The ECLIPSE

October 2020

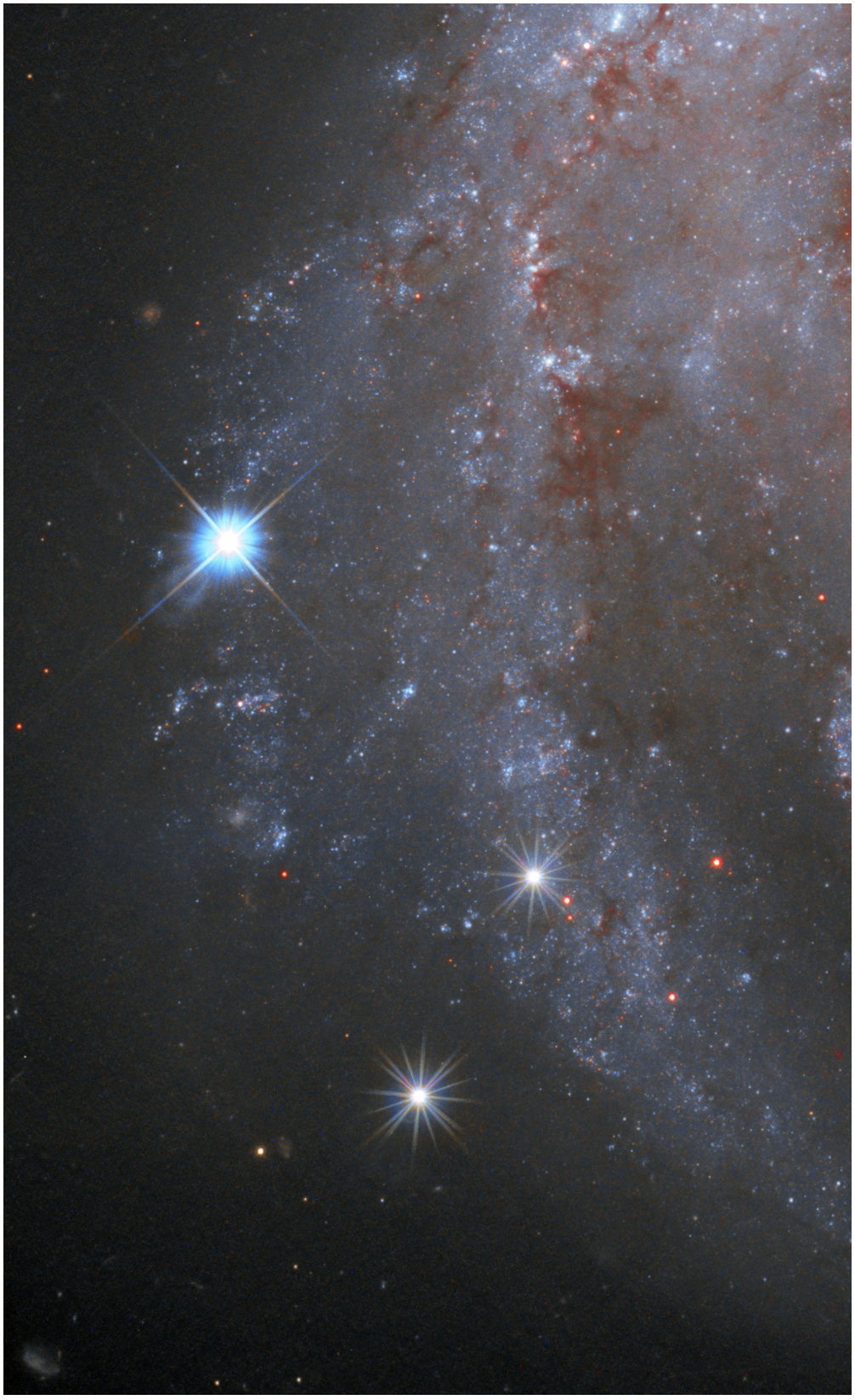
The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

October 23, 7:30 pm
Online meeting:

Topic: "What's Up?"

In this Issue:



BSAS
Barnard-Seyfert Astronomical Society
BSASNashville.com

BSAS
Barnard-Seyfert Astronomical Society

Officers

Keith Rainey
President
Keith.Rainey@gmail.com

Tom Beckermann
Vice President
tmbeckermann@gmail.com

Bud Hamblen
Secretary
wrhamblen@comcast.net

Theo Wellington
Treasurer
tmwellington@comcast.net

Gary Eaton
Ex-officio
gceaton@comcast.net

Directors at Large

Chip Crossman
chipcrossman@gmail.com

Thomas Gaudin
thomas.gaudin73@gmail.com

Drew Gilmore
eclipse@bsasnashville.com

K.C. Katalbas
hazeykc@gmail.com

Andy Reeves
reevesaf@gmail.com

Kathy Underwood
katy2222@comcast.net

Letter from the President

I must confess that I am sitting here with writer's block wondering what I can write about this month. I have been pretty busy with work so I haven't even been able to enjoy some of the clear nights we have been seeing. Have you been able to get out and enjoy some of the views? Mars is nearing opposition and is showing some spectacular views according to the pictures I have seen. Jupiter and Saturn have passed their oppositions but continue their slow but steady movement toward their close conjunction this December. They are still providing wonderful views though so hopefully we all get to go out and look when the opportunity arises.

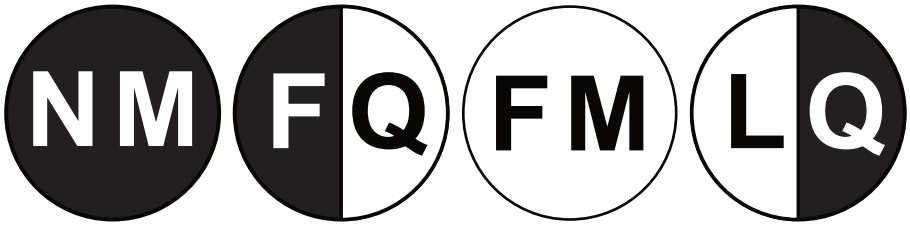
That's it for this month. Keep staying safe out there and keep looking up!

Clear skies,

Keith Rainey

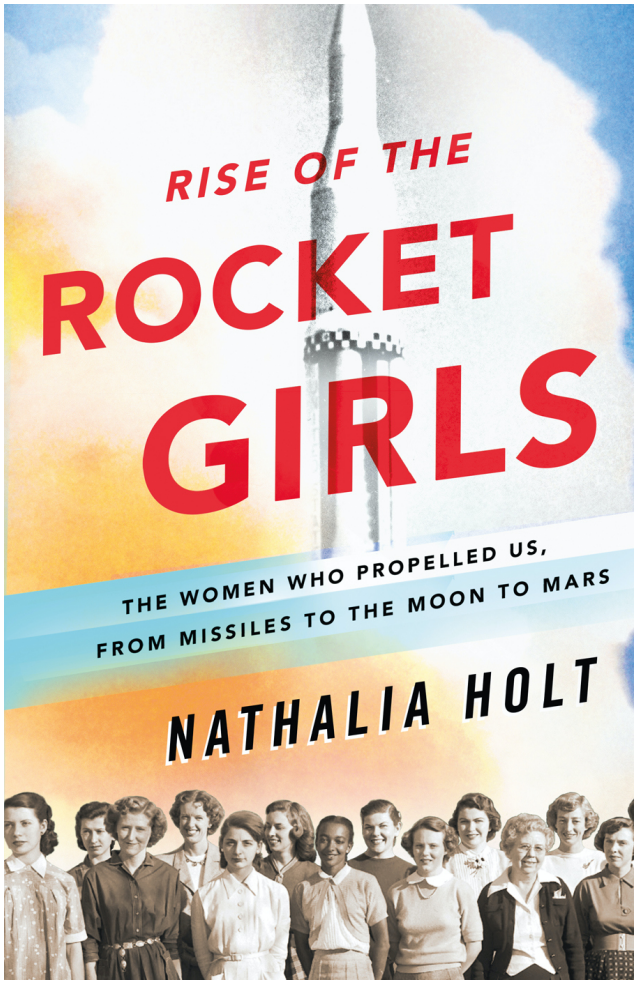
On the Cover: Astronomers using NASA's Hubble Space Telescope captured the quick, fading celebrity status of a supernova, the self-detonation of a star. The Hubble snapshots have been assembled into a telling movie of the titanic stellar blast disappearing into oblivion in the spiral galaxy NGC 2525, located 70 million light-years away.

Hubble began observing SN 2018gv in February 2018, after the supernova was first detected by amateur astronomer Koichi Itagaki a few weeks earlier in mid-January. Hubble astronomers were using the supernova as part of a program to precisely measure the expansion rate of the universe—a key value in understanding the physical underpinnings of the cosmos. The supernova serves as a milepost maker to measure galaxy distances, a fundamental value needed for measuring the expansion of space. Credit: NASA, ESA, and A. Riess (STScI/JHU) and the SH0ES team. Acknowledgment: M. Zamani (ESA/Hubble)



Oct 16 Nov 14 | Oct 23 Nov 21 | Oct 1, 31 Nov 30 | Oct 9 Nov 8

Book Review: Rise of the Rocket Girls
Reviewed by Robin Byrne



If you know anything about Annie Cannon and Henrietta Leavitt, you are aware of the women who worked as "computers" at the Harvard Observatory. The book and film "Hidden Figures" shone a spotlight on the women "computers" working at NASA. However, women working as "computers" occurred at other locations, too. "Rise of the Rocket Girls: The Women Who Propelled Us, From Missiles to the Moon to Mars" by Nathalia Holt brings to light the women computers working at the Jet Propulsion Laboratory (JPL). Their stories are equally fascinating.

The tale begins in the late 1930's, before JPL even existed, with a small group of men at the California Institute of Technology, who were notorious for blowing things up with their rocket experiments. They called themselves the Suicide Squad. With a grant from the National Academy of Sciences, they formally became an institution devoted to researching jet propulsion of airplanes. They found a location outside of Pasadena to more safely perform their experiments. What they needed was someone to help with all of the computations. As luck would have it, one of the men's wives excelled at mathematical computations. Barby Canright became the first of many women to work for JPL.

With America's entry into World War II, a successful jet airplane became of utmost importance. When JPL finally had a successful flight, they were guaranteed a regular income with the U.S. government. That meant hiring more people. The computer staff grew to four women and one man. One of the women, Macie Roberts, would ultimately become the head of the computer department. She was single-handedly responsible for turning the department into an all-female group. From the earliest days of the computers, the women became a close-knit group. Macie realized that for the benefit of their working relationships, it was better to hire only women. This was the start of a many decades long tradition.

The book is broken into each decade in the history of JPL, with each era focusing on several women who made contributions along the way. Some of the women only stayed at JPL for a short time, while others, like Roberts, would stay for decades.

Continued on next page

Book Review, continued

These were women who defied gender expectations. Almost all of them were married, but still pursued a career. Most managed to have children and continue working, with the help of husbands who worked alternate hours or family members providing childcare. None of this was typical for the 1950's or 1960's by any means. Not too surprisingly, we also see some marriages fall apart due to the strain of this lifestyle. What is consistent throughout are the deep friendships built up between the women and their dedication to their work. Being outsiders from the rest of society, they found a place to belong with this group of like-minded colleagues.

In the 1960's we start to see a shift of the job duties of the women with the introduction of electronic computers. Suddenly the women were not solely performing computations by hand, but also programming their mechanical counterparts to do some of the work. Taking classes at Cal Tech to learn the newest programming languages became typical for the women of JPL. The computers were transitioning into programmers. At the same time, some of the women moved up in ranks to positions side-by-side with male engineers. Despite not necessarily having official degrees in engineering, the women were considered the men's equals in their skills. It wouldn't be long before women started arriving at JPL with engineering degrees, too.

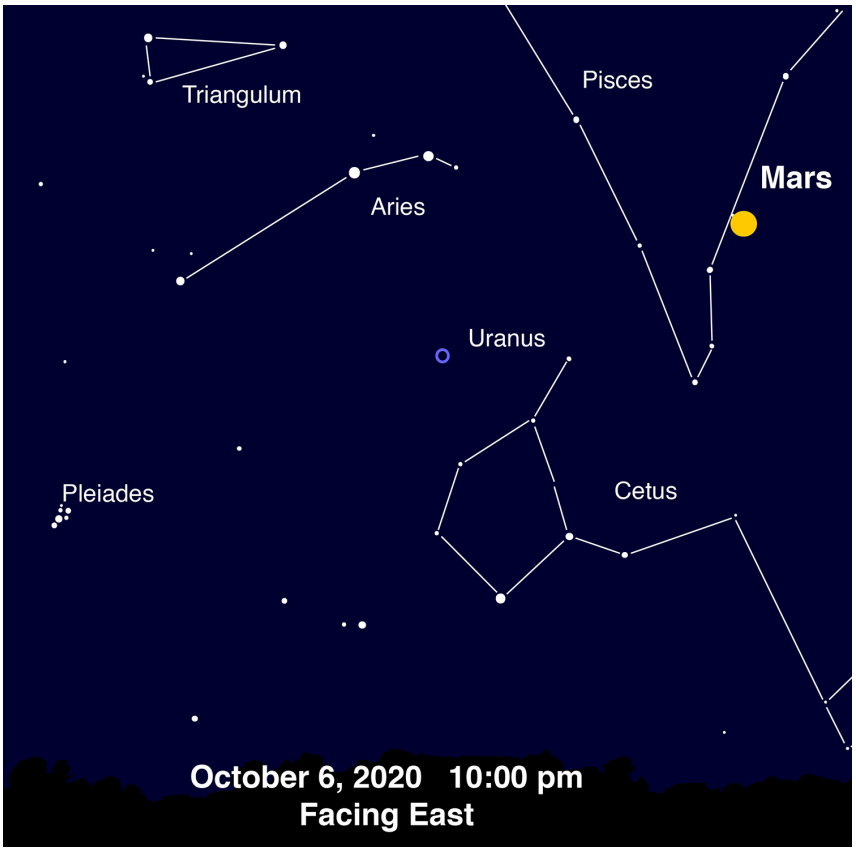
Throughout the time span covered, we see JPL's early years creating jets for airplanes, to building rockets, until finally settling into the role we think of today - spacecraft built to explore the solar system. What is not as well known is the role of JPL, and the women computers in particular, in the development of the Deep Space Network. It's all well and good to send a spacecraft to another planet, and, yes, calculating the path it will take was no mean feat - so it's a good thing the women were up to that task, but if you can't communicate with the spacecraft, there's not much point in sending it anywhere. It was up to some of the women to work out the entire communication network, as well as make sure that they could always contact the spacecraft, no matter where it was in space. That meant having stations around the globe, so all directions were along at least one antenna's line of sight. But it also meant that as a spacecraft travels around a planet or moon, being able to maintain communications as much as possible, with no obstruction from the celestial body, is equally important. It's the attention to this kind of detail that helped JPL have so many successful missions.

"Rise of the Rocket Girls" by Nathalia Holt is an engrossing tale, sharing a story that's not well known, and written in a style that makes it tough to put down. You'll find yourself wanting to know more about these remarkable women.

References: Rise of the Rocket Girls: The Women Who Propelled Us, From Missiles to the Moon to Mars by Nathalia Holt, Hatchett Book Group, 2016

Observe the Skies Near Mars
by David Prosper

October is a banner month for Mars observers! October 6 marks the day Mars and Earth are at closest approach, a once-every-26-months event. A week later, on October 13, Mars is at opposition and up all night. Mars is very bright this month, and astronomers are eager to image and directly observe details on its disc; however, don't forget to look at the space around the planet, too! By doing so, you can observe the remarkable retrograde motion of Mars and find a few nearby objects that you may otherwise overlook.



If you are paying this much attention to Mars, you're likely curious about the skies surrounding it! Find Mars in the constellation Pisces, with constellations Aries, Triangulum, and Cetus nearby. Aries may be the only one of these dimmer patterns readily visible from light-polluted areas. The Pleiades rises shortly after Mars. Dim Uranus is found close by, in Aries. If you are observing Mars up close, use the same eyepiece to check out Uranus's tiny blue-green disc. If you are uncertain whether you spotted Uranus, you didn't see it! Unlike stars, Uranus doesn't resolve to a point at high magnifications.

Since ancient times, Mars stood out to observers for its dramatic behavior. Usually a noticeable but not overly bright object, its wandering path along the stars showed it to be a planet instead of a fixed star. Every couple of years, this red planet would considerably flare up in brightness, for brief times becoming the brightest planet in the sky before dimming back down. At these times, Mars would also appear to slow down its eastward motion, stop, then reverse and head westward against the stars for a few weeks, before again stopping and resuming its normal eastward movement. This change in the planet's movement is called "apparent retrograde motion." While all of the planets will appear to undergo retrograde motion when observed from Earth, Mars's retrograde appearances may be most dramatic. Mars retrograde motion in 2020 begins on September 10, and ends on November 16. You can observe its motion with your eyes, and it makes for a fun observing project! You can sketch the background stars and plot Mars as you observe it night after night, or set up a photographic series to track this motion. Does the planet move at the same rate night after night, or is it variable? As you observe its motion, note how Mars's brightness changes over time. When does Mars appear at its most brilliant?

Continued on next page

Mars, continued

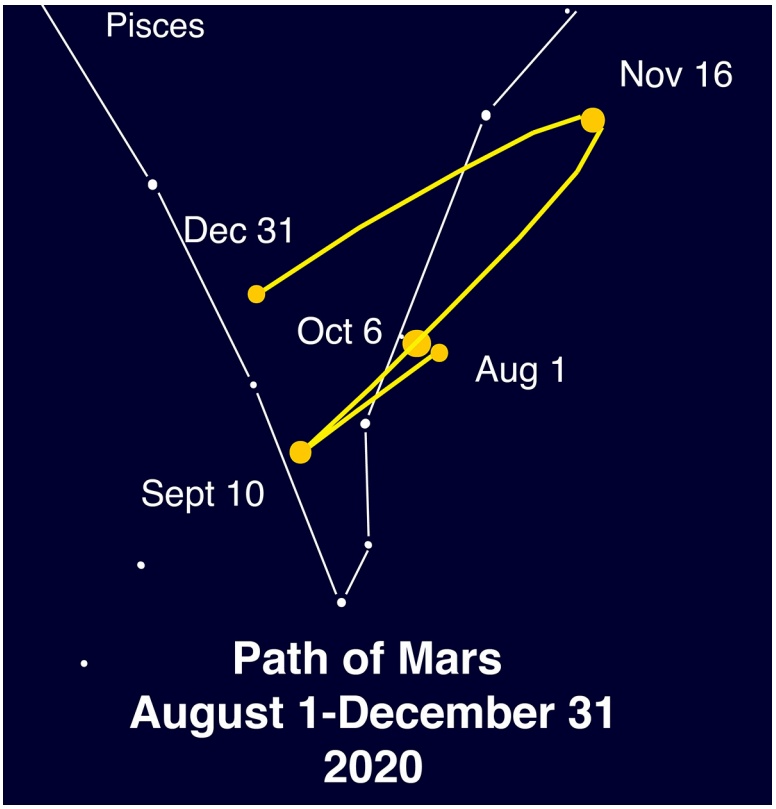
NASA has tons of great Mars-related resources! Want to know more about apparent retrograde motion? NASA has an explainer at bit.ly/marsretromotion.

Find great observing tips in JPL's "What's Up?" videos: bit.ly/jplwhatsup.

Check out detailed views with NASA's HiRISE satellite, returning stunning closeups of the Martian surface since 2006: hirise.lpl.arizona.edu.

NASA's Curiosity Rover will be joined in a few months by the Perseverance Rover, launched in late July to take advantage of the close approach of Mars and Earth, a launch window that opens two years: nasa.gov/perseverance

Calculate the ideal launch window yourself with this handy guide: bit.ly/marslaunchwindow.



The path of Mars during the last five months of 2020. Notice the retrograde motion from September 10 to November 16, with prime Mars observing time found in between. October 6 is the day of closest approach of Earth and Mars, "just" 38.6 million miles apart. Images created with help from Stellarium: stellarium.org

The Night Sky Network's Exploring Our Solar System handout invites you to chart the positions of the planets in the Solar System, and NSN coordinator Jerelyn Ramirez recently contributed an update featuring Mars opposition! You can download both versions at bit.ly/exploresolarsystem.

Young astronomers can find many Mars resources and activities on NASA's Space Place: bit.ly/spaceplacemars.

Here's to clear skies and good seeing for Mars's best appearance until 2033!

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!

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, September 16, 2020

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, September 16, 2020. Sixteen participants zoomed in.

Next Membership Meeting:

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

Topic: "What's Up?"

Zoom link will be posted to bsasnashville.com

Keith Rainey called the meeting to order at 7:30 PM. Theo Wellington reported that there was $11,314.44 in the Suntrust account and $364.72 in the PayPal account. Keith announced an upcoming virtual star party at the end of the month.

Chuck Allen, vice president and secretary of the Astronomical League, made a presentation on "Horizons" covering physical horizons, optical horizons and cosmic horizons.

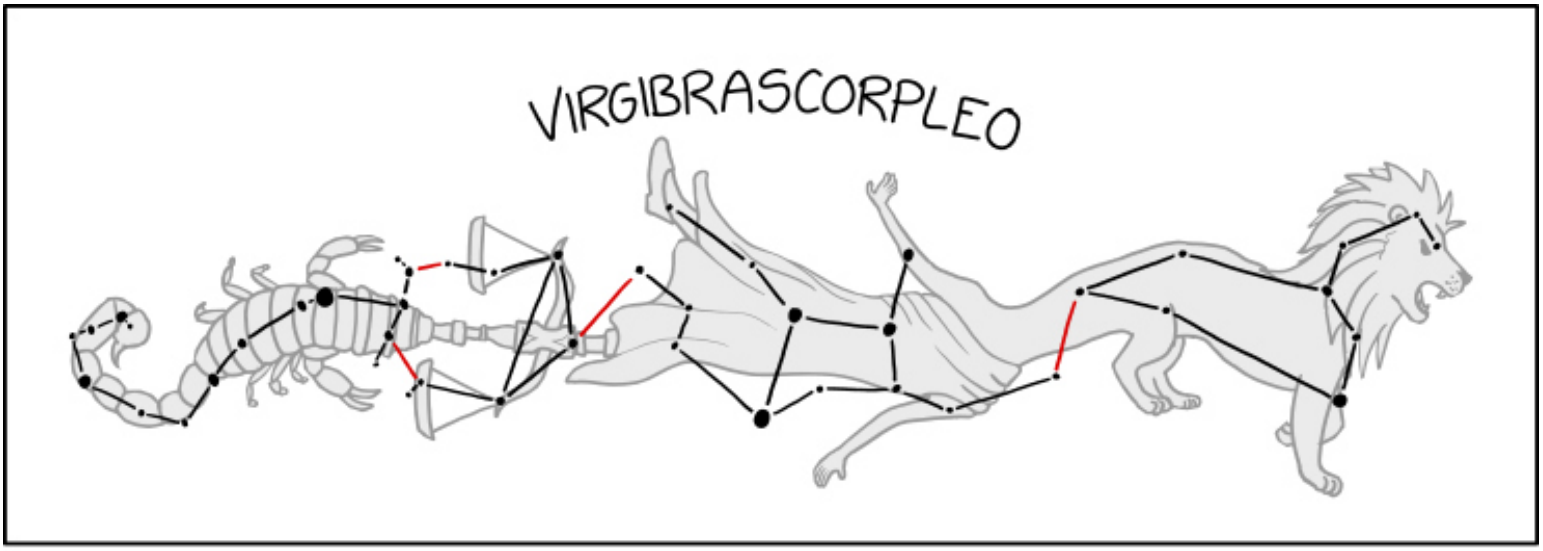
The being no further business, the meeting was adjourned at 8:40 PM

Respectfully submitted,

Bud Hamblen

Secretary

xkcd



I GOT KICKED OUT OF THE INTERNATIONAL ASTRONOMICAL UNION FOR ADDING EXTRA LINES BETWEEN THE CONSTELLATIONS TO CREATE A MONSTROSITY.

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.