The ECLIPSE

July 2021

The Newsletter of the Barnard-Seyfert Astronomical Society

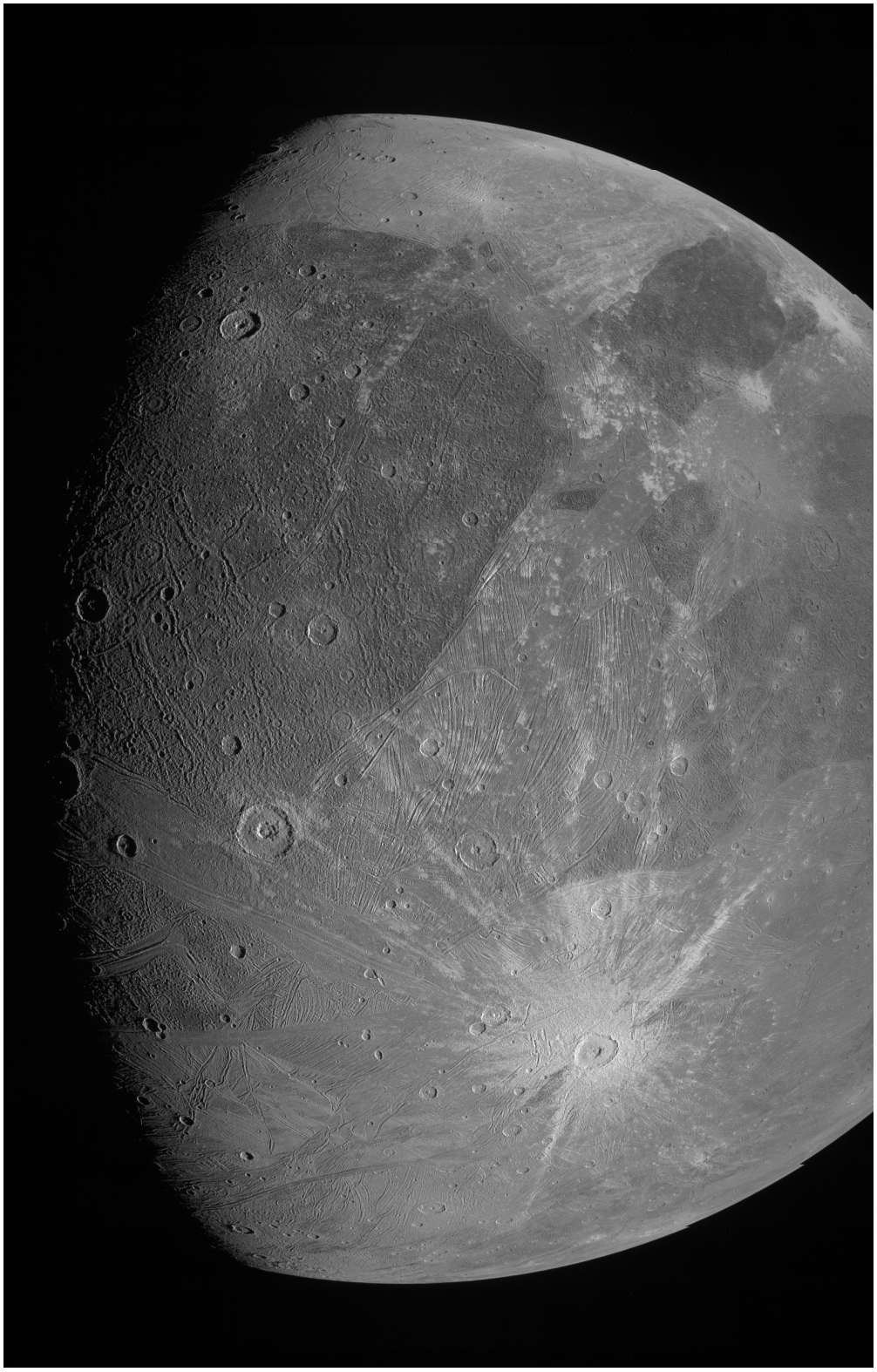
Next Membership Meeting:

July 21, 7:30 pm
Online meeting

Link will be posted on
bsasnashville.com

Topic TBD

In this Issue:



BSAS
Barnard-Seyfert Astronomical Society
BSASNashville.com

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Barnard-Seyfert Astronomical Society

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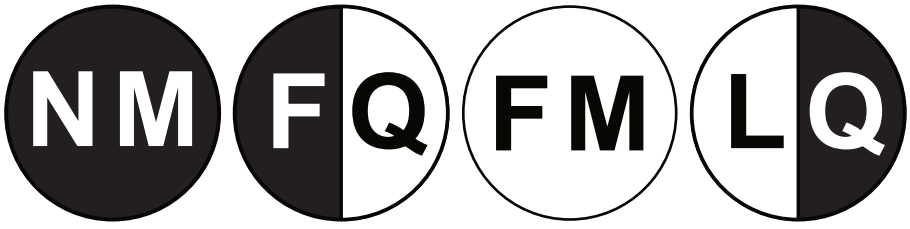
The magnificent spiral galaxy NGC 2276 looks a bit lopsided in this Hubble Space Telescope snapshot. A bright hub of older yellowish stars normally lies directly in the center of most spiral galaxies. But the bulge in NGC 2276 looks offset to the upper left.

In reality, a neighboring galaxy to the right of NGC 2276 (NGC 2300, not seen here) is gravitationally tugging on its disk of blue stars, pulling the stars on one side of the galaxy outward to distort the galaxy's normal fried-egg appearance.

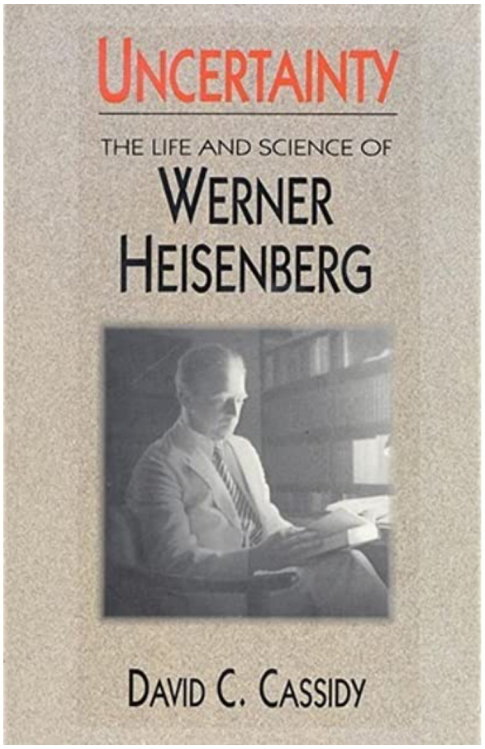
This sort of "tug of war" between galaxies that pass close enough to feel each other's gravitational pull is not uncommon in the universe. But, like snowflakes, no two close encounters look exactly alike.

IMAGE: NASA, ESA, STScI, Paul Sell (University of Florida)
ACKNOWLEDGMENT: Leo Shatz



July 9	July 17	July 23	July 1, 31
Aug 8	Aug 15	Aug 22	Aug 30

Book Review: Uncertainty
Reviewed By Robin Byrne



In choosing another title from my shelf of unread books, I found myself drawn to Uncertainty: The Life and Science of Werner Heisenberg written by David C. Cassidy. I was a little intimidated by the size of the book (669 pages, including notes and index), but it was calling to me, so I persevered. I'm glad I did.

The book covers, as the title indicates, the life and work of Heisenberg. Heisenberg lived from 1901 to 1976, spending most of his life in his native Germany. That means that he was in Germany during both World Wars. In addition to alluding to Heisenberg's contributions to quantum physics, the book's title of "Uncertainty" also refers to trying to understand Heisenberg's attitudes related to Germany's role in both wars, but especially the Nazi regime. My impression from the book is that Heisenberg had tremendous national pride and love of his country, compelling him to stay in Germany, even when many of his colleagues fled prior to World War II.

Heisenberg's attitude toward the Nazis is murkier, and I'm not sure how objective the author was in presenting this part of his life. Heisenberg never joined the Nazi party, believing that academics and politics don't mix. But at the same time, he also made a point of referencing Albert Einstein by name in lectures and publications, in defiance of policies that attempted to erase Einstein from the picture, and signed on to a petition condemning policies that were driving away prominent physicists. Within the physics community of Germany during the Nazi era, the most ardent supporters of Naziism were those who studied more traditional areas of physics, and they referred to relativity and quantum physics with the derogative phrase "Jewish Physics." They even dubbed Heisenberg, and others, as "White Jews" for their work in quantum physics, an accusation that could have been sufficient to send Heisenberg to a concentration camp. So, from this angle, Heisenberg appears clearly opposed to Nazis.

But the picture isn't crystal clear. We also see that he sought recognition and assistance from Heinrich Himmler to help secure his position at a university, participated in propaganda tours to occupied countries to give public presentations on German contributions to physics, and gave only half-hearted assistance to colleagues trying to rescue family members from concentration camps. After the war, Heisenberg and some of his colleagues were in the custody of the British. While there, they crafted a statement that claimed they deliberately didn't pursue building an atomic bomb to keep one out of the hands of the Nazis. This seems top be an

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Uncertainty, continued

exaggeration. They were certainly pursuing a way to harness nuclear power, and they knew they could use the same concepts to build a bomb. But to say that they deliberately didn't build a bomb seems untrue. By the end of the war, they had not even created a self-sustaining chain reaction, yet alone the ability to build a bomb. My personal conclusion is that Heisenberg was more interested in protecting his own reputation and career than in worrying about the atrocities perpetrated by the Nazis. He loved his country, he was proud of the accomplishments of German physicists, and felt it was his duty to protect the reputation and future of the physics community in Germany. In his writings, Heisenberg talked about the small circle of his life during the war; he didn't think beyond what directly impacted his life at that time. On the other hand, to his credit, Heisenberg was one of several prominent German scientists who helped convince the West German government in 1957 to not develop nuclear weapons.

The story of Heisenberg's personal life, especially during that time, is fascinating to read. The parts of the book covering his discoveries in physics was more of a challenge. It is not clear what the target audience was in the author's mind, because the level of the presented material ranges from feeling the need to explain what integers are, to presenting Hamiltonian functions in modern relativistic form. And if you have no idea what the last part of the previous sentence even meant, you are not alone. Much of the physics discussed in the book was presented as though the reader had taken more than one class in quantum physics and already was familiar with the material. Having not taken quantum physics, I recognized vaguely some of the ideas, but was lost by the details. So reading those sections of the book, I let it wash over me, without worrying too much about the details. Debates between S-matrix versus quantum field theory meant absolutely nothing to me, but the fact that there was a debate of how to approach modeling the behavior at the atomic level was interesting.

If you enjoy the history of science and learning about the lives of scientists, Uncertainty by David C. Cassidy is not an especially easy read, but it is worth the effort.

Uncertainty: The Life and Science of Werner Heisenberg by David C. Cassidy; W. H. Freeman and Company, 1992

Observe the Milky Way and Great Rift
By David Prosper

Summer skies bring glorious views of our own Milky Way galaxy to observers blessed with dark skies. For many city dwellers, their first sight of the Milky Way comes during trips to rural areas - so if you are traveling away from city lights, do yourself a favor and look up!

The Great Rift is shown in more detail in this photo of a portion of the Milky Way along with the bright stars of the Summer Triangle. You can see why it is also called the "Dark Rift." Credit: NASA / A.Fujii

To observe the Milky Way, you need clear, dark skies, and enough time to adapt your eyes to the dark. Photos of the Milky Way are breathtaking, but they usually show far more detail and color than the human eye can see – that's the beauty and quietly deceptive nature of long exposure photography. For Northern Hemisphere observers, the most prominent portion of the Milky Way rises in the southeast as marked by the constellations Scorpius and Sagittarius. Take note that, even in dark skies, the Milky Way isn't easily visible until it rises a bit above the horizon and the thick, turbulent air which obscures the view. The Milky Way is huge, but is also rather faint, and our eyes need time to truly adjust to the dark and see it in any detail. Try not to check your phone while you wait, as its light will reset your night vision. It's best to attempt to view the Milky Way when the Moon is at a new or crescent phase; you don't want the Moon's brilliant light washing out any potential views, especially since a full Moon is up all night.

Keeping your eyes dark adapted is especially important if you want to not only see the haze of the Milky Way, but also the dark lane cutting into that haze, stretching from the Summer Triangle to Sagittarius. This dark detail is known as the Great Rift, and is seen more readily in very dark skies, especially dark, dry skies found in high desert regions. What exactly is the Great Rift? You are looking at massive clouds of galactic dust lying between Earth and the interior of the Milky Way. Other "dark nebulae" of cosmic clouds pepper the Milky Way, including the famed Coalsack, found in the Southern Hemisphere constellation of Crux. Many cultures celebrate these dark clouds in their traditional stories along with the constellations and Milky Way.

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Where exactly is our solar system within the Milky Way? Is there a way to get a sense of scale? The “Our Place in Our Galaxy” activity can help you do just that, with only birdseed, a coin, and your imagination: bit.ly/galaxyplace. You can also discover the amazing science NASA is doing to understand our galaxy – and our place in it - at nasa.gov.

If the Milky Way was shrunk down to the size of North America, our entire Solar System would be about the size of a quarter. At that scale, the North Star, Polaris - which is about 433 light years distant from us - would be 11 miles away! Find more ways to visualize these immense sizes with the Our Place in Our Galaxy activity: bit.ly/galaxyplace

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!

Next BSAS Membership Meeting:

Wednesday, July 21, 7:30 pm Central
online on Zoom

Zoom link will be posted to bsasnashville.com

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, June 9, 2021

Present: Theo Wellington, Keith Rainey, Tom Beckerman, Tony Drinkwine, Andy Reeves

Tony moved to approve last months minutes and Tom seconded, approved.

Keith trying to get to Lonnie, if not then Theo will do the program in June. Would be nice to have someone speak on Juno

Keith looking to contact ASC to see when they might resume.

Question about mask wearing there. Looks like not required.

What about live star parties? *Let's ask Shelby and Warner."

Publicize the private star parties on the trace in the club.

The treasurer's report was presented. The club has $11,919.85 in the bank balance and $172.65 in Paypal.

We have 2064 followers on Facebook and 273 on Twitter.

Membership: 192 Members

People continue to join!

We need a speaker for July as well.

There being no other business, the meeting was adjourned.

Respectfully submitted,

Theo Wellington

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, June 16, 2021

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, June 16, 2021. 21 participants zoomed in.

Keith Rainey called the meeting to order at about 7:30 PM and asked for a vote to adopt the minutes for the April 21, 2021, meeting. Theo Wellington made the motion, KC Katalbas seconded and the minutes were adopted by voice vote. Theo Wellington reported that the SunTrust balance was $12,104.85. The PayPal balance was $7.56.

Theo reported on social media. The March 13 Virtual Star Party had 472 views. The April 17 Virtual Star Party had 403 views. The club's Facebook page has 1361 likes and is followed by 1833.

Keith reported about 192 members.

Theo presented a history of unmanned spaceflight, "Launch to Explore".

The being no further business, the meeting was adjourned at 8:30 PM.
Respectfully submitted,

Bud Hamblen
Secretary

June 5, 2021 – The SpaceX Cargo Dragon vehicle, on the SpaceX CRS-22 mission, approaches the International Space Station 265 miles above the Atlantic Ocean off the coast of Namibia on the African continent.

Photographer: Thomas Pesquet

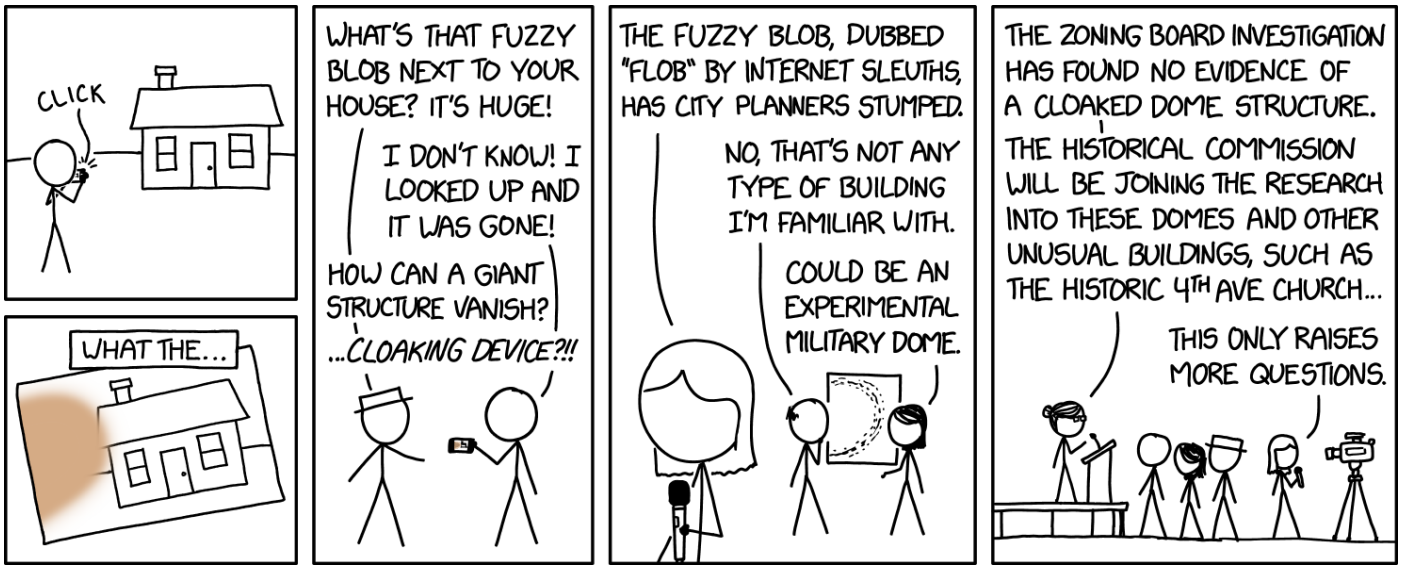
On the Cover: This image of the Jovian moon Ganymede was obtained by the JunoCam imager aboard NASA's Juno spacecraft during its June 7, 2021, flyby of the icy moon. At the time of closest approach, Juno was within 645 miles (1,038 kilometers) of its surface – closer to Jupiter's largest moon than any other spacecraft has come in more than two decades.

This image is a preliminary product – Ganymede as seen through JunoCam's green filter. Juno is a spin-stabilized spacecraft (with a rotation rate of 2 rpm), and the JunoCam imager has a fixed field of view. To obtain Ganymede images as Juno rotated, the camera acquired a strip at a time as the target passed through its field of view. These image strips were captured separately through the red, green, and blue filters. To generate the final image product, the strips must be stitched together and colors aligned.

At the time this preliminary image was generated, the "spice kernels" (navigation and other ancillary information providing precision observation geometry) necessary to properly map-project the imagery were not available. The red, and blue filtered image strips were also not available. When the final spice kernel data and images from the two filters are incorporated, the images seams (most prevalent on lower right of sphere) will disappear and a complete color image will be generated.

Credit: NASA/JPL-Caltech/SwRI/MSSS

xkcd



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.

Barnard-Seyfert Astronomical Society

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.