

The ECLIPSE

March
2022

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

March 16, 7:30 pm
Online meeting

Link will be posted on
bsasnashville.com

In this Issue:

Happy Birthday Heinrich Hertz By Robin Byrne	3
Happy Birthday Leroy Gordon Cooper By Robin Byrne	6
Embracing the Equinox By David Prosper	11
Board Meeting Minutes February 2, 2022	14
Membership Meeting Minutes February 16, 2022	15
Membership Information	17





Officers

Tom Beckermann
President

Bud Hamblen
Secretary

Theo Wellington
Treasurer

Keith Rainey
Ex-officio

Directors at Large

Cory Buckner

Chip Crossman

Tony Drinkwine

Oswaldo Gonzalez

Andy Reeves

Kathy Underwood

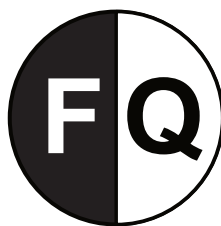
Contact BSAS officers at
bsasnashville.com/contact
Or email info@bsasnashville.com



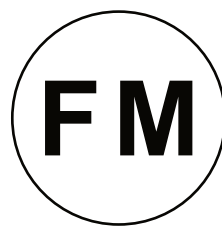
On the Cover: The mass of dust and bright swirls of stars in this image are the distant galaxy merger IC 2431, which lies 681 million light-years from Earth in the constellation Cancer. The NASA/ESA Hubble Space Telescope has captured what appears to be a triple galaxy merger in progress, as well as a tumultuous mixture of star formation and tidal distortions caused by the gravitational interactions of this galactic trio. A thick cloud of dust obscures the center of this image – though light from a background galaxy is piercing its outer extremities. Credit [ESA](#)



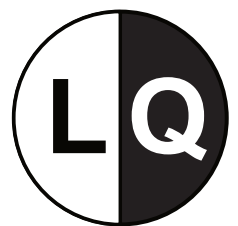
Mar 2
Apr 1



Mar 10
Apr 9



Mar 18
Apr 16



Mar 25
Apr 23

Happy Birthday Heinrich Hertz By Robin Byrne

Editor's note: This article was meant for the February issue of the Eclipse, but it got lost in the spam folder. Sorry for the delay!

This month we celebrate the life of a man who contributed so much in a very short amount of time. Heinrich Rudolf Hertz was born in Hamburg, Germany on February 22, 1857. He was the first of five children born to Anna and Gustov, who was an attorney who later became a senator. Heinrich's paternal grandfather was raised Jewish, but converted to Lutheranism when he married. Heinrich's parents, though officially Lutheran, were more focused on giving Heinrich a solid education, with his religious identity being secondary.

In 1863, at the age of 6, Heinrich began attending a private boys' school. It was highly competitive, but Heinrich consistently ranked near the top of his class. Even at a very young age, Heinrich knew he wanted to study something related to the sciences, first planning to pursue engineering. The school he attended had a strong focus on science, so his parents felt it was a good choice. When he was 15, Heinrich switched to being educated at home to better prepare for college, in particular focusing on languages not taught at the school, including Greek, Latin, some Arabic, and even Sanskrit. With the help of a private tutor, Heinrich also developed his skill at building and using scientific instruments, such as operating a lathe. He even built his own spectroscope, which was used to conduct experiments. In 1874, at the age of 17, Heinrich returned to the private school for one more year to be fully prepared for the college entrance exams.

After passing the exams, Heinrich then decided that instead of college, he would study as an apprentice to an architect. For a year, he lived in Frankfurt working as an apprentice, while still studying physics and ancient Greek literature in his spare time.

In 1876, Heinrich decided to go to college to study engineering, after all, so he moved to Dresden. After only a few months, he was drafted for his one-year compulsory service in the army. Heinrich liked the discipline of the military, but found the work very boring. Once his service was complete, Heinrich returned to college, but this time in Munich, still with the plan to study engineering. However, he soon discovered that his heart belonged to physics. A year later, he transferred to the University of Berlin, because they had a better physics laboratory, and two of the most prominent physicists of the time were there: Gustav



Kirchoff and Hermann Helmholtz.

Helmholtz recognized Hertz's talent, and thought that he could be the one to solve one particular problem: does electric current have mass? The university's Philosophy department even was offering a prize to anyone who could answer this question. Hertz performed a variety of experiments, and found that, if current has mass, it would be so incredibly small that the instruments of the time would not be able to measure it. He won the prize. It wasn't for another 18 years before J. J. Thomson would discover electrons and find that they do have a minuscule mass.

Next Helmholtz wanted Heinrich to try for another prize, this time offered by the Berlin Academy, to prove Maxwell's theory of electromagnetism. James Clerk Maxwell had proposed in 1864 that light was a wave comprised of both electricity and magnetism. Helmholtz thought this would make a good doctoral research project. Hertz thought it would be too difficult to build the equipment necessary to test this. Instead, Hertz studied electromagnetic induction for his thesis.

Heinrich graduated with his Ph.D. in physics in 1880 and remained at the University of Berlin for the next 3 years, working as a post-doctoral student with Helmholtz. From 1883 - 1885, Hertz was a lecturer at the University of Kiel, before becoming a full professor at the University of Karlsruhe in 1885. In 1886, Hertz married Elisabeth Doll. They would eventually have two daughters: Johanna and Mathilde, who would become a noted biologist.

In 1886, Hertz was showing his students some electrical sparks. He began to wonder how those sparks would affect an electric current. After performing a variety of experiments, he found that the sparks caused vibrations in the wires they jumped between. The vibrations were at a much faster rate than anything previously observed (about 100 million vibrations per second). Because the vibrating wires contained electric charges that were accelerating, by Maxwell's theory, they should generate electromagnetic waves. Hertz set up a loop of copper wire about 5 feet away. The loop had a small gap in it. If electromagnetic waves existed and travelled through the air, they should create a current in the loop, which would spark across the gap. Hertz saw that it did indeed have a spark! Hertz had produced and detected what we now call Radio Waves. Over the next 3 years, Hertz showed that these waves behaved just like optical light - experiencing reflection and refraction, and producing interference patterns and standing waves. He also was able to measure the speed of the waves, and they travelled at the speed of light, as predicted. Radio waves and visible light were shown to be part of one big family - the electromagnetic spectrum. While appreciating the theoretical value of this discovery, Hertz didn't think radio waves had any practical use, saying, "It's of no use whatsoever ... this is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there." Within the next decade, Guglielmo Marconi, among others, would prove Hertz's statement to be very wrong.

In 1887, Hertz performed an experiment that involved shining ultraviolet light on a piece of electrically charged metal. He found that the metal lost its charge faster when being lit by the UV light than without. While he had no conclusion about what caused this phenomenon, his discovery was then used by J. J. Thomson to eventually realize that the light was providing the necessary energy for the electrons to break free from the metal. That led Einstein to

propose that light came in bundles of energy, called photons. What is now known as the photoelectric effect, as well as Einstein's Nobel Prize in Physics, can trace their roots to Hertz's observations and experimentation.

In 1889, Hertz moved to Bonn to assume the role of Director of Physics at the Institute there. He would hold this position until his death. Here, Hertz concentrated his studies in the area of theoretical mechanics, and wrote a book about his findings, titled "The Principles of Mechanics Presented in a New Form."

In 1892, after suffering from several migraines, Hertz was diagnosed with an infection. For over a year, several operations were performed in an attempt to treat his illness, with no success. On January 1, 1894, Heinrich Hertz died at the age of 36.

In 1930, the International Electrotechnical Commission officially changed the name of the unit for frequency from "cycles per second" to "Hertz" (Hz) in honor of Heinrich's contributions to the field.

Despite being Lutheran, because of his Jewish ancestry, when the Nazis came to power, they removed the portrait of Hertz from the Hamburg City Hall and tried to undermine his reputation. After World War II, the portrait was returned back to where it belonged.

For such a short life, Heinrich Hertz leaves an amazing legacy. Proving that all electromagnetic waves are a form of light certainly has impacted the astronomical world. The recently launched JWST will be taking advantage of the infrared part of that very spectrum. As Hertz, himself, said, "We perceive electricity in a thousand places where we had no proof of its existence before. In every flame, in every luminous particle, we see an electric process. Even if a body is not luminous, provided it radiates heat, it is a center of electric disturbances. Thus the domain of electricity extends over the whole of nature."

References:

[Heinrich Hertz - Wikipedia](#)

[Heinrich Hertz and electromagnetic radiation by Steven A. Edwards, Ph.D.; 2012](#)

["Heinrich Hertz." Famous Scientists. famousscientists.org. 23 Nov. 2015. Web. 1/9/2022.](#)

Happy Leroy Gordon Cooper By Robin Byrne

This month, we celebrate the life of one of America's first astronauts. Leroy Gordon Cooper, Jr, "Gordo" to his friends, was born March 6, 1927 in Shawnee, Oklahoma. His mother, Hattie, was a school teacher. His father, Leroy, Sr., began his military career during World War I in the Navy, which delayed his chance to finish high school. After the war, he returned to school, where Hattie was his teacher. Leroy, Sr. went on to college, eventually graduating from law school, while also maintaining his military connections, serving in World War II in the Judge Advocate General's Corps, and then transferring to the Air Force after the war. So Gordo came from a long history of military service.

Growing up in Shawnee, Gordo was active in sports, running on the track team and playing halfback on the high school football team. He also was a member of the Boy Scouts, rising up to Life Scout. His father's love of flying was passed down to Gordo, learning to fly his father's biplane at an early age, soloing at the age of 12, and getting his pilot's license at 16.

Gordo graduated high school in 1945, and enlisted in the U.S. Marine Corps, planning to serve in World War II, but the war ended before he got an assignment. He served with the Presidential Honor Guard until his discharge in 1946.

At this time, Gordo's parents were stationed in Hawaii, so he joined them and began attending the University of Hawaii. As a member of a local flying club, Gordo met Trudy Olsen, who was an active flyer herself. They married August 29, 1947, and would eventually have two daughters.

In college, Gordo was a member of the ROTC, which led to a commission in the U.S. Army in 1949. He had this transferred to the U.S. Air Force. This was the beginning of Gordo's official military pilot training. When his training ended in 1950, Gordo was posted in West Germany. While there, he continued his college education, attending classes through an extension campus of the University of Maryland. After returning to the U.S. in 1954, Gordo attended classes at the U.S. Air Force Institute of Technology (AFIT), completing his Bachelor of Science degree in Aerospace Engineering in 1956. It was at AFIT that Gordo first met Gus Grissom.

After graduation, Gordo and Gus moved on to the the USAF Experimental Flight Test Pilot



School at Edwards Air Force Base in California. When his training was complete, Gordo remained at Edwards as a test pilot and project manager. Over the next two years, Gordo logged over 2000 hours of flight time, the majority of it being in jet aircraft.

In January 1959, Gordo got a new set of orders - report to Washington, D.C. No details were included. His commanding officer had heard about a space capsule being developed, and he warned Gordo to not become an astronaut. February 2 of that year, Gordo attended a briefing about Project Mercury and the role of the first astronauts. Gordo became one of 110 pilots who went through the selection process.

During this process, the candidates were asked about their home life. At the time, Gordo and Trudy were separated, but Gordo lied and said his home life was just fine. He immediately drove out to San Diego to convince Trudy to back up his story. She agreed, and moved back with Gordo to be a part of the big adventure.

On April 9, 1959, NASA introduced America to the Mercury Seven Astronauts, including Gordo Cooper, the youngest of the seven. Each astronaut had a particular area in which they were involved. Cooper was assigned to work on the Redstone rocket, to be used for the first two manned launches. He also was in charge of the committee that worked out the protocols for emergency escape procedures on the launch pad.

Because the astronauts were still active members of the military, which paid their salaries, the astronauts were motivated to fly as often as possible in order to receive their additional flight pay. But NASA didn't provide them with airplanes to fly. When Gordo told this to a reporter, the reporter wrote about it. That article led to Gordo meeting with a Congressman. Eventually the House Committee on Science and Astronautics got involved, leading to the astronauts having access to USAF F-102's to get in their flight time. However, NASA management was not happy with Gordo "going behind their backs" and talking to the press. This would not be the last time Gordo and the NASA brass were at odds.

A marketing campaign by a local Corvette dealer led to the astronauts having the opportunity to lease brand-new Corvettes for a dollar a year. John Glenn was the only one of the astronauts who didn't participate in the deal. The other six were known to race wildly around Cape Canaveral, while the local police looked the other way. Cooper took it a step further, becoming a member of the Sports Car Club of America and NASCAR. Racing speedboats was another of his passions. Anything that moved fast - Gordo was there.

Before Cooper went to space himself, he worked in a variety of capacities. He was capsule communicator (CAPCOM) for Alan Shepard's flight, taking America's first man into space in 1961. Cooper also served as CAPCOM for Scott Carpenter's orbital flight in 1962. In the same year, Cooper served as back-up pilot for Wally Schirra for his orbital flight.

The next, and final, flight of a Mercury capsule would be Cooper's. Though, for a time, it looked like he might be replaced with his back-up, Alan Shepard. First, Cooper got into an argument over changes to the pressure suit with the Deputy Administrator. That was followed by Cooper flying in low over the Cape while lighting his afterburners, startling and infuriating the NASA administrators. According to one report, it was President Kennedy who intervened and prevented Cooper from being replaced.

The goal of the mission was to fly 22 orbits in a spacecraft designed to last for 18 orbits. This was an attempt to get closer to the record set by the Soviet Union of 64 orbits. The spacecraft was originally built for Wally Schirra's flight, but hadn't passed inspection, so was sent back to the factory for repairs before being used for Cooper's flight. Because of all of these potential hurdles, Cooper decided to name the vehicle "Faith 7." NASA dreaded the potential headlines about "losing Faith" if anything were to go wrong.

On May 15, 1963, Gordo Cooper became the sixth American to enter space. His flight lasted for 34 hours 19 minutes, over 24 hours longer than any of the previous Mercury flights. This gave him the opportunity to be the first American to sleep in space. Though not part of the plan, he was also the first to sleep on the launch pad during countdown!

Because the spacecraft was being pushed well beyond its design limits, it's not surprising that Cooper encountered several problems during his flight: a power failure, rising carbon dioxide levels, temperatures in the cabin reaching over 130 °F, and failing clocks and gyroscopes. In the end, about all that did work was the radio and the manual controls. Despite being designed to have all components of the flight taken care of automatically, Gordo instead had to bring the capsule down completely manually. This was why pilots were needed in the first place. As Cooper later wrote in his autobiography, "My electronics were shot and a pilot had the stick." Using navigation by stars, lines drawn on the capsule window for reference points, and his wrist watch, Cooper not only brought the capsule down safely, but also managed to land within a mere four miles of the aircraft carrier that was waiting to retrieve him.

With the end of Project Mercury, Cooper remained at NASA to be part of the next era - Project Gemini. Cooper flew on Gemini 5 with one of the new rookies, Pete Conrad. This would be the first mission to not have a name for the capsule, which Cooper and Conrad were planning to name "Lady Bird" after the First Lady. However, NASA decided to "depersonalize" the space program. So, instead, it's the first mission to have a special mission patch. Cooper and Conrad incorporated into the patch design their names, a covered wagon, and a slogan of "8 Days or Bust," a reference to the 8-day mission that was planned.

On August 21, 1965, Cooper and Conrad launched into space. Due to some problems with a fuel cell, the astronauts had to contend with a cold capsule. Some of the maneuvering thrusters were also not working properly. The original plan was to rendezvous with an Agena target vehicle, but due to problems with the Agena, this goal was postponed to another mission. Instead, Cooper used the flight to test out the maneuvering procedures, even if there was no rocket with which to align. He proved that the capsule could be maneuvered to a predetermined location in space. Almost all other on-board experiments, mostly related to photography from orbit, were performed successfully, as well. With the appearance of Hurricane Betsy in the planned recovery area, the mission was cut short by a few orbits, just shy of the eight day goal. While Gus Grissom was the first American to go to space twice, only one of his flights was orbital, so this Gemini mission made Gordo Cooper the first American to twice go into orbit.

After the Gemini missions ended, Cooper remained with NASA for Project Apollo. His first assignment was as backup Commander for Apollo 10. If the rotation stayed on track, this would put him in line for Commander of Apollo 13. However, when Alan Shepard, who had been grounded for years due to an inner ear problem, was returned to active flight status, he

was named to command that mission. That crew was eventually delayed to Apollo 14 to allow Shepard more time to train. Seeing his chances of flying an Apollo mission becoming less likely, Gordo Cooper retired from NASA and the U.S. Air Force on July 31, 1970, with 222 hours of time in space.

Not long after leaving NASA, Gordo and Trudy divorced. In 1972, Gordo married Suzan Taylor, who was a school teacher. They would eventually have two daughters.

Over the following years, Cooper worked for a variety of corporations, many of them related to flying, sports cars, and speed boats. From 1973 to 1975, Cooper worked as vice president of research and development for the EPCOT Center at Walt Disney World.

In 1983, the film “The Right Stuff,” about the Mercury astronauts, was made. Before being cast for the role portraying Cooper, Dennis Quaid met with him to learn his mannerisms, and even had his hair cut and dyed to match how Gordo’s looked during the 1950’s and 60’s. He got the role. Cooper assisted in the making of the film, and many of his memories of events were used in the dialogue.

One of Cooper’s more controversial legacies is his insistence that he had seen UFO’s at various times (though not in space) and that the U.S. government was involved in a large conspiracy to cover up all reports of UFO sightings.

On October 4, 2004, Leroy Gordon Cooper passed away at his home in Ventura, California due to heart failure. He was 77 years old. Fellow Mercury astronaut, John Glenn, remembered him with, “Gordo was one of the most straightforward people I have ever known. What you saw was what you got.” In 2007, some of his ashes were flown on a private sub-orbital flight. Another sampling of his ashes were flown on the SpaceX COTS Demo Flight 2 on May 22, 2012, which was an unmanned mission to the International Space Station. A month later, the capsule burned up, according to plan, as it reentered Earth’s atmosphere.

Gordo Cooper was a remarkable, though far from perfect, man. Reckless and daring, unafraid to offend and speak his mind, Gordo always remained true to who he was. He was a pilot, astronaut, businessman, husband, father, and believer in UFO’s. And throughout his life, he always had the right stuff.

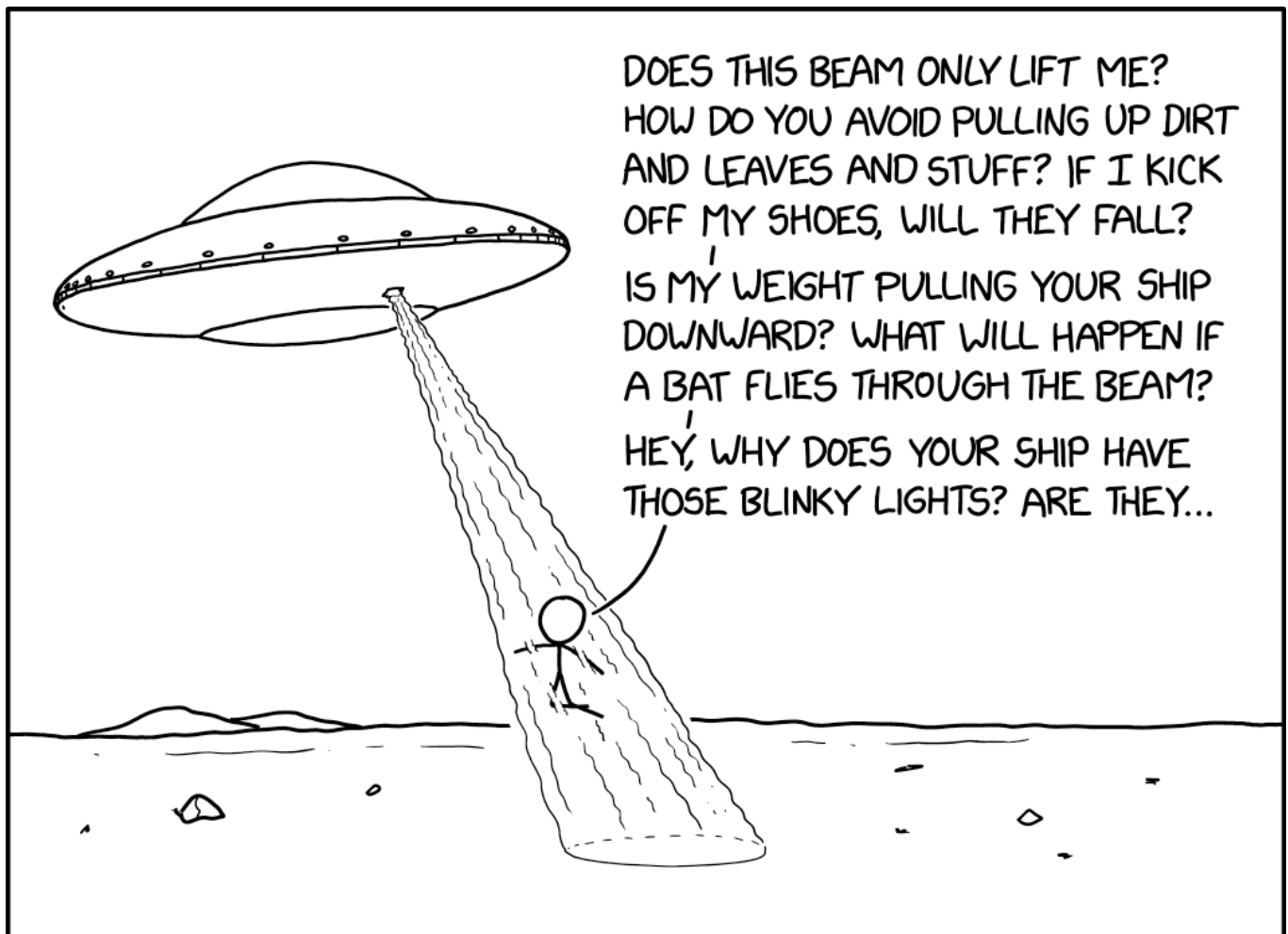
References:

[Gordon Cooper - Wikipedia](#)

[Remembering ‘Gordo’ by Amiko Nevills NASA Johnson Space Center, October 6, 2004](#)

[2060 Minutes: Gordo Cooper and the Last American Solo Flight in Space by Megan Garber, The Atlantic, May 17, 2013](#)

xkcd



MOMENTS LATER, THE ALIENS SET ME BACK DOWN AND LEFT.

Embracing the Equinox

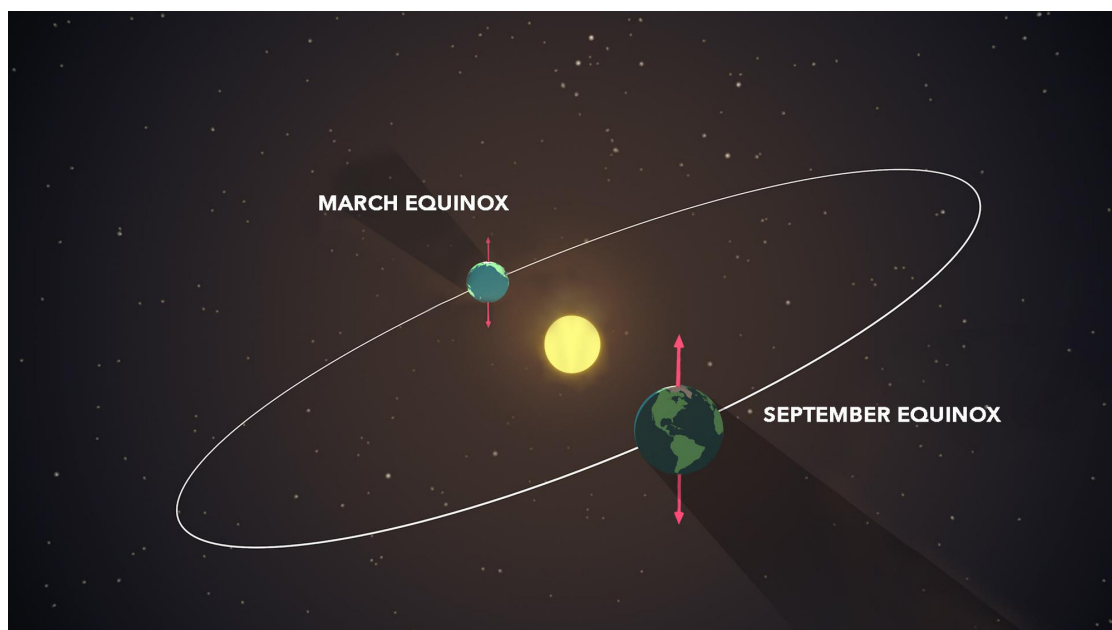
By David Prosper

Depending on your locale, equinoxes can be seen as harbingers of longer nights and gloomy weather, or promising beacons of nicer temperatures and more sunlight. Observing and predicting equinoxes is one of the earliest skills in humanity's astronomical toolkit. Many ancient observatories around the world observed equinoxes along with the more pronounced solstices. These days, you don't need your own observatory to know when an equinox occurs, since you'll see it marked on your calendar twice a year! The word "equinox" originates from Latin, and translates to equal (equi-) night (-nox). But what exactly is an equinox?

An equinox occurs twice every year, in March and September. In 2022, the equinoxes will occur on March 20, at exactly 15:33 UTC (or 11:33 am EDT), and again on September 23, at 01:04 UTC (or September 22 at 9:04 pm EDT). The equinox

marks the exact moment when the center of the Sun crosses the plane of our planet's equator. The day of an equinox, observers at the equator will see the Sun directly overhead at noon. After the March equinox, observers anywhere on Earth will see the Sun's path in the sky continue its movement further north every day until the June solstice, after which it begins traveling south. The Sun crosses the equatorial plane again during the September equinox, and continues traveling south until the December solstice, when it heads back north once again. This movement is why some refer to the March equinox as the northward equinox, and the September equinox as the southward equinox.

Our Sun shines equally on both the Northern and Southern Hemispheres during equinoxes, which is why they are the only times of the year when the Earth's North and South Poles are simultaneously lit by sunlight. Notably, the length of day and night on the equinox aren't precisely equal; the date for that split depends on your latitude, and may occur a few days earlier or later than the equinox itself. The

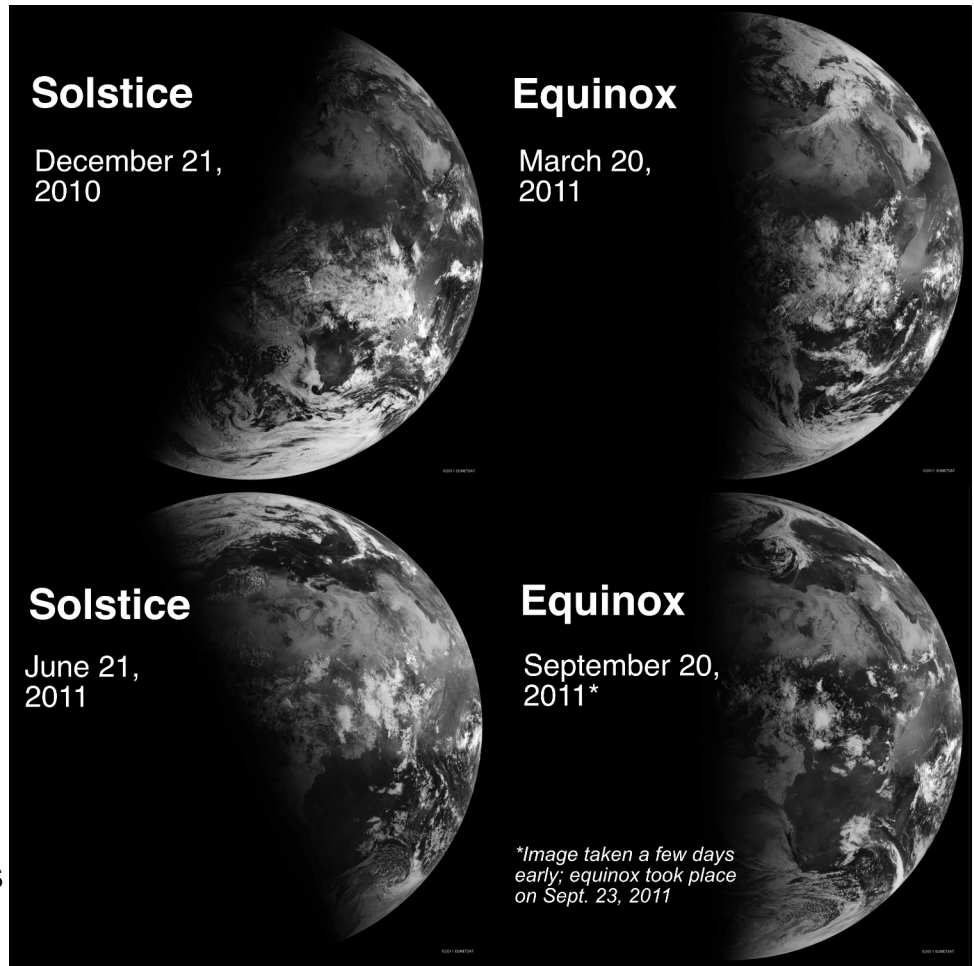


This (not to scale) image shows how our planet receives equal amounts of sunlight during equinoxes.

Credit: NASA/GSFC/Genna Duberstein

complicating factors? Our Sun and atmosphere! The Sun itself is a sphere and not a point light source, so its edge is refracted by our atmosphere as it rises and sets, which adds several minutes of light to every day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a perfect split of day and night on the equinox - but it's very close.

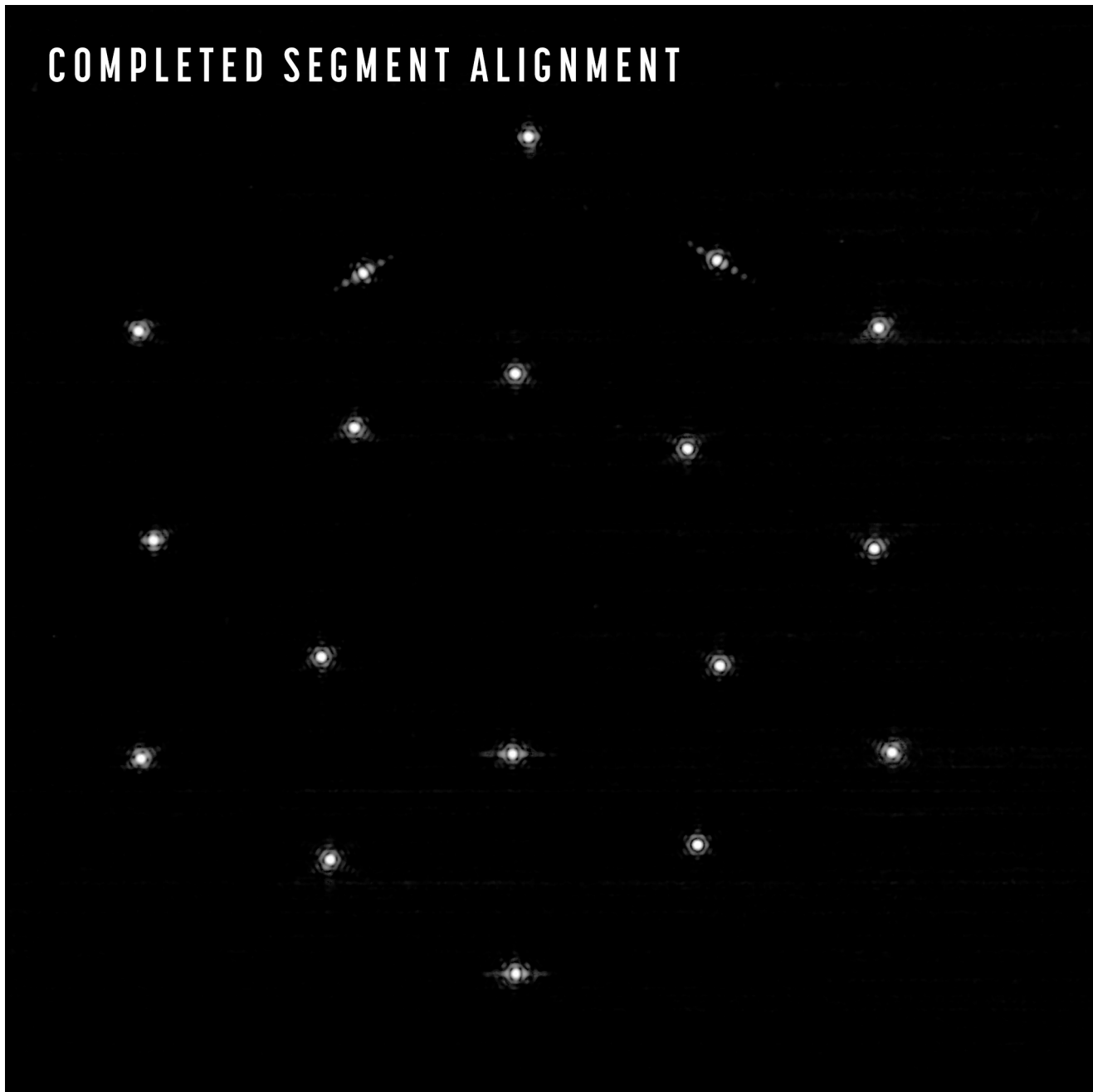
Equinoxes are associated with the changing seasons. In March, Northern Hemisphere observers welcome the longer, warmer days heralded by their vernal, or spring, equinox, but Southern Hemisphere observers note the shorter days - and longer, cooler nights - signaled by their autumnal, or fall, equinox. Come September, the reverse is true. Discover the reasons for the seasons, and much more, with NASA at nasa.gov.



Scenes of Earth from orbit from season to season, as viewed by EUMETSAT. Notice how the terminator - the line between day and night - touches both the North and South Poles in the equinox images. See how the shadow is lopsided for each solstice, too: sunlight pours over the Northern Hemisphere for the June solstice, while the sunlight dramatically favors the Southern Hemisphere for the December solstice.

Source: bit.ly/earthequinox Images: NASA/Robert Simmon

This article is distributed by NASA Night Sky Network. The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more! You can catch up on all of NASA's current and future missions at nasa.gov. With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



This hexagonal image array captured by the NIRCcam instrument shows the progress made during the Segment Alignment phase, further aligning JWST's 18 primary mirror segments and secondary mirror using precise movements commanded from the ground. Credit: [NASA/STScI](#)

Barnard-Seyfert Astronomical Society Minutes of a Regular Meeting of the Board of Directors Held On Wednesday, February 2, 2022

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held February 2, 2022, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Chip Crossman, Tony Drinkwine, Oz Gonzalez, Bud Hamblen, Andy Reeves, Kathy Underwood and Theo Wellington. An on-line quorum being present, Tom called the meeting to order at 7:30 PM.

Tom asked for a motion to adopt the minutes of the board meeting on January 5, 2022, as printed in the February, 2022, issue of the Eclipse and the minutes were adopted unanimously.

Treasurer's Report: The Suntrust bank balance was \$12,239.51 (\$4,578.07 in the equipment fund, \$7,661.44 in the general fund). The PayPal account balance was \$288.49. The annual insurance premium was \$355.52.

Social Media Report: The Facebook page was liked by 1,985 and followed by 2119. Twitter had 289 followers.

Outreach and star parties: The Middle Tennessee Science and Engineering Fair is March 25 – 26 at Belmont University. The club was asked if we want to sponsor an award this year.

Resolution 2022-2-2: Theo made motion to once again sponsor awards for astronomy projects in the MTSEF, with \$100 plus membership for first, \$50 plus membership for second place. Kat seconded, and the resolution was approved unanimously.

Equipment Report: Tom is going to follow up on people who haven't gotten back to him.

Upcoming programs: The February program will be a "What's Up" presented by Theo. Theo will ask Memphis club to do a presentation on their Stellina smart telescope. June would be a good time for a presentation on the Webb, Osvaldo will look into this.

Other business: On filling board positions, we still need a VP. Maybe one other person? Osvaldo has a friend who is interested in doing the webpage. What about the newsletter? Tom wants to know who our contact is at Mill Ridge Park to go over some of the member concerns. Sharing canned presentation for cloudy nights, need a place to post. Theo has one from Shelby Bottoms. Contact Ron Ladd to make sure Messier Marathon would be ok. Looking also at Cane Ridge park. Need to make sure the Natchez Trace permit gets posted on the BSAS group so that everyone has a copy, Tom will get with Keith on that.

There being no further business, the meeting adjourned at 8:30 PM.

Respectfully submitted,

Bud Hamblen
Secretary

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, February 16, 2022**

Because monthly in-person meetings are suspended due to the COVID-19 epidemic, the Barnard-Seyfert Astronomical Society held an on-line meeting via Zoom on Wednesday, February 16, 2022, Tom Beckermann presiding. 20 participants zoomed in.

Tom called the meeting to order at 7:30 PM. There being no discussion of the minutes, the minutes were adopted by acclamation.

Treasurer's report: Theo Wellington reported the SunTrust bank balance to be \$12,239.51 (\$4,578.07 in the equipment fund and \$7,661.44 in the general fund). The PayPal balance was \$421.16. The club has paid the liability insurance premium of \$355.52. We have received some more payments for RASC Observer's Handbooks.

Social media report: Theo reported that the Facebook page was liked by 1990 and followed by 2124. Twitter had 290 followers.

Star parties: The public star party on Saturday, February 5, from 6 to 8 PM at the Edwin Warner Park Special Events Field, was attended by about 50 guests, despite the cold weather. There were 7 telescopes set up. A private star party is scheduled for Saturday, February 26 at the Natchez Trace Water Valley Overlook (Mile Marker 412). A public star party at the Bells Bend Nature Center is scheduled for Saturday, March 12, from 7 to 9 PM.

The club is offering awards for astronomy based projects at the Middle Tennessee Engineering and Science Fair, Judging is on March 25 from 6:30 to 8:00 PM and the public viewing is on March 26 from 9:00 AM to 12:00 PM, at Belmont University, Jane Ayers Academic Center, 4th floor. If you would like to help judge projects for the BSAS awards, please contact the BSAS board. The first prize award is \$100 plus one year membership in the BSAS and the second prize award is \$50 plus one year membership in the BSAS.

Unfortunately, the meeting was zoom-bombed about 20 minutes in and had to be terminated. Tom sent a new meeting link to persons on the mailing list and restarted the meeting.

After the meeting was restarted, Theo continued to present "What's Up" in the winter sky using the free, open source program Stellarium for computers (<https://stellarium.org>) and tablets or smartphones (see your device's app store), and the Orion MoonMap 260 (<https://www.telescope.com/Orion-MoonMap-260/p/102819.uts>).

Oswaldo Gonzalez mentioned that an application had been made to NASA to cohost a James Webb Space Telescope community event at a date in July, when the telescope becomes operational.

There being no further business, the meeting was adjourned at about 9 PM.
Respectfully submitted,

Bud Hamblen
Secretary



In honor of the club's 90th anniversary we partnered with Hatch Show Print to create a unique poster that would honor the achievement of the club. For those who don't know Hatch Show has been making posters for a variety of events and concerts for 140 years. In all that time we are their first astronomy club.

On the poster at the center is the moon. This was made from a wood grained stencil that the shop has used for over 50 years. To contrast that the telescope that the people are using is a brand new stencil made for our poster. The poster has three colors. First the pale yellow color of the moon was applied. Next the small stars, circles, and figures at the bottom were colored in metallic gold. The third color is

a blue for the night sky. Where it overlaps with the metallic gold it creates a darker blue leaving the figures at the bottom looking like silhouettes. This was a one time printing so the 100 that we have are all that will be printed.

The prints are approximately 13 3/4" x 22 1/4" and are available for \$20 at our membership meetings, or \$25 with shipping by ordering through bsasnashville.com. Frame not included.



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.

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.