Monthly Meeting August 12th at 7PM at HRPO

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

Program: John Nagle will share his experiences at the Texas Star Party last May, includes video.

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What's In This Issue?

Like this newsletter? See PAST ISSUES online back to 2009
Visit us on Facebook – Baton Rouge Astronomical Society

President's Message

July 20, 2019, marked the 50th anniversary of the Apollo 11 Moon Landing. I was able to attend the Astronomical League's 50th anniversary celebration of the moon landing, held in Titusville, Florida from July 25th through July 29th, 2019, and their cruise to the Bahamas on the Mariner Of The Seas. It was great fun. We went to the Kennedy Space Center to meet Astronaut Al Worden. We also saw the July 25 SpaceX launch from the parking lot of a Cracker Barrel restaurant near the hotel. Food and talk were great.

AL's Apollo 11 cruise to the Bahamas on Royal Caribbean's "Mariner Of The Seas"

SpaceX Launch

ALCON 2018 and 2019 was so much fun I believe we should host one. I am setting up the "ALCON 2022 Bid Preparation and Planning Committee" to look into it. If we are picked to host, the Astronomical League will advance us funds up to $3,000.00 (we can also get sponsorships). I am checking with Visit Baton Rouge to see if the cost of deposits can be keeped down. Hosting it here will let members attend an ALCON without having to travel and pay for a hotel. Members would only pay the registration cost. Note: this is not final, and a vote will be taken before anything is signed. I believe Baton Rouge and Southeast Louisiana have a lot to offer and will make an excellent location for ALCON.

Space Shuttle Atlantis

BRAS ZAZZLE SHOP We opened a shop on Zazzle We are working some the bugs (i.e. T-Shirt prices). The shop can be found at:
https://www.zazzle.com/store/br_astronomical

VOLUNTEER AT HRPO: If any of the members wish to volunteer at HRPO, please speak to Chris Kersey, BRAS Liaison for BREC, to fill out the paperwork..

MONTHLY SPEAKERS: One of the club's needs is speakers for our monthly meetings if you are willing to give a talk or know of a great speaker let us know.

UPCOMING BRAS MEETINGS:

Light Pollution Committee - HRPO, Wednesday August 7, 6:15 P.M.
Business Meeting – HRPO, Wednesday, August 7, 7 P.M.
Monthly Meeting – HRPO, Monday, August 12, 7 P.M.

VOLUNTEERS: While BRAS members are not required to volunteer, if we do grow our volunteer core in 2019 we can do more fun activities without wearing out our great volunteers. Volunteering is an excellent opportunity to share what you know while increasing your skills.

SALE: BRAS is having a surplus telescope/equipment.

Articles: I want to invite members to write articles for our newsletter. And, use the Members Corner to share your interesting astronomy related trips, events, awards, and experiences by sending a write-up to Michele at newsletter@brastro.org

Member Pins: If you have not reserved yours yet, please come to a meeting to pick one up.

Outreach: Please check below for Ben's Outreach Requests. Also, be on the lookout for periodic email notices. Remember, Outreach to our community is a lot of what we do.
BRAG: Check below for BRAG's scheduled meeting.

Clear Skies

Steven M. Tilley, President

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Secretary's Summary of July Meeting

- President, Steven Tilley, calls the meeting to order at 7:00pm
- 27 members in attendance.
- Steven thanks everyone for coming.
- New members introduce themselves to the club.
- Steven gives the floor to Vice President, Thomas Halligan, to start the presentation. The the topic is The Eagle has landed. A short film called The Eagle Has Landed: The Flight of Apollo 11, was shown.
- Thomas gives the floor to anyone wishing to share stories about the Apollo landings. John Nagle, Craig Brendan, Dennis Demchek , Merrill Hess, Jim Gutierrez, and new member Ginny, all shared their recollections.
- Steven mentions the Zazzle store and encourages members to check it out.
- Chris Kersey, showed the club some NASA books. Chris also put a sign up sheet for the 2019 HRPO T-shirts at the front desk.
- Outreach Chair, Ben Toman, asked for those planning to attend the Feliciana Retreat Center camp out on July 31-Aug 1st to please let him know. They've offered cabins and meals free of charge for those doing the outreach. West Feliciana Library is hosting an outreach on Thursday July 11th, and the Makers Market is July 13th from 7-10pm.
- Scott Cadwallader reminded everyone about Connor Matherne's astrophotography exhibit at LASM on Thursday, July 11th.
- Raffle held
- Meeting adjourns 8:27 pm

Submitted by Krista Reed, BRAS Secretary

GET ZAZZLED

2019 Officers:

President: Steven M. Tilley
Vice-President: Thomas Halligan
Secretary: Krista Reed
Treasurer: Trey Anding

BRAS Liaison for BREC:
Chris Kersey
BRAS Liaison for LSU:
Greg Guzik

Committees/Coordinators:
Light Pollution:
John Nagle
Newsletter:
Michele Fry
Observing Notes:
John Nagle
Outreach:
Ben Toman
Webmaster:
Frederick Barnett

BRAS Outreach Report

Hi Everyone,

Well, we got in one of our two scheduled outreaches in mid July. Our outing to the **West Feliciana Parish Library** was great. Scott C. and myself gave a presentation on the Apollo Missions. The library is very nice and seems to be set out in the woods a bit. We both thought it might be a great place to do an evening of observing when the Sun is setting early enough again. The library was excited at that prospect, so I'm sure we'll be back up there in the near future.

This is Ben T. (that's me) giving the lecture at the WFP Library. Scott C. is behind the camera. Really nice facility!!!

Our second event, **Mid City Makers Market**, was cancelled due to the approaching storm that weekend. We'll try again in August. (See below)

As we go to press this month, we still have our big trip/outreach coming up in a day or two at the **Feliciana Retreat Center**. I'll be there with several other volunteers, and we'll be sure to get some pictures. We're keeping fingers crossed for some clear skies for good observing!

We won, we won . . . . congratulations . . . . and a box of Apollo/Moon related outreach materials from NASA & ASP!

We received this letter from Night Sky Network. It seems they chose a random club to receive a box of Apollo/Moon related handouts/giveaways and BRAS was the lucky one! We were eligible due to our use of their materials and continued reporting of our Outreach Events on the NSN website, (an Outreach Chair duty btw.)

July 12, 2019

To the members of the Baton Rouge Astronomical Society:

Congratulations: your club has won a set of lunar outreach materials from NASA and the Astronomical Society of the Pacific thanks to reporting your recent events to the **NASA Night Sky Network** calendar. Congratulations!

Thank you for all your club members' hard work in bringing astronomy to the public. We know your communities truly appreciate your efforts as well! We hope that you enjoy these Moon-related materials celebrating the 50th anniversary of the Apollo 11 landing

Sincerely,

Dave Prosper

Night Sky Network Administrator
Astronomical Society of the Pacific
nightskyinfo@astrosociety.org

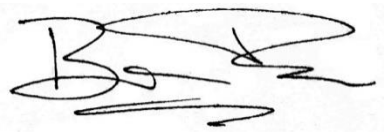
NSN has been an awesome source of materials for us and it's going to continue as long as we keep doing Outreach.

Enjoy the rest of the Summer. Let me know if you'd like to help out with the Outreach below.

Upcoming Outreach Events:

Saturday, August 10th
6pm-10pm
Mid City Makers Market
Telescope observing

Clear skies,



Ben Tomen, Outreach Chairperson

The Fermi Paradox

The **Fermi paradox** is named after Italian-American physicist Enrico Fermi and refers to the apparent contradiction between the lack of evidence for and various high probability estimates of the existence of extraterrestrial civilizations elsewhere in the Milky Way galaxy.

The basic points of the argument were more fully developed in a 1975 paper by Michael H. Hart and include:

- There are billions of stars in the galaxy that are similar to the Sun, and many of these stars are billions of years older than the Solar system.
- With high probability, some of these stars have Earth-like planets, and if the Earth is typical, some may have already developed intelligent life.
- Some of these civilizations may have developed interstellar travel, a step the Earth is investigating now.
- Even at the slow pace of currently envisioned interstellar travel, the Milky Way galaxy could be completely traversed in a few million years.

According to this line of reasoning, the Earth should have already been visited by extraterrestrial aliens, or at least their probes. ~ Source: Wikipedia

So

So, WHERE IS EVERYBODY????

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..

Meeting called to order by John Nagle, on July 3
No new members, with 6 members in attendance
June minutes were published in July newsletter

Old Business:

1. Chris reported on the Dark Sky Advocacy web pages.
2. Contacted Fred about linking a DSA page to the LPC Minutes that are in the newsletter. Fred said he would need a #LPC marker in the newsletter pdf. Thomas to provide info on how to do it to Michele.
3. The design for a checklist on "How to Make Your Property Dark" for use by BRAS members and the public will be based on a previous list by Chris Kersey.
4. Fred said he could put current SQM readings at HRPO on the home page of the DSA pages. Date and time taken, link to spread sheet. Would need a URL to do it.
5. New diorama on light pollution for permanent display at HRPO – design in progress. I will attend the next Baton Rouge Scale Modelers meeting on July 25.
6. Draft letter to Entergy and Demco about Light Pollution and light fixtures approved.
7. Fred says he can link the Country Roads article on light pollution on a DSA web page, just needs a URL for it.

New Business:

1. Good Lighting Award has been abolished due to lack of nominations and time since last award. - could be re-instated at some future time.
2. Will check out LSU School of Architecture to see if any mention of Light Pollution and Lighting in the curriculum.
3. Will contact the local chapter of the AIA about Lighting and Light Pollution.
4. Will try to get on the agenda of the next meeting of the **Federation of Greater Baton Rouge Civic Associations** to talk about Light Pollution.
5. Need to make up the Invitation list of City-Parish Departments for the third annual Natural Sky Conference.
6. Need to draft a letter to BREC about the bad lighting at the Burbank complex.

Minutes of this meeting read and approved
Meeting adjourned.

Clear skies,

John R. Nagle

Submitted by John Nagle, Chairman

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Globe At Night

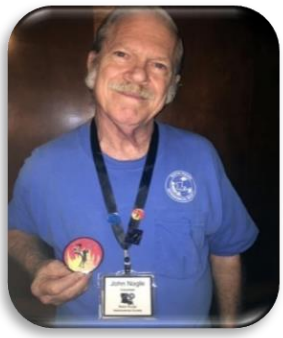
The target constellation is Cygnus, for July 24th to August 2nd, and August 22nd to August 31st

Members/Community 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

BRAS member **John Nagle** shares some highlights of his 5 day trip this past April/May, to the

John reports: I have wanted to attend the TSP for 10 years or more (largest dark skies star party in America, held annually just outside Fort Davis, Texas at the Prude Ranch), but I didn't register for it until November 2018. Spots are limited to 500, with a lottery if there are more applications, which there were. Imagine my teeth dropping when I received an email in February 2019 that my name had been confirmed. I would be in the "Angel's Nest" bunkhouse (conveniently close to the dining hall, meeting room, and central field – see map below). So in late April I packed my MKX to the gills with observing equipment, bedding, towels, clothes and the like for six days, and the granola bars and $100 my wife made me tuck here and there in my luggage, and took off. Also took 3 4" book binders containing all my Observing Notes for the past 6 years, plus other materials I've gathered, all in protective sheets.



EQUIPMENT: The 3 telescopes I took were: a Meade 10" truss tube Dobsonian; Explore Scientific ES 127 triplet; and a Celestron C5. I also took my I-Optron Mini Tower Pro and I-Optron IEQ 45 stand with an alt-az manual control stand. I took four binoculars – 10x20, 7x35, 10x35, and 10x50 – along with various eyepieces, collimator, solar filters, a tool kit made up for astronomy, a roll up table and camp chair, and various sizes of tarps and bungee cords. In short, all the usual equipment, except no canopies were allowed.


Angel's Nest Bunkhouse for 4

TRIP/SETUP: It was a 2 day drive from Baton Rouge. First day, 12 hours to Abilene, Texas via I-10W to I-49N, then I-20W thru Texas, where I stayed at a Quality Inn. Next day, 8 hours, continuing on I-20W, turn off at Texas Hwy 17S to Ft Davis, then Hwy 118 to Prude Ranch (elevation over 5000 feet in the Ft. Davis Mountains), arriving at 2 p.m. I checked in at the ranch office, then made for my assigned bunk house-- 4 bunks per room with all your gear stored on the upper or lower bunk. I chose a spot on the middle field to peg down my large tarp, unload my equipment onto it, then used bungee cords and another cloth to cover all of my equipment--laid down as flat as possible because the occasional "dust devil" has been know to hurl even a large Dob across the field.

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COST: $100 TSP Registration; $65/day for bunkhouse with 2 meals/day, plus gas for the 2000 mile round trip, and of course incidentals and snacks.

PRESENTATIONS: Two of my roommates were speakers at the TSP. One did an astrophotography training class, and the other, Mike Hotka, spoke about his newly published book, "Exploring Amateur Astronomy". His talk was "Finding Your Voice in Our Astronomy Hobby". There were speakers at each afternoon and evening program Wednesday through Saturday. Babek Tafreshi, a world renounded night landscape photographer, talked about "The World at Night". I met Robert Reeves whose lunar pictures have been put on 19 posters and he does the "365 Days of the Moon" series. I met people who have attended every TSP for 20 or more years, from all over the USA and from foreign countries.

VENDERS BUILDING (in the pavillion north of central field bathhouse: Open every day from 10 to 5, **t**here was lots of tables loaded with stuff for sale, from telescopes to books to jewelry and clothing.

DINING ROOM/SNACK BAR: Open for lunch and dinner. Dining room food was good, served cafeteria style. For breakfast, I ate my granola bars but could have driven into Fort Davis and bought some breakfast.. Snack bar was open from 10 p.m. to 3:30 a.m., with coffee, ice cream, cold drinks, burgers, dogs, chips, etc.

MY TSP ACTIVITIES: I brought with me three 4-inch binders containing all 61 of my Observing Notes from the last six years, with added information in the binders. The TSP administrator allowed me to set up my small table in the meeting hall to display my work, not far from the "official" exhibitors. I brought fifty printouts (and had to make 50 more) of a list I had prepared showing year and month each constellation was published in our Night Visions newsletter, along with a sample of our newsletter. They even let me enter my binders in the Astronomy Art Contest!!! Whenever the meeting hall was open, I was at my table, explaining and giving out copies of the list, along with the BRAS website URL so people could download such Observing Notes as they wanted. Everyone liked what they saw and said I should be selling this information, which convinced me that when all my updating is through, it has enough valaue I could put it in book form and sell it.

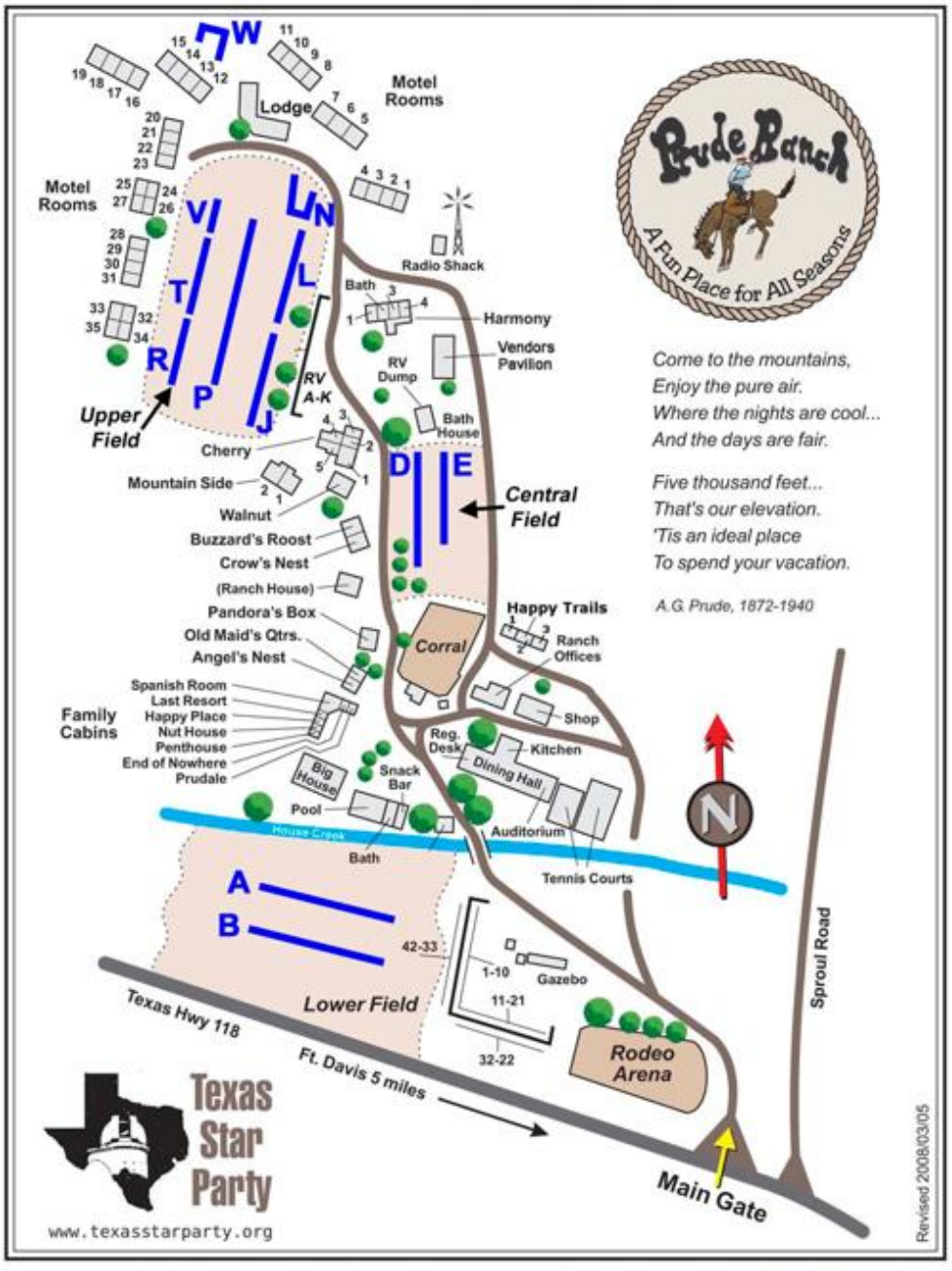
OBSERVING: the first two nights I set up all of my telescopes, but I was trying to do too much and not getting much of anything done. So I started on the third night to limit myself to the three binocular programs –see below. I would set up the C5 telescope on the manual stand for anything interesting, would sit in my folding chair with my star charts and a red flashlight and the observing lists, and using my 10x50 binoculars, work the programs. I would stay on the field until I saw the Milkey Way rise, between 3 and 4 a.m. It was spectacular!

OBSERVING PINS: There are individual pins for each observing program, which differ each year. You have to complete the program and turn in the paperwork at TSP to get a pin. I saw some people with 10 to 20 pins on their hats! I limited myself to 3 programs (boy, that

was hard) – Binocular Observing, Binocular Challenge, and the Binocular From Hell. I earned all 3 pins, and a 3-inch badge for the "Hell" program. It was fantastic under these dark skies.

FIELD TRIPS: On Friday, May 3rd, I rode a ranch bus to the McDonald Observatory (19 miles away by road, in sight from the ranch), and took the guided tour of the site including the 107-inch telescope. The 82-inch Otto Struve telescope was available for TSP attendees for observing time in four different sessions for $125.00/session/person. I also drove to Fort Davis and took a self-guided walking tour of Fort Davis fort.

CONDITIONS: Most nights were down in the 40's. I was glad to have my jacket and cap. The only time I've seen more stars was when working offshore on geological survey ships. There are very strict lighting rules, no headlights or lamps after dusk. There was no cell phone service, and very limited Wi-Fi. I would drive into Ft. Davis each morning to call home to Michele, and to get messages and emails. AC power on the fields was limited for only telescope equipment, anti-dew gear, drive correctors, up to 6-watt red light bulbs, and up to 90-watt laptop computers, with red screens. No portable generators were allowed. People tent camping on the outer edges of the observing fields, and where there were RV hookups, could only use red lights after dark!) Some people stayed off-site (parking their vehicle outside front gate before dark. The gates were locked at 9 PM).



AUGUST BRAS Meeting:

I will tell a lot more in my talk to the club at August's Member Meeting, and show a video touring the Prude Ranch facilities and showing more of our night activities (which another attendee put together). I hope ya'll will come, and I really hope you'll consider attending a Texas Star Party. I'm going back for sure, for it is well worth the time and expense, and gives added meaning to the slogan we use so oftren . . . . .

Clear skies

Amen to that. John

Messages from HRPO

Highland Road Park Observatory

FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

2 August: "Hunting Meteorites" Learn all you need to know to distinguish meteorites from other rocks, and to safely and legally search for the hundreds of meteorites still yet to be discovered!

9 August: "Tracking Asteroids" BRAS President Steven Tilley will explain how a mere mortal like yourself can tell whether a pinpoint of light is a star or an asteroid. He'll also provide a list of the brightest and easiest-to-find asteroids in our Solar System.

16 August: "Ice Giants and Beyond" As the Oppositions of Uranus and Neptune approach, we'll visit these majestic and cold objects and investigate what is being revealed of the mostly yet-to-be-seen expanse at the end of our Solar System.

30 August: "Earth to Moon to Mars" A remembering of Apollo naturally leads to a survey of the incredible Artemis mission to return human beings to the Moon—as a stepping stone to Mars!

SCIENCE ACADEMY

Saturdays from 10am to 12pm

For ages eight to twelve. $5/$6 per child.

3 August: "Summer Day"

10 August: "Rockets of the Past"

17 August: "Rockets of the Future"

31 August: "Spinoff Technology"

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Solar Viewing

Saturday 10 August from 12pm to 2pm.
For all ages. No admission fee.

SPECIAL SESSION: "ENGINEERING"
Saturday 24 August from 3:30pm to 7:30pm
For ages twelve to sixteen. $15/$18 per kid.

This program offers advanced topics, topic extensions and all-new games and activities to an older crowd. Certificates will be earned, and a section of archived experiments, some not seen in over fifteen years (and some *never* performed on site) take place. For August, the four-hour session focuses on the skill that created Hubble, Chandra, IBEX and the ISS!

SPECIAL ALERT: DAYLIGHT TIME DISCUSSION
The conversation in the Louisiana State Legislature to eradicate the back-and-forth of Daylight to Standard is probably ending this month. There are two options if the twice-yearly switch is ended: to remain on Standard time year-round, or to remain on Daylight time year-round.

Perseid Meteor Shower

Monday 12 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 twelve-day-old Moon will blot out the dimmest meteors. It will remain prominent in the sky for the duration of the event.
OTHER OBJECTS FOR VIEWING:
10pm to 10:30pm = Ceres / Pallas
10pm to 12am = Waxing Gibbous Moon / Jupiter / Saturn
11:30pm to 12am = Neptune

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Celestial Fantasia

Friday 23 August from 7pm to 10pm
For professional teachers, informal educators and students. / No admission fee.

This brand-new annual session (to occur at the beginning of every school year) introduces local teaching staff and students to the Highland Road Park Observatory. Representatives of all three owners will be on-site to explain how HRPO and its public programs and field trips can be used to fulfill education standards, science fair projects and extra-credit tasks.

Plus Night

Saturday 31 August from 7pm to 10pm

For all ages. No admission fee.

Binoculars recommended.

Sky Viewing Plus takes place about a half-dozen times per calendar year. It is the same program as "Evening Sky Viewing", with the following additions—

--marshmallow roast
--filtered views of the Moon, Mars and Jupiter (when those objects are available)
--physical science demonstrations
--unaided eye sky tour
--binocular sky tour
--quiz/scavenger hunt/task game for kids to earn prizes

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SPECIAL ANNOUNCEMENT:
2019 HRPO T-Shirt Available

The new T-shirt is here! White and blue on black, the design (created by HRPO Education Curator Amy Brouillette and BREC's Marketing Department) takes its inspiration from the legendary Apollo 8 "Earthrise" photo. The cost is $7.00 (tax included) per shirt. Sizes can be ordered at this time if necessary. To have a size and quantity held, call 768-9948 or email observatory@brec.org.

Observing Notes: August

by John Nagle

Cygnus – The Swan

Position: RA 20.62, Dec. +42.03°

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 will be new each month.

Named Stars

Deneb (Alpha Cyg), from "Al Dhanabal al Dajājah", "The Hen's Tail", obsolete name was "Aridede Aradif", from "Al Ridf", "The Hindmost", mag. 1.26, 20 41 25.91 +45 16 49.2, is a blue supergiant star and the 19th brightest in the night sky. Located at the top of the "**Northern Cross**", it is the faintest of the three 1st magnitude stars which outline the "**Summer Triangle**", consisting of the stars **Vega**, **Deneb**, and **Altair**. **Deneb** is considered to be the chief source of illumination for **NGC 7000**, the **North American Nebula**, which is located 3˚ to the east of the star. **Deneb** is also known as **HD197345**, **HIP 102098**, and as **50 Cygni**.

Albireo (Beta Cyg), from "Al Minhar al Dajājah", "The Hen's Beak", is a double star, perhaps a binary. **Beta^{1}Cyg**, mag. 3.05, 19 30 43.29 +27 57 34.9, is a golden yellow or topaz color. **Beta^{2}Cyg**, mag. 5.12, 19 30 45.4 +27 57 55, is a sapphire color. The two stars are separated by 34.3". **Beta^{1}Cyg** is a double star itself, to close to resolve in a telescope, and projected to be 9.4 arc-seconds. **Beta^{1}Cyg** is also known as **HD 183912**, **HIP 95947**, and **6 Cygni**. **Beta^{2}Cyg** is also known as **HD183914**, **HIP 95951**, and **6 Cygni**.

Sadr (Gamma Cyg), from "Al Sadral Dajājah", "The Hen's Breast", mag. 2.23, 20 22 13.70 +40 15 24.1, has a 10th magnitude companion at 142" of separation. The companion star is a close double star at 10th and 11th magnitudes, and a separation of about 2". **Gamma Cyg** is also known as **HD 194093**, **HIP 100453**, and as **37 Cygni**.

Rukh (Delta Cyg), from the Arab asterism "Al Fawāris", "The Riders", mag. 2.86, 19 44 58.44 +45 07 50.5, is a triple star with the binary as the common. The binary is difficult to see because the companion star, at magnitude 6.3, lies virtually on the first diffraction ring of the primary. The separation between the two stares is 2.5" or 220 au. The third star in the system is at 12th magnitude and is a giant orange star. **Delta Cyg** is also known as **HD 186882**, **HIP 97165**, and as **18 Cygni**.

Gienah (Epsilon Cyg), from "Al Janäb", The Wing", proper name is "Aljanah", mag. 2.48, 20 46 12.43+33 58 10.0, is a yellow star and probably a spectroscopic binary star. A 12th magnitude field star and **Epsilon Cyg** form an optical pair with a separation of 55'. **Epsilon Cyg** is also known as **HD 197989**, **HIP 102488**, and as **53 Cygni**.

Pennae Caudalis (Pi^{2}Cyg), from the Latin "Tail Feathers", and the Arabic "Sama al Azrab", "The Blue Sky", mag. 4.23, 21 46 47.6 +49 18 34.5, is a spectroscopic binary star. Also known as **HD 207330**, **HIP 107533**, and as **81 Cygni**.

Azelfafage (Pi^{1}Cyg), from "Al 'Azalal Dajājah", "The Tail of the Hen", mag. 4.69, 21 42 05.66 +51 11 22.7, is a spectroscopic binary star. Also known as **HD 206672**, **HIP 107136**, and as **80 Cygni**.

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Rachba (Omega Cyg), from "Al Rukbah al Dajäjah", "The Hen's Knee", is a visible double star with a separation of about 33'. **Omega¹Cyg**, mag. 4.94, 20 30 03.53 +48 57 05.6. **Omega²Cyg**, mag. 5.44, 20 31 18.8 +49 13 13.3, is itself a double star having a 10th magnitude companion at a separation of 56.3". **Omega¹Cyg** is also known as **HD 195556**, **HIP 101138**, **45 Cygni**, and as **V2014 Cygni**. **Omega²Cyg** is also known as **HD 195774**, **HIP 101243**, and as **46 Cygni**.
Mokhtarzada (22 Cyg), mag. 4.95, 19 55 51.76 +38 29 12.1, is a double star, with the components having magnitudes of 4.95 and 5.44. Also known as **HD 188892**, and **HIP 98068**.
Bessel's Star, or Prazzi's Flying Star, is a double star, a pair of white dwarf stars at a separation of 30.3", and is also known as **61 Cygni** and **V1803 Cygni**. **61 CygA**, mag. 5.20, 21 06 50.84 +38 44 29.4. **61CygB**, mag. 6.05, 21 06 52.19 +38 44 03.9. **61 CygA** is also known as **HD 201091**, and **HIP 104214**. **61CygB** is also known as **HD 201092**, and **HIP 104217**.
Campbell's Star, mag. 10.45, 19 34 45.24 +30 30 58.9, is small and has a very faint ring structure. It is also known as **HD 184738**, **HIP 96295**, **V1966 Cygni**, **BD303639**, **PK 64+5.1**, and **PNG 64.7+5.0**.

Deep Sky:

M29 (NGC 6913), mag. 6.6, 20 23.9 +38 32, 7' in size, 80 stars; detached, no concentration of stars; large range in brightness; brightest star is magnitude 8.6. The four brightest stars form a quadrilateral, with another three forming a triangle in the north. Located about 1.7˚ south-southeast from **Gamma Cygni**. Alias: **Cr 422**, **Mrk 46 (Cooling Tower)**, **Lund 952**, **OCI 168**, and **C2022+383** (the location for **HD 229239**).
M39 (NGC 7092), mag. 4.6, 21 32.2 +48 26, 32' in size, 30 stars; detached, no concentration of stars; moderate range in brightness; very large; brightest star is magnitude 6.8. Located 9˚ east-northeast from **Deneb**, or 2½˚ west and 1˚ south from **Pi² Cygni**. Alias: **Mel 236**, **Lund 994**, **OCI 211**, **OCI 211.0**, and **C2730+482**.
NGC 6871, mag. 5.2, 20 06 27 +35 47.4, 30' in size, 75 stars; not well detached, large range in brightness; brightest star is magnitude 6.8. Located 20' south-southwest of **27 Cygni**, with a dark nebula on the southwest side. Alias: **Cr 413**, **Mrk 43**, **Lund 921**, **OCI 148**, **OCI 148.0**, and **C2004+356**.
Cr 419, mag. 5.4, 20 18 07 +40 43 55, 4.5' in size, not well detached, moderate range in brightness; poor cluster. Located in the southeast portion of **IC 1311**. Central star is **HD 193322**(5.82 magnitude). Alias: **Lund 940**, **OCI 177**, and **C2016+405**.
Do 9, mag. 5.6, 20 25.8 +41 57, 5' in size. Located about ¾ of the way from **Deneb** (**Alpha Cyg**) to **Sadr** (**Gamma Cyg**). Alias: **Lund 955**, and **OCI 188**.
Do 8, mag. 6.0, 20 24.4 +42 16, 6' in size, 20 stars. Located 8' south-southwest of **vdB 136** and 5.4' from the northwest edge is **vdB 131**. Alias: **Lund 953**, **OCI 189**, and **C2022+421**.
Bi 2, mag. 6.3, 20 09.2 +35 29, 19' in size, 78 stars; no concentration of stars; moderate range in brightness; brightest star is magnitude 7.9. The star **Σ2639** is at the center. Alias: **Lund 924**, **OCI 150**, and **C2007+353**.
IC 1389, mag. 6.8, 21 12.1 +47 44, 4' in size, 40 stars; detached, strong concentration of stars; small range in brightness; small, faint cluster; brightest star is magnitude 12.1. Located just north of dark nebula **B361**. Alias: **Lund 983**.
NGC 6811, "Hole in a Cluster", mag. 6.8, 19 37 09.6 +46 22 32, 15; in size, 249 stars; not well detached, large range in brightness; brightest star is magnitude 9.9; large cluster. Alias: **Cr 402**, **Mel 222**, **Raab 138**, **Lund 897**, **OCI 185**, and **C1936+464**.
NGC 7063, mag. 7.0, 21 24.4 +36 30, 7' in size, 20 stars; detached, no concentration of stars; moderate range in brightness; brightest star is magnitude 8.9. Located 19' southwest of **67 Cygni**. Alias: **Lund 990**, **OCI 192**, and **C2122+362**.
Cr 470, mag. 7.2, 21 33 24 +47 16 00, 9' in size, 110 stars, in **IC 5146**. Alias: **C 19**, **Sh2-125**, **Lund 1001**, **OCI 213**, and **C2151+470**.
IC 5146, "Cocoon Nebula", mag. 7.2, 21 53.4 +47 16, 20' in size; large, pretty bright, several

absorption patches in the interior; has a small detached patch at 10' to the west-southwest at its center. Contains an open cluster of 20 stars that is not well detached; moderate range in brightness. Located at the east-southeast end of the dark nebula **B168**. Alias: **OCI 213**.

NGC 7082, mag. 7.2, 21 29.4 +47 05, 30'x30' in size; not well detached; moderate range in brightness; brightest star is magnitude 9.9; large cluster, poor. Alias: **H7-52**, **OCI 209**, **OCI 209.0**, **Lund 992**, and **C2127+468**.

IC 4996, mag. 7.3, 20 16 31.7 +37 38 35, 7' in size, 56 stars. Immediately to the north is **Burnham 442**, a double star (magnitudes 8.0 and 9.7), with a separation of 32", with a magnitude 9.7 companion star at a separation of 19'. Four stars form a trapezium at 20 12 18 +37 36 58. Located 25' southwest of **34 Cygni**. Alias: **Cr 418**, **Mrk 44**, **Lund 938**, **OCI 158**, **OCI 158.0**, and **C2014+324**.

NGC 6819, "Foxhead", mag. 7.3, 19 41.3 +40 11, 8'x8' in size, 929 stars; detached, strong concentration of stars; small range in brightness; brightest star is magnitude 11.5; very large. Alias: **Cr 403**, **Mel 223**, **Raab 139**, **Lund 900**, **OCI 155**, and **C1939+400**.

NGC 6910, "The Rocking Horse Cluster", mag. 7.4, 20 23.1 +40 47, 8'x8' in size, 69 stars; detached, strong concentration of stars; moderate range in brightness; brightest star is magnitude 9.6; pretty bright and pretty small. Located in the **Gamma Cygni Nebula**, ½° north-northeast of **Gamma Cygni**. Alias: **Cr 420**, **Mrk 45**, **H8-56**, **Lund 950**, **OCI 181**, **OCI 186**, and **C2081+406.**

NGC 6888, "The Crescent Nebula", mag. 7.5, 20 12 +38 21, 18'x13' in size; is a faint galaxy, very large, very elongated, crescent shaped; illuminated by **WR 136** (**HD 192163**). Center of the nebula contains the 7.4 magnitude double star **ADS 13515** (magnitudes 7.7 and 10.5, with a separation of 14"). Located between **Gamma Cygni** and **Eta Cygni**. Alias: **C 27**, **H4-72**, **Sh2-105**, **Ced 179**, and **LBN 203**.

NGC 6866, "The Kite Cluster", mag. 7.6, 20 03 55 +44 09.5, 15' in size, 125 stars; detached, weak concentration of stars; moderate range in brightness; brightest star is magnitude 10.7, Alias: **Cr 412**, **H7-59**, **Mel 229**, Raab 143, **Lund 917**, **OCI 183**, **C2002+438**, and **PK 83+12.1**.

NGC 7039, mag. 7.6, 21 11.2 +45 329, 25' in size, 50+ stars; detached, no concentration of stars; moderate range in brightness; brightest star is magnitude 11.3. Alias: **OCL 203**.

Bas 6, mag. 7.7, 20 06.8 +38 21, 10'x4' in size, 40 stars. Brightest star is magnitude 10.2. Involved in nebulosity. Alias: **NGC 6874**.

NGC 6974, mag. 7.7, 20 07.8 +38 14, 7' in size, 60 stars in a 10'x5' triangle. Central star is **HD 332843**. Alias: **Basel 6**, **H8-86**, **Lund 304**, **OCI 157**, and **C2005+382.**

NGC 6834, mag. 7.8, 19 52 13 +29 24.5, 5' in size, 128 stars; detached, weak concentration of stars; moderate range in brightness; brightest star is magnitude 9.7. Alias: **Mel 225**, **Cr 407**, **H8-16**, **Raab 142**, **Lund 909**, **OCI 134**, **C1950+292**, **CGCG 304-004**, and **CGCG 2022.4+5812**.

Be 86, mag. 7.9, 20 20.4 +38 42, 7' in size, 30 stars; detached, strong concentration of stars; large range in brightness; involved in nebulosity; brightest star is magnitude 9.5. Alias: **Lund 945**, **OCI 167**, **OCI 167.0**, and **C2018+385**.

NGC 6883, mag. 8.0, 20 11.3 +35 51, 14' in size, 30 stars; detached, strong concentration of stars; large range in brightness. Alias: **Cr 415**, **OCL 148**, **Lund 929**, **OCI 152**, **OCI 152.0**, and **C2009+357**.

NGC 7062, mag. 8.3, 21 23.2 +46 23, 6' in size, 30 stars; detached, no concentration of stars, small range in brightness; brightest star is magnitude 10.1; pretty small. Alias: **H7-51**, **Lund 988**, **OCI 205**, **OCI 205.0**, **C2121+461**, and **C2122+362**.

Bar 2, mag. 8.37, 21 43.6 +51 04, 5' in size, 20 stars. Alias: **Lund 999**, **OCI 216**, and **C2142+509**.

NGC 7086, mag. 8.4, 20 30.5 +51 35, 9' in size, 50 stars; detached, weak concentration of stars; moderate range in brightness; brightest star is magnitude 10.2; quite large. Alias: **H6-32**, **Lund 993**, **OCI 214**, and **C2128+513**.

NGC 7027, "Magic Carpet Nebula", mag. 8.5, 21 07.1 +42 14, 0.3'x0.2' in size; extremely bright and small; magnitude of center4 star is 16.3. Alias: **Lund 997**, **OCI 219**, **C2124+543**, and **PK 84-31**.

Cr 428, mag. 8.7, 21 03.2 +44 35, 13' in size, is the "**West Coast**" of the **North American Nebula** (**NGC 7000**). Alias: **C2101+443**.

Do 4, mag. 8.7, 20 17 46.6 +36 45 05, 9' in size, 20 stars, involved with **Sh2-104=LBN 195**. Alias:

Lund 195, **OCI 157**, and **C2015+365**.

IC 1369, mag. 8.8, 21 12.1 +47 44, 8' in size, 40 stars; detached, strong concentration of stars; small range in brightness; faint cluster; brightest star is magnitude 12.1. Located just north of **β361**. Alias: **Cr 432**.

NGC 6946, "Fireworks Galaxy", mag. 8.8, 20 34.9 +60 09, 11'x9.8' in size; very faint, very large; several massive arms; extremely small, bright nucleus. **NGC 6939** is only 0.6˚ to the northwest. Alias: **C 12**, **Arp 29**.

NGC 7058, mag. 9.0, 21 21.8 +50 48, 6.5'x4.5' in size, 25 stars. Located 2.3˚ east of **NGC 7031**. On the west-northwest edge is the 8.1 magnitude star **HD 203609**.

NGC 7031, mag. 9.1, 20 07 12 +50 52.1, 5'x5' in size. Located 1.8˚ east of **Be 55**. Alias: **H8-74**, Lund **978**, **OCI 210**, and **C2105+506**.

ClvdB 130, mag. 9.3, 20 17 42.2 +39 20 59, 7' in size, 15 stars. Alias: **Lund 1150**, **OCI 167.1**, and **C2015+391**.

NGC 6826, "The Blinking Planetary Nebula", mag. 9.5, 19 45 22 +50 34 19, 0.4'x0.4' in size; a bright, pretty large blue-green disk with a bright center within a larger, fainter outer disk. The central star is magnitude 10.4. Located less than 1˚ from **16 Cygni**. Alias: **C15**, **H4-73**, **PNG 083.5+12.7**, **PK83+12.1**, and **IRAS 19434+5024**.

NGC 7057, mag. 9.7, 21 25 06 +48 05 24, 3'x3' in size. Alias: **H7-50**, **Lund 989**, **OCI 208**, **OCI 208.0**, and **C2122+476**.

NGC 7128, mag. 9.7, 21 44 +53 43, 3.1' in size, 30 stars. Alias: **H7-49**, **Lund 998**, **OCI 218**, and **C2142+534**.

Items beyond magnitude 10 that are of interest is as follows:

NGC 7000, "The North American Nebula", 20 54.1 +45 17, 2˚x1.7˚ in size, is located due east of **Deneb** (**Alpha Cygni**). Alias: **C20**, **Ced 183**, **H5-37**, h 2096, **GC 4621**, **LBN 373**, and **Sh2-117**. This nebula consists of :

NGC 6869, 20 54.1 +45 17, 20' in size. Alias: **H8-82**. This is the part representing "***Canada***".

NGC 6997, mag. 10.0, 20 57 22 +44 42 18, 15'x15' in size, 75 stars. Alias: **H8-58**, **Lund 970**, **OCI 970**, and **C2054+44**4. This is the part that represents the "***East Coast***".

LDN 935, 20 56 54.5 +43 52 00, 150'x40' in size, represents the "***Gulf of Mexico***", with the "**Pelican Nebula**" (**IC 5067, IC 5070**) in the "***Atlantic Ocean***".

Cr 428, 21 03 12 +44 33 00, 13' in size, 40 stars, represents the "***North Pacific***".

"**Cygnus Wall**" represents "***Mexico and Central America***".

The Veil Nebula, The Bridal Veil Nebula, The Cirrus Nebula, The Cygnus Loop, located 3.5˚ south-southeast of **Epsilon Cygni**, or 2.5˚ east-northeast of **52 Cygni**: consists of the following:

East Part:

NGC 6992, 20 56.1 +31 43, 60'x8' in size, is very faint and crescent shaped. Alias: **The Network Nebula**, and **The Filamentary Nebula**, **C33** (northern part), **Ced 182b** (**NGC 6995** and **IC 1340** are attached to it).

NGC 6995, 20 57.1 +31 13, 12'x12' in size. Alias **C33** (southern part), **H8-18**, and **Ced 182c**.

West Part:

NGC 6960, 20 45 42 +30 43 00, 70'x70' in size; pretty bright, quite large, and crescent shaped. Contains the star **52 Cygni**. Alias: **C34**, **Ced 182a**, **LBN 191**, **Witch's Broom**, **Filamentary Nebula**, **Network Nebula**.

NGC 6974, 20 51 54 +31 54 02, 6"x4" in size, is the north end of the **Veil**. Alias: **SG3.202**.

NGC 6974a, 20 48.5 +31 09, 45'x30' in size, located 1˚ northeast of **52 Cygni**. Alias: **"Pickering's Triangle"**, **"Pickering's Wedge"** (north central **Veil**).

NGC 6979, 20 51 00 +32 09 00, 7'x7' in size, is the northwest end of the **Veil**, northeast of the northern end of **"Pickering's Triangle"**, or "**Wedge"**.

IC 1340, 20 56 58 +31 07 23, 25' in size, located within **NGC 6060**, with **Abell 78** being a part of it. Alias: **The Wedding Ring Nebula**.

N7008, "The Fetus Nebula", mag. 10.7, 21 00.6 +54 33, 1.4'x1.2' in size, is quite bright, large, and

oval shaped. Central star is magnitude 13.2. Located just north of **h1606**. Alias: **H1-192**, **PK 93+5.2**, and **PNG 93.4+5.4**.

M1-92, Minkowski's Footprint Nebula, mag. 11.7, 19 36.3 +29 33, 20" in size. Alias: **IRAS 1934.3+2926.**

Sh1-89, The Moth Nebula, mag. 14.1, 21 14.1 +47 46.

IC 1318, Butterfly Nebula, Gamma Cyg Nebula, 20 16.4 +41 49, 50'x30' in size, surrounds **Gamma Cygni.** All of **IC 1318** is within a 3.3˚x2.3˚ area. **LDN 809** runs through it. Alias: **Sh2-108**.

IC 1318a, Dolphin Nebula, 20 16.6 +41 49, 50'x15' in size. Alias: **DWB 82**.

IC 1318 b&c, The Butterfly Nebula, b is the east wing, and c is the west wing. Alias: **DWB 72**, **DWB 76**, **DWB 77**, and **DWB 81**.

The Pelican Nebula, located in the eastern part of the representation of the **"Atlantic Ocean"** in the **North American Nebula** (**NGC 7000**). Consists of the following:

IC 5067, 20 50.8 +44 21, 25'x10' in size, is the northern portion of the **Pelican Nebula**.

IC 5070, 20 50.8 +44 11, 60'x50' in size, is the southern portion of the **Pelican Nebula**.

IC 5068, "The Cygnus Arc", 20 50.8 +42 31, 80'x30' in size, is located in a detached region southwest of the **North American Nebula** (**NGC 7000**). Alias: **LBN 328**.

NGC 7011, "Mini Hyades", 20 01 45 +47 20.9, 3.8' in size, 35 stars.

B168, "The Dark Cigar", 21 53.2 +47 12, 1.7˚x0.2˚ in size, is an area of high opacity; irregular shaped. Extends northeast to southwest, with a lane extending south-southeast toward **IC 5146**. The **Cocoon Nebula** (**IC 5146**) is at the eastern end of **B168**.

B144&B341, "Fish On A Platter", 49 59+35 00, 30' in size. Alias: **LDN 857**.

B 348, "The Northern Coalsack", 19 34 00 +42 05 00, 60' x3' in size. Alias: **Cygnus Rift**, **LDN 857**, **LDN 896**.

B 343, "The Ghost Nebula", 20 13.5 +40 16, 13'x5' in size. Located 1.7˚ west of **Gamma Cygni**, in the northern part of **IC 1318**.

Cygnus Star Cloud, is a 20˚ long cloud from **Albireo** (**Beta Cygni**) running northeast to **Gamma Cygni**.

DWB 111, "The Propeller Nebula", 20 16 10 +43 40 11.

Kranberger 61, "The Succor Ball Nebula", 19 21 39 +38 18 57.

LeGentil 3, "The Funnel Cloud Nebula" (the northern part of the Coalsack), 21 00 +51 00, 720' in size.

Leiter 9, "The Little Orion", is an asterism located in the southern part on the **"Central America"** portion of the **North American Nebula** (**NGC 7000**).

MWP 1, "The Methuselah Nebula", 21 19 +34 24, 13'x9' in size, is one of the largest planetary known (15 ly across), and the oldest planetary known (150,000 years old). Central star is **RX J2117.1+3412**. Producing large amounts of X-rays. Alias: **PK80-10.1**, and **PNG 80.8-10.6**.

Omega²Cygni Group, 20 15 08 +47 34 26 19' in size, 7 stars, involved in nebulosity.

P Cygni Cluster, 20 17 43.5 +38 02 04, 3.7' in size, 25 stars.

Patchick's Planetary, 19 47.1 +29 30. Alias: **IRAS 19450+2922**.

PK 80-6.1, "The Egg Nebula", 21 02.3 +36 42, 19"x14" in size, central star is at magnitude 12.3. Alias: **CRL2686**, and **4Zw67**.

PK 86-08.1, "The Baby Dumbbell Nebula", 21 33.1 +39 30, shows a smooth disk with a central star at magnitude 17.3. Alias: **Hu1-2**, and **PNG 086.5-0.0**.

PNG 75.5+1.7, "The Soap Bubble Nebula", 20 15 26 +38 02 35.

Sh2-101, "The Tulip Nebula", 20 00 +35 17, 15'x8' in size, located 0.75˚ east-northeast of dark nebula **B144**. **ADS 13292** and **Teutsch J2002.3+3518** involved.

Cygnus A (3C405), mag. 16.27, 19 59 28.35 +40 44 02.096, is the first radio galaxy discovered, one of the strongest radio sources known, and is located next to **Gamma Cygni**. It appears visually as an elliptical galaxy in a small cluster. Classified as an active galaxy because the super-massive black hole at its nucleus is accreting matter, producing two jets of matter (about 100' apart) from its poles.

Cygnus OB_2, 0.5˚ to 1˚ in size, its heart is in the shape of a trapezium. Over 100 "Class O" stars are in

a volume of ½˚, centered 2˚ southeast of **NGC 6914**.
The Northern Cross, is an asterism formed by 5 stars; **Alpha, Beta, Gamma, Delta**, and **Epsilon Cygni**.
Deep Sky objects also beyond magnitude 10: 38 NGC; 108 UGC; 8 IC; 6 Minkowski; 13 Sharpless; 4 Basel; 29 Kro; 29 Barnard; 7 LBN; 278 LDN; 21 Dolitz; 4 DoDz; 1 Bar, 6 Koheutek, 10 C (clusters); 6 FSR (infra-red clusters); 1 Saurer; 7 Radio Galaxies; 1 Quasar; 15 MCG; 43 DWB (HII Regions); 4 Ruprect; 4 Abell; 2 Turner; 1 Bi; 3 Ro; 4 Ho; 2 Sh; 2 Kron; 2 DG; 2 Patchick; 9 Teutsch; 14 Berkley, 6 Caldwell, 6 vdB (van der Berg),; 3 Collinder; 3 Heinze; 1 Steine; 51 P, 5 PK; 29 Herschel; 20 [DB01] (infra-red galaxies); 1 [HR91] (infra-red galaxy); 1 Skiff; 1 Alessi; 1 HH; 1 SAI; 2 AGC; 1 ASCC; 1 PC, 1 Feibelman; 1 FRK; 1 Calvet; 1 SSNZ; 1 Platais; 1 Sherwood; 1 Alves; 1 Wei; 1 Topler; 1 NeVe; 1 LeWa; 3 KjPN; 1 DD; 1 SK; 1 Stu; 1 Lolano; 1 Simeis; 2 GM; 1 Sn; 1 D; 1 LeDû; 1 Magakian; 1 Al-Teu; 1 Naillon; 1 Mandushev; 1 Kar; 1 Ced; and 1 Cyg X. A total of 836 objects.

Sky Happenings: August, 2019

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

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Aug. 2nd - The **Moon** is at perigee (223,320 miles or 359,398 km from **Earth**) at 2:11 AM CDT.
Aug. 4th - Dusk: The thin waxing crescent **Moon**, in **Virgo**, will be 3˚ to the right of **Gamma Virginis** (**Porrima**).
Aug. 5th - **Mercury** passes 9˚ south of **Pollux** at 5 PM CDT,
Dusk: The waxing lunar crescent is less than 7˚ to the upper right of **Alpha Virginis** (**Spica**).
Aug. 6th - Asteroid **Psyche** is at opposition at 11 PM CDT.
Aug. 7th - **First Quarter Moon** occurs at 12:31 PM CDT,
Dusk: The first-quarter **Moon** is in **Libra**, an equal distance from **Alpha** and **Beta Librae**.
Aug. 9th - Dawn: **Mercury,** on the east-northeastern horizon, is at greatest western elongation (19˚),
The **Moon** passes 2˚ north of **Jupiter** at 6 PM CDT.
Aug. 11th - **Jupiter** is stationary at 11 AM CDT,
Evening: The **Moon** is just over 3˚ to the west of **Saturn**, in the **Teapot** of **Sagittarius**.
Aug. 12th - **Uranus** is stationary at 1 AM CDT,
The **Moon** passes 0.04˚ south of **Saturn** at 5 AM CDT,
The **Moon** passes 0.1˚ north of **Pluto** at 5 PM CDT,
The **Perseid Meteor** shower starts to peak in the late hours.
Aug. 13th - Asteroid **Eunomia** is at opposition at 1 AM CDT,
Early morning to Dawn: The **Perseid Meteor Shower** peaks.
Aug. 14th - **Venus** is in superior conjunction at 1 AM CDT.
Aug. 15th - **Full Moon** occurs at 7:29 AM CDT.
Aug. 16th - Asteroid **Laetitia** is at opposition at 10 PM CDT.
Aug. 17th - The **Moon** is at apogee (258,429 miles or 406,244 km from **Earth**) at 5:49 AM CDT,
The **Moon** passes 4˚ south of **Neptune** at 8 AM CDT.
Aug. 21st - The **Moon** passes 5˚ south of **Uranus** at 10 AM CDT.
Aug. 22nd - Asteroid **Juno** is in conjunction with the **Sun** at 5 PM CDT.
Aug. 23rd - **Last Quarter Moon** occurs at 9:56 AM CDT.
Aug. 24th - Dawn: The waning crescent **Moon**, in **Taurus**, is 2˚ from **Aldebaran**, in the **Hyades**.
Aug. 25th - Dawn: The crescent **Moon** is less than ½˚ from **Zeta Tauri**, with the star being occulted for much of western **North America**,
Mars is at aphelion (154.9 million miles from the **Sun**) at 8 PM CDT.
Aug. 27th - The thin lunar crescent is some 6˚ to 7˚ from **Pollux**, in **Gemini**, above the eastern horizon about two hours before twilight begins.
Aug. 28th - Dawn: The sliver of the **Moon**, in **Cancer**, is in the **Beehive Cluster** (**M44**),
The **Moon** is 0.3˚ north of the **Beehive Cluster** (**M44**) at 7 AM CDT.

Aug. 30th - **New Moon** occurs at 5:37 AM CDT,
The **Moon** is at perigee (221,931 miles or 357,176 km from **Earth**) at 10:53 AM CDT.

Planets:

Mercury – Mercury has a brief appearance before dawn this month. On August 3rd, it rises more than an hour before the **Sun**, but has brightened only to magnitude 1.4, being just marginally visible (use binoculars). On the 9th, the planet reaches greatest western elongation (19˚), and rises 90 minutes before the **Sun**. It will climb 7˚ high in the east-northeast 45 minutes before sunrise, shining at magnitude 0.0, and is only about 38% illuminated. On the 17th, the planet will shine at magnitude -0.9, and appears 6˚ high 45 minutes before sunup. By the 26th, **Mercury** has dropped deep enough into the **Sun**'s glow to be lost from view, on its way to a superior conjunction on September 3rd.

Venus – Venus is lost in the glare of the **Sun** throughout August, but will start coming into view at dusk in mid-September. The planet will reach superior conjunction on August 14th.

Mars – Mars is also lost in the glare of the **Sun** throughout August, but will reach aphelion, it's farthest from the **Sun** at a distance of 1.67 a.u., and then 7 days later it will be in conjunction with the **Sun**. **Mars** returns to visibility at dawn in the middle of October.

Jupiter – Jupiter, in **Ophiuchus**, will stay within 7˚ of **Antares** all month. The planet's westward retrograde motion ends on August 11th when it resumes its normal eastward motion. The planet will shine at magnitude -2.4 with a diameter of 43", but will fade to magnitude -2.2 and shrink to 39" diameter this month. The **Moon** will pass 2˚ north of the planet on the 9th, and from August 25th to 27th, **Jupiter** will skirt the edge of the 10th magnitude globular cluster **NGC 6325**. The planet will be highest in the sky around nightfall all month. On the evening of August 20th, the four **Galilean Moons** will line up in order (of increasing distance from the planet) – **Io**, **Europa**, **Ganymede**, and **Callisto** – on the east side of the planet. **Callisto** can be found south of the planet around midnight local daylight time on the night of August 16th/17th. There are no double transits this month, but two moons and their shadows will transit at different times on the nights of the 3rd/4th, 7th, 10th/11th, 14th, 17th/18th, 21st, 25th, and the 28th/29th. For a complete listing of the **Phenomena of Jupiter's moons**, see page 51 of the August issue of ***Sky and Telescope***, or page 235 of the ***RASC Observers Guide for 2019, USA Edition.***

Saturn – Saturn is in northern **Sagittarius** between the **Teaspoon** asterism and the **Teapot**'s handle, standing 25˚ high in the southeast as darkness descends, gaining a few degrees by the time it has climbed highest in the south in the late evening. The planet shines at magnitude +0.2, and its equatorial diameter is 18.3" at the beginning of August, and by the end of the month it will fade to magnitude +0.3, with its diameter diminishing to 17.6". The rings remain tilted to 24.7˚ to our line of sight. On the night of August 7th/8th, the planet will pass 0.6˚ due south of the 4th magnitude star **Omicron Sagittarii**, and on the 11th, the **Moon** will be 3˚ west of the planet. The best time to view **Saturn** is when it is highest in the sky – around 11:30 PM local daylight time – at the start of the month, and before 9:30 PM local daylight time at the end of the month. **Titan**, the planet's largest moon and the solar system's 2nd largest, is at 8th magnitude, and can be seen with any telescope. A four-inch or larger telescope will be needed to see the three 10th magnitude moons **Tethys**, **Dione**, and **Rhea**, that orbit the planet inside of **Titan**'s orbit. Outermost moon **Iapetus**, at 11th magnitude, is easiest to spot when it will pass 1.4' due north of the planet on the night of August 4th/5th.

Uranus – Uranus rises before midnight local daylight time in a sparse region of southern **Aries**, 11˚ south and a touch east of 2nd magnitude **Alpha Arietis** (**Hamal**). To find the planet, move 4˚ south of **Hamal** to the star **15 Arietis**, then another 4.3˚ south to the star **19 Arietis**. **Uranus** will lie 2.3˚ south-southeast of **19 Arietis**. The planet will not move much from this point all month because it reaches its stationary point on the night of August 11th/12th. The planet is highest in the south near the break of dawn, shining at magnitude 5.8, bright enough to be seen with the naked eye under a dark sky. A telescope will reveal the planet's distinctive blue-green disk which will measure 3.6" across.

Neptune – Neptune rises around 10 PM local daylight time in early August, and during twilight by the month's end. The planet will climb high enough by midnight to track it among the background stars of eastern **Aquarius**. To find the magnitude 7.8 planet, it will lie 0.9˚ east-northeast of **Phi Aquarii** on August 1st, with the gap shrinking t0 0.15˚ by the 31st. **Neptune** will show a distinct disk spanning 2.4", and will appear blue-gray in color.

Pluto – Pluto lies just 6˚ to the east of **Saturn,** in **Sagittarius**, glowing at magnitude 14.2. It will take an 8-

inch or larger telescope to see the pinprick of light on a dark night. The brightest star in **Pluto**'s vicinity this month id the magnitude 9.4 star **HD 1834431**. **Pluto** will pass 12' due north of this star on the 18th. On the 19th, the planet will slide 2' north of a magnitude 10.5 field star.

Moon – The waxing gibbous **Moon** is close to **Beta Scorpii** at nightfall on August 8th. On the 9th, the **Moon** will be 2˚ to the upper left of **Jupiter** at nightfall, with **Antares** close by about 6˚ to the lower right of **Jupiter**. On the 11th, the waxing **Moon** is not far to the right of **Saturn**. The **Moon** is a waning crescent at about 2˚ above or to the upper left of **Aldebaran** on the morning of the 24th, and less than ½˚ from **Zeta Taurii** on the morning of the 25th. At dawn on the 28th, a thinner lunar crescent will be to the lower right of **Pollux**.

Asteroids **–** Asteroid **16 Psyche**, **15 Eunomia**, and **39 Laetitia** wander through western **Aquarius** and **Capricornus**, offering an excellent opportunity for observers to spot all three in a single observing session. Any of the trio, shining between 8th and 9th magnitudes, should be visible in a small telescope or even 10x50 binoculars.

Asteroid **16 Psyche**, traveling across **Capricornus**, reaches opposition on the night of August 6th/7th. The magnitude 9.3 asteroid rises at sunset, and sets at sunrise, being about 20˚ high by the time darkness sets in. The waxing crescent **Moon** will be around for about another hour or so after the end of twilight, but is well out of the way by 1 AM, local daylight time, when **Psyche** transits the meridian and standing 35˚ high. By the end of August, **Psyche** will transit an hour before midnight, and will stand about 33˚ high. **Psyche**'s location, ***by my estimate***, is as follows: On August 1st – about 1⅓˚ west and a little south of the star **29 Capricorni**; on the 7th – just under 2½˚ due west of **29 Capric**orni or just under 2˚ north and a little east of **Theta Capricorni**; on the 16th – about 2⅓˚ northwest of **Theta Capricorni** at a 6th magnitude star; and on the 25th – just over 4˚ to the west-northwest of **Theta Capricorni**.

Asteroid **15 Eunomia**, in the sky all night, reaches opposition on the night of August 12th/13th, climbing halfway to the zenith in the southern sky by 1 AM local daylight time. At opposition, the asteroid will reach magnitude 8.2, but will remain above magnitude 8.5 all month. Asteroid **Eunomia** travels westward across **Aquarius**, beginning the month 1˚ southwest of **Beta Aquarii**. On the 26th, the asteroid passes just 0.1˚ south of the 6th magnitude star **12 Aquarii**. **Eunomia**'s location, ***by my estimates***, is as follows: On August 1st – about 1˚ southwest of **Beta Aquarii**; on the 4th – just over 1˚ to the southwest of **Beta Aquarii**; on the 7th – just under 2˚ to the west and a little south of **Beta Aquarii**; on the 13th – just over 3˚ and a little south of due west from **Beta Aquarii**; on the 19th – about 4.6˚ due west and a little south of **Beta Aquarii**; on the 27th/28th –about 6½˚ due west of **Beta Aquarii**, a little south of a 5th magnitude field star. Due to the waxing gibbous **Moon** non August 12th, the night of opposition, it would be easier to observe this asteroid earlier or later in the month.

Asteroid **39 Laetitia** reaches opposition on the night of August 16th/17th, under a just full moon, so try to observe it in the first half of the month**. Laetitia** travels northeast to southwest across **Aquarius** and **Capricornus** this summer, moved into **Capricornus** the first week of July, and will return to **Aquarius** in early September. The asteroid will be at its brightest for the year at magnitude 9.1, but at opposition it will be a little dimmer at magnitude 9.4 and culminating at an altitude of about 41˚ or so. **Laetitia**'s location, ***by my estimate***, is as follows: On August 1st – just a hair short of 3˚ east of
Xi Aquarii, or about 1.7˚ northeast of the star **46 Capricorni**; on the 7th – less than 1˚ northeast of **46 Capricorni**, just over the border of **Aquarius** in **Capricornus**; on the 10th – less than ½˚ northwest of **46 Capricorni**; on the 16th – about 1.7˚ west-southwest of **46 Capricorni**; on the 22nd – over 2½˚ southwest of **46 Capricorni**; and on the 28th – just shy of 4˚ to the southwest of **46 Capricorni**, or just shy of 5˚ due east of **Nu Aquarii**.

Comets **–** Comet **Africano** (**C/2018 W2**) brightens to 11th magnitude in August. You will need a 10-inch or larger telescope and a dark sky to see this first-time visitor to the inner solar system. The comet is in **Camelopardalis**, and is visible all night, but climbs highest in the north in the early morning. To find the comet, start at magnitude 1.8 **Alpha Persei**, then swing 5.7˚ north to the magnitude 5.1 star **SAO 24064**. The comet's position, ***by my estimate***, is as follows: On August 1st - about 1.5˚ north and a little west of the star **RV**

Camelopardalis; on the 6th – about 1.4˚ northwest of **RV Camelopardalis**; on the 11th – about 1.8˚ west-northwest of **RV Camelopardalis**; on the 16th – just under 3˚ due west of **RV Camelopardalis**; on the 21st – about 4.3˚ west and a little south of **RV Camelopardalis** or 4˚ northeast of the star **SAO 24064**; on the 26th – about 1.7˚ northeast of **SAO 24064**; and on the 31st – about 1.5˚ west and a little north of **SAO 24064**.

Meteor Showers **–** The **Perseid Meteor Shower**, peaking on the morning of August 13th, will be hindered by the **Moon**, 2-days shy of being full. On the 13th, the **Moon** sets in the southwest around 4 AM local daylight time, with the first hints of twilight lighting up the eastern horizon barely 15 minutes later. It is worth viewing the shower a morning or two before the peak, when the **Moon** will be setting two hours before twilight on the 11th, and on the 12th, the **Moon** will set one hour before twilight. The **Perseids** produce more of the extremely bright meteors, known as fireballs, than any other shower. By viewing a few days before the peak (peak is about 110 meteors hourly rate), you will only see about 50 to 60 on the 12th, and about 25 to 30 on the 11th. Still, it is worth observing the shower in the hour before dawn.

When to View the Planets:

Evening Sky		**Midnight**		**Morning Sky**	
Mercury	**(west)**	**Jupiter**	**(southwest)**	**Venus**	**(northeast)**
Mars	**(northwest)**	**Saturn**	**(south)**	**Saturn**	**(southwest)**
Jupiter	**(south)**	**Neptune**	**(east)**	**Uranus**	**(east)**
Saturn	**(southeast)**			**Neptune**	**(south)**

DARK SKY VIEWING - PRIMARY ON AUGUST 3RD, SECONDARY ON AUGUST 31ST.

Mythology:

Cygnus – The Swan

A popular name for Cygnus is the "Northern Cross", and indeed its shape is far larger and more distinctive than the famous "Southern Cross". In its cruciform shape the Greeks visualized the long neck, outstretched wings, and stubby tail of a swan flying along the Milky Way, in which it is embedded. The mythographers tell us that the swan is Zeus in disguise, on his way to one of his numerous affairs, but his exact target is a subject of some disagreement.

The version of the tale that goes back to Eratosthenes says that Zeus one day took a fancy to the nymph Nemesis, who lived at Rhamnus, some way northeast of Athens. To escape his unwanted advances, she assumed the form of various animals, first jumping into a river, then fleeing across land, and finally taking flight as a goose. Not to be outdone, Zeus pursued her through all these transformations, at each step turning himself into a larger and swifter animal, until he finally became a swan, in which form he caught and raped her. Hyginus tells a simpler story, but does not mention the metamorphosis of Nemesis. Rather, he says, Zeus pretended to be a swan escaping from an eagle and Nemesis gave the swan sanctuary. Only after she had gone to sleep with the swan in her lap did she discover her mistake.

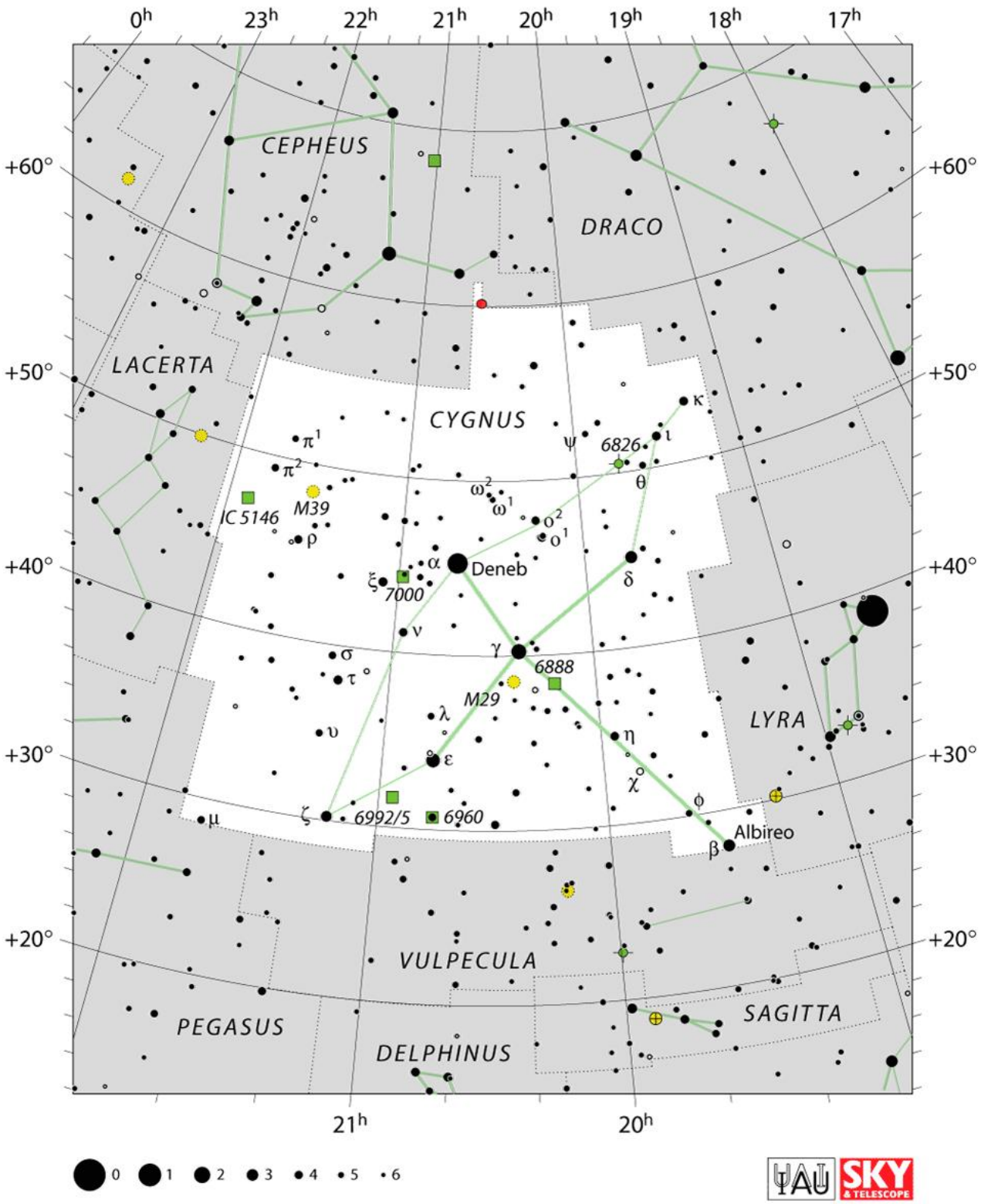
In both versions, the outcome was that Nemesis produced an egg which was given to Queen Leda of Sparta, some say by Hermes and others say by a passing Sheppard who found the egg in a wood. Out of the egg hatched the beautiful Helen (who later became the famous Helen of Troy).

A simpler version says that Zeus seduced Leda in the form of a swan by the banks of the river Eurotas. Leda was the wife of king Tyndareus of Sparta, which considerably complicated the outcome because she also slept with her husband later that same night. According to one interpretation, she gave birth to a single egg from which hatched the twins Castor and Polydeuces, as well as Helen. A rival account says that Leda produced two eggs, from one of which emerged Castor and Polydeuces, while from the other came Helen and her sister Clytemnestra. To add to the confusion, Polydeuces and Helen were reputedly children of Zeus, while Castor and Clytemnestra were fathered by Tyndareus. Castor and Polydeuces are commemorated by the constellation Gemini, where Polydeuces is better known by his Latin name, Pollux.

Cygnus is also sometimes identified with Orpheus, the Greek tragic hero who was murdered by the Thracian Maenads for not honoring Dionysus. After death, Orpheus was transformed into a swan and placed next to his lyre in the sky. The lyre is represented by the neighboring constellation Lyra.

The Cygnus constellation is also sometimes associated with any of several people called Cycnus in Greek mythology. The most famous ones are Cycnus, the murdered son of Ares, who challenged Heracles to a duel and was killed; Cycnus, the son of Poseidon, who fought on the side of the Trojans in the Trojan ware, was killed by Achilles, and transformed into a swan after death; and Cycnus, a close friend of Phaeton, the mortal son of the Sun god Helios.

Of the above three, the myth of Phaeton is the one most frequently associated with the Cygnus constellation. In the story, Phaeton and Cycnus were racing each other across the sky when they came too close to the Sun. Their chariots burned up and they fell to earth. Cycnus came to and, after looking for Phaeton for a while, he discovered his dead friend's body, so he made a pact with Zeus: If the god gave him the body of a swan, he would only live as long as a swan usually does. Once transformed, Cycnus was able to dive into the river, retrieve Phaeton's body, and give his friend a proper burial. This allowed Phaeton's soul to travel to the afterlife. Zeus was moved by Cycnus' sacrifice, and placed his image in the sky.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