

Night Visions

September 2020

Newsletter of the *Baton Rouge Astronomical Society*

Neowise Comet 2020, photo by [Ralf Rohner of Skypointer Photography](#)

Monthly Meeting September 14th at 7:00 PM, via Jitsi
(Monthly meetings are on 2nd Mondays at Highland Road Park Observatory,
temporarily during quarantine at meet.jit.si/BRASMeets).

GUEST SPEAKER: NASA Michoud Assembly Facility Director, Robert Champion

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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

Welcome to September. You may have noticed that this newsletter is showing up a little bit later than usual, and it's for good reason: release of the newsletter will now happen after the monthly business meeting so that we can have a chance to keep everybody up to date on the latest information. Sometimes, this will mean the newsletter shows up a couple of days late. But, the upshot is that you'll now be able to see what we discussed at the recent business meeting and have time to digest it before our general meeting in case you want to give some feedback. Now that we're on the new format, business meetings (and the oft neglected Light Pollution Committee Meeting), are going to start being open to all members of the club again by simply joining up in the respective chat rooms the Wednesday before the first Monday of the month—which I encourage people to do, especially if you have some ideas you want to see the club put into action.

September has it's nice little list of outreach activities to speak for: at least three events will occur at HRPO over the month, with a close approach of Mars, the opposition of Neptune, and the popular plus night. But in addition to those, we're finally going to take a stab at an official digital-outreach on the 22nd. In lieu of our beloved sidewalk astronomy from Perkins Rowe, anybody who wishes to come regale the curious with tales of astronomy daring do can log into our forum and provide commentary as we try to find night sky objects to broadcast, live over the internet, for the public at large. There is also talk of setting up a video-demo of some of our outreach kits that we can put online for people to watch at their leisure. But it's worth keeping an eye on the schedule for October too, since with the Martian opposition we'll be looking to get as many eyes on Mars as we can. To do that, we'll need volunteers—to get started at outreaches at HRPO, send an email to Chris Kersey observatory@brec.org who can start you on the necessary BREC paperwork. As a reminder, people who volunteer for the observatory will be invited for private viewing sessions at HRPO courtesy of Mr. Kersey. October will also bring an opportunity to make up for our missed astronomy day in the fall by means of the Spooktacular event, where the 8" Orion dobsonian will finally be raffled off: tickets are on sale now at HRPO for \$5 per chance, so drop by and pick up a couple of tickets if you want your chance to win and it's safe for you to do so.

If you don't feel like the gambling sort, but want to just buy your new telescope, we have two that are now part of our surplus sale that are worth mentioning. One is the giant 16" Meade reflecting scope (with functional electronic mount!) for a reasonable price of only \$800. The other is a much more modest 10" Dobsonian Odyssey compact that we're starting off at \$250. Both of these scopes are fully functional, but just a bit too bulky for our tiny storage space. If we can't sell either of these, expect to find new listings for them on the forums in the future. There are other objects in the closet for sale, including a large number of pretty nice eyepieces and a few other scopes. John has cataloged the EPs and we should have a book for perusal in the near future, with another book for the scopes soon after.

Our next meeting will be on the 14th and will be another digital meeting. Our guest speaker for the evening should be quite a fantastic one: Robert Champion, Director of NASA's Michoud Assembly Facility. So please make sure to login to help us give him a warm welcome and, hopefully, some great questions. As a quick reminder, membership dues are owed by the end of the year, and, due to the circumstances, Trey will be sending out a mailer with easy options to put you in good graces. I'm told that mention of the 2021 calendars (a year now close enough to contemplate) should also find there way into the same missive.

That's all I've got. Be sure to check the calendars below for more specifics on upcoming events. In the meantime, let's all celebrate the fact that Fall is nearly here with all of her attendant splendor and the promise of cooler weather and longer nights: here's hoping for clear skies and faint fuzzies.

Scott Cadwallader, President 2020

Secretary's Summary of August Member Meeting

The August meeting was held via Jitsi on 7/10/2020, as our city was still in quarantine due to Covid 19.

- President Scott Cadwallader called meeting to order.
- Scott introduced the guest speaker, Steve Caparotta of WAFB News. He spoke about the Coriolis Effect, La Niña winds, and hurricanes.
- The talk was live streamed and recorded, available on the BRAS You Tube Channel.
- Scott talked about getting outreach going again, BRAS members getting approval from BREC for volunteering, and putting the disassembled telescopes (in the closet) back together again. John Nagle was assigned to make an inventory of all the eyepieces in the BRAS closet.
- Scott talked about the Business Meeting to be held on the Wednesday before the first Monday of the month, and the MOON Night will be on the 16th of August with the backup date of the 23rd of August. No vehicles would be allowed near the field after 9:00 PM (to support night vision).
- Ben reported nothing new in outreach.
- Chris Kersey reminded everyone about the Perseid meteor shower tomorrow night, and that the LSU Astronomy classes at HRPO will start this month with Matthew Penny conducting them. Dr. Guzik was at HRPO tonight checking out the computers. Chris also mentioned that the dome needs protection from wasps. HRPO now has some WW II displays on site now. Volunteer hours are now kept track of online.
- Meeting was closed.



Submitted by Thomas Halligan

Upcoming BRAS Meetings:

Monthly Member Meeting: **7:00 Monday, September 14th**, via Jitsi remote access (open to the public).

Light Pollution Committee Meeting: **6 pm Wednesday, September 30th**, via remote access. (Open to the public), followed by

Monthly Business Meeting: **7 pm Wednesday, September 30th**, (via Jitsi remote access (Members Only)

MOON (Members Only Observing Night), **October 12th after the Monthly Member Meeting**, with a focus on viewing Mars.

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



Secretary's Summary of the BRAS Business Meeting -- September 2nd, 2020, remotely via Jitsi

(This meeting has been rescheduled to come early enough to be included in each monthly newsletter.
See President's Message)

- ❖ Scott Cadwallader opened the meeting discussing “Guerrilla Outreach” -- going to public areas and setting up telescopes. Coy Wagoner said to be “pro-active” in getting viewers or they will be otherwise busy. If anyone wants to do this, contact Scott. Ben Tomen said that the Raby's were thinking along the same line.
- ❖ Scott talked about donations: we now have a stack of very fine eyepieces in the closet, from a great donation.
- ❖ Scott said that high-schoolers like getting volunteer experiences. We (BRAS) can encourage them to make the volunteer hours astronomy related.
- ❖ Scott assigned Coy to take a picture of the Wally scope with a yard stick to show the scale of the scope. Scott said that the red scope is heavy, but good, and he is open to raffle it off – we have not had a \$5.00 per ticket raffle in a long time. Ben said do not give it to a school or library because it is not an easy scope to use. Scott said “let us start the bidding at \$250.00 (when the bidding actually starts, of course).
- ❖ Scott said we can hold our regular meeting in October if we want to. We can do Mars' closest approach party on the 5th also. Coy said that the closest approach is on the 6th at 9 AM. Scott then said the meeting (BRAS) back on the 12th, and we can then try out the 16 inch telescope for the Mars opposition, and for the public viewing of the opposition on the 13th.
- ❖ Scott said that the rebuilding of the scopes in the closet will be in November at the earliest, and we would want new and other members to be there so they could learn how to do it. Scott also said that a Sunday would be needed to make up the “New Member” kits.
- ❖ Coy said he will reach out to PAS for the speaker for the October meeting. Scott said that we need to start looking for the 2021 officers.
- ❖ Chris Kersey gave an HRPO update. LSU classes have started at HRPO, with no more than 10 students. Dr Gusik is still involved with HRPO. Remote registration has been problematic. HRPO has a WW II exhibit and an art contest. Tom Northrop is retiring this month. A custodian position is opening up. Jacob is back.
- ❖ Scott asked if everyone is satisfied with Jitsu. General response was yes.
- ❖ Scott closed the meeting at 8:18 PM.

There were 8 members at the meeting.

Submitted by Thomas Halligan



BRAS Outreach Report

Hi Everyone,

First of all, even though most of us live here in the Baton Rouge area, I'm sure many of us had friends or relatives that may have had to deal with the hurricane this past month. Hopefully the recovery will be swift!

As far as Outreach is concerned...second verse, same as the first! Once again, nothing new to report other than the fact we are still hopeful that we can get some live outreach in before the year is done. We still have some good ideas that may allow us to do some sidewalk astronomy without having to worry about coming in close contact with people. (Astro-video cameras and projectors! It could be pretty cool!!) We'll definitely let you know if anything like that is going to happen.

There has been some good interest in making an educational video or two. I think we have enough motivated people to make it happen. Again, we'll be sure to share with everyone whatever we do.

In the meantime, remember not to keep your interest a secret! People are consuming mass social media at higher rates than ever. If you share on any platforms (Facebook, Instagram, Twitter, Youtube, etc.) be sure to share your love of astronomy. Take a cell phone snap shot of the Moon and post it. You'll be amazed at the reactions from your non-astronomy minded friends. That is really the basis of Outreach. We are trying to pique someone's interest in the night sky. Right now, social media is our best way of continuing to do that until we can get back out in the public spaces.

In this issue of our newsletter (beginning on Page 11, Michele is working on a template for displaying member astrophotos (sample below) with each other, and this month includes some of mine, Coy's and Trey's. Please send yours in to newsletter@brastro.org, with captions, by the 25th of the month previous to publication. We'll let you know the specifications soon.

I am finding there is a lot you can do with a smartphone and some of the apps available! I will try to write up an article for the October newsletter, to share what I am learning about this.

Keep looking up, as the saying goes.
We'll be back at it again in no time.
(That means I'll be twisting arms again
to get people to go out!!)

Clear Skies,

Ben Toman



Star Trails. This was a 45 minute exposure using the Night Cap app on my iPhone XR at the BRAS Dark Sky Site on 8-17-20.



BRAS Light Pollution Committee Report

This committee meets at 6:15, same day as the 7:00 BRAS Business Meeting
(NEW SCHEDULE: Meetings will be the Wednesday before the 1st Monday of the month.)

Everyone is welcome to join in..

No meeting was held as there was not a quorum.

A handwritten signature in black ink that reads "John R. Nagle".

Submitted by John R. Nagle

Globe At Night

The target for the Globe At Night program is Cygnus from September 9th through the 18th.
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.](#)

A poster for the "Globe At Night 2020" event. The background is a dark blue space scene with a view of Earth from space. The text is white and light blue. It includes a calendar of dates for each month, the website URL, and a list of participating organizations.

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



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

As promised last month, BRAS member Chris Carlton herein summarizes the results of his search during the past several years for some dark sky sites within reasonable distance from Baton Rouge.

MY QUEST FOR A DARK PLACE

by **Chris Carlton, Ph.D**

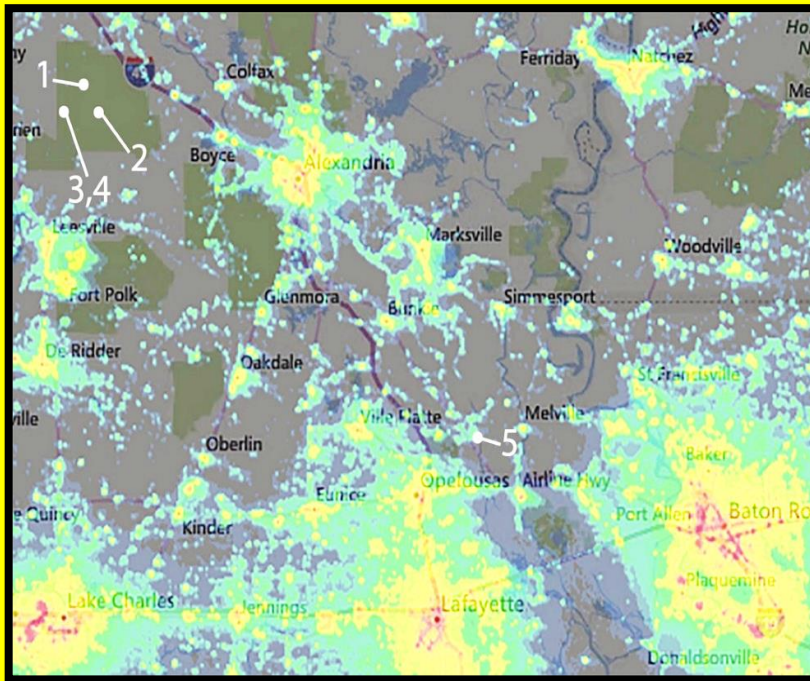
Director, Carlton Astronomy Campus
 Professor of Entomology, Emeritus
 Department of Entomology, Louisiana State University Baton Rouge

The parameters I set for candidate sites included: 1) within a four-hour drive of Baton Rouge; 2) a clear view to the south, north, and at least east or west to about 30 degrees elevation; 3) publicly accessible; and 4) ability to stay overnight without concerns over security. I used the online Light Pollution Map (www.lightpollutionmap.info) as a guide to plan my surveys. This annually (except for 2020) updated resource uses visible infrared and contributed sky quality readings to produce a global map of surface brightness intensities. In their system, high numbers are bad (Baton Rouge=85.00); low numbers are good (darkest places in Louisiana=<0.05). ***In the widely used Bortle scale, Baton Rouge is 8-9 (bad) and the best dark skies in Louisiana are 2.***

I visited Louisiana State Parks, National Forests (NF), and Wildlife Management Areas (WMA). The majority of the developed campgrounds have too much tree cover, not suitable for astronomy. I expanded my search to include open areas within Kisatchie NF where camping is possible on site or nearby. National Forests typically allow camping outside of established campgrounds (“dispersed camping”) so long as basic rules of camping etiquette are met. Here I list five sites that I consider among the best candidates for astronomical forays out of Baton Rouge. I have listed these in order of my personal preference, with 1 being best. I estimate ***number 5 is Bortle 4, the others are Bortle 2.*** I have set up and spent the nights at sites 1-4, and have evaluated number 5 only during daytime. These sites require that you be self-sufficient with respect to power generation for mounts, cameras, etc. Many campgrounds and recreation areas are currently closed due to covid 19. Check websites or call unit managers for up to date information.

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.



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

Descriptions follow:

Sherburne Wildlife Management Area (WMA) is in the dark sky slot of the Achafalaya Basin between Baton Rouge and Lafayette. A primitive campground (site 5) just south of Krotz Springs on La 975 has open skies at about SQL 1.00. Sherburne has a second campground, but I have not seen it. This is the closest site to Baton Rouge I have visited other than the BRASTRO members only observing site near Ramah.

Kisatchie National Forest (NF), is divided into numerous units. Two of them, Vernon and Kisatchie, are under good dark skies and within four hour drives from Baton Rouge. The Vernon Unit southeast of Leesville/Fort Polk has two developed campgrounds, Fullerton Lake and Enduro. Sky clearance is not adequate, but open fields or timber harvest areas may exist nearby. Inquire

with the folks at the Calcasieu District Office in Boyce. Numerous private inholdings are included within the Vernon Unit, so many open areas visible on satellite images are not publicly accessible.

The **Kisatchie Unit northwest of Alexandria** has numerous campgrounds, none with adequate open skies. The best access is via the “Longleaf Pine Scenic Byway” west of La 119. It takes you through the central part of the Kisatchie Unit and adjacent Red Dirt WMA. Campgrounds along the Byway offer convenient staging areas and dispersed camping is possible elsewhere. Several open, dark sky sites are available and are among the darkest places in Louisiana. **Kisatchie Bayou Campground** is located a few miles south of the Byway along a maintained gravel road. Just uphill from the main Kisatchie Bayou campground an open area designated as an overflow site is usually available for astronomy usage, though the open sky slot is a bit narrow. Kisatchie Bayou is currently, temporarily closed, so check for updates. Further west, Road 342 leads to **Red Bluff Campground**, which is open. On the road east of the campground, several open meadows provide open skies in all four directions. Vehicle access to the best site (1) is limited during hunting seasons, requiring a short hike to transport equipment. Another open area is located on 342 just a short distance to the west and others are visible on satellite imagery, but I have not investigated them. Finally, two abandoned gravel pits (sites 2, 3) are located along road 350 less than 3 miles south of the Byway/La 117 intersection west of the Kisatchie Lookout Tower. They are wide, shallow depressions that offer good 360° sky openings. Setting up along the edges is best if it has rained. Dispersed camping along the edges is possible, but sometimes they are used as informal shooting ranges, so plan accordingly.

The folks at the Kisatchie Unit office south of Bellwood were helpful in guiding me to good locations. They know about recent timber harvests, current use patterns, and other useful tips. Some open fields are used as nighttime landing zones for helicopters out of Fort Polk and occasionally as staging areas during prescribed burns. These are off limits during those times.

Flying “Rocks” and “Dirty Snowballs”:

Asteroid and Comet News

**September 2020
Volume 2, Issue 8.**

2018 VP1 in the News

The NEO 2018 VP1 has in news lately and NASA Asteroid Watch had to report it was no real risk. There is a low probability, 1 in 240, that the two-meter 2018 VP1 will strike the Earth's atmosphere and create spectacular fireballs on 2020-11-02. See Asteroid 2018 VP₁ may be heading for Earth. But there's no need to worry by Jonti Horner (<https://theconversation.com/asteroid-2018-vp-may-be-heading-for-earth-but-theres-no-need-to-worry-144930>)

Also, see Flying “Rocks” and “Dirty Snowballs”: Asteroid and Comet News July 2020 Volume 2, Issue 5.

Flying “Rocks” and “Dirty Snowballs”: Asteroid and Comet News December 2018 Pilot Issue.

The Asteroid 2020 QG Sets a New Record

On 2020-08- 16 a small asteroid made a record-setting close approach hours before being discovered. Given the size of 2020 QG and detraction, it came from it would have been difficult to discover before the close approach. See: A Small Asteroid Called 2020 QC Just Gave Earth the Closest Near-Miss Ever Seen by Phil Plait (<https://www.syfy.com/syfywire/a-small-asteroid-called-2020-qc-just-gave-earth-the-closest-near-miss-ever-seen>)

[JPL Close Approach Data](#) from Jul 28, 2020, to Aug 26, 2020, Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal LD (au)	If the Earth was the Size of a Basketball (in feet)	H (mag)	Estimated Diameter
(2020 OY4)	2020/07/28	0.11 (0.00028)	2.57	30.2	2.4 m - 5.5 m
(2020 PA)	2020/08/01	0.15 (0.00039)	3.51	28.8	4.6 m - 10 m
(2020 PX5)	2020/08/11	0.59 (0.00153)	13.80	29.6	3.2 m - 7.2 m
(2020 QJ5)	2020/08/12	0.77 (0.00197)	18.01	26.8	12 m - 26 m
(2020 PW2)	2020/08/14	0.73 (0.00187)	17.07	28.7	4.8 m - 11 m
(2020 QG)	2020/08/16	0.02 (6.23e-5)	0.47	29.9	2.8 m - 6.3 m
(2020 QF2)	2020/08/18	0.55 (0.00140)	12.86	27.9	7.1 m - 16 m
(2020 PY2)	2020/08/20	0.91 (0.00234)	21.28	26.6	12 m - 28 m
(2020 QY2)	2020/08/20	0.17 (0.00044)	3.98	31.2	1.5 m - 3.4 m

(2020 QN4)	2020/08/21	0.71 (0.00182)	16.60	28.6	5.0 m - 11 m
(2020 QQ4)	2020/08/22	0.80 (0.00206)	18.71	28.8	4.6 m - 10 m
(2020 QR5)	2020/08/23	0.83 (0.00214)	19.41	27.3	9.1 m - 20 m

As of 2020-08-26 there is:

1,040 objects listed on JPL's Sentry: Earth Impact Monitoring(JPL) (<https://cneos.jpl.nasa.gov/sentry/>)
 2,519 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/giorgjon.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 2020-07-28 to 2020-08-26

Object Designation	Removed (UTC)
2020 QQ4	2020-08-26 14:58:52
2020 PY4	2020-08-26 14:39:38
2020 PS4	2020-08-23 14:30:57
2020 QB2	2020-08-21 14:22:10
2020 QG3	2020-08-21 14:20:08
2020 OM6	2020-08-21 14:08:58
2020 QG	2020-08-20 15:20:36
2020 FT3	2020-08-20 14:33:15
2020 PB1	2020-08-20 14:31:34
2020 PS	2020-08-17 14:00:05
2020 PL1	2020-08-14 14:58:30
2020 OK5	2020-08-10 13:36:10
2014 UX34	2020-08-09 14:03:09
2020 NK1	2020-07-31 20:03:39
2020 OY4	2020-07-28 14:39:12

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>)



ASTROPHOTOS BY BRAS MEMBERS

Ben Toman's Photos



International Space Station passing over my house on Thursday, August 6th 2020. This is a single frame taken out of a 30 second video clip made with my iPhone XR while attached to my 10" Dob. I manually tracked it with my scope.



Milky Way shot (with Saturn and Jupiter below) taken with my iPhone XR using the Night Cap app, BRAS Dark Site. 8-17-20. phone mounted on a camera tripod.

#1



#2



#3



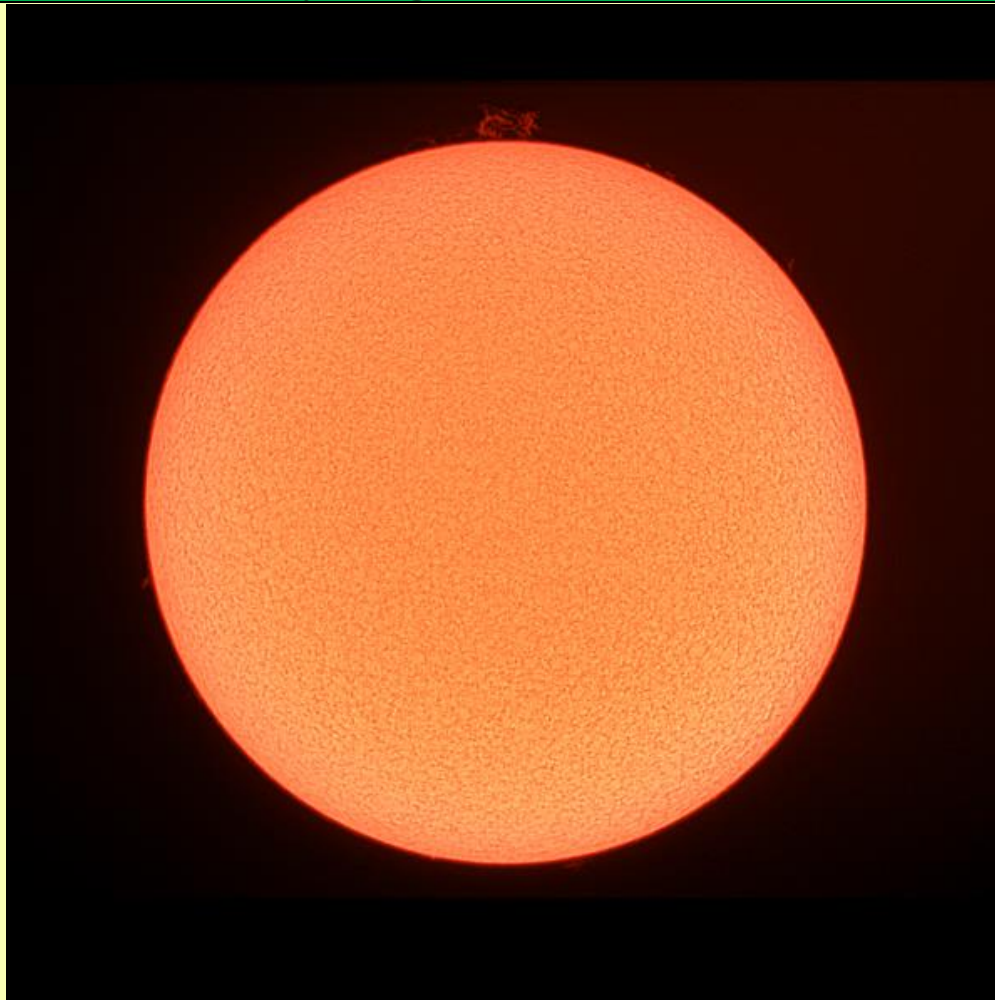
#4



1. Jupiter with its moons, (L-R, Europa, Io, Ganymede) Taken with my iPhone XR attached to my 10" Dob telescope. 58 second video processed with PIPP, Autostakkert, Registax and GIMP.
2. Shot of Mars using my iPhone XR attached to my 10" Dob. 60 second video processed with PIPP, Autostakkert, Registax and GIMP.
3. Jupiter with (dim) Europa casting a shadow. Taken with my iPhone XR through my 10" Dob. 45 sec video processed with PIPP, Autostakkert, Registax and GIMP.
4. Saturn taken with my iPhone XR through my 10" Dob. 50 second video processed with PIPP, Autostakkert, Registax and GIMP.

Coy Wagoner's Photos

S



Sun in Hydrogen Alpha. July 14. Camera: ASI224MC. 50mm Lunt. Processed with PiPP, Autostakkert, and Photoshop.



Jupiter with moons Io, Ganymede, & Europa. July 9. Camera: ASI224MC. Orion 4.5" Autotracker. Processed with PiPP, Autostakkert, and Registax.



Comet Neowise. July 18. Camera: ASI224MC all sky camera from BRAS dark site

Trey Anding's Photos



Full Moon. Taken April 27th in Baton Rouge
Equipment: 8 inch Dobsonian, Samsung Galaxy 7 smartphone with stabilizer, no filter



Comet NEOWISE Taken July 18th in Baton Rouge
Equipment: 8 inch Dobsonian, Samsung Galaxy 7 smartphone with stabilizer



Messages from HRPO

Highland Road Park Observatory



REMOTE DISCUSSIONS

All are for ages fourteen and older.

There will be two discussions (all remote)—one each on the 18th and the 25th. Speakers, topics and start times will be posted at hrpo.lsu.edu.



Solar Viewing

Saturday 12 September 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]



Plus Night

Saturday 26 September from 7pm to 10pm.

Theme: "The Martian Mystique"

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.



Mercurian Elongation

Thursday 1 October from 6pm to 7:30pm

at Burbank Soccer Complex

No admission fee; for all ages.

Periodically Mercury reaches its greatest angular separation in the sky (elongation) from the Sun. This is the safest way to view Mercury by amateurs. The planet will appear as a "half-Mercury". Venus will also be seen.



Spooky Sensation

Saturday 3 October from 2pm to 10pm

No admission fee. For all ages.

The response to the virus outbreak led to the cancellation of the 2020 International Astronomy Day. As a response, HRPO personnel have created a special one-time-only hybrid of IAD and the Spooky Spectrum that will include all regular IAD exhibitors who accept the invitation. *ALERT: It is unknown which "phase" of the outbreak response society will be experiencing. There is a possibility this event will have no rides or food.*



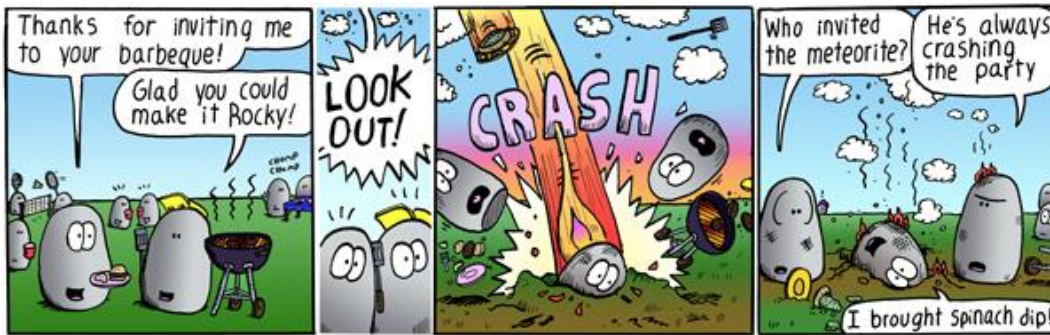
Great Martian Opposition

Tuesday 13 October from 6:30pm to 12:30am
No admission fee. For all ages.

Every twenty-six months the planet Earth catches up to the planet Mars, which orbit the Sun more slowly. As this happens, Mars rises earlier in the night sky and increases in angular size. Due to the fact that Earth's and Mars' orbits are not perfect circles, some *oppositions* are closer than others. During the second week of October, Earth will be closer to Mars than it will be for the next thirteen years. This is an excellent opportunity for formal and informal educators; viewers, sketchers and photographers; and families and children. The large Syrtis Major region and the southern polar cap both will be visible through at least October (a transient dust storm notwithstanding).

*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.



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.

- [Perseverance](#) on Its Way to Mars
- [Behnken and Hurley](#) Return from ISS
- Three [Active Regions on Sun](#) in Past Month
- Over 100 Attend [Perseid Viewing](#)
- [Asteroid ES4](#) Passes Closer Than Moon on 1 September
- Goodbye, [NEOWISE](#)
- [Star Cluster M72](#) Culminates Before Midnight in September
- First Glimpses of [Eskimo Nebula](#) Coming in Early Fall Sky
- Supernova Like One in [Siamese Twins Galaxy](#) Useful for Measurements
- [Universe](#) Possibly Not as Clumpy as Once Thought
- Can [Planets Form Around Black Holes?](#)



Observing Notes: September

by John Nagle

Aquila – The Eagle

Position: RA18 41 Dec 18

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

Altair (Alpha Aql), from the Arabic “Al Nesr Al Tair”, “The Flying Eagle”, mag. 0.76, 19 50 46.68 +08 52 02.6, is the 12th brightest star in the night sky. The Greeks and the Romans often confounded eagles with vultures, hence **Altair** would often be called “**Volans**” (**Vulture**). There are 2 visible companions to the primary (the **WDS** lists 6 companions), which is a yellowish-white, main sequence dwarf star that is a rapid rotator, one of the fastest known, with the speed of 160 miles per second, or a complete revolution in about 6.5 hours, forcing its shape into an oblate spheroid. Also known as **HD 187642**, **HIP 97649**, **Gould 86**, **STA 10**, and **53 Aquilae**.

Alshain (Beta Aql), from the Arabic word “Sahin” that is a portion of the Persian name for the constellation. Al Achsasi called it “Al Unuk al Ghuräb” – “the Raven’s Neck”, mag. 3.7, 19 55 18.77 +06 24 28.6, is a pale orange sub-giant star and a visible double star. The companion is a 12th magnitude red dwarf star at a separation of 12.8”, or 160 a.u. Also known as **HD 188512**, **HIP 98036**, **OΣ532**, **Gould 98**, and **60 Aquilae**.

Tarazed (Gamma Aql), from the Arabic “Sahin turazu”, “the Beam of the Scales”, also called “Menkib al Nest”, and “Humerus Vulturis”, mag. 2.72, 19 46 15.57 +10 36 47.8, is a pale orange giant star and a known source of X-rays. It is a suspected variable star, and is about 100 million years old – yet it is already fusing helium into carbon in its core. Situated near the **Milky Way’s Great Rift**. Dark Nebula **B143** is about 1.5° to the west. Also known as **HD 186791**, **HIP 97278**, and **50 Aquilae**.

Denebokab (Delta Aql), is also called “Djenubi Menkib al Nesr”, and “Australior Humerus Vulturis”, mag. 3.36, 19 25 29.75 +03 06 52.5, is a yellow-white sub-giant binary star with an unseen companion having a period of 3.42 years and an expected separation of 0.3”. Also known as **HD 182640**, **HIP 95501**, **Gould 46**, and **30 Aquilae**.

Deneb el Okab (Epsilon Aql), from the Arabic “Al Dhanub al ‘Okäb”, “The Eagle’s Tail”, and “Denebokab Borealis”, and from the Chinese “Woo, Yuë”, which are two ancient feudal states in China, mag. 4.02, 18 59 37.39 +15 04 06.5, is a triple star. The primary is an orange giant star with an atmosphere heavy with barium – hence it is often referred to as a “**Barium Star**”. Both companions are 10th magnitude stars. Also known as **HD 176411**, **HIP 93244**, **Engelmann 65**, and **13 Aquilae**.

Deneb el Okab (Zeta Aql), from the Arabic “Al Dhanub al ‘Okäb”, “The Eagle’s Tail”, also “Denebokab Australis”, and “Cauda Vulturis”, and the Chinese “Woo, Yuë”, two ancient feudal states in China, mag. 2.99, 19 05 24.61 +13 51 49.4, is a visual double star. The primary, a rapid rotator at a rate of 325 Km per second, is a main sequence white dwarf star. The companion star has a projected separation of 7.2” (175 a.u.). Also known as **HD 177724**, **HIP 93747**, **β287**, and **17 Aquilae**.

Bezek (Eta Aql), “**Lightning**”, also called “Al Mizan II”, mag. 3.87, 19 52 28.36 +01 00 20.4, is a yellow-white super-giant star, and a possible triple star system. It has a suspected companion at a separation of 0.6” (180 a.u.), and a hot companion with a maximum separation of 1.5”. The primary is a *Cepheid Variable Star* (magnitude 3.7 to 4.5) with a period of 7.17644 days that is visible to the

naked eye. Listed as **AAVSO 1947+00**. This star was the first *Cepheid Variable Star* discovered, but **Delta Cephei** is the proto-type star. Also known as **HD 187929**, **HIP 97804**, **Gould 89**, and **55 Aquilae**.

Thanih Ras al Akab (Theta Aql), also called “Tseen Foo” from the Chinese meaning “The Heavenly Raft”, “Al Mizan III”, and **Secanda Caputis Vulturis**, mag. 3.24, 20 11 18.26 -00 49 17.3, is a spectroscopic binary and suspected variable star. The companion star has a period of 17.124 days, and an average separation of about 15 million miles (0.2 to 0.28 a.u.). Also known as **HD 191692**, **HIP 99473**, **Gould 117**, and **65 Aquilae**.

Al Thalimain (Iota Aql), from the Arabic for two ostriches (the second being **Lambda Aquilae**), mag. 4.36, 19 36 43.28 -01 17 11.6, is a blue-white giant star. It is also known as **HD 184930**, **HIP 96468**, **Gould 64**, and **41 Aquilae**.

Al Thalimain Prior (Lambda Aql), from the Arabic for two ostriches (the second being **Iota Aquilae**), mag. 3.43, 19 06 14.95 -04 52 56.4, is a blue-white main sequence dwarf star and a suspected spectroscopic binary star. There is a wide optical double star **15 Aquilae**, less than 1° to the north and slightly west, and the very red n-type variable star **V Aquilae** is 1° to the southwest near the faint annular nebula **NGC 6751 (The Gleaming Eye Nebula)**. Also known as **HD 177756**, **HIP 93805**, **Gould 19**, and **16 Aquilae**.

Libertis (Xi Aql), mag. 4.722, 19 54 14.88 +08 27 41.23, has one planet in orbit. Also known as **HD 188310**, **HIP 97938**, **Gould 94**, and **59 Aquilae**.

Les Grey (37 Gould Aql), mag. 6.31, 19 18 52.75 +09 37 05.4. Also known as **HD 181122**, **HIP 94916**, and **Gould 37**.

Chechia (HD 192699), mag. 6.44, 20 16 06.03 +04 34 51.3, has one planet in orbit. Also known as **HD 192699**, **HIP 99894**, and **Gould 128**.

Phoenicia (V1703 Aql), mag. 8.10, 20 13 59.85 -00 52 00.8, is a variable double star with a planet in orbit. Also known as **HD 192263**, **HIP 99711**, and **V1703 Aquilae**.

Petra (WASP 80), mag. 11.88, 20 12 40.0 -02 08 44, has one transiting planet in orbit.

Sanduleak-Stephenson Star (SS433), mag. 14.2, 19 11 49.56 +04 58 57.6. This is a unique binary system lying in the center of a supernova remnant. The stars cannot be resolved visually. Spectroscopes reveal emission lines red and blue shifted, showing jets that precess and seem to sweep across the sky with a period of 164 days. The object is an eclipsing binary star with a period of 6.4 days, containing a very hot star with an invisible companion that is probably a neutron star because of the bizarre relativistic effects. Also known as **V1933 Aquilae**, **SS433**, and **W50**.

Van Biesbroeck's Star (VB10), mag. 17.30, 19 16 57.62 +05 09 02.2, is a red dwarf star that has one planet in orbit, it is the distant companion to the 9th magnitude dwarf M3 type star at 19 14.5 +05 06, with a separation of 400 a.u. Also known as **LFT 1467**, **Ross 652b**, and **Wolf 1055b**.

Deep Sky:

NGC 6709, mag. 6.7, 18 51.5 +10 21, 12'x12' in size, is an open cluster of 100 stars; detached, no concentration of stars; modest brightness range; magnitude of brightest star is 9.1. Located 5° southwest of **Zeta Aquilae**. Also known as **Mel 124**, and **Cr 392**.

Cr 401, photo mag. 7.0, 19 38 24.0 +00 20 00, 1' in size, 8 stars; not well detached; moderate brightness range; moderately rich.

Cz 39, mag. 7.5, 19 07 43.0 +04 20 03, 15' in size, 157 stars.

NGC 6755, mag. 7.5, 19 08 52 +04 18 03, 10' in size, is an open cluster of 100 stars; not well detached from the surrounding star field; moderate range in brightness; magnitude of brightest star is 10.2; very large. Located 4.5° west of **Delta Aquilae**. Also known as **OCL 96**, **H7-19**, and **Cr 397**.

NGC 6738, mag. 8.0, 19 02 21 +11 38 55, 15' in size, is an open cluster of 50 stars; not well detached; moderate brightness range; a poor cluster. Also known as **OCL 101**, and **Cr 396**.

NGC 6760, mag. 9.0, 19 11 12.1 +01 01 50, 6.6' in size, is a globular cluster with a low concentration of stars. It is faint, round, and has a 4' diameter halo. It is metal rich and contains two pulsars –

PSR J1911+0101B, a 5.8 millisecond pulses and **PSR J1911+0102A**, a binary with an orbital period of 3.38 hours. Located 4° south-southwest of **Delta Aquilae**. Also known as **GCL 109**, and **Mel 219**.

NGC 6741, “**The Phantom Streak Nebula**”, mag. 9.6, 19 02 37.1 -00 26 57, 8”x7” in size, is a planetary nebula that is near stellar; photo magnitude is 10.8; central star is magnitude 17.6. Located 4.5° north-northwest of **Lambda Aquilae**. Also known as **PK 33002.1**, **Sa2-380**, **Jonckheere 475**, **IRAS 19000-0031**, **ARO 53**, **PNG 33.8-02.6**, and **VV 217**.

Pal 11, mag. 9.8, 11 45 14.4 -08 00 26, 10’ in size, a globular cluster with a low concentration of stars.

Be 82, 9th mag., 19 11 21.1 +13 06 37, 4’ in size, 20 stars. Located 1.6° east-southeast of **Zeta Aquilae**.

NGC 6790, mag. 10.0, 19 22 57.1 +01 30 44, 7” in size, is a planetary nebula that appears stellar. It has a photo magnitude of 11.3, and the center star (**HD 182083**) is magnitude 15.5. Also known as **ARO 33**, **PK 37-06.1**, and **PNG 37.8-06.3**.

Objects beyond magnitude 10 of interest:

NGC 6814, mag. 11.2, 19 42 41 -10 19 25, 3.0’x2.8’ in size, is a galaxy that is pretty faint and pretty large; knotty arms; very small, very bright nucleus. It is a face-on **Seyfert** galaxy with at least 4 primary arms with knots, and it is also an **AGN**. Located 55’ east of **Σ 2547**. It contains **V1432 Aquilae**, and **1RXS J194241.3-101928**. Also known as **H3-744**, **MCG-02-50-01**, **PGC 063545**, **AGC 590025**, and **IRAS 19399-1026**.

NGC 6781, “**The Snow Globe Nebula**”, mag. 11.4, 19 18 28.2 +06 32 15, 1.75’x1.7’ in size, is a “C” shaped planetary nebula that is a faint, large, irregularly round disk, with a large, fainter outer disk; photo magnitude is 11.8; central star is magnitude 16.2. Located 3.8° north-northwest of **Delta Aquilae**. Also known as **H3-743**, **PK 41-02.1**, and **PNG 41.8-02.9**.

NGC 6828, mag. 11.5, 19 51 19 +07 57 29, 3’ in size, is an asterism of 20 stars. The **RNGC** says it is non-existent. Also known as **H8-73**.

NGC 6837, mag. 11.5, 19 54 08 +11 45 21, 3’ in size, is an open cluster of 20 stars. The **RNGC** says it is non-existent. Also known as **OCL 108**, and **H8-18**.

NGC 6751, “**The Glowing Eye Nebula**”, mag. 11.9, 19 05 55.5 -05 59 33, 26” in size, is a planetary nebula that is pretty bright, small, has an irregular disk; central star is magnitude 15.14. It has a greenish hued disk, with a hint of a ring structure. Also known as **GSC 05140-03417**, **Th1-j**, **HuLo 1**, **ARO 101**, **PN VV47**, **PN VV219**, **PK 29-05.1**, **PNG 29.2-5.9**, **Sa2-382**, and **IRAS 19032-0604**.

Merrill 1-1, mag. 11.8, 19 39 09.9 +15 56 45, 8” in size, is a planetary nebula located in far northern **Aquila**, near the border with **Sagitta**. Also known as **PK 52-02.2**.

Abell 70, “**The Diamond Ring**”, mag. 14.5, 20 31 33.2 -07 05 18, 0.75’x0.67’ in size, is a planetary nebula. The central star is magnitude 18.4, and the background galaxy is **MAC 2031-0205**. Also known as **PK 38-25.1**, and **PNG 38.1-25.4**.

Glimpse C01, mag. 22.4, 18 48 49.7 -01 29 50, is the most massive, intermediate sized cluster in the galaxy.

B127, 19 01 31 -05 26, 4.5’ in size, is an irregular shaped dark nebula. Located near the northeast edge of **B130**. Also known as **LDN 544**.

B129, 19 02 04 -05 10, 10’ in size, is a dark nebula that is very black, sharply defined with a small star at the west end. Appears semi-detached. Located northeast of **B127**. Also known as **LDN 549**.

B130, 11 01 56 -05 34, 7’ in size, is a dark nebula that is dusky and not well defined. Located 11’ north-northeast of the star **12 Aquilae**.

B127, **B129**, and **B130** form a “C” shape.

Barnard’s “E” is formed from **B142** and **B143**. Also called the **Double Dark Nebula**, and the **Triple Cane Nebula**. It is located about 1.4° west-northwest of **Gamma Aquilae**.

B142, 19 39 41 +10 31, 40’ in size, is a dark nebula that is large; irregular; and runs east to west. The star **BD+10 4016** is in the east part. Also known as **LDN 688**.

B143, 19 41 25 +11 00, 30’ in size, is a dark nebula that is a rather narrow, angular marking in the outline of a square with the inside missing. Also known as **LDN 694**.

NGC 6773, 19 16 11 +04 53 45, 12’x7’ in size, is an asterism of 30 stars. The **RNGC** says it is non-existent. Located 20’ west of the star **22 Aquilae** (magnitude 5.6). Also known as **H8-13**.

NGC 6775, 19 17 48 -00 53 37, 15' in size, is an asterism of 15 stars that is not easy to distinguish. The RNGC says it is non-existent.

NGC 6795, 19 27 25 +03 33 32, 30'x15' in size, is an open cluster of 60 stars in a triangular shape with **Delta Aquilae** at the south-southwest vertex. The RNGC says it is non-existent.

NGC 6858, 20 04 00 +11 19 41, 15'x15' in size, is an open cluster of 30 stars. The RNGC says it is non-existent.

Asterisms:

The Family of Aquila, 19 50 14 +08 40 30, 300"x300" in size.

The Summer Triangle, **Altair (Alpha Aquilae)** is the southernmost of the three stars that form the triangle. The other two stars are **Deneb (Alpha Cygni)**, and **Vega (Alpha Lyrae)**.

Al Mizän, "The Scale Beam", is comprised of **Delta**, **Eta**, and **Theta Aquilae**.

Yew Ke, from the Chinese meaning "The Right Flag", is composed of **Iota**, **Delta**, **Eta**, and **Kappa Aquilae**. **Tso Ke**, "The Left Flag", is **Rho Aquilae**.

Tseen Peen, from the Chinese for "The Heavenly Casque", is composed of **Lambda**, **h**, and **g Aquilae** with some stars in **Scutum**.

The Aquila Rift:

The **Milky Way** is bisected by a dark, irregular lane. The part that begins in **Aquila**, near **Altair**, extends over 20° of galactic latitude into eastern **Ophiuchus**, and is called the **Aquila Rift**. A molecular cloud with a mass of about 270,000 solar masses is near its core (at 18 30 -02 00). There are 201 **Young Stellar Objects (YSO)** in it.

Objects in Aquila: 42 NGC; 7 IC; 42 UGC; 62 MCG; 48 ARO; 39 B (Barnard); 24 CGCG; 21 IRAS; 23 K (Kohoutek) 133 LDN; 5 Cr; 11 Abell; 7 Be (Berkley), 11 H (Herschel), 18 Radio Galaxies; 1 Quasar; 5 OCL; 11 Min (Minkowski), 12 Sa; 2 Mel; 48 PGC; 80 PK; 74 PNG; 13 Sh2; 5 He2; 1 Ap1; 1 Ap2; 1 Ap4; 1 AG; 1 Ap; 4 Al 1 AGC; 1 Crinklaw; 3 CTSS; 1 Do; 1 DeHt; 3 FSR; 3 GCL; 1 Holm; 1 HaTr; 1 HaWe; 1 HtDe; 5 HtTr; 1 HtWe; 1 HuLo; 1 J (Jonckheere); 2 Ju; 2 King; 1 Kro; 1 KPG; 2 Leda; 1 Leiter; 1 Ling; 1 LSA; 1 Merrill; 2 MaC; 1 NPM1G; 1 Nassau; 1 O'Neal; 1 Pal; 1 Pat; 1 Parsamyan; 1 Pot; 1 PMI; 2 PB; 2 PC; 1 Poole4; 3 Ray; 2 Rem; 1 RNO; 1 SrWe; 1 Teutsch; 1 Teu; 1 TDC; 1 Th1; 1 Vy2; 1 VV; 2 V-V; 3 V; 1 WeSb; 1 WE; 1 X-ray; and 1 II Zw; for a total of 766 objects.

Other Stars:

18 Aquilae, mag. 5.07, 19 06 58.6 +11 04 16.7, is a double star and an eclipsing binary star. Also known as **HD 178125**, **HIP 93867**, **Y Aquilae**, and **18 Aquilae**.

Sigma Aquilae, mag. 5.18, 19 38 11.64 +05 23 52.0, is a rapidly rotating eclipsing binary dwarf star. The secondary is also a dwarf star. The orbital period is 1.95027 days, and the separation is 0.07 a.u. – 6.35 million miles. There is an optical companion at magnitude 12.5, and a separation of 48" – probably not related. Also known as **HD 185507**, **HIP 96665**, **Gould 68**, and **41 Aquilae**.

HD 181234, mag. 6.0, 19 20 00 -09 19 25, has one planet in orbit. Also known as **HIP 95015**.

R Aquilae, mag. 6.09, 19 06 22.25 +08 13 48.0, is a variable star in the **Aquila Rift** in the **Great Rift of the Milky Way**. It is a red giant long term variable star (period of 270.5 days) and is also Infra-red source. Located 5.5° south of **Zeta Aquilae**. Also known as **HD 177940**, **HIP 93820**, **Gould 22**, and **AAVSO 1901+08**.

V1401 Aquilae (64 Sagittarii) mag. 6.38, 20 05 05.42 -11 35 57.8, is a semi-regular variable star. Also known as **HD 190390**, **HIP 98910**, and **Gould 108**.

V Aquilae, mag. 6.78, 19 04 24.15 -05 41 05.4, is a semi-variable carbon star, one of the reddest stars known. Its magnitude varies from 6.6 to 8.4 over a period of 353 days. To find, go to about ¼ the way from **12 Aquilae** to **Lambda Aquilae**, then to an arc of 3 stars, then east-southeast to the star.

HD 186641, mag. 7.34, 19 45 41 -00 41 48, has one planet in orbit. Also known as **HIP 97233**.

HD 183263, mag. 7.86, 19 28 24.51 +08 21 29, has two planets in orbit. Also known as **HIP 95740**.

HD 179079, mag. 7.96, 19 11 09.03 -02 38 18.2, has one planet in orbit. Also known as **HIP 94256**.

HD 176986i, mag. 8.45, 19 03 60 -11 02 38, has two planets in orbit. Also known as **HIP 93540**.

WASP-74, mag. 9.7, 20 18 10 -01 04 33, has a transiting planet in orbit.

Stars of interest beyond magnitude 10 :

HAT-P-41 (mag. 11.09); **COROT-2** (mag. 12.57); **COROT-8** (mag. 14.8); **COROT-10** (mag. 15.22)

all have one transiting planet.

COROT-3, mag. 13.3, has a transiting brown dwarf star.

V603 Aquilae, mag. 11.64, is the 1918 Nova Aquilae.

W 50 Nebula, 19 11 49 -04 59 12, is a supernova remnant.

Contained within Aquila are the following stars:

64Σ; 5 OΣ; 3 OΣΣ; 20β; 14 Numbered; 9 A; 4 S; 80 V (variable); 10 Lettered; 11 h; 2 Hd; 1 Hh; 1 Hl; 5 Ho; 1 Hu; 1 Hwe; 3 J; 1 Kui; 1 Rst; 1 Sh; 1 South; 1 SS; 1 Str; 3 GSO; 15 BD; and 9 Greek Lettered; for a total of 266 stars.

Sky Happenings: September, 2020

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

- Sept. 1st - Venus passes 9° south of **Pollux** at 12 noon CDT.
Asteroid **Juno** discovered in 1804.
- Sept. 2nd - **Full Moon** occurs at 12:22 AM CDT,
Asteroid **Pallas** is stationary at 8 AM CDT,
The **Moon** passes 4° south of **Neptune** at 4 PM CDT.
- Sept. 5th - Evening: The waning gibbous **Moon** and **Mars** rise together as a close pair in **Pisces**.
- Sept. 6th - The **Moon** passes 0.03° north of **Mars** at 12 AM CDT,
The **Moon** is at apogee (252,000 miles or 405,607 km from **Earth**) at 1:29 AM CDT,
The **Moon** passes 3° south of **Uranus** at 11 PM CDT.
- Sept. 9th - Dawn: The **Moon** is just outside the **Hyades** with the **Pleiades** to its upper right,
Mars is stationary at 1 PM CDT.
- Sept. 10th - **Last Quarter Moon** occurs at 4:26 AM CDT,
Dawn: The **Last Quarter Moon** is between the **Horns of Taurus**, framed by **Aldebaran**,
Beta Taurii, and **Zeta Taurii**.
- Sept. 11th - Asteroid **Fortuna** is at opposition at 2 AM CDT,
Neptune is at opposition at 3 PM CDT.
- Sept. 12th - **Jupiter** is stationary at 7 PM CDT.
- Sept. 14th - The **Moon** passes 4° north of **Venus** at 12 AM CDT,
Double shadow transit of **Jupiter** starts at 12:18 AM CDT,
Dawn: Some 5° separate the waning crescent **Moon** from brilliant **Venus**, while the **Beehive Cluster (M44)** is to its upper left.
- Sept. 15th - Dawn: A very thin crescent rises, with **Regulus** lagging by 5°.
- Sept. 17th - **New Moon** occurs at 6 AM CDT.
- Sept. 18th - The **Moon** is at perigee (223,123 miles or 359,082 km from **Earth**) at 8:48 AM CDT,
The **Moon** passes 6° north of **Mercury** at 5 PM CDT.
- Sept. 21st - Dusk: The waxing crescent **Moon** is less than 1° from the double star **Beta Scorpii**. The **Moon** will eclipse **Beta Scorpii** (mag. 2.6 and 4.5) with its dark limb at about 8:45 PM CDT.
- Sept. 22nd - The **Moon** passes 0.3° north of **Spica** at 4 AM CDT,
The **Autumnal Equinox** occurs at 8:31 AM CDT.
- Sept. 23rd - **First Quarter Moon** occurs at 8:55 PM CDT,
Neptune was discovered in 1846.
- Sept. 24th - Dusk: A trio, comprising the waxing gibbous **Moon**, **Jupiter**, and **Saturn**, are arranged in an arc of about 11° long, adorning the southern horizon.
- Sept. 25th - The **Moon** passes 1.6° south of **Jupiter** at 2 AM CDT,
The **Moon** passes 2° south of **Saturn** at 4 AM CDT,

- Dusk: The **Moon** is 8° to the lower left of **Saturn**, and along with **Jupiter**, forms a triangle.
- Sept. 28th** - **Saturn** is stationary at 10 PM CDT.
- Sept. 29th** - The **Moon** passes 4° south of **Neptune** at 9 PM CDT,
Asteroid **Leto** is at opposition at 10 PM CDT.
- Oct. 1st** - **Mercury** is at greatest eastern elongation (26°) at 11 AM CDT,
Full Moon occurs at 4:05 PM CDT.
- Oct. 2nd** - **Venus** passes 0.09° south of **Regulus** at 7 PM CDT,
The **Moon** passes 0.7° south of **Mars** at 10 PM CDT, occultation will be visible in the southern hemisphere
- Oct. 3rd** - The **Moon** is at apogee (252,476 miles or 406,322 km from **Earth**) at 12:22 PM CDT.
- Oct. 4th** - **Pluto** is stationary at 1 AM CDT,
The **Moon** passes 3° south of **Uranus** at 4 AM CDT.
- Oct. 6th** - **Mars** comes closest to Earth (38.6 million miles away) at 9 AM CDT.

Planets:

Mercury – **Mercury** is difficult to spot as it approaches its greatest eastern elongation on October 1st, as the ecliptic lies so low to the horizon. The planet sets less than 50 minutes after the **Sun**, On September 21st and 22nd, the planet passes close to **Spica**. The pair will be difficult to see, due to the bright twilight. They are side-by-side on the 21st, standing 0.7° apart. Try spotting them 20 minutes after sunset, when the pair are 5° above the horizon. Ten minutes later, they are only 3° high. They will then set 20 minutes later. On the 30th, the planet will set 50 minutes after the **Sun**.

Venus – **Venus** rises around 3 AM local daylight time (ldt) on September 1st, south of **Castor** and **Pollux** in **Gemini**, shining at magnitude -4.3, with a gibbous phase of 60%. The planet, during the month, will start in **Gemini**, cross **Cancer**, and move into **Leo**, ending up 3° west of **Regulus**. During the month, the planet will dim from magnitude -4.3 to -4.1, and its disk will decrease from 19.5” to 15.6”, but its phase will increase from 60% to 72% illuminated. On the 14th, the planet will lie 2.5° south of the **Beehive Cluster (M44)** in **Cancer**. A waning crescent **Moon** floats only 5° from the planet and **M44**.

Mars – The **Mars** observing season begins as we near next month’s opposition of the planet. The planet is less than ½ a.u. from **Earth**, with its disk growing from 18.9” to 22.4” during the month. The planet, located in **Pisces**, will halt its eastward drift (at about 5° north of **Alpha Piscium**) on September 9th, then start its retrograde loop, tracking west. The planet starts the month at magnitude -1.9, ending the month at magnitude -2.5 (slightly brighter than **Jupiter** at the end of the month). The planet’s closest approach to **Earth** will be on October 6th. A bright, waning gibbous **Moon** will lie 1.5 moon-widths south of the planet on the 5th. The best viewing of the planet will be after midnight. Telescopes will show the disk 92% illuminated on the 1st, and 99% illuminated by end of the month. In early September, the major features will be visible at 2 AM local time, including **Syrtis Major** and the bright **Hellas Basin**. In the second week of the month, the dark **Mare Sirenum** and **Mare Cimmerium** will span the planet’s disk. In mid-month, the brighter volcanic **Tharsis Ridge** and **Olympus Mons** neat the terminator. By the 21st, the **Mariner Valley** will rotate onto the disk. During the last week of the month, **Sinus Sabaeus** and **Sinus Meridiani** will appear.

Jupiter – **Jupiter** wanders westward (retrograde) in eastern **Sagittarius** until September 12th, when it will halt at its stationary point, and return to direct motion. During the month, the planet fades from magnitude -2.6 to -2.4, and its angular diameter decreases from 44.3” to 40.7”. There will be a double shadow transit on the 14th, with **Io** starting transit at 12:07 AM CDT, followed by its shadow’s transit starting at 1:18 AM CDT. **Callisto**, whose transit ended at 6:47 PM CDT on the 13th, has its shadow start transit at 1:57 AM CDT (on the 14th). **Io** ends its transit at 2:23 AM CDT, with its shadow ending transit at 3:34 AM CDT. **Callisto**’s shadow ends transit at 6:18 AM CDT. On the 15th, **Io** and **Ganymede** will pass each other, with the pair’s closest approach (10” separation) will occur at around 9:30 PM CDT.

Saturn – **Saturn**’s magnitude will decrease from +0.3 to +0.5, while its disk will shrink from 18” to 17.2”. The rings extend outward 40”, and are tilted earthward at an angle of 23°. The planet’s 8th magnitude moon, **Titan**, will be due north of the planet (in western **Sagittarius**) on the 1st and 17th, and due south on the 9th and 25th. The 10th magnitude moons **Tethys**, **Dione**, and **Rhea**’s relative positions change over a few hours.

Enceladus, 12th magnitude, is near the bright edge of Ring A – it can be lost in the ring’s brilliance, so you will need to look carefully. **Iapetus** will reach superior conjunction on the 7th, when it lies 63” due north of the planet, with it being near 11th magnitude. At its superior conjunction, the moon’s two toned surface will show 50% of each hemisphere to **Earth**. **Iapetus** will reach greatest eastern elongation on the 25th.

Uranus – **Uranus** will be 13° east of **Mars** on September 1st. **Uranus** will rise near the end of evening twilight, and shines at magnitude 5.7 in **Aries**. The best time to view is after midnight. To find the planet, first locate **Hamal (Alpha Arietis)** and **Menkar (Alpha Ceti)**. The two stars are 23.5° apart. **Uranus** lies between them, just under 11° from **Hamal**, with the 6th magnitude star **29 Arietis** near it. On the 1st, the planet is 0.6° southwest of **29 Arietis**, and by the 30th, it is just over 1° from it. The planet’s greenish disk is visible in a telescope, and with high magnification will reveal a 3.5” wide disk.

Neptune – **Neptune**, in **Aquarius**, reaches opposition on September 11th (4.0 light hours or 28.9 a.u. from **Earth**), at magnitude 7.8. The planet rises with a full **Moon** in the east after sunset on the 1st. Binoculars will show the magnitude 7.9 planet near the star **Phi Aquarii**. Scan 2.5° east of the star to find the planet, where it forms a triangle with a pair of 6th magnitude field stars. The planet will lie midway between the stars on the 30th, and now be only 1.5° east of **Phi Aquarii**. A telescope will reveal its bluish disk spanning 2.3”.

Moon – The **Moon** is full at 12:22 AM CDT on September 2nd. The waning gibbous **Moon** is in conjunction with **Mars**, passing ½° south of the planet about 12 AM on the night of the 5th/6th.

Favorable Librations: **Compton Crater** on the 1st; **Vallis Bouvard** on the 14th; **Oken Crater** on the 21st, and **Humboldt Crater** on the 22nd.

Greatest North Declination on the 12th (+24.3°)

South 25th (-24.4°)

Libration in Longitude: East limb most exposed on the 25th (+7.1°)

West limb most exposed on the 13th (-7.2°)

Libration in Latitude: North limb most exposed on the 3rd (+6.5°)

South limb most exposed on the 17th (-6.5°)

Asteroids – Asteroid **1 Ceres** (a minor planet) – **Ceres**, at magnitude 7.7, spends all month one binocular field of view above **Fomalhaut**, in **Piscis Austrinus**. **Ceres** positions, according to the *RASC Observer’s Manual, 2020 USA Edition*, are as follows: On September 8th – 22 44.2 -24 39.4, at mag. 7.7; on the 18th – 22 36.2 -25 09.8, at mag. 7.9; and on the 28th – 22 29.54 -25 20.1, at mag. 8.1. **Ceres** positions, by my estimates, are as follows: On September 1st – about 3.2° northeast of **Epsilon Piscis Austrinus**; on the 5th – just under 3° north-northeast of **Epsilon Piscis Austrinus**; on the 10th – about 2.5° due north and a little east of **Epsilon Piscis Austrinus**; on the 15th – just over 2° north-northwest of **Epsilon Piscis Austrinus**, or just under 2° northeast of **Zeta Piscis Austrinus**; on the 20th – just over 1° north-northeast of **Zeta Piscis Austrinus**; on the 25th – 0.6° due north and a little west of **Zeta Piscis Austrinus**; and on the 30th – just over 1° northwest of **Zeta Piscis Austrinus**.

Asteroid **8 Flora** – **Flora**’s positions, according to the *RASC Observer’s Manual, 2020 USA Edition*, are as follows: On September 8th – 02 56.32 +06 40.7, at mag. 9.2; on the 18th – 03 01.37 +06 16.1, at mag. 8.9; and on the 28th – 03 02.79 +05 38.7, at mag. 8.7.

Asteroid **11 Parthenope** – **Parthenope**’s position on September 28th, according to the *RASC Observer’s Manual, 2020 USA Edition*, is 02 24.61 +06 27.3, at mag. 9.9.

Asteroid **19 Fortuna** – **Fortuna**’s positions, according to the *RASC Observer’s Manual, 2020 USA Edition*, are as follows: on September 8th – 23 18.22 -02 17.1, at mag. 9.3; on the 18th – 23 09.73 -03 19.3 (on the **Pisces/Aquarius** border), at mag. 9.4; and on the 28th – 23 02.07 -04 18.7 (in **Aquarius**), at mag. 9.7.

Asteroid **20 Massalia** – **Massalia**’s position, on September 8th, according to the *RASC Observers Manual, 2020 USA Edition*, is 22 19.43 -09 31.1, at mag. 9.9.

Asteroid **68 Leto** – **Leto**’s positions, according to the *RASC Observer’s Manual, 2020 USA Edition*, are as follows: on September 18th – 00 50.17 -04 34.6, at mag. 9.7; and on the 28th – 00 41.61 -04 56.8, at mag. 9.5.

Asteroid **471 Papagena** – **Papagena**’s position on September 28th, according to the *RASC Observer’s Manual, 2020 USA Edition*, is 02 50.81 -06 21.1, at mag. 9.8.

Comets – Comet **88P/Howell**, discovered in 1981, has an orbital period of 5.5 years. The comet's closest approach to the **Sun** is on September 26th, and it should be around 9th magnitude all month. It will have a green halo. The comet will travel from **Libra** to northern **Scorpius** during the month, low in the southwest sky at evening twilight. On the 4th, **Howell** is just 14' southwest of the 8.4 magnitude globular cluster **NGC 5897**. On the evenings of the 26th and 27th, the comet will pass roughly 1° north of **Antares**. **Howell's** positions, according to **ALPO**, are as follows: On September 9th – 15 28.9 -21 58, at mag. 9.0; on the 19th – 16 02.7 -24 04, at mag. 8.9 in **Scorpio**; and on the 29th – 16 39.09 -25 44, at mag. 8.8 in **Scorpio**. **Howell's** positions, *by my estimates*, are as follows: On September 2nd – about 1.2° southwest of **Iota Librae**; on the 4th - 1° south-southeast of **Iota Librae**; on the 6th - 1° south-southwest of **Iota Librae**; on the 8th – about 1.8° southeast of **S Librae**; on the 10th – about 2.4° northwest of **42 Librae**; on the 12th – about 1.2° north-northwest of **42 Librae**; on the 14th – about 1.4° northeast of **42 Librae** - then **Howell** crosses over into **Scorpius** - on the 16th – about 2° southwest of **Delta Scorpii**; on the 18th – about 1.2° due north of **Pi Scorpii**, or 1.3° due south of **Delta Scorpii**; on the 20th – about 2° southeast of **Delta Scorpii**; on the 22nd – about 1.6° west and a little south of **Omicron Scorpii**, or just under 2° east-southeast of **Sigma Scorpii** – **M80** is 1.8° to the north-northeast; on the 24th – 0.6° due north of **Sigma Scorpii** – **M4** is 1° to the south-southeast; on the 26th – just over 1° south and a little east of **Antares (Alpha Scorpii)** – **NGC 6144** is 0.7° south; on the 28th – 1.6° northeast of **Antares**; and on the 30th – 2.8° northeast of **Tau Scorpii**, or 3¼° east and a little north of **Antares**.

Comet **2P/Enke** – **Enke's** positions, in **Scorpio**, according to **ALPO**, are as follows: On September 9th – 16 37.0 -31 45, at mag. 15.4; on the 19th – 17 13.1 -31 15, at mag. 16.3; and on the 29th – 17 42.8 -30 30, at mag. 17.1.

Comet **C/2017 T2 (PANSTARRS)** - **T2's** positions, according to **ALPO**, are as follows: on September 9th – 14 23.8 +00 12, in **Virgo** at mag. 10.9; on the 19th – 14 37.6 -03 29, at mag. 11.2 in **Virgo**; and on the 29th – 14 51.3 -06 48, at mag. 11.5 in **Libra**.

Comet **C/2019 U6 (Lemmon)** – **Lemmon's** positions, according to **ALPO**, are as follows: On September 9th – 15 31.9 +22 45, at mag. 10.1 in **Serpens**; on the 19th – 15 57.0 +22 57, at mag. 10.5 in **Serpens**; and on the 29th – 16 20.7 +23 01, at mag. 10.9 in **Hercules**.

Comet **C/2020 F3 (Neowise)** –if there is anything left to see after it fragmented- according to **ALPO**, its positions are as follows: On September 9th - 14 37.3 -06 10 , in **Virgo**; on the 19th – 14 50.8 -09 18, in **Libra**; and on the 29th – 15 02.8 -11 45, in **Libra**.

Comet **C/2020 F8 (SWAN)** – **Swan's** positions, according to **ALPO**; are as follows: On September 9th – 06 46.3 +12 16, in **Gemini** at mag. 10.8; on the 19th – 06 42.7 +09 39, in **Gemini** at mag. 11.0; and on the 29th – 06 36.5 +06 58, in **Monoceros** at mag. 11.2.

Meteor Showers – There are no major meteor showers (Class I) peaking in September. The only major shower active in September is the **Orinids**, active from September 23rd to November 27th, peaking on October 22nd. There are 4 active Class II showers this month. The **Aurigids**, active from August 18th through September 7th, with a peak on August 31st; The **September Epsilon Perseids**, active from September 3rd through October 3rd, peaking on September 10th with a maximum zenith hourly rate (mzhr) of 5; **The Epsilon Geminids**, active from September 30th through October 25th, peaking on October 11th; and **The Southern Taurids**, active from September 23rd through December 24th, peaking on October 30th.

There are no variable meteor showers (Class III), in September. There are 7 Minor (Class IV, with an mzhr of 2 or less) showers active in September. **The Eta Eridanids**, active from July 23rd through September 17th, peaked on August 10th. **The August Gamma Cepheids**, active from August 19th through September 7th, peaked on August 28th. **The Daytime Zeta Cancriids**, active from August 13th through September 10th, peaked on September 2nd. **The Chi Cygnids**, active from September 8th through September 17th, peaks on September 13th. **The Nu Eridanids**, active from August 23rd through November 16th, peaks on September 23rd. **The Daytime Sextantids**, active from September 16th through October 10th, peaks on September 28th. **The October Capricornids**, active from September 20th through October 14th, peaks on October 2nd.

When to View the Planets:

Evening Sky

Mercury (west)
Jupiter (south)
Saturn (south)
Neptune (east)

Midnight

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

Morning Sky

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

DARK SKY VIEWING - PRIMARY ON SEPT 19TH, SECONDARY ON SEPT 26TH

mythology

Aquila – The Eagle

Aquila represents an eagle, the thunderbird of the Greeks. There are several explanations for this eagle in the sky. In Greek and Roman mythology, the eagle was the bird of Zeus, carrying (and returning) the thunderbolts which the wrathful god hurled at his enemies. But the eagle was involved in love as well as war.

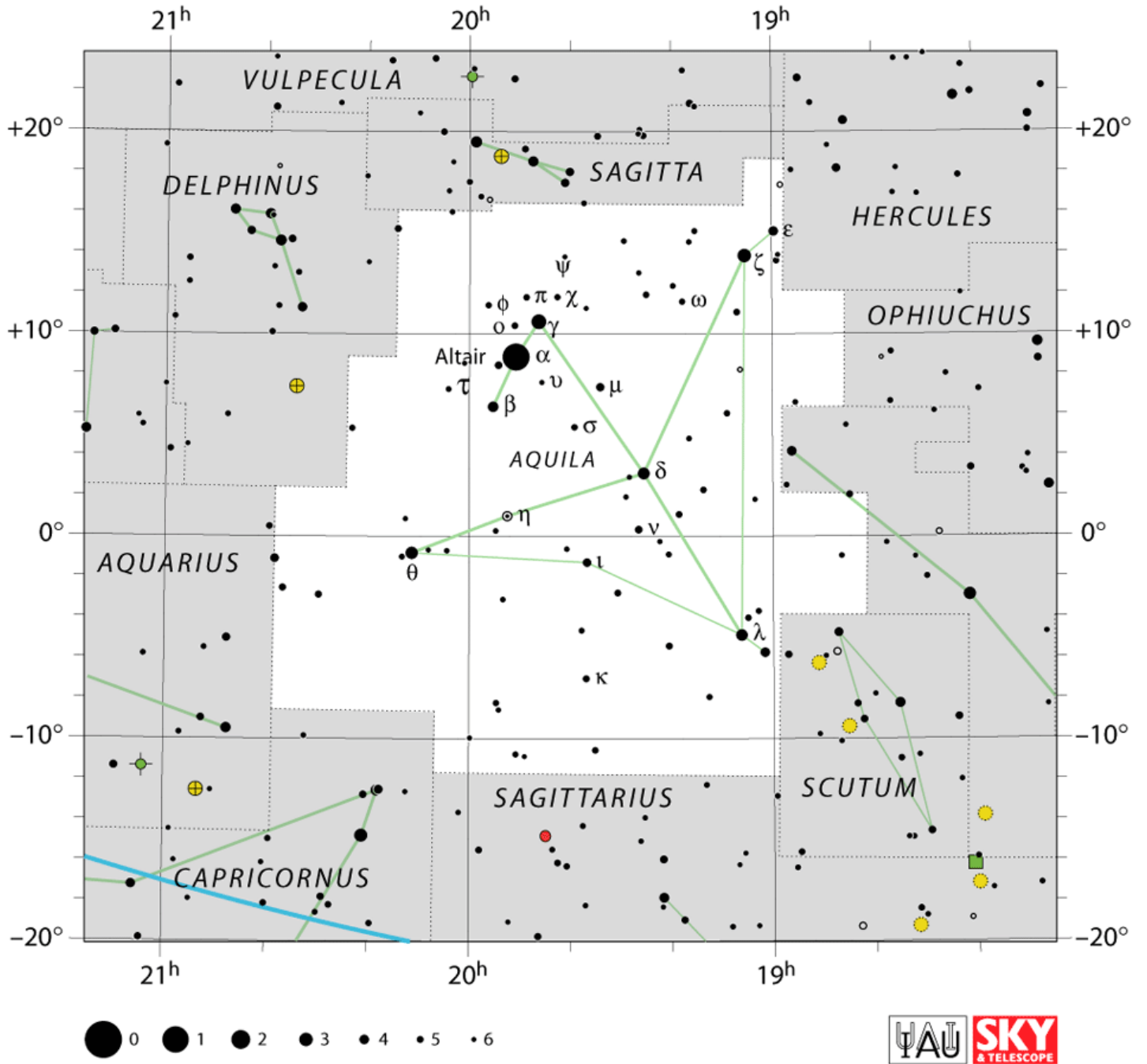
According to one story, Aquila was the eagle that snatched up the beautiful Trojan boy Ganymede, son of King Tros, to become the cup-bearer of the gods. Authorities such as the Roman poet Ovid say that Zeus turned himself into an eagle, whereas others say that the eagle was simply sent by Zeus. Ganymede himself is represented by the neighboring constellation of Aquarius, and star charts show Aquila swooping down towards Aquarius. Germanicus Caesar says that the eagle is guarding the arrows of Eros (the neighboring constellation of Sagitta), which made Zeus love-struck.

The constellations of the eagle and the swan (Cygnus) are linked in an account by Hyginus. Zeus fell in love with the goddess Nemesis but, when she resisted his advances, he turned himself into a swan and had Aphrodite pretend to pursue him in the form of an eagle. Nemesis gave refuge to the escaping swan, only to find herself in the embrace of Zeus. To commemorate this successful trick, Zeus placed the images of the swan and eagle in the sky.

The name of the constellation's brightest star, Altair, comes from the Arabic "al-nasr al-ta'ir" meaning "Flying Eagle" or "Vulture". Ptolemy called it Aetus, the eagle, the same name as the constellation. The German scholar Paul Kunitzsch notes that the Babylonians and Sumerians referred to Altair as the eagle star. Altair's neighboring stars Beta and Gamma Aquilae form the eagle's outstretched wings. These two stars have their own names, Alshain and Tarazed, which comes from a Persian translation of an old Arabic word meaning "the Balance".

Altair forms one corner of the so-called "Summer Triangle" with the stars Vega and Deneb, found in the constellations Lyra and Cygnus, respectively. A charming eastern myth visualizes the stars of Aquila, and the stars of Lyra, as two lovers separated by the river of the Milky Way, able to meet on just one day each year when magpies collect to form a bridge across the celestial river.

The southern part of Aquila was sub-divided by Ptolemy into a now obsolete constellation called Antinous, visualized on some maps as being held in the eagle's claws.



The End