

Night Visions

August 2020

Newsletter of the *Baton Rouge Astronomical Society*

Neowise Comet 2020, photo by Ralf Rohner of Skypointer Photography (see Page 4)

Monthly Meeting August 10th at 7:00 PM, venue TBA

(Monthly meetings are on 2nd Mondays at Highland Road Park Observatory).

**PRESENTATION: Steve Caparotta from WAFB News
will talk to us about hurricanes and tropical weather.**

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**Like this newsletter? See [PAST ISSUES](#) online back to 2009
Visit us on Facebook – [Baton Rouge Astronomical Society](#)**

President's Message

And that brings us to August, which should bring to an end the absolute worst time of the year for doing astronomy in south Louisiana. Soon, the cooler weather will start coming back and start sending all of the bugs back to whatever foulness they crawled out of. But, most importantly, the sun will start setting earlier and earlier in the evening and, before we know it, we'll actually be able to do some observing and get home before midnight once again.

July had a few grand events that were worthy of note. The most striking of which was the evening apparition of what turned out to be the comet we've all been really hoping for. Comet Neowise (C/2020 F3) was an absolute treat for those of us who've been staring at the slight movement of faint-fuzz balls and crooning about how cool those were for the past few years. A naked eye comet of that caliber is something I haven't seen since back in the 90s. To celebrate, we had several events through BREC, many more impromptu trips down to the levee in town, and at least one mass gathering of club members out at the dark site—the invite for that was last minute, but so is the weather in Louisiana. Those of us who did make the long trek across the river caught sight of something we won't soon forget, but a lot of us brought cameras anyway. I am encouraging anybody who took a photo of comet Neowise to submit those pictures to our webmaster, Fred (fred@eatel.net), so we can put them all up in one place on our website. Be sure to include where and when you shot it and what kind of equipment you were using. Don't worry about quality, just submit what you've got: we just want to chronicle the club's experience of this event.

On top of that, the Observatory enjoyed several events including plus night, two Neowise viewings, and viewings for Jupiter and Saturn oppositions. Coming up this month, we'll also be having an event for the Perseid meteor shower for the public. And we are just two months out from the big events scheduled for October (Mars and, for lack of a better phrase, "Spooky Astronomy Day," combining the annual Spooky Spectrum and re-scheduled Spring Astronomy Day. So if you haven't talked to Chris yet about getting some BREC credentials, this would be a good time to do so if you want to help out. The Spooky event will be the day for the raffle of the 8" Dobsonian that's been camped out at HRPO since the start of the year. If you want a crack at winning it, tickets are \$5 a pop through BREC and can be purchased from at the Observatory whenever they're open (Just call first to make sure sales have started).

For those of you looking for some quality HRPO time outside of the volunteer corps, we'll be having two events coming up in the next couple of months just for club members. August should see the next in our series of MOONights, so look for the email detailing when you can bring your kit out to hang out with some club members and enjoy the HRPO grounds. In addition, we have been granted an additional Observing Night for October to coincide with the closest approach of Mars, which is always a treat. No word yet on whether the big scope will be up and running for that one yet, but here's hoping. At the very least, we may wheel out the old 16". Incidentally, we are now looking to offload that big blue whale, so, if you're interested, speak to one of the officers.

Which reminds me, although we haven't really been focusing on it lately, we are still having an unused equipment sale in an effort to help open up some storage space at the Observatory. We're still working on a booklet showcasing what's available, but if you happen to know something we have that we're looking to let go of, make us a (reasonable) offer.

Lastly, we've decided to migrate our online meetings to a new platform for various reasons. Although we've received very gracious offers for sponsorship of our ZOOM account, we think we've got a better solutions. The web-based service [Jitsi Meet](https://meet.jit.si), <https://meet.jit.si> looks like it will serve our purposes pretty well until we can actually move back into the Observatory for our meetings. It should also allow us to offer a long-term presence for our meetings for people who might want to attend and interact with us but who just don't feel like leaving the house. Details on the how of implementing it are still in the works, but it should be pretty straightforward. And that's it. Coy has lined up a great speaker for this month's meeting, so we really hope you'll join us.

Scott Cadwallader, President 2020

Secretary's Summary of July Meeting

The July meeting was held via Zoom on 7/13/2020, as our city was still in quarantine due to Covid 19. There were 20 people in attendance:

Program started at 7:05 PM

Our presenter, Scott Cadwallader, spoke about all aspects of Astrophotography. Topics ranged from telescopes used, cameras, types of astrophotography, pre-processing, processing images, and programs for processing images. Note: Scott's talk is available on the BRAS You Tube Channel (see link below).

- Chris Kersey talked about tickets for the raffle in October (the raffle normally held at IAD), Dr. Parks of LSU is reportedly leaving to go to Georgetown University, and Matthew Penny is to teach the graduate course this fall (using the 20 inch telescope at HRPO).
- This year is the 75th anniversary of the end of WW II, and HRPO will have tie-ins to WW II.
- Outreach: Ben reports that Rob Bourgeois wants either July 23rd or 30th (both Thursday nights) for Bras to conduct astronomy events for the Boy Scouts.
- Scott Cadwallader says that BRAS is looking into projects on Facebook and You Tube to add to any BRAS projects.
- Restatement of the BRAS Loaner Telescope Program, "A member in good standing for a year may check out a telescope for one month".
- BRAS will phase out using Zoom for meetings (it costs BRAS every month).
- New member Jerald welcomed.
- Scott C noted that tonight was the opposition of Jupiter, and might be viewed at HRPO
- Barrow inquired about viewing Comet Neowise. Scott C said that tonight would not be a good night to view the comet.

Meeting ended at 8:38 PM

Submitted by Thomas Halligan

Link to the meeting: <https://www.youtube.com/watch?v=LxHGeo7feol>

Upcoming BRAS Meetings:

NSN Training Kit Session, Postponed

Monthly Business Meeting: 7:00 p.m., Wednesday, Aug 5; Venue TBA

Light Pollution Committee Meeting: Venue TBA

Monthly Member Meeting: 7:00 Monday, August 10; venue TBA.

MOON (Members Only Observing Night), TBA

Photo of Neowise submitted by Coy Wagoner



2020 Officers:

President: Scott Cadwallader

Vice-President: Coy Wagoner

Secretary: Thomas Halligan

Treasurer: Trey Anding

BRAS Liaison for BREC:

Chris Kersey

BRAS Liaison for LSU:

Greg Guzik

Committees/Coordinators:

AL Awards

Merrill Hess

Light Pollution:

John Nagle

Newsletter:

Michele Fry

Observing:

John Nagle

Outreach:

Ben Toman

Public Information

Krista Reed

Webmaster:

Frederick Barnett



BRAS Outreach Report

Hi Everyone,

We can actually report on a recent outreach event this month! Scott C. and I gave a presentation via the internet to a group of Boy Scouts and their parents on July 23rd. It was our first official outreach event in more than 4 months, I think.

Our presentation focused on the Moon, Jupiter, Saturn, Mars and also some techniques astrophotographers use to get such nice images of them. I started by giving an abbreviated presentation on the Apollo Missions and showed each of the landing sites (as previously imaged by me) along with one from the Lunar Reconnaissance Orbiter to show off some of the traces left over up there. Here's where we moved into new territory for us...

Scott took over the presentation (logged in at his own house) for a bit to talk about astro imaging techniques while I went outside to my telescope. I logged my phone into the webinar and was able to use its camera to offer LIVE views of the Moon. It was a relatively young Moon, but you could see some nice definition in craters near the terminator. Clouds began to cover it up (of course they did, this was set up by Rob "The Bringer Of Clouds" for his Scouts, haha!) so I moved back inside. Following the Scout's motto of "Be Prepared", I had previously taken video of the Moon and Scott had videos of Jupiter, Mars and Saturn. We were able to show those videos while explaining what they were seeing to finish off the presentation.

Overall, I think it was a success for us and a great first step into "virtual" outreach, as it's being labeled. I was able to list it on the Night Sky Network site and log it as an event. (They now have a Virtual Event category!) I can definitely see us doing more of these in the future even when we are able to start having in-person events. I hope you'll be able to be a part of one sometime, too!

Nothing on the books right now. We are still in "wait and see" mode like the rest of the state...country...world. In the meantime, I think we'll be ready with at least one or two game plans for when the next request comes in.

Clear Skies,

Ben Toman



This month's masthead photo of the Neowise Comet, recently discovered and visible to the naked eye, was taken in multiple layers. The process is explained on the Facebook page of astrophotographer Ralf Rohner of Skypointer Photography, [here](#).



BRAS Light Pollution Committee Report

This committee meets at 6:15, same day as the 7:00 BRAS Business Meeting
(normally on Wednesday before the Monthly Meeting)

Everyone is welcome to join in..

There was no meeting in July. There will be a meeting in August via the internet. Details are not firm yet. There will be a separate communication about the meeting.

John R. Nagle

Submitted by John R. Nagle

Globe At Night

The target for the Globe At Night program is Cygnus from August 10th through the 19th.
If you would like to participate in this citizen science program, you can find instructions at

<https://www.globeatnight.org>

[Here is a handy 2020 GLOBEATNIGHT Post card, in case you are out and about at night.](#)

GLOBE AT NIGHT 2020

WWW.GLOBEATNIGHT.ORG
Get Out and Observe the Night Sky!

Engage people worldwide in observing the nighttime sky.
Encourage students and families to participate in citizen-science with a hands-on learning activity.
Gather light pollution data from an international perspective to monitor sky brightness and its effects.

Can you see the stars?

January 16 – 25	July 12 – 21
February 14 – 23	August 10 – 19
March 14 – 24	September 9 – 18
April 14 – 23	October 8 – 17
May 14 – 23	November 7 – 16
June 13 – 22	December 6 – 15

NSF's National Optical-Infrared Astronomy Research Laboratory | IDA | INTERNATIONAL DARK-SKY ASSOCIATION | AURA

P.S. The “Loss of the Night” app can be used for information and for reporting your observations

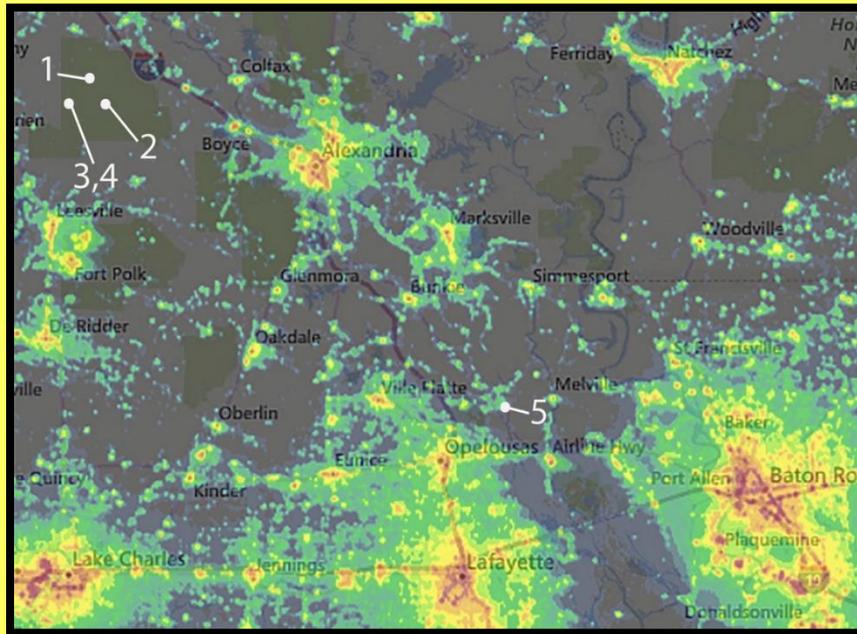
DARK SITES IN LOUISIANA

by **Chris Carlton, Ph.D**

Director, Carlton Astronomy Campus
 Professor of Entomology, Emeritus

Department of Entomology, Louisiana State University Baton Rouge

In September’s Member’s Corner Dr. Carlton will give detailed descriptions of his investigations of these sites, distances from Baton Rouge, best equipment to bring, considerations on time of year to visit, best campsites, safety concerns, etc.



Screen shot of light pollution overlay of Louisiana indicating approximate location of the five dark sky sites in the Table below (www.lightpollutionmap.info).

Table 1. Five dark sky sites within 4-hr. driving distance from Baton Rouge.

#	Name	Lat Long (dec. degrees)	2020 Light Pollution Map Value	Comments
1	Red Bluff fields	31.503° -93.117°	<0.05	Dispersed camping. Road access restricted during hunting seasons. Other fields in vicinity.
2	Gravel pit 1	31.460° -93.200°	<0.05	Dispersed camping. Only site listed with a Clear Sky Chart (“Kisatchie Star Party”).
3	Gravel pit 2	31.461° -93.204°	<0.05	Dispersed camping.
4	Kisatchie Bayou Rec. Area	31.445°, -93.093°	<0.05	Set up in overflow area. Temporarily closed (check for updates).
5	Sherburne South Campground	30.458°, -91.729°	1.00	Day use permit required, free camping.



Members Corner

Here's where we feature articles and photos about BRAS members' astronomy-related accomplishments and adventures outside of BRAS activities (as if there were any spare time for such things!), and/or other astronomical happenings in our neck of the Universe. Send your contributions to Michele at newsletter@brastro.org



A Star-Studded Wedding

CAPTION: Fredrick, the cake dragon is resting his head on top of Sagittarius, Scorpius, and the Milky Way. (Amazing Cakes named him Fredrick)

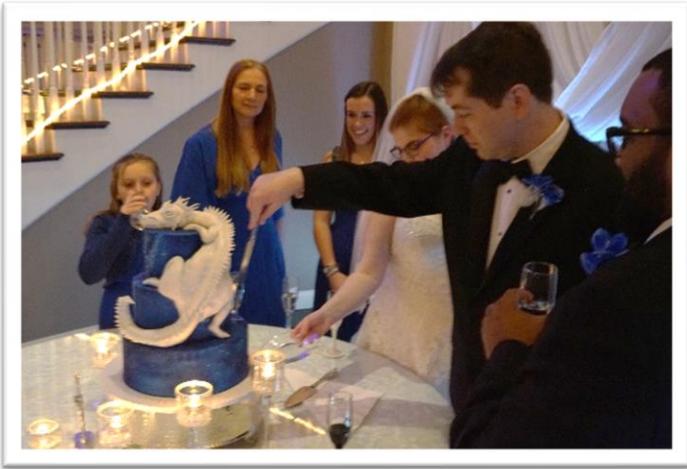
Long time BRAS members and HRPO staff **Justin Northrop** and **Amy Brouillette**, got married on February 29, 2020 at Elegant Affairs in Gonzales. It was quite a party!

Amy says: I'm the Education Program Specialist at HRPO, Justin had been working at HRPO on and off since 2007. He started work at BlueStreak Technologies in January of 2019 and stopped work at HRPO in February 2019. I started work at HRPO in spring of 2011. We started dating that August. He proposed on April 12, 2019. Covid 19 hit not even a week after the wedding, postponing the processing of our pictures until recently, thus the delay in getting them to Michele, who requested them in March.



CAPTION: Several BRAS members and HRPO employees attended the gala affair.

Front Row: Tom Northrop, Stephanie Northrop, Rebekah Northrop, Amy Brouillette (Northrop), Justin Northrop, Merrill Hess, Judah Santiago, Krista Reed, Roslyn Readinger, Karen Des Roches, Michele Fry, John Nagle, Steven M. Tilley
Back Row: James DeOliveira, Scott Cadwallader, Jordan Cobbs, Chris Kersey, Trey Anding, Erin Anding, John LeBlanc



Justin cutting the cake



"Take Turns to Show Off" Dancing



The DJ had almost everyone tapping their toes, on the dance floor and at their tables – couples dancing, line dancing, limbo, etc. -- so much fun.



The Best Man, wearing several of the glow sticks given out to everybody for the last dance. It was quite a finale.



Amy getting her groove on, barefoot, in a getaway dress applied with stars, with Justin watching on!



The getaway car, appropriately decorated, with Saturn, and BRIDEzilla (aka "a dragon mingled with alcohol").

Flying “Rocks” and “Dirty Snowballs”:

Asteroid and Comet News

August 2020

Volume 2, Issue 7.

Comet C/2020 F3 (NEOWISE)

The Naked Eye Comet C/2020 F3 (NEOWISE) has been filled our social media news feeds with many great photos and our sky with a great opportunity to see a great comet. Sadly in the coming weeks, it will fade from our sky.

The NEO 2020 NK1 has been rated as Torino Scale 1

When it comes to asteroid risk assessment, there are two commonly used scales. The first is the Palermo Technical Impact Hazard Scale use by NEO specialists to set priorities in planning observations. It compares the risk of a potential impact against the random background risk of an object's impact equal to or greater than potential impactor. This scale is logarithmic so that objects posing less risk than the background are negative and objects posing greater than the background are positive. -2 is 1% as likely as the background, and +2 would be 100 times more likely than the background. When an object is greater than - 2, it gets additional attention.

The second and older scale is the Torino Impact Hazard Scale; it is used for public communication of impact risk and only for the next 100 years. On this scale 0 is for objects that are very small or have a risk of effectively zero; 10 is for

"A collision is certain, capable of causing global climatic catastrophe that may threaten the future of civilization as we know it, whether impacting land or ocean. Such events occur on average once per 100,000 years, or less often."

Recently the NEO 2020 NK1 has been rated as Torino Scale 1

"A routine discovery in which a pass near the Earth is predicted that poses no unusual level of danger. Current calculations show the chance of collision is extremely unlikely with no cause for public attention or public concern. New telescopic observations very likely will lead to re-assignment to Level 0."

2020 NK1 has been placed on Arecibo Asteroid Radar Schedule for July 31, 2020. As of 2020-0730, 2020 NK1 has seven potential impacts from 2086 through 2101, a Palermo Scale (cumulative) of -1.73, and the only object with a greater Torino Scale rating than 0.

The NEO 2020 NK1 on 2020-07-21 from Siding Spring Observatory Australia - MPC Q62 using T30 (0.50-m f/6.8 reflector + CCD) Three stacks of 15 - 20 second luminance BIN2 images . By Steven M. Tilley

[see the full article at

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.491.5401&rep=rep1&type=pdf>])

(2020 NK1 -- Earth Impact Risk Summary | Center for NEO Studies (CNEOS)

<https://cneos.jpl.nasa.gov/sentry/details.html#?des=2020%20NK1>)

Citizen Scientists Making Discoveries

Lately, the major news outlet has reported that two Indian schoolgirls had discovered an asteroid through SPACE India and International Astronomical Search Collaboration (IASC). IASC "is a citizen science program. It provides high quality astronomical data to citizen scientists around the world. They are able to make original astronomical discoveries and participate in hands-on astronomy. This service is provided at no cost!" Congratulations to Vaidehi Vekariya Sanjaybhai, Radhika Lakhani Prafulbhai and all the other IASC discovers.

(Home Page - IASC: International Astronomical Search <http://iasc.cosmosearch.org/>)

(School girls in India discover Earth-bound asteroid Reuters <https://www.reuters.com/article/us-india-asteroid/school-girls-in-india-discover-earth-bound-asteroid-idUSKCN24S278>)

(Two class 10 girls discover asteroid set to pass Earth, NASA confirms rare find India Today

<https://www.indiatoday.in/education-today/news/story/two-class-10-girls-discover-asteroid-set-to-pass-earth-nasa-confirms-1704955-2020-07-27>)

[JPL Close Approach Data](#) from Jun 14, 2020 to Jul 29, 2020 Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal LD (AU)	CA Distance Nominal KM	If the Earth was the Size of a Basketball (in feet)	H (mag)	Estimated Diameter
(2020 NB)	2020/07/05	0.46 (0.00119)	1.78E+05	10.76	26.3	15 m - 33 m
(2020 OY4)	2020/07/28	0.11 (0.00028)	4.19E+04	2.57	30.2	2.4 m - 5.5 m

As of 2020-07-29 there is

959,226 discovered asteroids (MPC)(<https://www.minorplanetcenter.net/>)

[546,077 have been numbered] (<https://minorplanetcenter.net/iau/lists/NumberedMPs.html>)

23,298 discovered Near-Earth Objects (MPC) (<https://www.minorplanetcenter.net/>)

4179 discovered Comets (MPC)(<https://www.minorplanetcenter.net/>)

1,023 objects listed on JPL's Sentry: Earth Impact Monitoring(JPL)

(<https://cneos.jpl.nasa.gov/sentry/>)

2,505 objects have been removed from Sentry(JPL) (<https://cneos.jpl.nasa.gov/sentry/removed.html>)

For more information read Jon Giorgini's "Understanding Risk Pages"

(<http://www.hohmanntransfer.com/by/giorgion.htm>) (i.e. "A risk-page listing is not a *prediction* of impact")

The following objects were removed from NASA JPL's Sentry: Earth Impact Monitoring list from 2020-04-26 to 2020-06-30

Object Designation	Removed (UTC)
2020 OY4	2020-07-28 14:39:12
2020 OO1	2020-07-28 14:36:25
2020 LD	2020-07-25 14:16:17
2016 FY13	2020-07-19 14:10:54
2020 NY	2020-07-18 15:59:51
2020 LO	2020-07-03 17:09:08
2020 MA1	2020-06-29 13:41:05

Useful Links:

Guide to Minor Body Astrometry (<https://www.minorplanetcenter.net/iau/info/Astrometry.html>)

How Are Minor Planets Named? (<https://www.minorplanetcenter.net/iau/info/HowNamed.html>)

New- And Old-Style Minor Planet Designations (<https://www.minorplanetcenter.net/iau/info/OldDesDoc.html>)

The Tracking News

(<http://www.hohmanntransfer.com/news.htm>)

Accessible NEAs

(<https://cneos.jpl.nasa.gov/nhats/intro.html>)

Recent Entries in the BRAS Forum

Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 6800 posts.

Still [Active Volcanoes on Venus?](#)

[Moon Older](#) Than Previously Thought?

Celebrating [Apollo 11's 51th Anniversary](#)

July Was the Month of [NEOWISE](#)

Did [Quantum Fluctuations](#) Actually Move LIGO's Mirrors?

[Odd Radio Circles](#) in Deep Space?

Glimpse at Early [Cosmic Reionization?](#)

[SHERLOC](#) to Perform Comparison Study on Martian Grains





Messages from HRPO

Highland Road Park Observatory



FRIDAY NIGHT LECTURE SERIES

All start at 6:30pm. All are for ages fourteen and older.

There will be at least three lectures (all remote)—one each on the 7th, 14th and 21st.
Speakers, topics and start times will be posted at hrpo.lsu.edu.



SOLAR VIEWING

Saturday 8 August from 12pm to 2pm.

For all ages. No admission fee.

(Solar Viewers, \$2 each. Add-on Activity: \$2.50.)

Phase 2 Guidelines in effect.

The hobby of astronomy immediately brings to mind thoughts of darkened backyards and dimly-lit nighttime activities at HRPO. But patrons also have the option of visiting during daylight hours to see our parent star.

Weather permitting, once monthly HRPO personnel offers three views of the Sun...

12pm to 12:30pm - *indirect projection onto white viewing surface* // Patrons get a sense of the speed of Earth's rotation as they see the Sun's image slide on or off the projection device. [Learning Technologies Sunspotter]

12:15pm to 1:15pm - *safely-filtered optical light sent through standard telescope* // This option allows patrons to spy sunspots both small and large. [Orion 10" Skyquest Dobsonian Reflector]

12:30pm to 2:00pm - *hydrogen-alpha light* // Flares and prominences are seen easily in this wavelength. [Coronado Solar Max II 90mm]



Perseid Meteor Shower

Tuesday 11 August from 10pm to 2am

No admission fee. For all ages.

ABOUT THE PERSEIDS: The Perseids are one of the major meteor showers of the year,

caused by debris left from the passings of [Comet Swift-Tuttle](#). Come learn about meteors and let's see if we can spot some "earthgrazers". Although telescopes aren't needed for the Perseids, we'll have a telescope available from 10pm to midnight for leisurely gazing at other celestial objects. But look fast for the meteors; Perseid meteoroids hit our atmosphere traveling about sixty kilometers a second! If you're lucky, you may see a fireball...

POSITION OF THE MOON: The twenty-two day-old Moon will cause moderate trouble during the last hour of viewing.

OTHER OBJECTS FOR VIEWING

10pm to 12am = [Jupiter](#) / [Saturn](#) / [Pallas](#)

11:45pm to 12am = [Neptune](#)



Triple Conjunction with Moon

Friday 28 August from 8:30pm to 10pm

No admission fee. For all ages. Binocular recommended.

This astounding sight is a "one night only" thrill, as Jupiter and Saturn join the waxing gibbous Moon.



Plus Night

Saturday 29 August from 7pm to 10pm.

Theme: "WWII Victory!"

For all ages. No admission fee.

Phase 2 Guidelines in effect.

During Plus nights sky viewing starts a half-hour earlier and extra features are available to the public...

*The well-known marshmallow roast commences at the campfire ring behind the building, lasting at least one hour and ending no later than 9:30pm. (The campfire, like the sky viewing, is weather-dependent.)

*Four to eight of HRPO's collection of over fifty physical science demonstrations will be on hand to perplex and amaze. Which demos will it be?

*An unaided eye sky tour takes place, showing the public major features of the sky for that month. The tour takes place at 8pm during Standard Time, and at 9pm during Daylight Time.

*Filters are inserted into the viewing mechanisms, to show patrons "hidden" details of the Moon, Mars and Jupiter (when they are available).

*Reveal your age, and be shown any "birth stars" in the sky at that time.



Observing Notes: August

by John Nagle

Sagittarius – The Archer

Position: RA 19, Dec. -25°

Note: For six years I have been writing these Observing Notes, featuring the 60 constellations we can see before midnight from Baton Rouge, that contain objects above magnitude 10. Beginning with the February 2019 newsletter, I began to recycle and update the constellations, but the Sky Happenings calendar and associated information are new each month.

Named Stars. Deep Sky. Other Stars.

Due to the number of objects in this constellation (over 2,000), the first part of the Observing Notes will be published as an addendum, emailed separately within a few more days.

Sky Happenings: August 2020

(what follows pertains ONLY to the current month. Material above is good year after year.)

- Aug 1st** - Dawn: **Venus** and **Zeta Taurii** are less than 2° apart, with **Mercury**, to their lower left, rising in the east-northeast, shepherded by **Pollux** to its upper left.
The **Moon** passes 1.5° south of **Jupiter** at 7 PM CDT,
Dusk: The waxing gibbous **Moon**, **Jupiter**, and **Saturn** form a triangle above the southeast horizon.
- Aug 2nd** - **Mercury** passes 7° south of **Pollux** at 1 AM CDT,
The **Moon** passes 1.1° south of **Pluto** at 1 AM CDT,
The **Moon** passes 2° south of **Saturn** at 8 AM CDT.
- Aug 3rd** - **Mars** is at perihelion (128.4 million miles from the **Sun**) at 4 AM CDT,
Full Moon occurs at 10:59 AM CDT.
- Aug 6th** - The **Moon** passes 4° south of **Neptune** at 10 AM CDT.
- Aug 9th** - The **Moon** passes 0.8° south of **Mars** at 3 AM CDT,
The **Moon** is at apogee (251,444 miles or 404,659 km from **Earth**) at 8:50 AM CDT.
- Aug 10th** - The **Moon** passes 4° south of **Uranus** at 4 PM CDT.
- Aug 11th** - **Last Quarter Moon** occurs at 11:45 AM CDT.
- Aug 11/12** - All Night – The **Perseid Meteor Shower** peaks
- Aug 12th** - **Venus** is at greatest western elongation (46°) at 7 PM CDT.
- Aug 13th** - The waning lunar crescent rises in tandem with **Aldebaran**, with less than 4° separation.
- Aug 14th** - Double shadow transit of **Jupiter** starts at 1:31 AM CDT.
- Aug 15th** - Dawn: The slender **Moon** and **Venus** are a little more than 3° apart in **Gemini**, with **Castor** and **Pollux** to their lower left,
The **Moon** passes 4° north of **Venus** at 8 AM CDT,
Uranus is stationary at 12 noon CDT.
- Aug 17th** - **Mercury** is in superior conjunction with the **Sun** at 10 AM CDT,
The **Moon** is 1.7° north of **M44 (The Beehive)** at 1 PM CDT.

- Aug 18th** - **New Moon** occurs at 9:42 PM CDT (Lunation 1208).
- Aug 21st** - The **Moon** is at perigee (225,876 miles or 363,513 km from **Earth**) at 5:57 AM CDT.
- Aug 22nd** - Double shadow transit of **Jupiter** starts at 5:04 AM CDT,
Dusk: The waxing crescent **Moon** is slightly more than 5° from **Spica**.
- Aug 25th** - **First Quarter Moon** occurs at 12:58 PM CDT,
Dusk: The first quarter **Moon** gleams in **Scorpius**, 5° to 6° from **Antares**.
- Aug 27th** - Dusk: The **Moon**, **Jupiter**, and **Saturn** form a line above the southern horizon.
- Aug 28th** - Dwarf planet **Ceres** is at opposition at 7 AM CDT,
Asteroid **Massalia** is at opposition at 4 PM CDT,
Dusk: The waxing gibbous **Moon** is 2° below **Jupiter**, with **Saturn** to their left,
The **Moon** passes 1.4° south of **Jupiter** at 9 PM CDT.
- Aug 29th** - The **Moon** passes 1.2° south of **Pluto** at 6 AM CDT,
The **Moon** passes 2° south of **Saturn** at 12 noon CDT,
Dusk: The **Moon**, **Saturn**, and **Jupiter** form a graceful arc above the southern horizon.
- Sept 2nd** - **Full Moon** occurs at 12:22 AM CDT,
Asteroid **Pallas** is stationary at 8 AM CDT.

Planets:

Mercury – **Mercury** is briefly visible, very low in the dawn sky, early in August. On August 1st, the planet stands only 5° high 45 minutes before sunrise, shining at magnitude -0.9. The planet will drop lower toward the horizon each day. On August 4th, shining at magnitude -1.1, the planet will be 3° high 45 minutes before sunrise. The planet reaches superior conjunction on the far side of the **Sun** on August 17th, and will reappear in the evening sky late in the month, where it will remain difficult to see, and will disappear again in mid-September.

Venus – **Venus** will rise above the horizon at around 2:45 AM, local daylight savings time, virtually all month. On August 1st, the planet will be just south of **Zeta Taurii**, glowing at magnitude -4.5, and by 3:30 AM ldt, with a 43% lit disk spanning 27". During the month, the planet will trek across northeastern **Orion**, and then across **Gemini**. The planet will reach greatest western elongation (46°) on August 12th. On the 15th, the planet is 4° due south of a waning crescent **Moon**. During the month, the planet will fade a little from magnitude -4.5 to -4.3, with its apparent width shrinking from 27" to 20", and its illumination will grow from 43% to 59%. On August 31st, the planet will be at magnitude -4.3 and will be less than 9° south of **Pollux**, with a 59% lit disk and a span of 27".

Mars – **Mars** rises in the south about 3 hours after sunset (shortly before midnight), local daylight time, in the beginning of August, at magnitude -1.1 in **Pisces**, and 1 hour earlier by month's end. The planet moves briskly eastward through **Aquarius** with a waning gibbous **Moon** passing 0.8° south of it on the 9th. On the 3rd, the planet reaches perihelion. During the month, the planet's magnitude will increase from -1.1 to -1.0, and its apparent diameter growing from 14.6" to 18.7". Its illumination will also increase from 86% to 92% lit. We are now entering the peak of the **Mars** observing season, which will last until mid-December. The best time now to observe is in the pre-dawn hours. By 4 AM local time on the 31st, the planet will stand nearly 60° high in the due south.

Jupiter – **Jupiter** shines in the south-southeast after dusk, and moves retrograde (westward) in eastern **Sagittarius** during August, and will arrive less than 6° northeast of **Sigma Sagittarii** by the 31st, just below the **Teaspoon** asterism. The planet's disk spans 47", and shrinks less than 5% during the month. The planet's magnitude will dim a bit from -2.7 to -2.6 as the month progresses. Early on the evening of the 14th, **Ganymede** starts transiting the planet at about 6:30 PM CDT, with its shadow starting its transit at about 9:31 PM CDT. **Ganymede's** transit egresses at around 9:50 PM CDT, while at about 10:24 PM CDT, **Io** starts its transit of the planet. **Io's** shadow will follow, starting transit at about 11:08 PM CDT. **Io** will egress transit at about 12:40 AM CDT on the 15th, with **Ganymede's** shadow egresses at about 12:54 AM CDT, and **Io's** shadow egresses at about 1:25 AM CDT. This event is repeated on the 21st. **Ganymede** starts transit at about 9:59 PM CDT, with **Io** starting transit at about 12:11 AM CDT on the 22nd. **Io's** shadow starts transit at about 1:04 AM CDT, while **Ganymede** egresses at about 1:17 AM CDT. **Ganymede's** shadow starts ingress at about 1:31 AM CDT. **Io** egresses at about 2:27 AM CDT, and **Io's** shadow egresses

at about 3:20 AM CDT, and **Ganymede's** shadow egresses at about 4:55 AM CDT.

Saturn – **Saturn** starts August rising in the south-southeast after dusk, only 8° east from **Jupiter**. **Saturn's** disk spans 18", and the rings stretch to 41" span. The planet's polar axis is tilted nearly 22° toward us, revealing the northern side of the rings. As the planet moves retrograde through **Sagittarius**, its magnitude will decrease from +0.1 to +0.3, and its apparent diameter will shrink from 18.4" to 18.0". The brightest moon of the planet, **Titan**, glows at 8th magnitude, and will be located due north of the planet on the 1st and on the 17th, and will be due south of the planet on the 9th and 25th. The trio of 10th magnitude moons – **Tethys**, **Dione**, and **Rhea** – orbit closer to the rings. The moon **Enceladus** is faint and orbits near the edge of the "A" ring. The moon **Iapetus** will be less than 3' southwest of the planet on the 1st, shining at magnitude 11, and will brighten and move west of the planet reaching 9' due west on the 17th.

Uranus – **Uranus** rises just after midnight, local time, in southern **Aries** (where it will be all month) on August 1st, and is well up in the eastern sky on the 31st at the same time. The planet can be spotted with binoculars, shining at magnitude 5.8, and has no other bright stars around it. A telescope will reveal a greenish colored disk spanning 3.6". Shortly after midnight on the 10th, the planet will be 9° northeast of the almost last quarter **Moon**. On the 31st, the planet will be 14° northeast of **Mars**.

Neptune – **Neptune** is in northeast **Aquarius**, rising after 10 PM local time in early August, and is up by sunset on the 31st. The planet, at magnitude 7.8, will show a 2.4" diameter bluish disk when seen in a telescope. To find the planet, start at 4th magnitude **Phi Aquarii**, move 3° east-northeast to find it in early August. By the 31st, it is only 2.5° from **Phi Aquarii**.

Pluto – **Pluto**, at a faint 14.6 magnitude, can be found slightly south of a line between **Jupiter** and **Saturn** in **Sagittarius**. **Pluto's** positions, *by my estimates*, are as follows: On August 2nd – about 25' south and a little east of the star **SAO 188414**, or 18' north-northwest of the star **SAO 188405**; on the 6th – about 28' south and a little west of **SAO 188414**, or 15' northeast and a little east of **SAO 188405**; on the 10th – about 18' north-northwest of **SAO 188405**; on the 14th – about 15' northwest of **SAO 188405**; on the 18th – about 18' northwest of **SAO 188405**; on the 22nd – about 1.2' northwest of **SAO 188405**; on the 26th – about 2.5' northwest of **SAO 188405**; and on the 30th – about 2.8' northwest of **SAO 188405**.

Moon – On August 1st, the **Moon** shines less than 3° below **Jupiter**. On the 2nd, the **Moon** will sit well to the left of **Saturn**. On the morning of the 9th, the waning gibbous **Moon** will pass a little more than 1° south of **Mars**. At dawn on the 15th, the slender waning lunar crescent is about 3.5° above **Venus** as the pair rise. On the 16th, the very thin **Moon** is 6.5° to the right of **Pollux**. On the 21st, the young waxing crescent **Moon** is less than 1° from **Gamma Virginis**. On the 28th, the waning gibbous **Moon** is just below **Jupiter**, and on the 29th, it is to the lower left of **Saturn**.

Favorable Librations: On August 1st – **Mare Marginis**; on the 16th – **Mare Orientale**; on the 24th – **Mare Australe**; and on the 27th – **Mare Smythi**.

Greatest North declination is on the 16th (+24.1°)

Greatest South declination is on the 1st (-24.0°) and on the 29th (-24.1°)

Libration in Longitude: East limb most exposed on the 2nd (+4.9°) and 28th (+5.9°)

West limb most exposed on the 16th (-6.3°)

Libration in Latitude: North limb most exposed on the 7th (+6.7°)

South limb most exposed on the 21st (-6.6°)

Asteroids – Asteroid **1 Ceres** (a minor planet) reaches opposition on August 28, in southern **Aquarius**, just north of the **Piscis Austrinus** border, shining at magnitude 7.7. **Ceres** will rise at about 9 PM local daylight time, transiting the meridian at around 1:30 AM, at a southern declination of about -24°. **Ceres's** positions, according to the *RASC Observer's Manual, 2020 USA Edition*, are as follows: On August 9th – 23 07.62 -21 39.0, at mag. 7.9; on the 19th – 23 00.78 -22 48.6, at mag. 7.7; and on the 29th – 22 52.70 -23 50.8, at mag. 7.7. **Ceres's** positions, *by my estimates*, are as follows: On August 1st – about 0.7° northeast of the star **88 Aquarii**; on the 4th – about 0.2° northeast of **88 Aqr**; on the 7th – 0.2° southwest of **88 Aqr**; on the 10th – 0.8° southwest of **88 Aqr**; on the 16th – 1.6° due west of **89 Aqr**, or 1.6° north-northwest of **86 Aqr**; on the 19th – 1.6° northwest of **86 Aqr**; on the 22nd – 2° west-northwest of **86 Aqr**; on the 25th – 2.8° due west and a little north of **86 Aqr**; on the 28th – 3° due west of **86 Aqr**; on the 31st – 3.6° due west and a little south of **86 Aqr**; on September 3rd – 4.2° due west and a little south of **86 Aqr**; on the 6th – just under 5° due west and a little south of **86 Aqr**; and on the

9th – 5.6° due west and a little south of **86 Aqr**.

Asteroid **2 Pallas** – The positions of **Pallas**, according to the *RASC Observer's Manual, 2020 USA Edition*, are as follows: On August 9th – 18 45.81 +17 42.8, at mag. 9.7; on the 19th – 18 41.82 +15 50.9, at mag. 9.8; and on the 29th – 18 39.85 +13 51.5, at mag. 9.9.

Asteroid **7 Iris** – **Iris** stays nearly motionless this month. You can find **Iris** 1° southwest of **M23**, in northern **Sagittarius**. Look for four stars in a trapezoidal shape, and then scan west for the magnitude 9.8 asteroid. **Iris**'s positions, according to the *RASC Observer's Manual, 2020 USA Edition*, are as follows: On August 9th – 17 53.74 -19 52.9, at mag. 9.7; on the 19th – 17 52.16 -19 47.7, at mag. 9.8.

Asteroid **8 Flora** – **Flora**'s positions, according to the *RASC Observer's Manual, 2020 USA Edition*, are as follows: On August 9th – 02 24.29 +06 23.7, at mag. 9.8; on the 19th – 02 37.26 +06 44.8, at mag. 9.6; and on the 29th – 02 48.09 +06 50.4, at mag. 9.4.

Asteroid **19 Fortuna** – **Fortuna**'s position, according to the *RASC Observer's Manual, 2020 USA Edition*, is as follows: On August 29th – 23 16.17 -01 21.2, at mag. 9.7.

Asteroid **20 Massalia** – **Massalia**' positions, according to the *RASC Observer's Manual, 2020 USA Edition*, are as follows: On August 19th – 22 37.62 -07 41.2, at mag. 9.9; and on the 29th – 22 28.58 -03 35.9, at mag. 9.6.

Comets – Comet **C/2020 F3 (Neowise)** is fading as it is leaving our solar system, not returning again for over 6,000 years. Positions for **Neowise**, according to *ALPO*, are as follows: On August 10th – 13 28.0 +13 52.0, in **Virgo** at mag. 7.9 ?; on the 20th – 14 00.5 +04 09, in **Virgo** at mag. 9.0 ?; and on the 30th – 14 21.4 -01 57, in **Virgo** at mag. 10.0 ?

Comet **C/2020 F8 (Swan)** is also fading out. **Swan**'s positions, according to *ALPO*, are as follows: On August 10th – 06 43.8 +19 53, in **Gemini** at mag. 10.0 ?; on the 20th – 06 46.6 +17 20, in **Gemini** at mag. 10.3 ?; and on the 30th – 06 47.5 +14 49, in **Gemini** at mag. 10.6 ?

Comet **2P/Encke** is fading out fast. **Encke**'s positions, according to *ALPO*, are as follows: On August 10th – 13 30.4 -25 33, in **Hydra** at mag. 11.8; on the 20th – 14 49.9 -30 11, in **Centaurus** at mag. 13.1; and on the 30th – 15 51.0 -31 41, in **Lupus** at mag. 14.3.

Comet **88P/Howell** comes back to visit us every few years. To see this comet, you will need at least a 4" telescope under dark, country skies, between dusk and midnight. *Astronomy Magazine* says it is at 11th magnitude. *ALPO* projects the following positions for the comet: On August 10th – 14 05.1 -14 29, in **Virgo** at mag. 9.8; on the 20th – 14 30.0 -17 03, in **Libra** at mag. 9.5; and on the 30th – 14 57.9 -19 35, in **Libra** at mag. 9.2. **Howell**'s positions, *by my estimate*, are as follows: On August 1st – about 6° due east and a little south of **Spica (Alpha Virginis)**; on the 5th – about 8° due east and a little south of **Spica**, or not quite 6° due west and a little south of **Lambda Virginis**; on the 10th – just over 3° southwest of **Lambda Vir**; on the 15th – about 2.3° due south and a little west of **Lambda Vir**; on the 20th – just over 4° west-southwest of **Alpha Librae (Zubenelgenubi)**; on the 25th – about 3° south and a little west of **Alpha Librae**; and on the 30th – 4° south and a little west of **Nu Librae**, or about 2.5° due west of **Iota Librae**. Note: around August 23rd/24th, **Howell** will be less than 2° south of **NGC 5228**, and on the 28th or 29th, will be less than 2° north of **HN 28**.

Comet **C/2017 T2 (PANSTARRS)**, is also fading fast. *ALPO* gives **T2**'s positions as follows: On August 10th – 13 40.7 +14 17, in **Boötes** at mag. 10.0; on the 20th – 13 55.4 +09 02, in **Boötes** at mag. 10.3; and on the 30th – 14 09.7 +04 21, in **Virgo** at mag. 10.6.

Comet **C/2019 U6 (Lemmon)** – **Lemmon**'s positions, according to *ALPO*, are as follows: On August 10th – 14 01.1 +19 40, in **Boötes** at mag. 8.6; on the 20th – 14 35.0 +21 20, in **Boötes** at mag. 9.1; and on the 30th – 15 04.9 +22 16, in **Boötes** at mag. 9.6.

Meteor Showers – The only *Major Meteor Shower* (Class I) in August is the **Perseids**, active from July 17th through September 1st, with the peak on August 12th, having a maximum zenith hourly rate (mzhr) of 100. This year, a **Last Quarter Moon**, in **Aries**, will add a lot of light to the sky. Consequently, low rates of only the brightest meteors will be observable. Watch for a glowing, persistent trains left by these brighter shower

members. The **Perseids** originate from the debris trail of Comet **109P/Swift-Tuttle** that completes one full orbit of the **Sun** every 133 years.

Minor Meteor Showers (Class II) – The **Piscis Austrinids**, active from July 30th through August 18th, peaking on August 8th with an mzh of 5; the **Kappa Cygnids**, active from August 8th through August 17th, peaking on August 13th with an mzh of 3; and the **Aurigids**, active from August 18th through September 7th, peaking on August 31st with an mzh of 6.

There is one **Variable Meteor Shower** (Class III) in August. The **Beta Hydusids**, active from August 15th through August 19th, peaking on August 16th, the mzh being variable – most of the time the observed rate is one per night.

There are 4 **Weak Meteor Showers** (Class IV) that are active in August, but do not peak in August. The **49 Andromedids**, active from July 6th through August 14th, peaking on July 20th; the **Psi Cassiopeiids**, active from July 5th through August 7th, peaking on July 21st; the **Daytime Zeta Cancriids**, active from August 13th through September 10th, peaking on September 2nd; and the **Nu Eridanids**, active from August 23rd through November 16th, peaking on September 23rd.

When to View the Planets:

Evening Sky

Jupiter (southeast)
Saturn (southeast)
Neptune (east)

Midnight

Jupiter (south)
Saturn (south)
Mars (east)
Uranus (east)
Neptune (southeast)

Morning Sky

Mercury (northeast)
Venus (east)
Mars (south)
Uranus (south)
Neptune (southwest)

DARK SKY VIEWING - PRIMARY ON AUGUST 22ND, SECONDARY ON AUGUST 15TH

Mythology:

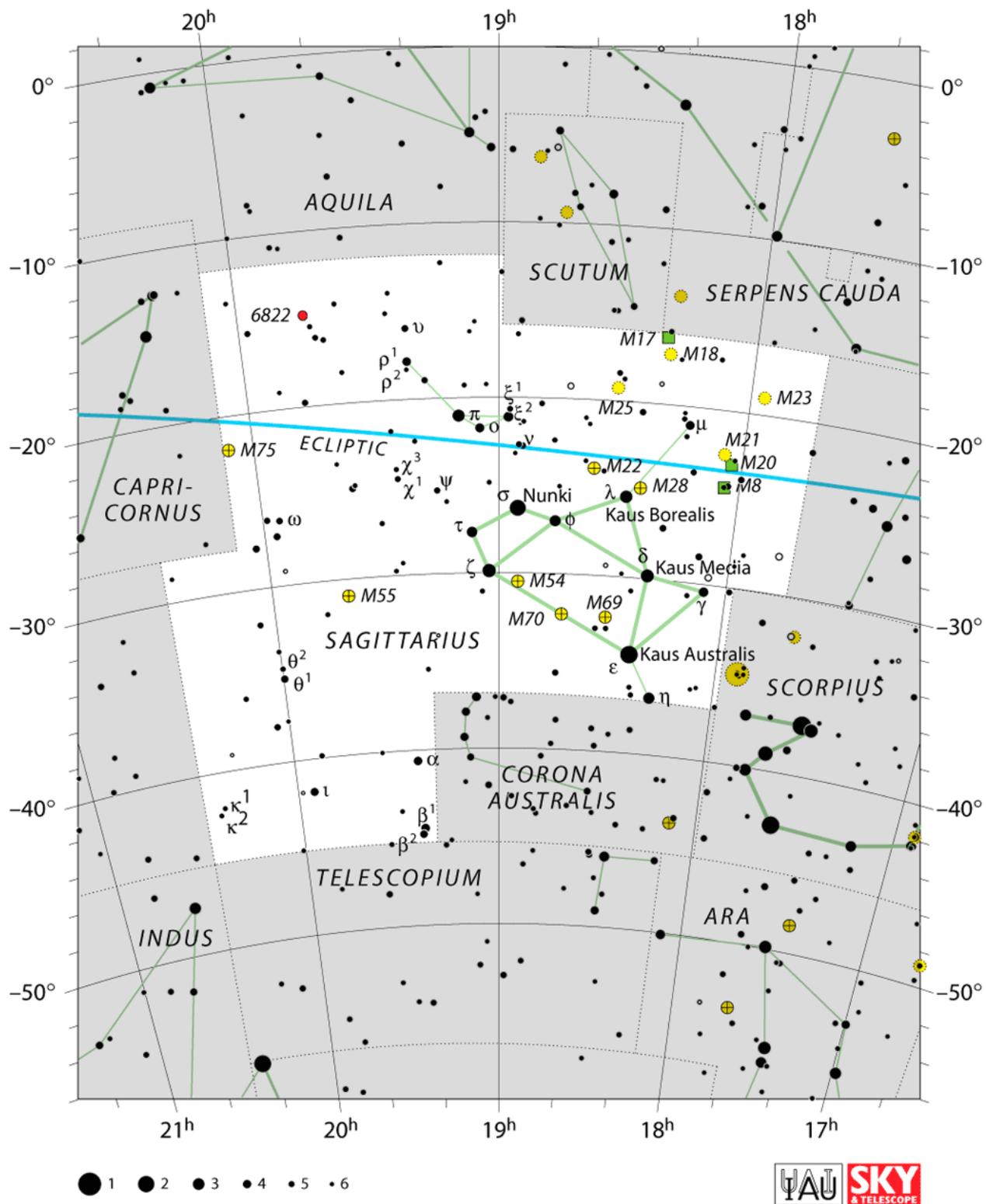
Sagittarius – The Archer

Sagittarius is depicted in the sky as a centaur, with the body and four legs of a horse but with the upper torso of a man. He is shown wearing a cloak and drawing a bow, aimed in the direction of the neighboring Scorpion. Aratus spoke of the Bow and the Archer as though they were separate constellations. Sagittarius is sometimes mis-identified as Chiron. But Chiron is in fact represented by the other celestial centaur, the constellation Centaurus.

Sagittarius is a constellation of Sumerian origin, subsequently adopted by the Greeks, and this helps explain the confusion over its identity. Eratosthenes doubted that this constellation was a centaur, giving as one of his reasons the fact that centaurs do not use bows. Instead, Eratosthenes described Sagittarius as a two foot creature with the tail of a satyr. He said that this figure was Crotus, son of Eupheme, the nurse to the Muses, who were nine daughters of Zeus. According to the Roman mythographers Hyginus, the father of Crotus was Pan, which confirmed the views of Eratosthenes that Sagittarius should be depicted as a satyr rather than a centaur.

Crotus invented archery, and often went hunting on horseback. He lived on Mount Helicon among the Muses, who enjoyed his company. They sang for him, and he applauded them loudly. The Muses requested that Zeus place him in the sky, where he is seen demonstrating the art of archery. By his forefeet is a circle of stars that Hyginus said was a wreath “thrown off as by one at play”. This circlet of stars is the constellation Corona

Australis.



text, map and artwork. (I will arrange it to fit.)