



# The Observer

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**Schedule of public programs on last page!**

## Happy 400<sup>th</sup> Birthday, Modern World!

So, Kentuckiana, how does it feel to travel faster than a speeding bullet? Yes, as you sit reading this, the rotating Earth is carrying you along at about 850 mph, which is quicker than some bullets. We can thank Galileo Galilei for this common-sense-shredding piece of knowledge; four hundred years ago this month, in March of 1610, Galileo published his *Starry Messenger*, the most influential book ever written this side of the Bible. In fact, the date on Galileo's note dedicating the book to a member of the powerful Italian Medici family is March 12, 1610 – precisely four hundred years ago today. That is why we have this special edition of the *Observer*. While we are at it, we can thank Galileo for our modern world, as well.

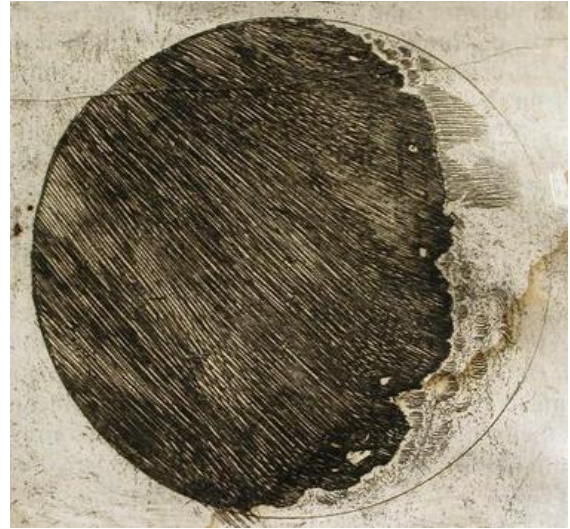
In the *Messenger* Galileo announced the astronomical discoveries he had made thanks to that brand-new piece of cutting-edge 17<sup>th</sup> century technology, the telescope: the moon had mountains and plains, Jupiter had moons of its own circling around it, and there were far more stars in the sky than what the eye alone could see. These discoveries pulled the rug



[www.jefferson.kctcs.edu/observatory](http://www.jefferson.kctcs.edu/observatory)

out from under the established ideas of the time – the ideas of Aristotle.

Aristotle lived about two thousand years before Galileo; his ideas had been around a long time. They had been adopted by the ancient Greco-Roman civilization, then by the early medieval Islamic civilization, and finally by the later medieval European civilization. For Aristotle, the heavenly lights, which (sure as the sun will rise tomorrow) never burn out, had to be made of a special substance not found on this Earth (where the only sure thing is change). Aristotle knew that he could sit still, and he could see the Sun rise in the East and set in the West: clearly the Sun revolves around Earth. (By the way, Aristotle understood that Earth was round. It's really not hard to figure that out, just watch a lunar eclipse and see the Moon pass through the Earth's *round* shadow. The idea that everyone used to think the Earth was flat is a myth).



Images of the moon passing through Earth's shadow in an eclipse.  
[www.nasa.gov/vision/universe/watchtheskies/eclipse\\_images.html](http://www.nasa.gov/vision/universe/watchtheskies/eclipse_images.html)

Of course there were a few oddballs with their “alternative” theories. Aristarchus in the time of Aristotle, and Copernicus in the 16<sup>th</sup> century, each proposed that the Earth might circle the Sun while rotating on its axis. There was a certain appealing elegance to such theories, but they had huge problems: why can't we detect our motion (which must be incredibly fast)? and what power source would make a heavy Earth move? If you

think to yourself, “well, what power source made the *Sun* move in Aristotle’s theory?” please keep in mind that Aristotle said the Sun was made of the special substance, which he called “quintessence”, and that quintessence might be very light and easily moved, while the Earth is made of very unspecial, and very heavy, *rock*. (If you think making up a mysterious “something” to explain what we see in the heavens was a dumb thing for Aristotle to do then I have four words for you: “dark matter”, “dark energy” – modern astronomers say most of the universe is made of this modern “quintessence”.)

But Galileo saw moons circling Jupiter, and the Moon sporting mountains and plains. That meant Aristotle was wrong about everything circling Earth and about heavenly bodies being completely unlike Earth. The *Starry Messenger* marked the end of Aristotle’s dominance – a dominance that had traversed millennia, cultures, and religions. That kind of dominance does not end easily. You may have heard that the Galileo story is about “religion vs. science”, or about humankind not being at the center of the universe any more. Forget about it. Aristotle wasn’t stupid or blinkered, and neither were the Greco-Roman, Islamic, and Christian thinkers who endorsed his ideas over the centuries. With no telescope, his ideas made sense. But with a telescope, they didn’t, and the *Starry Messenger* made that clear.

With the *Messenger*, Galileo launched four centuries of new ideas and new technologies, introduced at impressive rates. The process that followed the *Messenger*, which we call “modern science”, is not always neat. For example, contrary to yet another myth, Galileo did *not* prove that the Earth circles the sun. There were “alternative” theories besides that of Copernicus which worked with his observations, such as that of Tycho Brahe. It took nearly a century, and the development of Isaac Newton’s physics, to hash out that Copernicus was right (and to explain how the heavy Earth could move). But neat or not, modern science sure seems to work. At any rate, it gives us cell phones and air conditioning and effective medicine and the rest of our modern world.

Believe it or not, there are local connections to all this science stuff. The University of Louisville libraries have an original edition of one of Galileo’s books in their William Marshall Bullitt collection. It and their original edition of Copernicus’s work were on display last year at Louisville’s Frazier International History Museum as part of its “Fathers of

Astronomy” exhibit. Yes, right here in Kentuckiana there are resources about Galileo such as his original work! A third partner in that exhibit was Otter Creek-South Harrison Observatory. Yes, we have an active program of historical astronomy research, and have produced numerous talks and academic publications in the past few years. The research has even been featured on the web page of the top science journal *Nature*. Yes, right here in Kentuckiana we are adding to the body of Galileo scholarship! That’s not just an academic exercise – the observatory’s scholarship benefits the community. The Frazier exhibit is one example, a free presentation last fall at Rauch Planetarium made in partnership with the scientific research society Sigma Xi is a second, and a series of exhibits and programs the at the Louisville Free Public Library branches entitled “Galileo’s *Starry Messenger: 1610-2010*” is a third. The library exhibits, which feature a reproduction of the original *Starry Messenger*, started in January at the Southwest Regional library, and will end later this month at the Middletown library. They have been timed to coincide with the 400<sup>th</sup> anniversary of the period during which Galileo was putting together and publishing the *Starry Messenger*. Louisville is very much a part of the ongoing Galileo story.

So Happy 400<sup>th</sup> Birthday to Galileo’s *Starry Messenger*! This isn’t just old history. It’s why we believe crazy things like “the sun ‘rises’ and ‘sets’ because we are hurtling along faster than a speeding bullet”, and why we believe “we can build a better cell phone”. Today is the 400<sup>th</sup> birthday of the modern world!

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**News**

### Galileo backed Copernicus despite data

Stars viewed through early telescopes suggested that Earth stood still.

[Katharine Sanderson](#)

Galileo Galilei was right: Earth moves around the Sun, just as Nicolaus Copernicus said it did in 1543. But had Galileo followed the results of his observations to their logical conclusion, he should have backed another system – the Tychonic view that Earth didn't move, and that everything else circled around it and the Sun, as developed by Danish astronomer Tycho Brahe in the



Your Kentuckiana observatory is contributing to knowledge about Galileo. Our research has been headline news on the web page of *Nature*, one of the world’s top science journals.

# 2010 Spring and Summer South Harrison Park Observatory Events

\*\*\* **ALL PROGRAMS ARE FREE!** \*\*\*

## Nighttime programs:

Mar. 20<sup>th</sup> 8:30 pm to 10:30 pm

April 24<sup>th</sup> 8:30 pm to 10:30 pm  
**NASA Night**

May 15<sup>th</sup> 9:00 pm to 11:00 pm

June 12<sup>th</sup> 9:30 pm to 11:30 pm  
**NASA Night**

July 3<sup>rd</sup> 9:30 pm to 11:30 pm

July 17<sup>th</sup> **NASA Night Event**  
@ Buffalo Trace Park

Aug. 28<sup>th</sup> 9:00 pm to 11:00 pm

## Daytime programs:

Mar. 6<sup>th</sup> 11 am to 1 pm

April 3<sup>rd</sup> 11 am to 1 pm

May 1<sup>st</sup> 11 am to 1 pm

May 29<sup>th</sup> 11 am to 1 pm

June 26<sup>th</sup> 11 am to 1 pm

July 17<sup>th</sup> **NASA Day Event**  
@ Buffalo Trace Park

Aug. 14<sup>th</sup> 11 am to 1 pm

**All times are Eastern time zone.**

All programs at South Harrison Park are open rain or shine.

**Daytime programs** allow you to safely view the Sun using solar filters.

**Nighttime programs** allow you to view the Moon, Stars, Planets, and more.

The facility is handicapped accessible and we feature a video display system for cloudy days and/or nights.

Contacts: Park Astronomer – Henry Sipes Home 270-828-6191  
Cell 270-668-2103  
Harrison County Park Office – 812-738-8236

Websites: <http://www.harrisoncoparks.com/Observatory.html>  
<http://www.jefferson.kctcs.edu/observatory/>