

The ECLIPSE

July
2016

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

July 20, 2016, 7:30 pm
Glendale United Methodist
Church - Fellowship Hall
900 Glendale Lane

Details on page 8

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From the President:

Warm and muggy nights... hopefully a few will be clear!! hope a few of you have taken advantage of the NSN webinars... you don't have to watch them live, they are archived for you to watch at your leisure. [The most recent was pretty interesting.](#)

Our spacecraft return a lot of data... and NASA is doing a better job these days at making it available to everyone! This last webinar focused on a new online tool that allows the visualization of some of the large datasets for Mars and the Moon. Try out [Mars Trek](#) to explore Mars using data sets you choose. Pick the mission and the instrument, create layers to overlay, zoom in to see detail... it's a really nice interface that lets anyone explore and perhaps even discover new relationships. Maybe Vesta is what you want to explore: yep, [Vestra Trek](#). Or check out [the Moon](#) (although this site will eventually port to the newer interface). The demonstration of Moon data was impressive... see the video for how to overlay the LRO images with laser altimetry data and more to see a broad shield volcano on the Moon. As more data is available it will be added... expect a Ceres Trek at some point as well. Sitting in the comfort of home you can virtually roam our sister worlds and be really impressed at how much we actually do know about them!

Member and longtime Astronomical League representative Mike Benson gave a program at the June meeting on double star observing. The list of stars to observe for the AL certificate is [here](#). A form to [enter your observations](#). Trying to split double stars will sharpen your telescope observing skills. Don't have a telescope? There are several observing challenges for the eyes or binoculars, try the Earth Orbiting Satellite Observing Program. It's fun to see how many different satellites you really can see apart from the bright



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Observing Highlights July and August

Nebulae

NGC3242 (*Ghost of Jupiter*),
M97 (*Owl*), NGC6302 (*Bug*),
NGC6309 (*Box*),
NGC6543 (*Cat's Eye*),
M20 (*Trifid*), M8 (*Lagoon*),
M16 (*Eagle*), M17 (*Swan*),
M57 (*Ring*),
NGC6818 (*Little Gem*),
NGC6826 (*Blinking Planetary*),
M27 (*Dumbbell*)

Multiple Star Systems

Gamma Leonis (*Algieba*),
M40, Gamma Virginis
Alpha Canum Venaticorum
Zeta Ursae Majoris (*Mizar*),
Epsilon Bootis (*Izar or Pulcherrima*)
Mu Bootis (*Alkalurops*),
Beta Scorpii (*Acra*),
Alpha Herculis (*Rasalgethi*),
Epsilon Lyrae (*Double Double*),
Beta Cygni (*Albireo*)

Galaxies

NGC3115 (*Spindle Galaxy*),
M95, M96, M105, M108,
M65/M66/NGC3628 (*Leo Triplet*),
M109, M98, M99, M106, M61, M100,
M84, M85, M86, M49, M87, M88, M91,
M89, M90, M58,
M104 (*Sombrero Galaxy*),
M59, M60, M94,
M64 (*Black-Eye Galaxy*),
M63 (*Sunflower Galaxy*),
M51 (*Whirlpool Galaxy*),
M83, M101/M102,
NGC 6822 (*Barnard's*)

Open Clusters

Mel111 (*Coma Star Cluster*),
M6 (*Butterfly*), M7, M23,
M21, M18, M25, M26,
M11 (*Wild Duck*)

Globular Clusters

M68, M53, M3, M5, M80, M4,
M107, M13, M12, M10, M62, M19,
M92, M9, M14, M28, M69, M22,
M70, M54, M56, M55, M71

Upcoming Star Parties

Saturday 7/2	BSAS Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Saturday 7/9 9:00 pm to 11:00 pm	Public Star Party Edwin Warner Park
Saturday 7/30	Private Star Party Natchez Trace Parkway mile marker 435.3
Friday 8/5 8:30 pm to 10:30 pm	Public Star Party Bells Bend Outdoor Center
Friday 8/12 8:30 pm to 10:30 pm	Public Star Party Bowie Nature Park (Fairview)



July 4
Aug 2



July 11
Aug 10



July 19
Aug 18



July 26
Aug 24

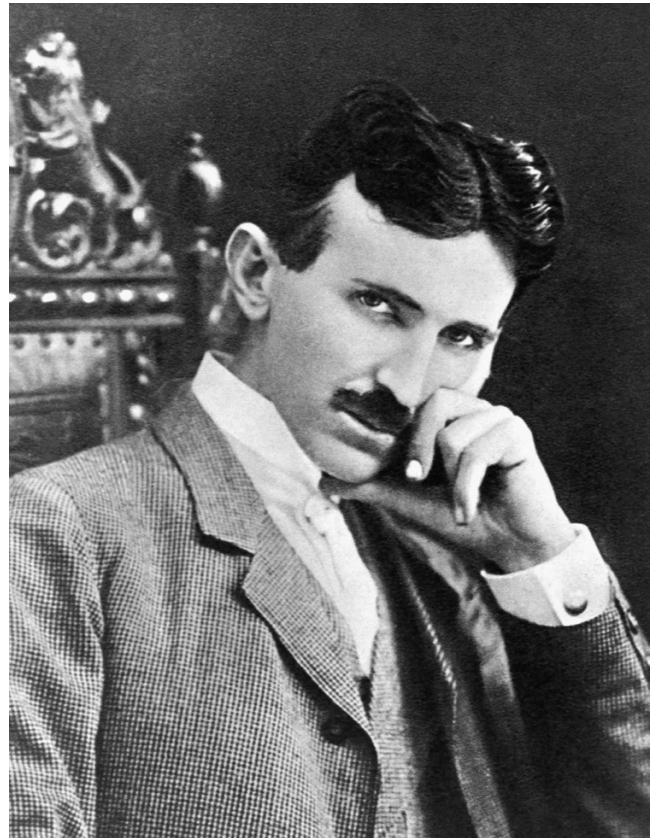
Happy Birthday Nicola Tesla by Robin Byrne

This month, we celebrate the life of a man who revolutionized the world of electricity. Nikola Tesla was born in Smiljan, Croatia on July 10, 1856 (although he may have celebrated it on June 28 since Croatia had not yet converted to the Gregorian calendar at the time). Tesla's father was a priest, but his mother was a bit of an inventor, creating tools and mechanical appliances for the home. She also was able to memorize large amounts of material, a skill Tesla inherited with a photographic memory.

Tesla began going to school at the age of five. The following year, the family moved to another town, where Tesla completed his primary education. Tesla attended the equivalent to high school in Karlovac at the Higher Real Gymnasium. It was here that his skill with mathematics began to shine, including the ability to perform integral calculus in his head. In 1873, at the age of 17, Tesla graduated, and promptly came down with a severe case of cholera. His father was so worried, despite wanting Nikola to follow in his footsteps into the priesthood, instead promised to send Nikola to engineering school if he got better.

Before Tesla could go to college, he ran into another obstacle: the draft. To avoid being conscripted into the Austro-Hungarian Army, Tesla went into hiding in the mountains. The experience helped him to regain his strength, and offered the opportunity to read many books. By 1875, he felt safe to return to society, and entered the Austrian Polytechnic in Graz. It was here that Tesla's work ethic became obvious, studying from 3:00 am to 11:00 pm seven days a week. His professors feared he would kill himself with this schedule. However, by his third year, his behavior had changed as he became addicted to gambling, and lost all of his money. He never did graduate. Tesla moved to Maribor to hide from his family that he had dropped out of school. In 1879, Tesla was arrested for not having a residence permit, and was essentially deported back home. He took a job teaching at his old school until two of his uncles paid his way to Prague to continue his studies. Since he didn't meet the school's prerequisites, Tesla just sat in on the classes, learning all he could.

In 1881, Tesla moved to Budapest to be the chief electrician at the Budapest Telephone Exchange. Some of his first inventions were created here, though none were patented. The following year, he moved to France to work at the Continental Edison Company, once again creating new and better equipment designs.



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Nicola Tesla, continued

In 1884, Tesla moved to New York City with just a few items of clothing, and not much else. A friend of his, Charles Batchelor, wrote a letter introducing Tesla to Edison, in which he said, "I know two great men, one is you and the other is this young man." Edison hired Tesla to work at the Edison Machine Works, initially as an electrical engineer, but later making use of his ingenuity to solve more difficult problems. Edison asked Tesla to redesign their direct current generators, purportedly saying, "There's fifty thousand dollars in it for you—if you can do it." A few months later, Tesla came back with a much improved design. When he asked about the money, Edison said he had only been joking, but offered a \$10 per week raise, instead. Tesla was furious, and quit.

With the financial backing of two investors, Tesla created his own business, Tesla Electric Light & Manufacturing. Tesla's first U.S. patents came from equipment he designed while here. However, while Tesla wanted to create new and interesting electrical equipment, his investors just wanted it to be a utility company. They ultimately forced Tesla out, even leaving him without rights to his patents, since they were filed in the name of the company. Once again broke, Tesla took on a variety of jobs, from ditch digger to electrical repair. He was at the lowest point of his life.

Tesla then met two men who wanted to help him with backing for a new company, the Tesla Electric Company. Unlike his previous backers, these men were interested in developing patents on new designs and inventions. They even provided a laboratory in which Tesla could work. In less than a year, Tesla had created an induction motor that ran on alternating current. The following year, Tesla demonstrated his motor at a meeting of the American Institute of Electrical Engineers. Word of his design reached George Westinghouse, who was very interested. A deal was made for Westinghouse to have a license to the motor and transformer designs, for \$60,000, plus royalties of \$2.50 per AC horsepower produced by each motor (They would later regret the royalty deal, and had to buy the patents for \$216,000 to save on future expenses.). Tesla was also hired on as a consultant to design an alternating current power system for running streetcars. Ultimately, he developed alternating current systems of motors, generators, and transformers.

Meanwhile, Edison was pushing his direct current system as the way to power cities. In what became known as the "War of Currents," Edison tried to convince the public that alternating current was dangerous. The problem with direct current was that it grew weak so quickly, power stations would need to be located every 2 miles along a transmission line. Alternating current could travel much farther. That decided the fate, and alternating current became the standard.

In 1891, Tesla became a U.S. citizen and started his own laboratory in New York City. Within the year, he had patented the Tesla coil, and had shown how to light lamps through a wireless power transmission system. The wireless system became Tesla's obsession, wanting to distribute power through the air, and he even proposed using similar technology to transmit communications wirelessly. At the 1893 World's Columbian Exposition in Chicago, while Westinghouse was

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Nicola Tesla, continued

demonstrating the wonders of alternating current, Tesla was demonstrating his wireless power system under the title of “Tesla Polyphase System.” One result of the Exposition was Tesla recommending a two-phase AC system to the people who were wanting to harness Niagara Falls to produce power. Westinghouse Electric got the contract to build the generator, based on Tesla’s advice. Tesla designed the plant, the first hydroelectric power plant in the U.S., which came on line two years later, providing all of the power for Buffalo, New York..



Continuing with his interest in wireless electronic transmissions, Tesla built a radio-controlled boat in 1898. He wanted to sell the design to the military for use controlling torpedoes, but they weren't interested. The following year, Tesla moved to Colorado Springs, Colorado so that he would have more open space to continue working with high-voltage, high-frequency inventions. Also, he had friends at the power distribution center there who offered to provide him with free electricity. Tesla studied lightning, to try to understand its electrical properties. He then created artificial lightning, with discharges as long as 135 feet and packing millions of volts. Thunder from these discharges were heard 15 miles away. He even knocked out a power station. The receivers Tesla built to study lightning also picked up signals that Tesla thought were from aliens. He was sure they were counting out "1 ... 2 ... 3 ...". Coincidentally, at the same time, Marconi was testing his transmitter using Morse code of the letter S, which is three dots.

Tesla left Colorado in 1900, and continued his work on electrical transmitters, for which he filed several patents. Then Marconi made his radio transmission across the Atlantic. Tesla claimed it was all done with equipment he, himself, had designed. This was the beginning of a patent battle between the two that wasn't resolved until 1943, when the Supreme Court upheld Tesla's patents. Meanwhile, Tesla was on to his next big project, to build the Wardenclyffe Tower in Shoreham, New York on Long Island. He wanted a bigger and better transmitter for his experiments. The problem was funding. Tesla tried to get J. P. Morgan to back him. Morgan provided the initial funds, but denied any further assistance. Despite the lack of funds, Tesla built a 187 foot

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Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, June 1, 2016.

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held June 1, 2016, at Glendale United Methodist Church, 900 Glendale Lane, Nashville, TN 37204. Present were Mike Benson, Spencer Buckner, Gary Eaton, Bud Hamblen, Rob Mahurin (by telephone) and Theo Wellington (by telephone). A quorum being present, Gary called the meeting to order at 7:45 PM. Gary asked for a motion to adopt the minutes of the May board meeting as printed in the June 2016 edition of the Eclipse. Spencer made the motion, Gary seconded, and the minutes were approved by a unanimous voice vote. There was no treasurer's report.

The star party scheduled for Friday, June 3, at Bowie Nature Park is likely to be clouded out or rained out. Because of the weather, and the planned picnic at Spot Observatory, the private star party on the Trace was cancelled for June 4. Hopefully, the scheduled star party at Long Hunter State Park for June 11 can be held.

Bud planned to be at the Warner Parks Nature Center for the Solar Skills event on June 15. Chuck Schlemm and John Walker will be asked whether they could be there.

Spencer noted that solar observing on Earth Day went well, apart from interference from clouds and trees.

The picnic scheduled for June 4 had to be moved from Long Mountain Observatory to Spot because the Long Mountain site was being used by another group that Saturday.

Gary will coordinate the nominating committee. Spencer said that he would be twisting arms hard.

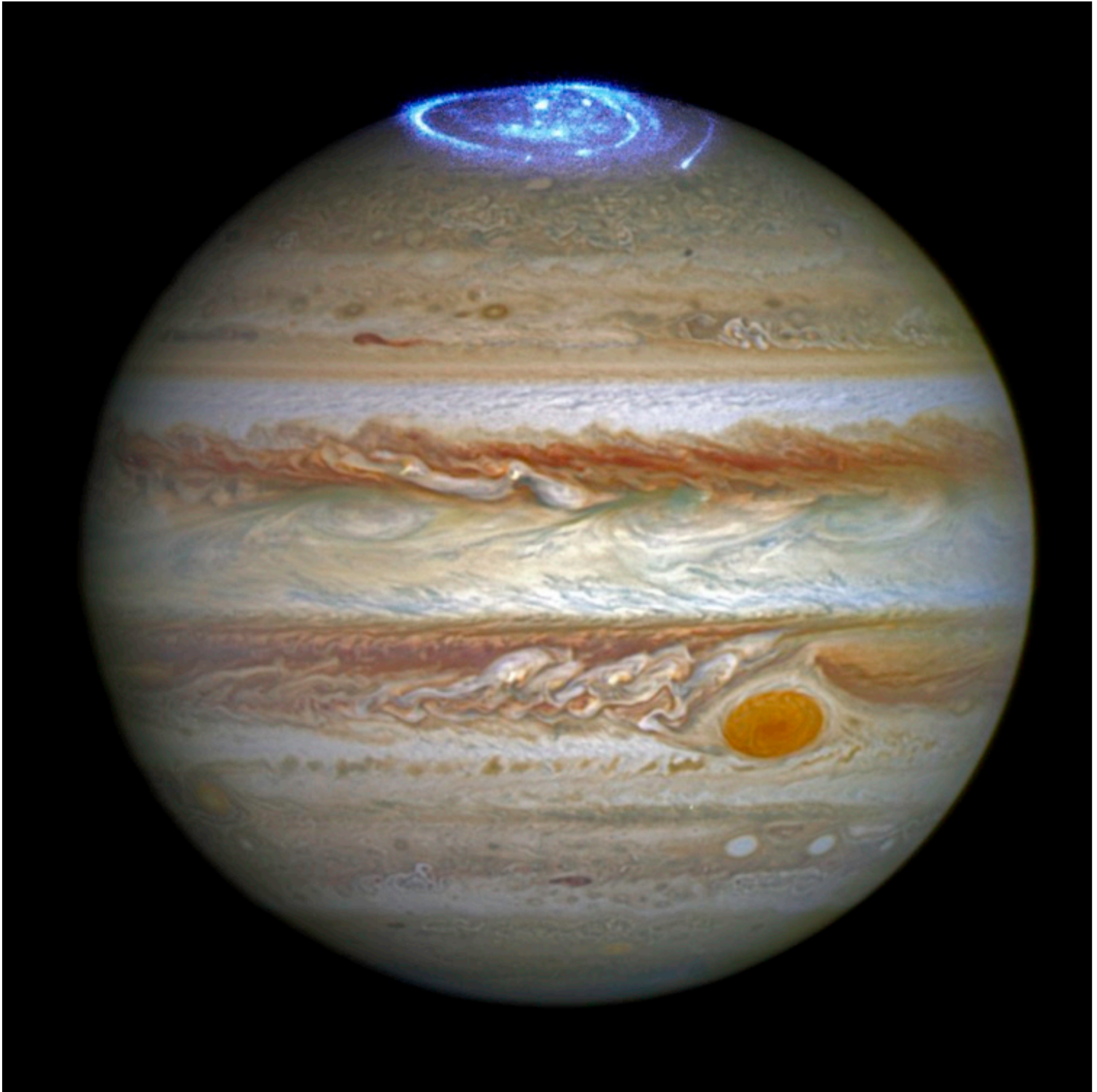
Possible subjects discussed for presentation at the Bellevue branch library included how to find your way in the night sky using binoculars.

There being no further business, Mike moved for adjournment, Spencer seconded, and the meeting was adjourned at 8:20 PM.

Respectfully submitted,

Bud Hamblen
Secretary

Send your cool astrophotos to
eclipse@bsasnashville.com!



This image combines an image taken with Hubble Space Telescope in the optical (taken in spring 2014) and observations of its auroras in the ultraviolet, taken in 2016.

Credit: [NASA, ESA](#)

From the President, continued

ISS. Or resolve to better know our nearest neighbor in space, the Moon, with the Lunar Observing Program. That gives you an excuse to be out under the night sky when the Moon is bright.

Enjoy the summer nights! Three planets make this a summer to grab the bug spray, a cool drink, and head outside whenever the sky permits.

Clear skies,

Theo Wellington

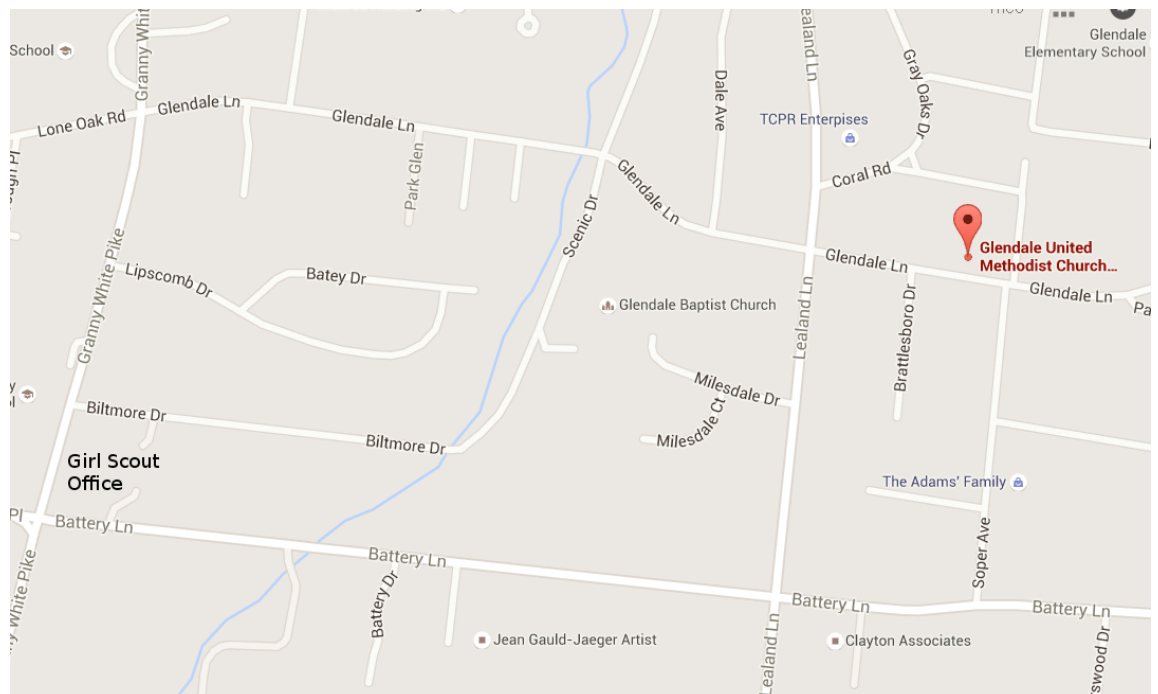
Next BSAS meeting
July 20, 2016, 7:30 pm
Glendale United Methodist Church - Fellowship Hall
900 Glendale Lane

Topic: This month's program will feature a short presentation by our MTSEF prizewinner Katelyn Henke on her project, plus Bud Hamblen on how to view the Sun with the unaided eye or through a telescope safely with projection methods and solar filters. Get ready for Eclipse 2017!

NOTICE: the location for our board and member meetings has changed for June, July and August!

The Girl Scouts are renovating, so we will be at the [Glendale United Methodist Church, 900 Glendale Lane, Nashville 37204](#).

It's just around the block from the Girl Scout office.



**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, June 15, 2016.**

The Barnard-Seyfert Astronomical Society held its monthly membership meeting at the Glendale United Methodist Church, 900 Glendale Lane, Nashville, Tennessee, on Wednesday, June 15, 2016. Twenty-one members and guests signed in. Theo Wellington called the meeting to order at 7:45pm. Theo called for a motion to approve the minutes of the May meeting. Bill Griswold so moved, Mike Benson seconded, and the minutes were approved by an unanimous voice vote. Tom Guss reported that there were \$2,288.21 in the club's checking account and \$1,619.84 in the savings account.

The following requests for outreach assistance were received:

Cumberland Paddle on 6/19

A home school group at a date to be determined

Cheekwood Full Moon Festival in October

Katherine Shaw at the Donelson Branch of the Nashville Public Library

Contact Theo for more information.

The following star parties were announced:

Montgomery Bell State Park, June 18

Water Valley Overlook, July 2

Edwin Warner Park, July 9

Mike Benson presented a talk on observing double stars.

URLs mentioned by Mike included:

[Astronomical League Double Star Club Observing List](#)

[Astronomical League Double Star Club Observing Log](#)

[Eyepiece Position Angle Scale](#)

Published works mentioned by Mike included:

The Cambridge Double Star Atlas by James Mullaney and Wil Tirion

A Field Guide to the Stars and Planets (Petersen Field Guide) by Jay M. Pasachoff

The Night Sky (Golden Field Guide) by Mark R. Chartand and Helmut K. Wimmer

The Observer's Sky Atlas by Erich Karkoschka

StarList 2000 by Richard Dibon-Smith

Uranometria 2000.0 by Wil Tirion, Barry Rappaport and George Lovi

There being no further business, the meeting was adjourned at 9:00 PM.

Respectfully submitted,

Bud Hamblen
Secretary

Nicola Tesla, continued

tower, which he claimed would be used for both wireless communication and wireless power transmission. It never came to fruition.

Among others of Tesla's ideas, he claimed that applying electricity to the brain would enhance intelligence. The superintendent of New York City Schools seriously considered wiring classroom walls to bombard students with electric waves. Tesla also proposed a device using electric rays, for locating submarines - essentially he was describing radar. The ultimate inventor of radar, Girardeau, noted that Tesla's ideas were right, but that he just didn't have the technology to do it.

It was around this time that Tesla suffered a nervous breakdown. After that, he mostly worked as a consultant and spent his free time feeding pigeons in the park. In 1934, after hearing of Tesla's decline, Westinghouse Electric started paying Tesla \$125 per month plus covering his rent. This continued until Tesla's death. Tesla's ideas became more and more bizarre, even claiming to have designed a "death ray" capable of destroying 10,000 enemy airplanes from 200 miles away. Nikola Tesla died of coronary thrombosis on January 7, 1943 in his room at the New Yorker Hotel. He was 86 years old. Two thousand people attended his funeral. In 1960, he was honored by the General Conference of Weights and Measures when they named the unit for magnetic flux density the "Tesla."

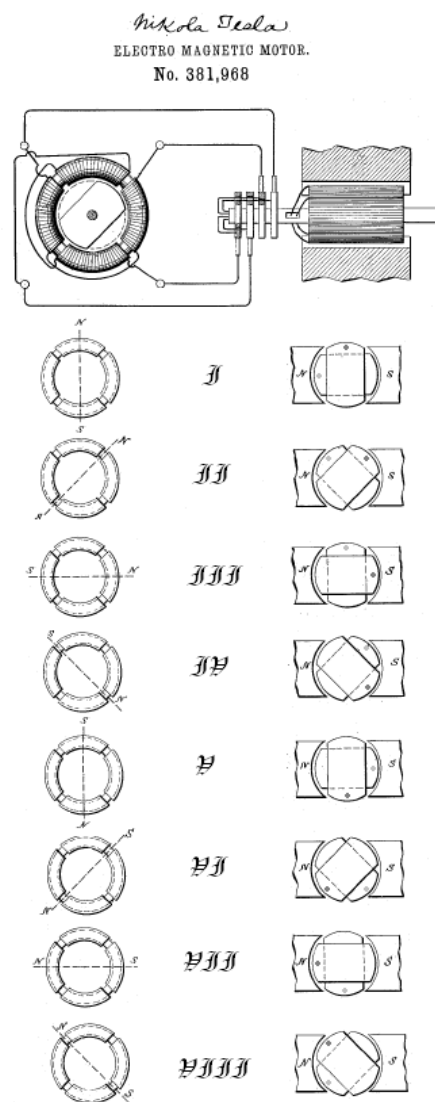
The owner of roughly 300 patents, the creator of so many of the electrical devices used today, Nikola Tesla was a remarkable man. On July 10, now known as Nikola Tesla Day in many states, flip your lights on and off in memory of a genius.

References

[Nikola Tesla - Wikipedia](#)

[Nikola Tesla - Engineer, Inventor - biography.com](#)

[Tesla's Biography - Tesla Memorial Society](#)





*Milky Way from CCC Memorial
Pickett State Park
June 28, 2016*



Become a Member of BSAS!
Visit bsasnashville.com to join online.

All memberships have a vote in BSAS elections and other membership votes. Also included are subscriptions to the BSAS and Astronomical League newsletters.

Annual dues:

Regular: \$25
Family: \$35
Senior/Senior family: \$20
Student:* \$15

* To qualify as a student, you must be enrolled full time in an accredited institution or home schooled.

About BSAS

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Wednesday of each month at the Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to *Astronomy and Sky & Telescope* at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Theo Wellington at (615) 300-3044.

Free Telescope Offer!

Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact info@bsasnashville.com.

Tom Murdic Annual Telescope Night at Vanderbilt Dyer Observatory

Monday, July 18, 2016

8:00pm - 10:00pm



A public telescope night at Vanderbilt Dyer Observatory on July 18 will pay tribute to the late Williamson County civic leader and amateur astronomer Tommy Murdic.

Murdic had hosted the annual night at Dyer Observatory on behalf of the Williamson County Public Library before he passed away March 6, 2015. This event, which has been renamed the Tom Murdic Annual Telescope Night at Vanderbilt Dyer Observatory, will begin at 8 p.m. Williamson County Mayor Rogers Anderson will be at Dyer for brief remarks on Murdic's public service as well as his passion for stargazing. In addition, some of Murdic's photographs and images will be displayed. The retired engineer, who had previously worked at the Nashville

Thermal Transfer Plant, enjoyed spending many hours at Dyer as an amateur astronomer.

Murdic, a former chairman of the Franklin Municipal Planning Commission, had served on the Williamson County Commission and Joint Parks and Recreation Committee of Williamson County. In addition, he had a strong interest in preserving the African-American heritage of his ancestors through his leadership with the African American Heritage Foundation of Williamson County. He also helped spearhead the establishment of McLemore House, an African-American history museum in Williamson County. He was a member of the Franklin Tomorrow founding steering committee and a board member. His family accepted the Ned Lea Lifetime Achievement Award, presented posthumously, at the 2015 Franklin Tomorrow Exemplary Volunteer Awards.

Cost: \$6.27 per person (\$5.00 admission + \$1.27 online handling fee). Reservations can be made [here](#).

Registration is required for this special event, and each person must have their own reservation. **NO TICKETS SOLD AT DOOR. NO REFUNDS OR EXCHANGES - THIS IS A CLEAR OR CLOUDY EVENT.**

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