

The Mason-Dixon Astronomer



June Meeting:

- Wed., June 12th – 7:30pm
Bear Branch Nature Center
- **Dr. Boncho Bonov**
"Diversity in the World of Comets."

St*r Points

Siblings of our Sun

June 2013 – Curt Roelle

It's the month of June, and that means schools will be letting out soon. For the northern hemisphere this year, summer begins on Thursday, the 21th according to the U.S. Naval Observatory.

Each year there are two solstices and two equinoxes marking the start of the four seasons. For us north of earth's equator, these are the summer and winter solstices in June and December, and the vernal (or spring) and autumnal (or fall) equinoxes in March and September.

Some may consider it intuitive to assume that the different seasons are caused by the varying distance between the earth and the sun. It's hotter in the summer, so we must be closer to the sun at that time, correct? Not really. The earth is actually farthest from the sun in July two weeks after the summer solstice, and July is not the coolest month of the year by far.

While it's true that the earth-sun distance varies during the year, the difference in distance is not enough to account for the temperature swing between the summer and winter seasons, and vice versa. The average sun-earth distance is about 93 million miles. And although earth's orbit around the sun isn't quite circular, the difference between the farthest and nearest separation is only three percent.



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President's Message

June 2013 - Vanessa Thomas

Hello WASians!

I heard that the May meeting was another good one. I'm sorry I wasn't there. Thank you to our First Vice President, Christian Ready, for taking over the reins during the meeting. Sometimes my hobbies get in the way of each other. For those who don't know, I'm a card-carrying roller coaster enthusiast. And sometimes, when an amusement park is opening a new roller coaster or having a camera crew there to film for a television program, they ask coaster fanatics like me to come ride their coasters at odd hours of the day and be happy about it! The morning after our May meeting, I needed to be at Cedar Point in Sandusky, Ohio, at 4 o'clock in the morning for a media day event for their newest roller coaster, named Gatekeeper. I have to say, it's a little weird going to an amusement park when the stars are still out. Astronomy and roller coasters are about the only things that can motivate me to get up and go outside in the middle of the night!

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June Meeting – Guest Speaker



Dr. Boncho Bonov (Catholic University)

"Diversity in the World of Comets"

Dr. Bonov will describe how comets differ in appearance and composition. He will also discuss the relevance of cometary astronomy to understanding our solar system's origins and the emergence of the biosphere. His talk will touch on three bright comets expected this year: L4/PanSTARRS, F6/Lemmon, and the expected S1/ISON.

Bio:

Dr. Bonov is a Research Associate at Catholic University of America (Washington, DC) and NASA's Goddard Center for Astrobiology (GCA).

Summer Reading (& Listening)

Pankaj 'Doc' Desai



Astronomy and reading go hand in hand! Summer will be more interesting (and fun) trying to get a hold of some- or all - of these books to read. The music is awesome, too!!

1. How I killed Pluto- and Why it Had it Coming - Mike Brown
2. Death by Black Hole- and other Cosmic Quandaries - Neil DeGrasse Tyson
3. All 4 books written by Dava Sobel -

A More Perfect Heaven- How Copernicus Revolutionized the Cosmos

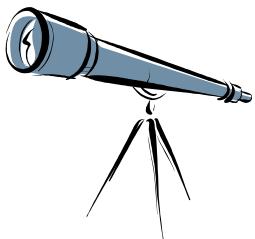
Galileo's Daughter- A Historical Memoir of Science, Faith & Love

Longitude – The True Story of a Lone Genius who Solved the Greatest Scientific Problem of His Time

The Planets

As you read these books, listen to 'The Planets' by Gustav Holst. I think the best rendition is the one recorded by the Los Angeles Philharmonic and conducted by Zubin Mehta and John Williams.

Upcoming Events From Our Calendars



- ❖ **Monthly Meeting** June 12th, 7:30 p.m., at Bear Branch Nature Center (BBNC)
- ❖ **Soldiers Delight Public Stargazing** June 8th 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills
- ❖ **Planetarium Show** June 15th, 7:30 p.m., at BBNC

St*r Points for June...

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As we all learned in school, the seasons are due to the tilt of the earth's rotational axis. The rotational axis is the imaginary line passing through the earth's north and south poles. This line then intersects the celestial sphere near North Star in the Little Dipper, which is in the constellation Ursa Minor – the lesser bear.

During the colder months, the sun seems to pass in front of the more southerly constellations such as Scorpius and Sagittarius. It is low in the daytime sky which causes its rays to come in at a shallow angle and the northern hemisphere experiences winter.

In warmer months, the sun rides through northern constellations such as Taurus and Gemini. It transits high in the sky during the day and its rays are more direct, causing the northern hemisphere to heat up.

The commonly accepted main stream astronomical theories put the age of the sun at approximately 4.6 billion years. Astronomers look out and see stars being born in nebulous regions of gas and dust throughout our Milky Way galaxy. Pockets of this material coalesce and form stars. As the stars heat up the remaining nebula is driven off leaving a cluster of new born stars.

As a cluster rotates around the galaxy, gravitational and drag forces may eventually cause its members to disperse. Indeed, as we look around us, our sun is all alone and not part of any known star cluster.

So what happened to the siblings of the sun, is there a way to identify them? After all, even if the sun's natal nursery is dispersed, the original members could still be traveling in galactic orbits whose characteristics are similar to the sun. At least that's how the theory goes.

Estimates of the number of siblings, within the volume of space reaching out to a distance of 330 light years (100 parsecs) from the sun, range from three to more than 50 stars. Astronomers are looking for certain stars whose motion, composition, and estimated age is similar to the sun's.

The goal of the search is to ascertain which stars, that are similar to the sun, are its true siblings. It's a daunting search with many hurdles. A 2012 summary identified only three candidate stars. The brightest of these is a magnitude 5.5, double star, 268 light years away in the summer constellation of Lyra, known as HIP 92831.

Join The Westminster Astronomical Society...

Joining WASI gives you a great opportunity to meet fellow astronomers and provides group memberships to the [Astronomical League](#) and the [International Dark-Sky Association](#). Additionally, benefits include access to our [Library](#) (over 500 astronomy-related books), the ability to borrow [club scopes](#), a subscription to the Astronomical League's *Reflector*, access to members-only observing sessions and sites, and club discounts on astronomical magazine subscriptions.

Membership is still only \$25 per year.

<http://www.westminsterastro.org>

May St*r Points...

May 2013 – Curt Roelle

Saturn Putting On A Show

The star of the month for May is the spectacular planet Saturn. Well placed for long views in any telescope on warm nights, Saturn never leaves anyone disappointed. Then, at month's end, three other major planets join to form a striking grouping in evening twilight.

Its rings are Saturn's most noticeable feature. During its 29 year solar orbital period, Saturn's rings are viewed tilted toward our line of sight at varying angles. The planet is currently halfway between the two extremes. The rings appeared edge-on in 2009 and will be viewed at their widest in 2017.

The first recorded observation of Saturn's rings was in 1610 by Galileo Galilei. However, Galileo's small and, by today's standards, crude telescope did not reveal the nature of the rings. He interpreted what he saw as a triple planet – a large disc with a smaller one on either side. He also described the latter as "ears."

Two years later the rings were edge on and no longer visible in Galileo's instrument. They then returned a year later. Galileo found these events to be inexplicable.

In the 1650s, Christiaan Huygens used an improved telescope to resolve the nature of the rings. He observed them as being thin or "flat" and correctly deduced that Saturn's axis is tilted and that our viewing it at different positions as it revolved around the sun accounted for the varying tilt in the rings' appearance.

Even at low power, small telescopes will reveal the ringed nature of Saturn. For centuries there were thought to be only three rings. The A and B rings are the brightest, with the former being farthest out from the planet. The faint C or "crepe" ring is the next one in, closer to the planet than B.

Why is the May St*r Points in the June Newsletter?

Because your editor (me) messed up. Here is last month's article for your (delayed) enjoyment!

In 1676, astronomer Giovanni Cassini discovered a dark gap between the A and B rings. This gap, known as the Cassini Division, is visible in moderate sized telescopes. It's best observed at the far edges of the rings on either side of the planet.

Saturn has dozens of moons. The largest moon is Titan. It is larger than our moon and its diameter would reach from the tip of Florida to Washington state's pacific coast. Cold Titan has a dense atmosphere and on its surface are lakes of liquid methane. The Huygens probe measured Titan's surface temperature at -290°F.

Like the rings, Titan is another of Saturn's features visible in small telescopes. Look for a faint star that stays close to the planet and is usually in the same eyepiece field.

The larger the telescope, the more moons will be visible. A JavaScript utility showing the appearance of Saturn, orientation of its rings, and locations of five of its brightest moons is available from SkyAndTelescope.com. Just enter in the expected time of observation and press update.

A chance to observe an interesting grouping of three major planets during evening twilight occurs on May 26 and 27. The planets are Mercury, Venus, and Jupiter. Plan to begin looking 20-30 minutes after sunset, about 8:45-9:00 p.m. EDT, and be patient.

Jupiter will be to the left of Venus - the brightest of the trio. Fainter Mercury is above Venus. The configuration will slowly change over the course of several days. The trio will appear very low to the horizon, so make sure you have a clear view. Use binoculars to help pick out the planets in the twilight.

President's Message

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Here's a picture of me (and some other coaster enthusiasts) on another of Cedar Point's coasters, Millennium Force, during a break from riding Gatekeeper and after the Sun came up. (I'm in the second row, in case you don't spot me.)

Just two weeks later I was at Kennywood Park near Pittsburgh bright and early (but after dawn this time, thankfully) for a Travel Channel filming for their "Insane Coaster Wars: World Domination" program. I participated in filming last fall at Kings Dominion and Busch Gardens (both in Virginia) as well. So if you're interested in coasters and want to try to spot your WASI president being hurled through the air, the show's season debuts June 9th.

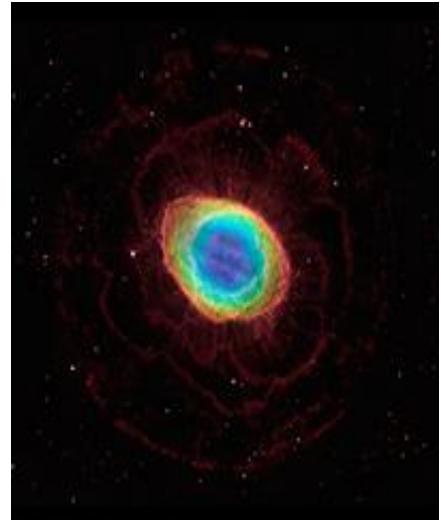
Don't worry, though. I am just as passionate about astronomy as I am about roller coasters. I'm looking forward to our upcoming members' observing night on June 1 (probably past by the time you read this, though). Perhaps I'll get a glimpse of the Ring Nebula, which the Hubble Space Telescope took another look at not too long ago. Here's a new composite image combining exposures from Hubble and the Large Binocular Telescope in Arizona, which reveals the fainter outer gas shells we don't see with our telescopes.

The Hubble observations suggest that the Ring is actually a donut-shaped cloud encircling another football-shaped cloud (the blue-colored area in the center), which has one of its tips pointed roughly in our direction. If you have a chance, check out hubblesite.org/newscenter to see some 3D animations of the nebula's shape (created by some of my talented colleagues at STScI in Baltimore).

I have no roller coaster plans for June 12th. So I'm looking forward to seeing everyone at the meeting at Bear Branch that evening!



Credit: Great Ohio Coaster Club



Credit: NASA, ESA, C.R. O'Dell (Vanderbilt University), and D. Thompson (Large Binocular Telescope Observatory)

May Meeting Minutes

Bob Clark

Minutes, Westminster Astronomical Society
8 May 2013, at Bear Branch.

Called to order at 7:35 by Christian Ready, Vice President.

Attending were about 35 persons.

The principal Speaker was: Dr. Demosthenes 'Demos' Kazanas.

Topic: The Ins and Outs of Black Holes.

Principal Topics and Points:

- 1) A black hole is not a thing with a surface but rather a region including an edge of space-time.
- 2) That view is quite different from the popular “image” of an object that sucks everything into its maw.
- 3) The “edge of space-time” description requires some understanding of Einstein’s theory of special relativity. The hypothetical experiment involving a railroad train and a pair of clocks was used to demonstrate this. The clock on a moving train runs slower than a stationary one.
{No matter what the direction RLC}
- 4) The idea of “the ether” as a propagating medium was abandoned long ago.
- 5) Accelerated motion is equivalent to a gravitational field in that each can be represented as a tensor.
- 6) The “Schwarzschild radius” is the distance from a black hole at which the velocity is the speed of light.
- 7) There is a concept/phenomena “black hole evaporation” which has caused a great deal of controversy recently.
- 8) Questions and Answers.

Short Member Observing and Outreach reports.

Adj 9:45 PM

Respectively Submitted

Robert L Clark



Triple Treat

By Dr. Ethan Siegel

The solar system is a busy place, with five wandering planets visible to the naked eye alone. When any two pass close by each other from our point of view, we see an astronomical *conjunction*, but on very rare occasions, three planets will find themselves grouped together: a *triple conjunction*. Towards the end of May, Mercury, Venus and Jupiter will treat us to the best triple conjunction in years.

On May 25th, Mercury will pass within 1.4° of Venus, then two days later Mercury comes within 2.4° of Jupiter, and finally on the 28th, Jupiter and Venus approach within 1° of one another. If it weren't for the slight orbital tilt of our solar system's planetary orbits, these conjunctions would all be *occultations* instead. During the nights of May 26th-27th, all three planets are visible immediately after sunset within the same 3° field of view, with the triple conjunction peaking in a triangular shape on the 26th. (For scale, the full Moon subtends about $1/2^\circ$.) The three planets appear close together for a few days more, making a line in the sky on the 30th/31st.

How does this happen? Mercury and Venus race around the Sun far faster than Earth, with Mercury completing more than four revolutions around the Sun for each one that Earth makes. At the same time, Jupiter is far slower, taking 12 years to orbit just once around the Sun. Jupiter's been high in the sky during the early parts of the night, but steadily lowers throughout May as Earth continues to move away from it, approaching its maximum distance from Earth. Mercury and Venus, meanwhile, begin to move out from behind the Sun during May: Venus at the beginning of the month and Mercury in the middle.

Thus, during this triple conjunction, *all three* planets will be on the far side of the Sun, something that happens just 25% of the time in triple conjunctions involving Mercury and Venus! If you telescopically resolve these planets into disks, you'll see our inner worlds in a nearly-full gibbous phase. Jupiter will appear largest in terms of angular diameter, followed by Venus and lastly by Mercury. Just a year ago, during its now-famous transit, Venus took up more than a full arc-minute in the sky; during this conjunction, it will just *one-sixth* that angular size and less than a third the apparent diameter of Jupiter. Nevertheless, Venus will still be more than **six times** as bright as Jupiter during this time, outshining all night-sky objects other than the Moon. Closer conjunctions of two naked-eye planets are frequent, but getting three or more like this happens just once or twice per decade, so don't miss your chance to see it.

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And speaking of occultations, The Space Place has a great kid-friendly explanation of the Venus transit and solar eclipses of 2012 at spaceplace.nasa.gov/venus-transit.

Dr. Ethan Siegel, a theoretical astrophysicist, is a professor at the University of Portland (OR) and Lewis & Clark College.



Caption:

The image shows the configuration of Mercury, Venus, and Jupiter in the western sky just after sunset on May 26, 2013. Insets show the relative size appearance of the planets on that date.