 3, BRAS OTAA: Solar 3 p.m., doors open 5 p.m.
  - Wednesday, September 7, 7 p.m.: Regular Meeting, Carlisle Visitors Center. Program: Dave Lengyel on transit of Mercury
  - Friday, September 9, 9-11 p.m.: Public observing, Neilsen Observatory (cloud backup date September 10)
  - Saturday, September 10, 10 a.m.-4 p.m.: Adventure Fest Solar Observing, Mill Hollow Reservation
  - Sunday, September 11, noon-4 p.m., Sidewalk Astronomy Solar Observing, Tappan Square, Oberlin
  - Thursday, September 15, 7 p.m.: Board Meeting, Blue Sky Restaurant, Amherst
  - Friday, September 16, 5-7 p.m.: Wellington Farmers Market, Solar Observing, Wellington Square
  - Friday, September 23, 9-11 p.m.: Public observing, Nielsen Observatory (cloud backup date Saturday, September 24)
  - Saturday, September 24, RESCHEDULED CAA OTAA, 3 p.m. - ?, Letha House (note: Spencer Lake Road closed—take Garver Road to Richman Road south to Letha House)
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## **Visit Our Website**

Explore the informative BRAS [website](#) and all its interesting, timely [links](#), and join the interactive members-only [BRAS Forum](#) to better keep in touch.

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## **BRAS IS HAVING A PARTY AND YOU'RE INVITED!**

The BRAS is a member of an organization called the OTAA, or the Ohio Turnpike Amateur Astronomers. As the name implies, this is a loose organization of clubs that are located somewhat near the Turnpike and occasionally share information and network to benefit all area astronomers. The OTAA was started by several people including one of our founding members George Diedrich. One of the best parts of the OTAA is that each club puts on a convention every year, to which the other clubs are invited. Our OTAA Convention is Saturday September 3<sup>rd</sup>, and we hope you will attend!

We have our convention at the Birmingham United Methodist Church hall on South Street in Birmingham, Ohio. A map is available on our website, [blackriverastro.org](http://blackriverastro.org). Click on the “Calendar” tab, then click on the event. Then click on “map” when the event listing opens up. (Coming from the east of Birmingham, take 113 across the Vermilion River, turn left at the first street past the bridge, go past the entrance to Schoepfle Gardens and take Market Street—which changes to South Street—heading west until you reach the church driveway where you take another left.)

We will start doing solar observing at 3:00 p.m. for anyone interested. Actual registration starts at 5:00 p.m. with a pot luck dinner at 6:00. The club provides hot dogs, buns, condiments, paper plates, napkins and plastic forks, spoons and knives. We will also provide coffee, tea, hot chocolate and water. Please bring a dish to pass. Everyone who registers will get a ticket to be used in the door prize drawing that follows dinner. There are also some high priced items that will be available as door prizes for which extra tickets can be purchased. The hall is air conditioned and has restrooms. Behind the hall is a large open field where telescopes will be set up. If the weather cooperates, people from four or five other astronomy clubs will attend and will set up scopes. This is a great opportunity to travel through the field and look through many different types of

telescopes at many different objects. Please note that the convention is rain or shine. If the weather is poor, we still have dinner, distribute many door prizes and we will also have a couple of talks for people to enjoy. This site is surprisingly dark and if the weather is clear we have permission to stay as late as we wish. Often, people attending will bring objects that they wish to sell, and we provide tables for free for them to do so. We also sometimes have vendors attend with eyepieces, binoculars etc. for sale. Registration is \$5.00 which we charge in order to pay for the hall.

This is a fun event. If you are new to astronomy and want to see different types of telescopes, astronomers are a friendly bunch. Simply ask why they like their particular telescope, and they will be glad to discuss it with you. If you are a long time member, it is a chance to observe and to network with old friends from other clubs. The food is good (and free!) and the company is excellent. We really hope as many BRAS members as possible will join us! Please note that this year we have our convention over Labor Day Weekend. We haven't done this for many years, but we felt that the 3<sup>rd</sup> was the best date given the Moon phase and a date that did not conflict with other clubs' events. We hope the long weekend means that it is easier for our members to attend. See you there!

~Steve Schauer

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## **BOARD SUMMARY      August 4, 2016**

The meeting was called to order at 7:05 p.m. with 9 Directors present. The minutes were distributed by Secretary Bill Ruth and were read and approved. In the absence of the Treasurer, Schauer read the treasurer's report.

Next came committee reports, with the Guidescope editor reporting that all was status quo as was the website. There was nothing new under Instrumentation, with all equipment working well except for the digital setting circles on the black C-14 Losmandy mount. Under OTAA, Schauer reported that the MVAS OTAA convention was August 6<sup>th</sup>, our OTAA will be Saturday Sept.3<sup>rd</sup>, and the rescheduled CAA OTAA will be September 24<sup>th</sup>. Members are encouraged to attend. The MetroParks liaison had no report.

Programming is as follows:

September      Dave Lengyel      Member photos of the Transit of Mercury

October	Lee Lumpkin	Elections, program on using the BRAS website, Forum, Photo Gallery and TNS.
November	OPEN	Anyone interested in giving a short program?
December	Christmas Party and Pot Luck at at the MetroParks Amherst Beaver Creek Reservation	

Old Business came next. The first item was an offer by BRAS member Ray Sajka to set up a private tour of the NASA Plum Brook facility in Sandusky for us. The Board suggested the following dates: October 11,12,17,18,19 and will communicate these to Ray to see which might work best on his end. These dates are all weekdays as there is little activity there on weekends. More to follow on this!

The second item of Old Business was planning for the BRAS OTAA convention. Various duties were assigned with Vice President Greg Zmina providing water and ice, Mickey Hasbrook purchasing hot dogs, buns and condiments, and Treasurer Dan Walker providing the cash box, tickets and change. John Reising will be the door prize Master of Ceremonies, and Dave Lengyel will bring charcoal. Lee Lumpkin will bring his laptop and will do a reprise of his "How to use Stellarium" program if the weather is poor for viewing. Schauer will get the key and will bring the club projector.

The final item was a brief discussion of next year's World Wide Solstice Festival. Schauer asked for volunteers to be on a planning committee and Micky Hasbrook was kind enough to volunteer.

Next came New Business. The first item was the Lorain County Metro Parks Adventure Fest, to which we have been invited. This event is on Saturday September 10<sup>th</sup> and runs from 10:00 a.m. to 3:00 p.m. at the Mill Hollow Reservation. We will do solar viewing, and will hand out club materials, sell solar glasses and try to recruit new members. We will need help, so anyone who would like to help staff the booth or anyone with a solar filter equipped telescope is invited to join us. Adventure Fest is a large event where organizations that do outdoor activities such as fishing, canoeing etc. are invited to demonstrate what they do.

The second item of New Business was an invitation to attend the Wellington Farm Market on Friday evening September 16<sup>th</sup> from 5:00-7:00 p.m. This is a nice Farmers Market where we will do solar viewing and pass out club materials. It is held on the square in Wellington, and club members are invited to help out or to just attend.

The last item of New Business was a report from Greg Cox on a product called First Contact that he saw advertised at NEAF. First Contact is a film that one applies to a telescope mirror and then peels off in order to clean it. Greg has brochures and small samples for anyone interested.

Dates were set, and the meeting was adjourned at 8:32 p.m.

~Steve Schauer

**Has anyone ever removed a Meade LX series telescope from its fork mount?** I bought the mount with its electronics fried, so damaging it in the process of scope removal is no concern. Email me (Denny Bodzash) if this is something you've done this before. [dabodzash@gmail.com](mailto:dabodzash@gmail.com)

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## **Top Ten Mysteries of Astronomical Proportions**

### **10. Closer than Mercury?**

In 1781, William Herschel discovered Uranus, 7<sup>th</sup> planet from the Sun. In the years following discovery, it was noted that the predicted and observed motions of Uranus did not match, directly implying a more distant, 8<sup>th</sup> planet. In 1846, French mathematician Urban LeVarrier hypothesized where this hypothetical 8<sup>th</sup> planet could be found. Within the year, Johann Galle discovered Neptune, 8<sup>th</sup> planet from the Sun, thus beginning the marriage of astronomy and theoretical mathematics. In the following years, it was noticed that Mercury, too, exhibited orbital eccentricities that indicated that there was a planet between the Sun and Mercury. Again entering the fray again in 1859, LeVarrier predicted where a planet closer to the Sun than Mercury, which he preemptively named Vulcan, could be found. Again, within the year, the hypothetical planet was discovered but, over the course of the years, a problem emerged: there was no pattern to sightings of planet Vulcan, which soon became a cosmic phantom, appearing and disappearing at will. Over the next 50 years after its discovery in 1859, many astronomers claimed to see Vulcan, but no pattern of appearance presented itself. By the dawn of the 1920s, Einstein's General Relativity explained Mercury's erratic orbit and the need for a planet closer to the Sun than Mercury to explain the first planet's orbit disappeared forever.

### **9. The Day the Sun Fell to Earth**

June 30, 1908 dawned like any other day in the Tunguska region of Siberia. That was until an object described as being as bright as the Sun fell to the Earth and exploded. The explosion was so powerful that a shockwave circled the Earth 3 times and the resultant dust (and light it reflected) from the explosion allowed people as far away as London to read newspapers at night. However, thanks to political events, namely WWI and the Russian Civil War resulted in no scientific expedition traveling to Tunguska until 1929 when Leonid Kulik became the first man to make the trip. What Kulik found was astounding: over 1,000 square miles of flattened trees in a curious butterfly pattern, save the epicenter, where the trees, stripped of their branches, still stood upright. Hypothesizing a meteor impact (then a revolutionary idea), Kulik searched in vain for a meteor, never finding one. Fast forward to the 1960s, the mechanism of the unusual pattern of flattened trees was finally explained, an aerial

explosion. The reason for the revelation? Nuclear bomb tests. Type of explosion known, the cause remains a mystery thanks to the fact that the heavy metals associated with an asteroid impact (specifically Iridium) have not been found in the area. Comets? Current theory does not give them the tendency to explode in mid air. What caused the explosion? No one knows, but late night talk radio has plenty of ideas . . .

## **8. “Wow”**

The search for extraterrestrial life has been ongoing for over 50 years. In all of that time, no conclusive evidence for an alien civilization has ever been found, though there have been some curious findings, the most notable of which was in 1977 and intercepted at the Big Ear radio telescope in Dublin, Ohio, operated by Ohio State University. The date was August 15 and Jerry R. Ehman, the man at the printout machine that day, now famously scribbled a “wow!” next to the reading for an abnormally long signal (72 seconds) that also rose and fell during its duration. If that weren't enough, the signal was broadcast at 1420MHz, which is a “forbidden spectrum” reserved for research purposes. The problem: try as they may, the radio astronomers could not recapture the signal, which suggested that the signal may have been some weird natural occurrence or even some deliberate Earthly mischief on the part of radio operators. Still, nearly 40 years later, the origin of the “wow!” signal remains a mystery.

## **7. A Sign from Heaven?**

The story of the Star of Bethlehem is known t he world over, but what was the Star? There are two current schools of thought to determining the identity of the Star: astronomical and astrological. Taking place around the year 0, the Star is not lost in the mist of time and historic records are plentiful. Problem: no unusual astronomical events stand out, which leads to the other interpretation: astrology. Looking at the wording in Matthew is crucial. Maji is a word referring to Zoroastrian priests from Persia, who were well known for their skills in astrology. Looking at astrology, an event fitting the bill by describing the birth of a future king of the Jews and took place in 6 B.C., when the planet Jupiter (associated with kingship) entered the constellation of Aries the ram (associated with Israel) just ahead of the rising Sun (when constellations are at their post powerful). Perhaps the most telling evidence for the Star being a planet? In Matthew, the Star was described as going before the Maji until it stopped where the infant Christ was. For anyone familiar with the night sky, this can mean only one thing: the Star was a planet as stars don't move relative to each other, but planets undergo retrograde motion. Was the Star in fact the planet Jupiter? There's no way to know, but the above theory I the best one going.

## **6. Death Star?**

It's not in dispute that death can come from the sky, the dinosaurs would tell you that if they were alive to talk about when a massive asteroid hit the Earth 65 million years ago. In geologic terms, 65 million years is not that distant, but when traveling farther back into time, causes of mass extinctions can be much harder to pinpoint. Roughly 440 million years ago, at a time when all life was in the water, roughly 70% of all species went extinct from what has been blamed on a combination of a drop in sea levels and a global cooling. So far, impact and volcanism appear unlikely, leaving an unusual suspect: a real death star, known as a gamma ray burst (GRB). What is a GRB? It is among the most powerful explosions in the cosmos, unleashing in just a few seconds more energy than the Sun will release in a 10 billion year stellar lifetime. If one of these beams were to hit Earth, it could destroy the ozone layer, create a layer of smog, dramatically cool the planet and cause the oceans to freeze (and sea level to drop) all while bombarding the planet with gamma rays. If such an event were to take place, deep-water-dwelling organisms and those that burrow into mud at the bottom of the ocean would be expected to have the best odds for survival. Coincidentally, all subsequent life evolved from deep-water and/or burrowing organisms. Proof-positive? Certainly not, but the circumstantial evidence is compelling.

## **5. Where Did We Come From?**

How did it all start? The question of where everything came from is one of the most hotly-debated in science and a common battleground in the debate of science vs. religion. As of now, science can explain the entire evolution of the universe down to the instant after creation. Unfortunately, the mechanisms behind the act of creation itself remain unknown, leaving open the door to debate that God/the gods did it. However, there are scientific ideas, the most probable of which involves quantum mechanics, the study of subatomic particles. To start with, in quantum theory, there is no such thing as absolute zero, only quantum zero, which is not zero at all as quantum theory holds that there can be tiny variations from zero of energy in any given quantum system. These variations create in the system instability, which will create a greater variation from zero. Current theory holds that it was a runaway quantum energy fluctuation that eventually became so large that it exploded in the Big Bang, creating the universe and all contained therein. Think that is weird? Well, just wait until you reach #2 on this list!

## **4. More Than Meets the Atmosphere?**

Can solar weather influence weather on Earth? That is a long-debated scientific topic that found its roots in the advent of solar astronomy. When Galileo first turned his telescope on the Sun in the early 1610s, Europe (where records are most complete) was mired in a centuries-long cool-down that began suddenly in the first half of the 1300s. Proof? England had a booming wine industry (which collapsed) in the 1200s, there were widely-reported crop

failures from cold, and the Vikings had to abandon their 200-year old colony in Greenland because it became too cold to farm, as it remains to this day. In London, the Thames would commonly freeze solid in winter. After the Maunder minimum ended, sunspot activity also peaked up, leading some to believe that the lack of solar activity was directly responsible for Earth's sudden cooling. With the discovery of the 11-year solar cycle, grand predictions about climate based on sunspot activity were made only to fail spectacularly in a few years' time, leading many scientists to discount the Sun-Earth weather connection. In the 1970s, Jack Eddy, who was ironically attempting to prove the Sun's stability, inadvertently discovered links between temperature trends, carbon levels, and sunspot activity all overlapped. Eddy's work was persuasive enough to spur further research, which has been contradictory. Unfortunately, with the scientific and political focus being on man-made global warming, it is unlikely that Sun-Earth weather connections will be getting any attention anytime soon.

### **3. Is Anyone Out There?**

As vast as the cosmos is (the Milky Way alone contains up to 400 billion stars and there could be as many as 200 billion galaxies in the entire universe), shouldn't there be life out there somewhere? That's the question at the forefront for people involved in the Search for Extraterrestrial Intelligence (SETI) projects. So far, the search has come up empty. In 1960, SETI pioneer Frank Drake came up with his famous thought experiment, the Drake Equation, which contains a set of variables that, when multiplied together, give a hypothetical answer to how many technical civilizations exist in the Milky Way Galaxy. The first four variables (number of stars in the galaxy, fraction of stars with planets, number of planets per system suitable for life, fraction of planets on which life has evolved) are relatively certain. The later variables (fraction of life that develops intelligence, fraction of intelligent life that develops technology, and fraction of a planet's lifetime inhabited by a technical civilization) are much more subject to opinion and can greatly skew the final result. There are a few trains of ideas among scientists when pondering other technical civilizations, namely that technical civilizations quickly self-destruct, that we are the first, that no civilization has gotten our signals yet (we've only been transmitting just over 100 years and the Milky Way is 100,000 light years across), or that such civilizations communicate in a way we have yet to understand. And there's also a philosophical question: does a civilization need to have wireless radio technology to be considered intelligent? No one could argue that we were stupid until the advent of wireless radio. That considered, there may be many intelligent civilizations just on the cusp of being able to talk to us, perhaps just next door in astronomical terms. For all of this, only one thing is certain: so far, our search has come up empty.



## 2. The Nature of Reality

Before Einstein, it was assumed that the universe had always existed as it is now. After Einstein, a wide range of theories appeared suggesting multiple universes or even the idea that the whole universe as we perceive it is nothing more than some far more advanced civilization's computer simulation. The idea of multiple universes first appeared in Hugh Everett's 1957 doctoral dissertation, in which he called the idea the "universal wavefunction." Widely panned at the time, the idea faded into the background for two decades until Bryce Dewitt coined the much more accessible term "multiple universes." Since then, such theories have run rampant, with these being the most common:

*Inflationary Multiverse*, which states that the energy reservoir created by gravitational fields created by the Big Bang can set off an infinite series of Big Bangs, each of which creates another universe. This theory is theoretically testable by looking for disruptions in the cosmic background radiation, none of which have been found.

*Quilt Multiverse*, which, in a variation of the immortal monkey at a typewriter eventually tapping out verbatim a work of Shakespeare, holds that the universe is infinite and, since there's only so many ways to arrange atoms, everything must eventually repeat. To test, scientists can look for the opposite: a finite universe, which would be evidenced by distant galaxies showing up multiple times in different places in deep sky (as in Hubble Deep Field deep) photos. So far, no galactic doubles have been discovered.

The *Membrane Multiverse*, which states that universes may exist in layers like slices in a loaf of bread separated by some as-yet undefined membrane. In theory, the Large Hadron Collider could best by blasting subatomic particles into each other and then looking for a net drop in energy (Einstein states that energy cannot be destroyed), which could indicate that subatomic debris could have escaped our universe and into another.

The *Quantum Multiverse*, perhaps more metaphysical than scientific, the Quantum Multiverse states that there is no way to measure something before it happens, meaning that every action in this universe creates another universe as a divergent train of events in another. Implication: in another universe, I chose not to do something as menial as write this and the world-shaping event of your choice did not happen. Obviously, there is no way to test this theory.

If all of this wasn't weird enough, in 2003, Nick Bostrom of Oxford postulated that we are not living in reality, but rather *some far more advanced civilization's computer simulation*. Perhaps the only than this idea is that there are a pair of ways to scientifically test it. Way 1: since all computer simulations work on a lattice model, look for traces of this lattice in gravitational fields. Way 2: since software is prone to glitches, look for these hypothetical errors that could

take the form of disruptions in the laws of physics. So far, neither of these signs has materialized.

## **1. Where Are We Going?**

If creation was the greatest mystery of the past, the fate of the universe is undoubtedly the greatest mystery of the future. So far, the answer is shrouded in darkness, as in dark matter and dark energy. What are these things? Physics allows scientists to predict the amount of matter in the observable universe. Unfortunately, observations always fall far short of observed matter. This unseen matter is thus referred to as dark matter. As for dark energy, the universal expansion is not slowing down or even staying the same, but accelerating by an as-yet unseen mechanism, which has been dubbed dark energy. In the end, the crux of the problem is whether the universe is open, balanced, or closed, which is a fancy way of relating the expansive force of the Big Bang to the contracting force of gravity created by the mass of everything in the universe. Basically, the 3 fates are these:

*The Big Rip.* The universe is open, the expansion overwhelms the gravity and expansion continues to accelerate until, at the last moment of the universe, the very atoms of everything contained therein are ripped to shreds.

*The Big Freeze.* The universe is balanced, expansion eventually stops and, as generations of stars are born and die, the light gases essential for stellar formation run out. The last stars eventually burn out and the universe goes cold and dark.

*The Big Crunch.* The universe is closed, gravity overcomes expansion and the universe contracts until it reaches a singularity much like at the Big Bang, at which point all matter is destroyed.

So far, current models tend to point away from the Big Crunch but, as instruments become more precise and the data more accurate, opinions, and models, may change.

If you want the full-length version, go here:

<http://bodzashphotoastro.blogspot.com/2016/08/top-10-unsolved-mysteries-of.html>

~Denny Bodzash