



Monthly Meeting February 10th at 7:15 PM at HRPO

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

Presentation: "Dr. Parks from LSU discusses how students are using the observatory".

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President's Message

It seems like we've finally made it through what seems like the longest month of 2020 so far (quite possibly the longest January on record, but we'll have to check on that). February should have a few interesting events coming up in very short order. Right off the bat, for those interested in doing community outreach with us, we have a training event set for Sunday, 2 February at the Observatory at 1300. Here, we plan to spend an hour or so familiarizing ourselves with some of the awesome outreach kits provided for us by the Night Sky Network. In addition to showing everybody how to use these kits, this should be a great opportunity for people who've never done an outreach with us before to get the feel for what our outreaches are like and to get to know some of the people you'll be doing outreaches with. These are fun and easy activities, and I encourage everyone to come and check them out with us.

Later that week will be our first outreaches of the month, with our popular Sidewalk Astronomy series over at Perkins Rowe—contacting Ben is usually a good idea if you plan to attend, but generally this is one of those where you can just show up with a scope or a positive attitude and you'll fit right in. We should have a couple of other outreaches for February, just check the outreach section to find out more.

The big event for the club is one of what Poppa Desselles has called an "in-reach" but which some of the other's have dubbed our MOON (Member's only observing night) at HRPO, this will be the second in what we hope to be a continuing series of these events and is scheduled for 21 February after the public program has concluded for the evening. We have enlisted Merrill Hess to run the 20" for us, but feel free to bring your own scope, stake out your claim in the field, and observe until about 1am.

In other in-reach news, the big Poppa himself has decided to welcome members to his home out in Denham for an evening of stargazing on 6 March. The focus here was originally just for the Photography group, but we had so much fun stargazing last time that he's decided to extend the invitation to any member who wants to come. We're not sure we've got the horizons for it, but we may go ahead and try to turn this into an adumbrated Messier Marathon. If we get enough interest here, we might try to set up other attempts in the future from a more favorable site. Photographers are still welcome, and power will be supplied for those needing a little juice. Interested parties can contact Chris Desselles at poppachris3057@gmail.com so he can know how many people to expect. We've got a backup date in mind for this one, so if the cloud gods come thundering into town, all will not be lost.

As a reminder to all club members, we do still have an excess equipment sale going on in order to help us clear out some space in the BRAS storage room at the observatory. John Nagle is in the process of putting together a reference book with pictures of items that are available in order to facilitate your ability to find possible purchases. The main home for this book will be in the BRAS room at HRPO, which is a good enough reason to show up for the meeting.

One bit of club news of importance is that we've formally established a position for Awards Coordinator for the club to accept submissions for Astronomical League and BRAS certificates. Merrill Hess has agreed to take up the duties here. Individuals submitting for AL and club awards are asked to send submissions in to Merrill so he can check them out and then make a recommendation to the higher ups. He can be reached at merrilhess@gmail.com or by just running into him at one of our general meetings as he's usually pretty good about showing up. For those unfamiliar with the AL awards, information on various programs can be found at the AL website <https://www.astroleague.org>. These programs cover lots of areas of interest for amateur astronomers and are a fantastic way of guiding your viewing sessions and either teaching you something new or reinforcing information you may have forgotten. We are in the process of acquiring guide books for most of the popular programs for our library to help interested members. Also, for those pursuing these certificates, it's

useful to remember that we have a loaner scope program for members. The 8" Dob we've got sitting in there should be good enough to get you through most of the lower level awards.

The main meeting for the month will take place on 10 February at 1915, just a little bit later than our usual start time in order to accommodate people that are planning to go over to the Burbank Soccer Complex to try for a gander at Mercury while it's at greatest Eastern elongation—which is another event that club members are welcome to attend before the meeting, especially since it's really close by HRPO. Coy tells me our speaker this month will be Dr. Parks from LSU and he will be giving a talk about some of what he and his students have been doing lately out at the observatory.

I encourage everybody to check out the upcoming community outreaches in the sections below and get in touch with Ben T or Chris K depending on what tickles your fancy. And that's it for this rather lengthy intro to the newsletter. On one last note, we'd like to thank BRAS member Dr. Brad Schaefer for his research that should lead to a once in a lifetime observing opportunity a few years from now. According to the paper he presented at the American Astronomy Society conference this past January, V Sagitta should go supernova sometime around 2083, give or take 15 years, and in the process become the brightest star in the night sky for a time. It should be easy to find, just follow the giant arrow.

Submitted by Scott Cadwallader, President 2020

What an amateur astronomer who tracks satellites can do.

Abstracted by John Nagle from an article in the February issue of *Astronomy Magazine* (page 62), and from Marco Langbroek's SatTrackCam Leiden blog (link below).



On August 30, 2019, President Donald Trump tweeted this image of Iran's **Imam Khomeini Space Center**, taken shortly after the explosion of an Iranian **Safir** rocket – a rocket that could put a payload into **Earth** orbit. Soon after the release of the photograph, Langbroek noticed that the shadows of the structures of the space center formed a pretty good sundial. The level of detail quickly led to speculation: what platform took this image? A drone? A high altitude reconnaissance aircraft? A satellite?

Langbroek and some of his colleagues analyzed the shadow directions on the image and which satellites were in position to take the photo of the launch site in that time window, and they performed other analyses which shows there is little doubt that the USA 224 satellite took this picture.

All of this was worked out by a group of amateurs! See what we can do!

Read the details of this story (towards the bottom) and other amateur astronomer and astrophotographer feats on Mark's blog: [SatTrackCam Leiden](http://marcolangbroek.nl/)

Spy Satellite Observations: <http://marcolangbroek.nl/>

Send your articles for possible inclusion in Night Visions to newsletter@brastro.org

Upcoming BRAS Meetings:

NSN Training Kit Session, 1-3 p.m., Sunday February 2, HRPO

Monthly Business Meeting: 7:15 p.m., Wednesday, February 5; HRPO

Light Pollution Committee Meeting: 6:15 Wednesday, February 5th (before the business meeting)

Monthly Member Meeting: 7:15 Monday, February 10th; HRPO

MOON, Friday, February 21st, 10 pm til

ALCon Planning Meeting: Saturday, February 15, 3 p.m.; Coffee Call, 3132 College Dr F, BR, LA 70808

Secretary's Summary of January Meeting

The January meeting was an informal get-together due to LSU playing in the National Championship football game that night, plus we had inclement weather.

- MOON night was discussed.
- Don Weinell discussed the upcoming Rockefeller weekend.
- Krista Reed received the AL Binocular Messier award, which was presented by 2019 Awards Coordinator John Nagle.
- Chris Deselles plan to have a get-togethr at his house in March for BRAG (our Astrophotography Group) was discussed, including opening it up for other BRAS members.
- Ben talked about upcoming outreaches.
- Chris Kersey showed the BRAS volunteers (for BREC) the new online way to record their volunteer hours.



The informal meeting ended a little past 8 p.m. so we could go home and watch the second half of the LSU football game.

LSU WON! GEAUX TIGERS!!!!

Secretary was not in attendance.

These notes were submitted by John Nagle

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
 Webmaster:
 Frederick Barnett



BRAS Outreach Report

Hi Everyone,

Second month into 2020 already. At this rate, that eclipse in 2024 will be here in no time at all! (And not that I'm wishing time away, but I can't wait! The 2017 eclipse was so incredible...anyway, back to the message...)



We set up 6 scopes in the central square, across from the Rave Theatre, in the heart of Perkins Rowe. *Volunteers included Coy, Craig, Chris, John, Krista, Roz, Steven, Scott C., Scott L. (who finally remembered!), and me (Ben).*

The **January Sidewalk Astronomy at Perkins Rowe** was a success, once again. It was a bit chilly so the crowd was lighter, but we had a good amount of interested people and we're starting to get some repeats, too, that are bringing their friends.

Scott C. and I also went to the **LSU Lab School** and worked with their 1st graders talking about the Moon and Earth relationship, the Sun and pretty much everything else a typical 1st grader could come up with to question us on.

By the time you get this, we will have already had 4 outreach events in January, and our first **NSN Tool Kit Training Session** at the Observatory (Sunday, February 2, 1 p.m.)

At the time of my writing this, we have two upcoming outreach events on January 30th. One at Westdale Heights Academic Magnet and one at West Baton Rouge Parish Library. We are regulars at both places and excited to be getting back. Hopefully the weather will clear for us, though, so we can give them some great views through our telescopes.

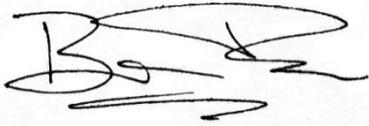
It would be great to see some new names pop up in this new year (along with our regular volunteers), wanting to help with Outreach. We have a LOT coming up (see below) so there are plenty of opportunities for promoting Astronomy in our community. Also by the time you receive this newsletter, you will have received a reminder to join us at the Training Session on Sunday, February 2nd at 1pm at the Observatory. Hopefully some of you were able to make it out!



Ben (pictured) and Scott C. (behind the camera) at LSU Lab School with 1st Graders

Now, take a look at this monster list and let me know if you'd like to help out with any of them! (Also, you will notice we have two dates with TWO events on each day. We will be needing extra help to fulfill these requests!)

Clear skies,



Outreach Chairperson

Upcoming Events:

Sunday, February 2nd

1pm-3pm

Highland Road Park Observatory

Training Session (learn to use the toolkits for outreach)

Tuesday, February 4th

6:30pm-8:30pm

Sidewalk Astronomy at Perkins Rowe

Thursday, February 20th

5:30pm-7:30pm

Holy Family School STEM Night (Port Allen)

2-3 people needed

(demos and toolkits)

Thursday, February 20th

5:30pm-7pm

St. James Episcopal School Family Astronomy Night (Baton Rouge)

2-3 people needed

(telescope viewing requested)

Tuesday, March 3rd

6:30pm-8:30pm

Perkins Rowe Sidewalk Astronomy

Tuesday, March 3rd (*Back-up date of Thursday, March 5th*)

6:30pm-8:30pm

St. George School Family Star Night

3 or more people needed

(telescope viewing and possible assisting families with their OWN scopes)

Saturday, March 7th

9am-4pm

Rockin' At The Swamp Bluebonnet Swamp and Nature Center

6-8 or more people needed to make shifts throughout the day

(demos, toolkits and solar observing)

Tuesday, March 10th

5:30pm-8pm

Oak Grove Primary STEAM Night (Prairieville)

2-3 people needed

(demos and toolkits)



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

December minutes were published in January newsletter

Old Business:

1. Status of Diorama
2. Develop a petition/form on Light Pollution for the Dark Sky Advocacy web pages.
3. Discussed small, realistic goals for 2020.

New Business:

1. Discussed goals for the coming year:
 - A. Investigate the new lighting at the lake at LSU.
 - B. Codifying our ideas concerning environmental sustainability into the new CEA with BREC and LSU.
 - C. Develop a letter for the public to send to utilities about Light Pollution
 - D. Contact the Public Works Department, Entergy, and Demco to find out who controls which street lights.
 - E. Draft letter to BREC about their Environmental Sustainability Program
2. Discussed training BRAS members about Light Pollution
3. Discussed exploring contacts with other groups in regards to Light Pollution
4. Discussed ways to get the public involved in the reduction of Light Pollution
5. Discussed developing a handout/brochure about Light Pollution localized for Baton Rouge and surrounding area to be handed out at outreaches. Wanted something by our next sidewalk astronomy. Ben showed a “draft” postcard size hand out. Everyone liked it. Note: It has since the meeting been approved and ordered.
6. Discussed interfacing with other Astronomy clubs in regards to Light Pollution.

Minutes of this meeting read and approved

Meeting adjourned.

Submitted by John R. Nagle



Globe At Night

The target for the Globe At Night program is Orion from February 14th through the 23rd
If you would like to participate in this citizen science program, you can find instructions at

<https://www.globeatnight.org>

P.S. There is an app called “Loss of the Night” that can be used for information and for reporting your observations



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

Baton Rouge Astronomical Society (BRAS) Annual Weekend Visit to Rockefeller Wildlife Refuge



The observation porch of the West End Dorm



Peveto Woods Bird and Butterfly Sanctuary



Lesser Scaup taking shelter behind a breakwater

By Don Weinell On the weekend of January 24 – 26, 2020, nine members of BRAS took part in our annual Rockefeller Road Trip, including my family (Kate, John, Diana and me), Roz R., Susan M., Mark & Debra Canatella, and Carlos (alas the group photo didn't come out). The outing has been a tradition with BRAS since 2000 with the exception of one year. In 2006 the refuge was still recovering from the destruction left by Hurricane Rita, so the facilities were unavailable to us.

In the early years, our club stayed in a lodge known as the West End Dorm. It was a perfect location for stargazing as it was some distance from the other buildings on the refuge and the associated lighting. Unfortunately, the original West End Dorm was one of the most heavily damaged buildings by Rita. So, for the past decade or more, we've stayed in the General Quarters near the main refuge headquarters. The skies were not quite as dark and the views to the north were limited. This year we were back in the newly constructed West End Dorm.

On Friday, the skies were perfectly clear. As darkness fell, only a few wisps of high clouds were visible way out over the Gulf. These seemed to dissipate throughout the evening. Three telescopes were set up on the lawn near the dorm. Carlo, a new member of the club, set up a dob. Roz brought her 8" dob also. We checked the collimation while there was still plenty of light and found it to be severely out of alignment. Using a laser collimator, the situation was soon resolved.

I brought my new 12.5" truss-tube dob and gave it first light. My telescope shroud hadn't been delivered yet, so for this outing I improvised with a large black garbage bag. It looked funny, but it worked. Another issue I discovered was that the Telrad was set too low on the upper tube assembly to be easily adjusted. It made aiming a bit tricky during the night.

By coincidence, the refuge was also being visited at the time by members of the Acadiana Master Naturalists, to do some binocular astronomy as part of their training program. We invited them to come over to our building and look through our scopes with us. For about an hour, we enjoyed sharing our views of the night sky with them.



Sunset at the refuge



The only Alligator we saw all weekend



Indian Blanket



A Yellow-rumped Warbler

All in all, Friday night was one of the best nights of stargazing we've had in many years at the refuge. Roz was able to pick out the Trapezium in the Orion Nebula. I was able to see M81 and M82 (Bode's Nebulae) brightly even though they were relatively low on the horizon.

Saturday started out partly cloudy, but increased throughout the day. Since most of our group are also birders, we drove over to Sabine National Wildlife Refuge to see what we could see. Not much. We then drove over to the Peveto Woods Bird and Butterfly Sanctuary. Again, the birds were unusually scarce this winter. Few ducks, few geese, and even fewer songbirds. The only birds that seemed to be in higher numbers this year were the Roseate Spoonbills. On the way back to Rockefeller Saturday afternoon, Mark and Debra were able to photograph a pair of Crested Caracaras.

By Saturday evening, we were completely socked in with clouds. No stargazing that night. After a communal spaghetti dinner, we enjoyed watching a video Mark had prepared of our past trips to Rockefeller. Some of our members may remember Dottie Hartman and Peter Lazarre. They used to join us with their kids. It was funny to see them and our own kids from twenty years ago running around the beach or crabbing. Now they are all grown up. My youngest son, John, was with us this weekend. Of course, he was embarrassed by how young and silly he looked in the videos.

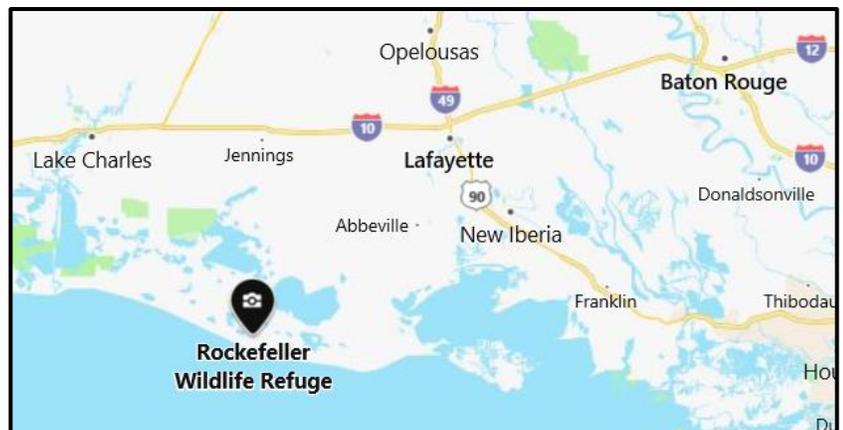
During the evening, rain rolled in. By Sunday morning it was pouring down. Luckily the buildings at Rockefeller are elevated so we were able to load up under cover from the rain. As far as I know, everyone had a great weekend and an uneventful ride home.

Until next year

Don Weinell



Don and John on the beach.



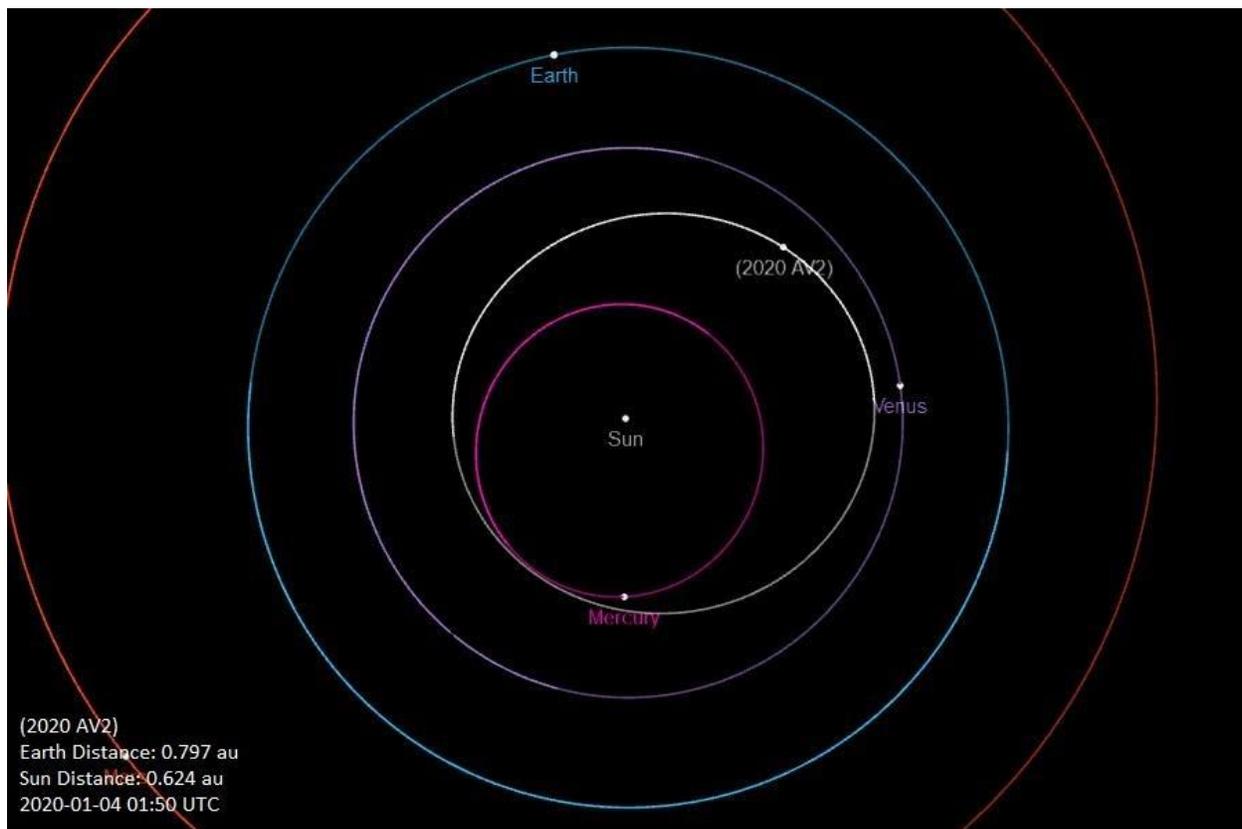
Flying “Rocks” and “Dirty Snowballs”:

Asteroid and Comet News

February 2020

Volume 2, Issue 2.

An asteroid has been discovered orbiting inside the orbit of Venus. 2020 AV2 was first observed by Zwicky Transient Facility at Palomar Observatory (MPC Code I41) on 2020-01-04. It was submitted to The Minor Planet Center using the observer-assigned temporary designation ZTF09k5. This is the first known asteroid (Vatira) to orbit completely inside the orbit of Venus.



NASA JPL Orbit Diagram (2020 AV2) Earth Distance: 0.797 au Sun Distance: 0.624 au 2020-01-04 01:50 UTC
<https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=3985571;old=0;orb=1;cov=0;log=0;cad=1#orb>

See:

MPEC 2020-A99 : 2020 AV2: <https://www.minorplanetcenter.net/mpec/K20/K20A99.html>

Meet 2020 AV2, the first asteroid found that stays inside Venus's orbit!, by Phil Plait:
<https://www.syfy.com/syfywire/meet-2020-av2-the-first-asteroid-found-that-stays-inside-venuss-orbit>

For the first time, an asteroid has been found nearer to the sun than Venus:
<https://www.sciencenews.org/article/first-time-asteroid-has-been-found-nearer-sun-than-venus>

2020 AV2 – Wikipedia: https://en.wikipedia.org/wiki/2020_AV2

[JPL Close Approach Data](#) from Dec 23, 2019 to Jan 27, 2020 Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal LD (au)	H (mag)	Estimated Diameter
(2019 YV4)	2019-Dec-25	0.98 (0.00251)	27.3	9.2 m - 21 m
(2020 AP1)	2020-Jan-02	0.85 (0.00218)	29.6	3.2 m - 7.1 m
(2020 BK3)	2020-Jan-20	0.78 (0.00200)	26.9	11 m - 25 m
(2020 BB5)	2020-Jan-22	0.69 (0.00177)	29.6	3.2 m - 7.1 m
(2020 BH6)	2020-Jan-25	0.18 (0.00047)	28.6	5.2 m - 12 m

As of 2020-01-27 there is

853,561 discovered asteroids (MPC)(<https://www.minorplanetcenter.net/>)
[543,334 have been numbered]

21,951 discovered Near-Earth Objects (MPC) (<https://www.minorplanetcenter.net/>)

4,138 discovered Comets (MPC)(<https://www.minorplanetcenter.net/>)

981 objects listed on JPL's Sentry: Earth Impact Monitoring(JPL) (<https://cneos.jpl.nasa.gov/sentry/>)

2,418 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 2019-12-26 to 2020-01-27

Object Designation	Removed (UTC)
2020 AY1	2020-01-26 14:40:38
2019 YP3	2020-01-26 14:30:17
2020 BF1	2020-01-25 14:58:18
2020 BB	2020-01-25 14:34:33
2019 YW2	2020-01-25 14:13:07
2019 XO3	2020-01-25 00:58:24
2020 BU3	2020-01-23 19:47:59
2015 TC25	2020-01-13 19:39:31
2019 YX1	2020-01-11 07:30:04
2020 AR1	2020-01-07 14:57:30
2019 YA2	2020-01-06 14:35:36
2020 AP	2020-01-05 14:48:29
2020 AK	2020-01-04 13:58:10
2019 YZ4	2020-01-04 13:55:52
2019 XQ2	2020-01-04 13:37:13
2019 YJ3	2019-12-30 13:57:35

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>)

Win a FREE raffle ticket if you can see and correctly identify the object in this MagicEye puzzle.

Email your answer to newsletter@brastro.org

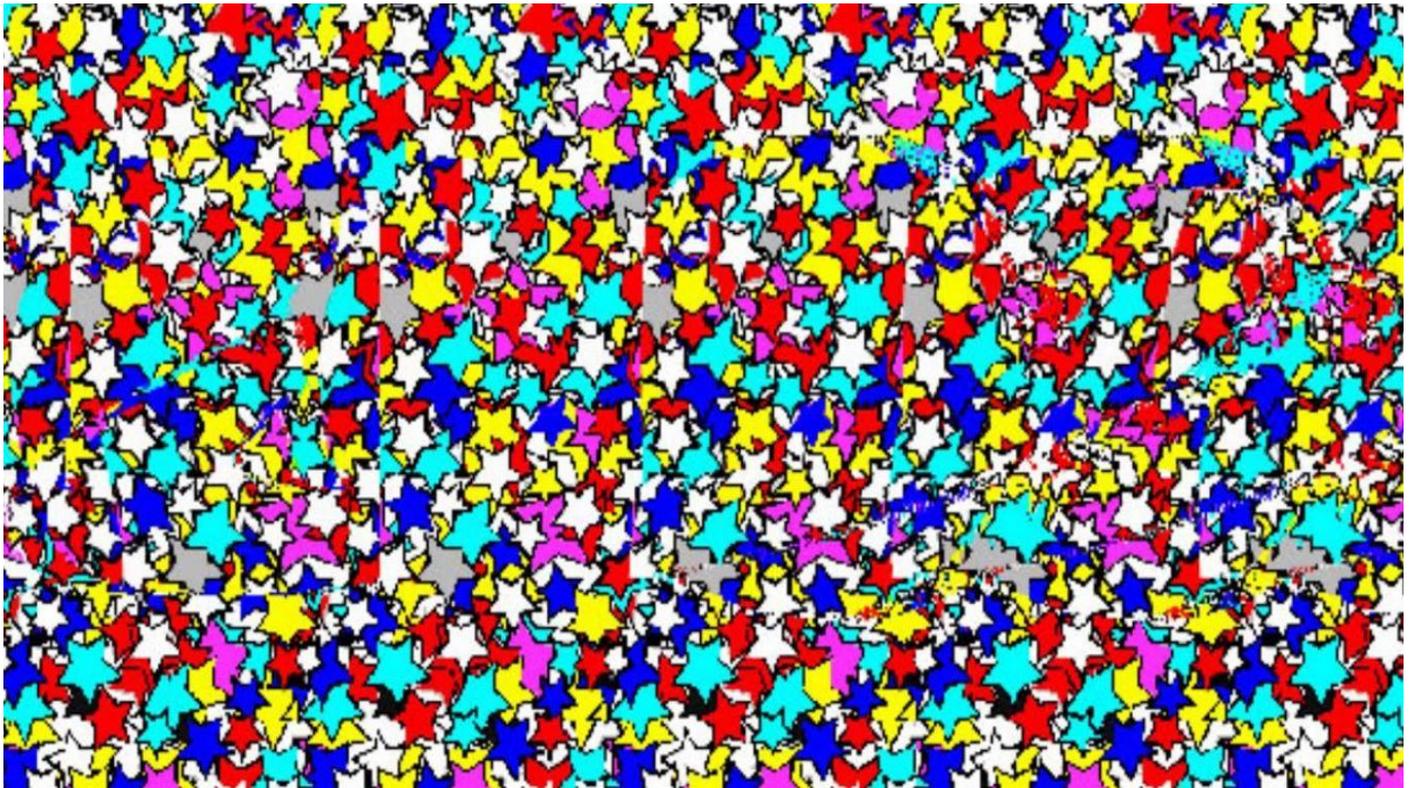
You must be present at the February meeting to qualify.

To make this easier, expand the document on your computer screen to 150%. Or visit link below

If you've never done a Magic Eye puzzle, instructions are here:

https://www.magiceye.com/How_to_see_printer_version.htm

Of course, the honor system applies. Don't give the answer away to anyone else.





Messages from HRPO

Highland Road Park Observatory



FRIDAY NIGHT LECTURE SERIES

All start at 7:30pm. All are for ages fourteen and older.

7 February: “Astrophotography for Youth” Judah Santiago has attended several programs at HRPO. He was inspired to [image the sky](#) any way he know how, and now he’s imparting that information to the audience in this special lecture aimed at adolescents aged eleven to twenty.

14 February: “The Current State of Betelgeuse” The fainting of the great supergiant [Betelgeuse](#) (usually one of the fifteen brightest stars in the sky) is a major topic of discussion within the professional and amateur ranks. Betelgeuse has dimmed to a pathetic (for it) magnitude not seen in recent skygazing history. We will explain the type of regular variability Betelgeuse has, how this current dimming deviates from that, and what to expect in the future.

21 February: “Hurricanes” BREC Center Supervisor Jordan Cobbs shows it never too early in the calendar year to start preparing! How do [hurricanes](#) form and how accurate are the current prediction models?

28 February: “The Saga of Daylight Time” From intriguing beginnings this bizarre policy has been with us throughout our entire lives. Now we are asked serious questions. What does Daylight Time do for modern society? Is Daylight Time no longer needed? We’ll hear from members of the Baton Rouge Astronomical Society—and you.



Science Academy

Saturdays from 10am to 12pm

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

1 February: “Earth Orbit Trips II/Electrical Behavior II” This standalone, never-to-return-again series of sessions (each about a month apart) focuses on the space stations and [satellites that orbit our home planet](#), and a collection of electricity demonstrations. Cadets who participates in sessions I, II and III will receive a special notation on their next certificates!

8 February: “Power in the House III” The first of this three-session series has Cadets focus on how the [motion of water](#) can be transformed into energy for families and businesses!

15 February: “Mercury” Cadets come to understand the closest planet as the site of the MESSENGER visit, and as an elusive object that can be spied above the horizon during certain times in its orbit.



Solar Viewing

Saturday 15 February from 12pm to 2pm.

For all ages. No admission fee. 20OGS Tour at 1pm.

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

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]



STEM Expansion

“Science, Technology, Engineering, Math”

Saturday 22 February 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.



Plus Night

Saturday 8 February from 12pm to 2pm..

For all ages. No admission fee.

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

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

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

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

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

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



Mercurian Elongation

Monday 10 February from 5:30pm to 7pm

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.



Lunar Occultation of Mars

Tuesday 18 February from 4:15am to 6:15am

No admission fee. For all ages.

The first attempted viewing of Mars at HRPO is this extremely rare event of the Moon passing in front of the Red Planet. Fair warning: the sky will be brightening, and the Moon and Mars will be very low. A clear view of the occultation cannot be guaranteed.



Edge of Night

Friday 6 March from 5:30pm to 7:30pm

No admission fee. For all ages.

It's not light, it's not dark. It's that special time called twilight, and HRPO wants to introduce you to it! *Are all sections of the sky the same shade of blue? Which stars are seen first? Are Mercury and Venus or the Moon out? Is that moving object a plane, a satellite or space debris? How much actual darkness should I expect in a light-polluted city when twilight has passed?* There is no other time like twilight. Bring it into your life!



Venusian Elongation

Tuesday 24 March from 9pm to 10:30pm

at Burbank Soccer Complex

No admission fee; for all ages.

Periodically Venus reaches its greatest angular separation in the sky (elongation) from the Sun. This is the safest way to view Venus by amateurs. Come join us at the Burbank Soccer Complex! The planet will appear as a 'half-Venus'. The Pleiades and the Orion Nebula will also be seen.



NanoDays

Saturday 4 April from 3pm to 7pm

For ages eight and older. No admission fee.

For the ninth consecutive year at HRPO, big things in the Universe take a backseat to all things tiny. Children and adults alike will be able to see how big they are compared to nanoscale objects; understand how a Scanning Probe Microscope explores the nanoworld; try to pour water out of a nano-cup; learn about nanomaterials used stain-free clothes; have a chance to build models of nanoscale structures; play with liquid crystals; make fluids part in the middle by applying magnets to them.

+++++



HRPO's NEW STARGAZING OUTFIT??

NO!!!!!!!!!!!!!!

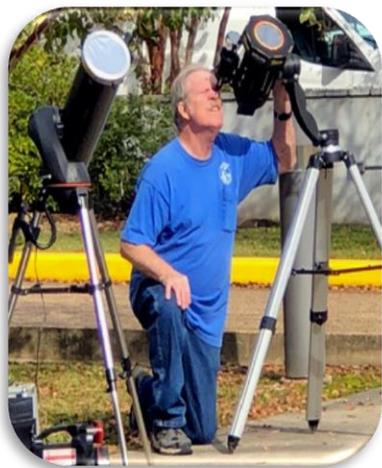
It's from a fascinating article submitted by BRAS member Mayann Stroup

How To Dress Like An 18th Century Astronomer

<https://www.atlasobscura.com/articles/what-to-wear-to-stargaze>

Check it out!

Submit articles of your own to newsletter@brastro.org



Observing Notes: February

by John Nagle

Monoceros – the Unicorn

Position: RA 07.15, Dec. -5.74°

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

Ctesias (Alpha Mon), mag. 3.94, 07 41 14.88 -09 33 03.9, is an orange giant star. Also known as **HD 61935**, **HIP 37447**, **26 Monocerotis**, **HR 2970**, **SAO 134986**, and **BD-09° 2177**.

Cerastes (Beta Mon), is a triple star system forming a triangle, with circumstellar disks orbiting them. The system is also known as **HD 45725**, **ADS 5107**, and **STF (Σ) 919**.

Beta Mon A, mag. 4.60, 06 28 49.07 -07 01 59, is a hydrogen fusing dwarf star with a projected rotational rate of 123 km/sec. Also known as **HIP 30867**, **11 Monocerotis**, **HR 2356**, **GC 8412**, and **BD-06° 1574**.

Beta Mon B, mag. 5.40, 06 28 49.5 -07 02 04, is a hydrogen fusing dwarf star with a projected rotational rate of 123 km/sec. Also known as **11 Monocerotis**, **HR 2357**, and **BD-06° 1575B**.

Beta Mon C, mag. 5.60, 06 28 49.5 -07 02 04, is another hydrogen fusing dwarf star with a rotational rate of 331 km/sec. Also known as **HR 2358**, and **BD-06° 1575C**.

Beta Mon D, is a 12th magnitude line-of-sight only companion, not physically related. Separations: AB – 7.3”; AC – 10”; AD – 25.9”; and BC – 2.8”.

Tempestris (Gamma Mon), mag. 3.99, 06 14 51.34 -06 16 29.0, is an orange giant star. Also known as **HD 43232**, **HIP 29651**, **5 Monocerotis**, **BD-06° 1469**, **GC 7986**, **HR 2227**, and **SAO 133012**.

Kartajan (Delta Mon), mag. 4.15, 07 11 51.86 -00 29 34, is a white main sequence giant star. Also known as **HD 55785**, **HIP 34769**, **22 Monocerotis**, **BD-00 1636**, **GC 9518**, **HR 2714**, and **SAO 134330**.

Plaskett's Star, mag. 6.05, 06 37 24.04 +06 08 07.4, is a spectroscopic binary star consisting of two massive blue supergiant stars orbiting a common center of gravity every 14.4 days (a separation of only about 50 million miles). These two stars are the most massive pair yet identified in our galaxy. The dimmer star of the pair is a very fast rotator with a projected rate of 300 km/sec, resulting in a bulge at the equator of this star. Located about $1\frac{1}{2}^{\circ}$ southeast of **13 Monocerotis**. The stars are probably a member of the huge aggregation of **NGC 2244**, and its associated nebula **NGC 2237**, that lies less than 2° distant. Also known as **HD 47129**, **HIP 31646**, **V640 Monocerotis**, **HR 2422**, **BD+06 1309**, and **GC 8631**.

Deep Sky:

M50 (NGC 2373), mag. 5.9, 07 02.8 -08 23, 20'x15' in size, is an open cluster of over 80 stars, with curving arcs of stars, giving the perimeter a rather heart-shaped outline; detached, weak concentration of stars; large range in brightness; very large; magnitude of brightest star is 7.9. A red star is located near the southern verge, and a pretty little equilateral triangle of stars is just north of it. To find **M50**, draw a line between **Sirius** (**Alpha Canis Major**) and **Procyon** (**Alpha Canis Minor**) – you will find the cluster about 1/3 of the way up from **Sirius**, or locate the roughly shaped square formed by **Alpha**, **Beta**, and **Delta Monocerotis** along with **Sirius** – right in the middle of that square is **M50**. The center star of the cluster is **BD-08° 1700**. Also known as **Cr124**, **Mel 158**, **OCL 559**, **OCL 559.0**, **Raab 45**, **Lund 283**, and **CGCG 0700-087**.

NGC 2232, mag. 3.9, 06 26.6 -04 45.5, 30' in size, is an open cluster of 20 stars; not well detached; large range in brightness; a large cluster; includes the bright star **10 Monocerotis** (magnitude 5.1). Divided into two irregular arcs. Also known as **Cr 93**, **Lund 220**, **OCL 545**, **H8-25**, and **CGCG 0624-047**.

NGC 2264, mag. 3.9, 06 40 59 -09 53.7, 26'x15' in size, 40+ stars bathed in bright nebulosity; not well detached; large range in brightness; large; magnitude of brightest star is 4.7. The southeast part of the cluster is a small, dark nebula known as the **Cone Nebula** (06 41.1 +09 53, 35'x15' in size), it is an emission nebula also known as **H8-5**. There are two other objects within **NGC 2264**, but are not officially included: **The Snowflake Cluster**; and the **Fox Fur Nebula** (a diffuse, dark nebula).

NGC 2264 is called the **Christmas Tree Cluster**, with the star **S Monocerotis** (**HD 47839**, **5 Monocerotis**) marking the trunk of the tree, and the variable star **V429 Monocerotis** (6th magnitude) representing the top of the tree. Also known as **Cr 112**, **Lund 246**, **Mel 49**, **OCL 495**, **Mrk 16**, **CGCG 0638+099**, **LBN 911**, **H5-27=H8-5**, **Sh2-273**, and **LBN 202.92+02.18**.

Cr 106, mag. 4.06, 06 37.1 +05 57, 44' in size, is an open cluster of 20 stars; detached, no concentration of stars; large brightness range. Located about 1° northeast of the **Rosette Nebula** (NGC 2237, 2238, 2239, and 2244). Also known as **Lund 239**, **OCL 510**, **WB89 846**, **CGCG 0634 +060**, and **IRAS 06346+0608**.

NGC 2239, mag. 4.8, 06 33 01 +04 55 36, 24' in size, 40 stars, is **NGC 2244**. Part of the **Rosette Nebula**. Also known as **OCL 515**, **Mel 47**, **Cr 99**, and **Lund 227**, **Lund 229**.

NGC 2244, mag. 4.8, 06 32 19 +04 55 34, 24'x24' in size, 100 stars; weak concentration of stars; large range in brightness; large, bright; magnitude of brightest star is 5.8. The center star is 6th magnitude **12 Monocerotis**, probably does not belong to the group. Totally surrounds **NGC 2239**. It has numerous slender dark lanes and irregular tendrils. Also known as **NGC 2239**, **Mel 17**, **Cr 99**, **OCL 515**, **OCL 515.0**, **Lund 229**, **Lund 227**, **Mrk 15**, **H7-2**, **OCL 512.0**, **C 50**, and **CGCG 0629+049**.

Cr 107, mag. 5.1, 06 37.7 +04 45, 30' in size, 15+ stars; not well detached; large brightness range. Located about 1° east-southeast of the **Rosette Nebula**. Also known as **Lund 240**, **OCL 518.0**, **OCL 518**, and **CGCG 0635+047**.

Cr 97, mag. 5.4, 06 30 58.1 +05 49 30, 25' in size, is an open cluster of 15+ stars; not well detached; large range in brightness. Also known as **Lund 228**, **OCL 508**, **OCL 508.0**, and **CGCG 0628+059**.

NGC 2237, mag. 5.5, 06 31 55.5 +04 56 34, 80'x50' in size, **Nebula Only!** Totally surrounds **NGC 2244**. Official designation for the **Rosette Nebula**. Also known as **OCL 511**, **OCL 511.0**, **C 49**, **Lund 229**, **LBN 948**, and **Sh2-275**.

NGC 2323, See **M50**.

NGC 2238, mag. 6.0, 06 31 46 +04 59 51, 80'x60' in size. Also known as the **Rosette Nebula**, **LBN 918**, **Ced 76a**, and **Sh2-275**.

NGC 2301, mag. 6.0, 06 51 46 +00 27.6, 15' in size, is an open cluster of 80+ stars; detached, strong concentration of stars; large range in brightness; large; magnitude of brightest star is 8.0; a curving group topped with a flying wedge of stars. **NGC 2301=BD+00 1660**. Also known as **Cr 119**, **Lund 263**, **Mel 54**, **OCL 540**, **OCL 540.0**, **Raab 41**, **H6-27**, and **CGCG 0649+005**.

Cr 91, mag. 6.4, 06 21 33 +02 20.3, 16' in size, is an open cluster of 20+ stars; not well detached;

moderate range in brightness; a diamond-shaped group. Also known as **Lund 216**, **OCL 519**, and **CGCG 0619+023**.

NGC 2167, mag. 6.6, 06 07 -06 12, one star. Also known as **H4-44**.

NGC 2343, mag. 6.7, 07 08 07 -10 37 00, 6' in size, is an open cluster of 55 stars; detached, no concentration of stars; large range in brightness; quite large; magnitude of brightest star is 8.4. Also known as **Cr 128**, **Lund 300**, **OCL 565**, **H8-33**, and **CGCG 0705-105**.

Cr 111, mag. 7.0, 06 38.7 +06 55, 3.2' in size, has two bright stars and a scattering of fainter stars – probably not a true cluster. Also known as **Lund 245**, **OCL 505**, and **CGCG 0636+069**.

NGC 2353, mag. 7.1, 07 14 31 -10 16 00, 18' in size, is an open cluster of 106 stars; detached, weak concentration of stars; moderate range in brightness; large. Located on the northern tip of bright nebula **LBN 1036**. Also known as **Cr 130**, **Lund 308**, **Mel 62**, **OCL 567**, **OCL 567.0**, **Raab 49**, **H8-34**, **EQ 0712-1026**, and **CGCG 0712-102**.

NGC 2335, mag. 7.2, 07 06 50 -10 01.7, 12' in size, is an open cluster of 57 stars; detached, no concentration of stars; large range in brightness; large; involved in nebulosity; magnitude of brightest star is 9.5. Also known as **Cr 127**, **Lund 292**, **Mel 60**, **OCL 562**, **Raab 47**, **H8-32**, and **CGCG 0704-100**.

Cr 96, mag. 7.3, 06 30.3 +02 52, 12' in size, is an open cluster of 15+ stars; not well detached; moderate range in brightness; magnitude of brightest star is 8.8. Located about 2° south-southwest of the **Rosette Nebula**. Also known as **Lund 224**, **OCL 573**, and **CGCG 0627+029**.

NGC 2251, mag. 7.3, 06 34 39 +08 22 00, 10' in size, is an open cluster of 92 stars; detached, no concentration of stars; moderate range in brightness; elongated and large; magnitude of brightest star is 9.1. Located $\frac{3}{4}$ ° north of **14 Monocerotis**. Also known as **Cr 101**, **Lund 232**, **OCL 499**, **H8-3**, and **CGCG 0632+054**.

NGC 2286, mag. 7.5, 06 47 41 -03 08.9, 15' in size, is an open cluster of 80 stars; not well detached; large range in brightness; magnitude of brightest star is 9.7. Also known as **Cr 117**, **Lund 257**, **OCL 548**, **H8-31**, and **CGCG 0645-031**.

Do 25, mag. 7.6, 06 45.1 +00 18, 23' in size, is an open cluster of 50 stars; not well detached; moderate range in brightness; involved in nebulosity; magnitude of brightest star is 8.9. Two wish-bone shaped groups of stars joined by a pair of stars at their stems. Also known as **Lund 254**, **OCL 537**, and **CGCG 0642-1003**.

NGC 2506, mag. 7.6, 08 00 02 -10 46.2, 12' in size, is an open cluster of 150+ stars; detached, strong concentration of stars; moderate range in brightness; a large cluster; magnitude of brightest star is 10.5. Located 35' northeast of **7 Monocerotis**. Also known as **C 54**, **Cr 170**, **Lund 415**, **Mel 80**, **OCL 513**, **Raab 67**, **H6-37**, **Bennett 39**, **MCG+03-19-21**, **CGCG 0757-106**, **EQ 0757-106**, **CBCG 86-41**, **CBCG 87-02**, and **NPM1G+18**.

Ced 78, mag. 7.7, 06 31 00.8 +09 54 33, 25'x20' in size, is an open cluster of 30 stars; not well detached; moderate range in brightness; involved in nebulosity; magnitude of brightest star is 9.0. Located on the northeast edge of the **Rosette Nebula**, or 3.4° northeast of **NGC 2244**. Also known as **Cr 102**, **Lund 233**, **OCL 514**, **H8-50**, **CGCG 0632+054**, and **IRAS 06323+0527**.

NGC 2215, mag. 8.4, 06 20 50 -07 17 00, 11' in size, is an open cluster of 40+ stars; detached, weak concentration of stars; moderate range in brightness; large cluster; magnitude of brightest star is 10.5. Located 35' north-northeast of **7 Monocerotis**. Also known as **Cr 90**, **Lund 215**, **Mel 45**, **OCL 550**, **H7-20**, **Raab 35**, and **CGCG 0618-072**.

NGC 2324, mag. 8.4, 07 04 08 +01 02.7, 8' in size, is an open cluster of 130 stars; detached, weak concentration of stars; moderate range in brightness; large; magnitude of brightest star is 11.0. Located 22' to the north is **O Σ 82**. Also known as **Cr 125**, **Lund 287**, **Mel 59**, **OCL 542**, **Raab 46**, **H7-38**, and **CGCG 0701-114**.

Bas 7, mag. 8.5, 06 36 19 +08 20.4, 5' in size, is an open cluster of 130+ stars. Also known as **Lund 1125**, **OCL 499.2**, and **CGCG 0633+084**.

NGC 2236, mag. 8.5, 06 29 40 +06 49.8, 8' in size, is an open cluster of 200+ stars; detached, no concentration of stars; moderate range in brightness; magnitude of brightest star is 11.0. Also known as

Cr 94, Lund 221, OCL 501, OCL 501.0, H7-5, and CGCG 0627-068.

Cr 92, mag. 8.6, 06 22.9 +05 07, 11' in size; large, faint, and loose, poor cluster; weak concentration of stars in a 10' area – probably not a true cluster. Located about 2° west of the **Rosette Nebula**. Also known as **Lund 218, OCL 504, and CGCG 0620 +051.**

vdB 80, mag. 8.6, 06 30 50 -09 39.3, 5.8' in size, 6 stars. Also known as **LBN 1015, OCL 553.1, and CGCG 0628-096.**

NGC 2247, mag. 8.7, 06 34 13 +10 18 20, 6'x6' in size. Also known as **HD 259431, HIP 031235, BD+10 1172, and LBN 901.**

vdB 87, mag. 8.8, 07 00 -08 52.

NGC 2250, mag. 8.9, 06 33 47 -05 05.3, 10' in size, is an open cluster of 25 stars, oblong shape (E-W) in a 10'x5.5' group with **HD 46576** on the northeast side. Also known as **h 394, and OCL 547.**

NGC 2299, mag. 8.9, 06 51.1 -07 00, 6' in size, not obvious in a 0.4° field. The **RNGC** says it is non-existent. Also known as **NGC 2302, and OCL 554.0.**

NGC 2302, mag. 8.9, 06 51 54 -07 05 00, 5' in size, 30+ stars. Also known as **Lund 264, OCL 554, OCL 554.0, H8-39, NGC 2299, and CGCG 0649-070.**

vdB 68, mag. 9.0, 06 08 -06 14, 4'x3' in size, is a reflection nebula. Located 13' northeast of **NGC 2170.**

vdB 69, mag. 9.0, 06 08 -06 22, 2'x2' in size, located 8.5' east of **NGC 2170.**

NGC 2254, mag. 9.1, 06 35 46.6 +07 40 16, 6' in size, is an open cluster of 50+ stars. It is an irregular, 2' diameter, group of faint stars in two rows, 17' northeast of **14 Monocerotis**. Also known as **Cr 103, Lund 234, OCL 500, H7-22, and CGCG 0633+077.**

Cr 115, mag. 9.2, 06 46 40 +01 46.7, 10' in size, 50+ stars. Also known as **Lund 225, OCL 535, and CGCG 0643 +018.**

vdB 01, mag. 9.5, 06 37 05 +03 03.8, 5' in size, 39 stars, = **CV Monocerotis = GSC 0150-0121.** Also known as **Lund 527, CV Monocerotis Cluster, Anonymous vdB Cluster, OCL 527, CGCG 0634+031.**

Cr 104, mag. 9.6, 06 36.5 +04 50, 20' in size, is a loose, 20' long “integral sign” shaped chain of 15 stars. Also known as **Lund 235, OCL 517, OCL 517.0, and CGCG 0633 +048.**

Bo 2, mag. 9.7, 06 48 50 +00 22.6, 1.5' in size, 10 stars = **BD+0 1617**, is a faint, obscure cluster. Also known as **Lund 1126, and CGCG 0646 +004.**

Bo3, mag. 9.9, 07 03 28 -05 00.3, 4' in size, 25 stars = **HD 296184.** Also known as **Lund 112, and CGCG 0700-050.**

NGC 2261, mag. 10.0, 06 39 09.54 +08 44 39.6, 3.5'x1.5' in size, has a bright, fan (comet) shaped apex at its southern end. The variable star **R Monocerotis** illuminates the nebula and is also surrounded by the nebula. There are long filaments that cast shadows inside the nebula. The filaments appear to form some 2.2 au from **R Monocerotis**, and may rotate with help of magnetic fields. This nebula is tricky to find – locate **Epsilon Monocerotis**, then star hop to **13 Monocerotis**, and then further up to the northeast is **S Monocerotis**. Between **13 Monocerotis** and **S Monocerotis**, just about half-way, is where the great nebulosity surrounding **S Monocerotis** begins. At the extreme southern edge of this nebulosity is **Hubble's Variable Nebula**. This nebula was the first object to be photographed with the 200 inch reflector at Palomar Observatory on January 26, 1949. **NGC 2261** is located 1° from **NGC 2264** (the **Christmas Tree Cluster**) and its associated HII nebulosity (**Sh2-273** – home of the **Cone Nebula**). Also known as **LBN 920, C 46, and the R Monocerotis Nebula.**

NGC 2269, mag. 10.0, 06 43 16.8 +04 37 04, 3' in size, 12 stars. Also known as **Cr 114, Lund 252, OCL 524, H6-3, and CGCG 0641 +046.**

BEYOND Magnitude 10:

NGC 2346, mag. 11.6, 07 09 22.4 -00 49 24, 1'x0.9' in size, is an hourglass shaped planetary nebula with a 40" disk. The central star is **V651 Monocerotis**. Located 42' west-southwest of **Delta Monocerotis**, inside the **Rosette Nebula**. Also known as **PK 215+03.1, Min 1-10, Sand 2-5, H4-65, LBN 948, and the Butterfly Nebula.**

IC 446, 06 31 06 +10 27 35, 5'x4' in size, is a faint, easily seen patch of nebulosity, involved with a magnitude 9.5 star. **LDN 1607** is to the south. Also known as **IC 2167**, **LBN 898**, and **Ced 77**.

IC 447, 06 31 06 +09 52 00, 25'x20' in size, is a large reflection nebula. Also known as **IC 2169**, **LBN 903**, and **Dryer's Nebula**.

IC 2177, 07 04 25.3 -10 27 13, 120'x40' in size, is a pretty bright, extremely large, very diffuse nebula extending north-south, illuminated by a 6.2 magnitude star. Bright nebula **Ced 90** (in **Canis Major**) is located at **IC 2177**'s southern tip. **Gum 2** and **NGC 2335** are at the northern edge of the nebula. Also known as the **Seagull Nebula**, the **Eagle Nebula**, **Gum 1**, **vdB 93**, **Sh2-292**, and **LBN 1027**.

NGC 2282, 06 47 55 +01 17 33, 3'x3' in size, 15 stars. A 10th magnitude star (**HD 289120**) is involved in a faint nebulosity in the southeast part of the nebula (**vdB 85**). Also known as **IC 2172 = BFS 54**, **Ced 87**, associated with **OCL 535**, **OCL 535.1**, **Lund 1160**, and **CGCG 0644 +013**.

CRL 915, 06 19 58.2 -10 38 14.09, is a proto-planetary nebula, a compact, bipolar nebula with X-shaped spikes around **HD 441798** (magnitude 9.02) – **V 777 Monocerotis**. Also known as **RAFGL 915**, and **The Red Rectangle**.

LDN 1607, 06 41 14 +09 23 09, 8'x3.5' in size, located 6' south-southwest of **IC 446**, and 21' west of **B37**. Also known as the **Conus Nebula**.

Rosette Nebula is consisted of **NGC 2237** (nebula only), **NGC 2238**, **NGC 2239** (cluster), **NGC 2244** (**NGC 2239**), and **NGC 2246**.

Objects in Monoceros: 62 **NGC**; 6 **IC**; 6 **UGC**; 39 **Cr**; 7 **Bi**; 12 **Be**; 4 **B**; 8 **Sh2**; 4 **Do**; 4 **Min**; 8 **Al**; 4 **Cz**; 2 **Bo**; 2 **Str**; 3 **Abell**; 3 **Bas**; 1 **LBN**; 33 **LDN**; 13 **PNG**; 4 **MCG**; 6 **Al**, 8 **vdB**; 3 **Radio Galaxies**; 1 **Quasar**; 2 **Teutsch**; 1 **[AO84]**, 1 **[DB01]**; 29 **H**; 7 **PK**; 12 **FSR**; 21 **Wein**; 4 **K**; 12 **Mel**; 1 **Ju**; 1 **Gum**; 1 **Tr**; 1 **Dias**, 1 **Fr**; 1 **Frr**; 1 **Semeis**; 1 **Monti**; 1 **Ru**; 1 **Pakan's**; 1 **VMT**, 2 **Parsamyan**; 1 **GM**; 1 **S**; 1 **Steph**; 1 **ASC**; 1 **Rei**; 1 **Haf**; 1 **CHR**; 1 **Lor**; 1 **SAI**; 1 **Hrr**; 1 **CRL**; and 1 **HaWe**.

Other Stars:

Epsilon MonA, mag. 4.39, 06 23 46.10 +04 35 34.2, is a rapid rotator with a projected rotational velocity of 137 km/second. It has a dim, line of sight companion (**Epsilon MonC**) at magnitude 12.7.

Epsilon MonB, mag. 6.72, 06 23 46.5 +04 35 45.1, is a yellow-white, main sequence dwarf star. Separation of AB is 12.1", and an orbital period of at least 6000 years. AC separation is 93.7".

Epsilon MonA is also known as **HD 44769**, **HIP 30419**, and **8 Monocerotis**. **Epsilon MonB** is also known as **HD 44770**, **HIP 30422**, and **8 Monocerotis**.

Zeta Mon, mag. 4.36, 08 08 35.66 -02 59 01.6, is a triple star system. The B component has a magnitude of 10.0, and the C component is at magnitude 7.8. AB separation is 32.0"; AC separation is 66.5". Also known as **HD 67594**, **HIP 39863**, **ADS 6717**, and **29 Monocerotis**.

S Mon, mag. 4.66, 06 40 58.66 +09 53 44.7, is a massive blue giant spectroscopic binary star in a binary system, consisting of two stars that cannot be resolved, orbiting each other with a period of 25 years. The spectrum matches that of a main sequence dwarf star. The B component is at magnitude 7.5, with a separation of 2.8", while the C component is at magnitude 9.8, with a separation from the A component at 16.6". Located inside **NGC 2264**, totally surrounded by the **Sharpless 2-273** nebula, and is just north of the **Cone Nebula**. Also known as **HD 47839**, **HIP 31978**, **ADS 5322**, and **15 Monocerotis**.

HD 52265, mag. 6.3, 07 00 18.10 -05 22 02.5, is a yellow main sequence dwarf star with two planets in orbit (b and c). **HD 52265b** has an orbital period of 120 days and a mass of 1.1 Jupiter. Also known as **HIP 33719**.

HD 46149, mag. 7.61, 06 31 52.53 +05 01 59.2, is a spectroscopic binary and a rotating, pulsating variable star. Located within **NGC 2244**. Also known as **HIP 31128**.

HD 44219, mag. 7.70, 06 20 14.32 -10 43 30, is a yellow main sequence dwarf star with one planet, of 0.58 Jupiter mass, in orbit with a period of 472 days. Also known as **HIP 30114**.

HD 46375, mag. 7.84, 06 33 12.82 +05 27 46.5, has a hot, sub-Saturn planet in orbit with a period of 100 days. Also known as **HIP 31248**.

HD 46380, mag. 8.0, 32 43 23 -07 30 32.3, is a Be star. Also known as **HIP 31199**, and **V728 Monocerotis**.

HD 45652, mag. 8.13, 06 29 13.19 +10 56 02, has one planet, 0.47 Jupiter mass, in orbit with a period of 43 days. Also known as **HIP 30905**.

HD 66428, mag. 8.25, 08 03 28.67 -01 09 45.8, has one planet, of 2.82 Jupiter mass, in orbit with a period of 1,973 days. Also known as **HIP 39417**.

HD 50064, mag. 8.30, 06 51 34.11 +00 17 50.4, is a variable star and one of the most luminous stars known.

HD 47732, mag. 8.40, 06 40 28.59 +09 49 04.3, is a rotating ellipsoidal variable star. Also known as **HIP 31939**, and **V641 Monocerotis**.

HD 44179, mag. 8.94, 06 19 58.22 -10 38 14.7, is the central star in the “**Red Rectangle Nebula**”. It is in a re-radiating binary system. Also known as **HIP 30089**, and **V777 Monocerotis**.

Stars of interest beyond magnitude 10:

Ross 614, mag. 11.08, 06 29 23.40 -02 48 50.3, is a binary system of two red dwarf stars. The primary is a “flare” star with the companion at magnitude 14.23. The separation is 1.2” (3.9 au), and it has an orbital period of 16.5 years. Also known as **HIP 30920**, and **V577 Monocerotis**.

A0620-00, mag. 11.2, 06 22 44.5 -00 20 44.7, is an X-ray nova and rotating ellipsoidal variable star. Also known as **V616 Monocerotis**.

R Mon, mag. 11.85, 06 39 09.95 +08 44 10.6, is the star that illuminates **NGC 2261**. It is heavily obscured and truly encased within the nebulosity. It has a dusty accretion disk. It is a **Herbig Ae/Be** star with one companion. Has a strong and fast stellar wind (around 300 km/second).

AFGL 961, 06 34 37.63 +04 12 42.8, is a young stellar object.

Monoceros R2 IRS 3, 06 47 47.8 -06 22 55, is a young stellar object.

NGC 2264 IRS 1, 06 41 10.06 +09 29 35.8, is a young stellar object in **NGC 2264**.

UGPS J072227.51-054031.2, 07 22 27.87 -05 40 34.1, is a brown dwarf star.

There are 9 COROT stars with transiting planets.

Other stars in Monoceros are: 30 Σ ; 3 $O\Sigma$; 12 β ; 7 A; 1 $H\Sigma$; 4 h; 85 V(riable); 2 Ho; 1 Bgh; 1 AC; and 2 Rst.

Sky Happenings: February, 2020 *(what follows pertains ONLY to the current month. Material above is good year after year.)*



- Feb. 1st - **First Quarter Moon** occurs at 7:42 PM CST.
- Feb. 2nd - The **Moon** passes 0.5° north of asteroid **Vesta** at 3 AM CST.
- Feb. 5th - The **Moon** passes 1.4° south of **M35** at 7 PM CST.
- Feb. 8th - The waxing gibbous **Moon** is 1° north of the **Beehive (M44)** at 5 AM CST.
- Feb. 9th - **Full Moon** occurs at 1:33 AM CST.
- Feb. 10th - **Mercury** (magnitude -0.5) is at greatest eastern elongation (18°) at 8 AM CST, The **Moon** is at perigee (223,980 miles or 360,461 km from **Earth**) at 2:28 PM CST.
- Feb. 13th - Asteroid **Juno** is stationary at 1 AM CST, The **Moon** passes 0.6° north of asteroid **Juno** at 4 AM CST – occultation will occur except in northeast **Canada**.
- Feb. 15th - **Last Quarter Moon** occurs at 4:17 PM CST.
- Feb. 16th - **Mercury** is stationary at 4 AM CST, Dawn: The **Moon** is in **Scorpius** about 1° or so from **Beta Scorpii (Graffias)**.
- Feb. 18th - Dawn: The waning crescent **Moon** occults **Mars** (magnitude 1.2), except in western **Canada**.
- Feb. 19th - Dawn: The thinning **Moon** and **Jupiter** are 3° to 4° apart to the left of the **Teapot** asterism in **Sagittarius**, The **Moon** passes 0.9° south of **Jupiter** at 2 PM CST, an occultation will occur except in western **Canada** and **Alaska**. The **Moon** passes 0.7° south of **Pluto** at 2 AM CST,

- Feb. 20th** - **Mars, Jupiter, and Saturn** align on the **Ecliptic** in the early morning, Dawn: The slender lunar crescent lies about 2° to the lower right of **Saturn**, The **Moon** passes 1.7° south of **Saturn** at 8 AM CST.
- Feb. 23rd** - **New Moon** occurs at 9:32 AM CST (lunation 1202).
- Feb. 25th** - **Mercury** is in inferior conjunction with the **Sun** at 8 PM CST.
- Feb. 26th** - The **Moon** is at apogee (252,450 miles or 406,278 km from **Earth**) at 5:34 AM CST.
- Feb. 27th** - The **Moon** passes 6° south of **Venus** at 6 AM CST.
- Feb. 28th** - The **Moon** passes 4° south of **Uranus** at 6 AM CST in the western twilight.

Planets:

Mercury – On the 1st of February, **Mercury** (6” diameter disk, 83% lit) is 7° high in the southwest a half-hour after sunset, shining at magnitude -1.0, among the background stars of **Aquarius**. From February 1st to the 14th, the planet dims from magnitude -1.0 to +0.2. On the 10th, the planet reaches greatest eastern elongation (18.2°) from the **Sun**, standing 11° high 30 minutes after sunset, with its 7” wide disk at almost exactly half-lit. From the 14th to the 17th, the planet fades from magnitude +0.2 to 1.6, and then starts to dim by one magnitude or more every two days on its way to an inferior conjunction with the **Sun** on the 25th.

Venus – **Venus** begins the month in **Aquarius**, crossing the border into **Pisces** on February 2nd. The planet will climb from almost 35° to a bit more than 41° in sunset altitude during February. The angular diameter of the planet will increase from about 15” to 19” during the month, while its illumination percentage drops from about 75% to 63%. The planet will brighten in magnitude from -4.1 to -4.3 during the month, and does not set until about 3½ hours after the **Sun** on the 1st, and about 3¾ hours after the **Sun** on the 29th. On the 26th, the **Moon** is within 10° of the planet, and on the 27th, within 7° of the planet.

Mars – **Mars** rises above the southeast horizon shortly before 4 AM local time. On February 1st, the planet is in **Ophiuchus**, shining at magnitude 1.4. The planet will cross into **Sagittarius** on the 11th, preparing for a series of terrific conjunctions. On the 17th, the planet passes between the **Lagoon Nebula (M8)** and the **Trifid Nebula (M20)** – the two objects are only 1.4° apart. Shortly before dawn on the 18th, the waning crescent **Moon** slides in front of the planet, occulting it, and taking up to 15 seconds to completely cover the featureless 5.2” diameter disk.

Jupiter – **Jupiter** starts February by rising in **Sagittarius**, east of the **Teapot** asterism, 90 minutes before the **Sun**, and ends the month rising about 2½ hours before the **Sun**. During the month, the planet will brighten from magnitude -1.9 to -2.0, with its globe growing ever so slightly from 32” to 34” in diameter. On the 1st, **Jupiter** and **Saturn** will stand 11° apart, with **Saturn** at magnitude 0.6. On the 19th, the **Moon** is 4° to **Jupiter**’s right. By the end of the month, **Jupiter**, **Saturn**, and **Mars** will rise before twilight begins, spread out 19° along the ecliptic, with **Mars** highest, **Jupiter** 10° to its lower left, and **Saturn** 9° further on.

Saturn – **Saturn** rises in **Sagittarius** about 50 minutes before the **Sun** on February 1st, about 40 minutes after **Jupiter**, with the two planets 11° apart. By the end of the month, **Saturn** will rise about 2 hours before the **Sun**, nearing the borderline of **Sagittarius** and **Capricornus**. The planet will dim from magnitude +0.6 to +0.7 during the month. The ring system spans 35” and tilts 22° to our line of sight. The waning crescent **Moon** passes 2° south of **Saturn** on the 20th.

Uranus – **Uranus**, at magnitude 5.8, will set around midnight local time in early February and around 10 PM local time by month’s end. To find **Uranus** (in **Aries**), first find **Alpha Arietis (Hamal, magnitude 2.0)**.

Uranus is 12°, nearly two binocular fields, south of **Hamal**. **Venus** and **Uranus** are 8° apart on the 29th.

Neptune – **Neptune**, in **Aquarius** at magnitude 7.9, will lie 6° west (below) **Venus** on February 1st. To locate **Neptune**, find 4th magnitude **Phi Aquarii**. The planet stands 18’ due west of this star on February 1st. On the 10th, the planet will skim 2’ north of **Phi Aquarii**. On the 15th, the planet is a minimum distance of 5.8° east of **Mercury**. **Neptune** will disappear into the bright evening twilight after the 15th, on its way to a conjunction with the **Sun** on March 8th. To confirm sighting of **Neptune**, only the planet will show a 2.2” diameter disk with a subtle blue-gray color.

Pluto – The **Moon** passes 0.7° south of **Pluto** about 2 AM CST on February 20th. **Pluto**’s position on the 10th, *by my estimate*, about 1.7’ east and a little south of **HD 185447** (magnitude 7.4 in **Sagittarius**).

Moon – The waxing gibbous **Moon** is in the **Hyades** at dusk on February 3rd. On the 4th, it is to the right or upper right of **Zeta Taurii**. The waning crescent **Moon** occults **Mars**, above the **Teapot** in **Sagittarius**,

before or at sunrise on the 18th. At dawn on the 19th, the thinning lunar crescent is a few degrees to the right of **Jupiter**. On the 20th, the crescent **Moon** will be some 2° to 3° to the lower right of **Saturn**. On the 27th, the waxing lunar crescent will be some 5° or more to the left of **Venus** at dusk.

Favorable Librations: **Baade Crater** on the 9th; **Hausen Crater** on the 10th; **Drygalski Crater** on the 11th; and **Schomberger Crater** on the 12th.

Greatest northern declination on the 7th (+23.2°)

Greatest southern declination on the 19th (-23.2°)

Libration in longitude East limb most exposed on the 17th (+6.6°)

West limb most exposed on the 5th (-7.0°)

Libration in latitude North limb most exposed on the 26th (+6.6°)

South limb most exposed on the 12th (-6.6°)

Asteroids – Asteroid 4 **Vesta** lies some 20° west of 1st magnitude star **Aldebaran** (in **Taurus**). The guide stars, to locate **Vesta**, are **Omicron Taurii** and **Xi Taurii** – both are 4th magnitude, and form one of the **Bull's** front feet. The asteroid, at 8th magnitude, is best found in the early evening when the region lies high in the southwest. You can see it move in one night on February 11th, when it passes within 2" of a magnitude 5.6 field star. **Vesta's** positions are as follows: On the 1st – 02 57.31 +11 58.2 (mag. 7.9); on the 11th – 03 05.55 +13 05.0 (mag. 8.1); and on the 21st – 03 15.51 +14 13.9 (mag. 8.2). **Vesta's** position, *by my estimates*, are as follows: On the 1st – about 3.4° north and a little west of **Lambda Ceti**; on the 5th – 4° north and a little east of **Lambda Ceti**, or just over 3½° southwest of **Sigma Arietis**; on the 9th – 5° north-northeast of **Lambda Ceti**, or 4° southeast of **Sigma Arietis**; on the 13th – about 5.3° north-northwest of **Lambda Ceti**, or about 5.7° east-southeast of **Sigma Arietis**; on the 17th – about 5° west and a little south of **5 Tauri**; on the 21st – about 4° west-northwest of **5 Taurii**; on the 25th – about 3.3° northwest of **5 Tauri**; and on the 29th – about 2.7° north-northwest of **5 Taurii**.

Asteroid 5 **Astraea** – positions of the asteroid are as follows: on the 1st – 07 57.57 +17 38.4 (mag. 9.2); 07 50.16 +18 39.4 (mag. 9.5); and on the 21st – 12 03.24 +19 32 (mag. 9.7).

Asteroid 27 **Euterpe** – position of the asteroid is on February 21st – 12 03.24 +02 29.9, mag. 9.9.

Asteroid 37 **Fides** – positions of the asteroid, *by my estimates*, are as follows: On February 5th – 1.5° south-southwest of **Xi Cancri**; on the 10th – 2.1° west-southwest of **Xi Cancri**; on the 15th – 3.5° west and a little south of **Xi Cancri**, or 3.5° due east of **Gamma Cancri**; on the 20th – just over 2° east and a little north of **Gamma Cancri**; and on the 25th – 1½° east and a little north of **Gamma Cancri**.

Comets – Comet **PANSTARRS (C/2017 T2)** moves slowly northward near the **Perseus-Cassiopeia** border. It begins February 1° northwest of the **Double Cluster**, and then curves around the cluster **Stock 2** at around mid-month, and closes the month a few degrees west of the **Heart and Soul Nebula (IC 1805 and B48)**. It will lie highest in the sky in the early evening. The comet's position, per the **RASC Observing Handbook**, is as follows: On February 10th – 02 08.4 +58 42 (mag. 9.0) in **Perseus**; on the 20th – 02 05.8 +59 49 (mag. 8.9) in **Cassiopeia**. The comet's positions, *by my estimates*, are as follows: On February 4th – about 0.8° west-northwest of **8 Persei**, or 0.6° north and a little east of **5 Persei**; on the 11th – about 1.3° north-northwest of **5 Persei**; on the 18th – about 2° north-northwest of **5 Persei**, or about 4.2° south-southeast of **Epsilon Cassiopeiae**; on the 25th – about 3.2° south-southwest of **Epsilon Cassiopeiae**; and on March 3rd – about 2.4° southwest of **Epsilon Cassiopeiae**.

Comet **C2I/2019 Q4 (Borisov)** is an interstellar comet. Note: This comet is too far south for observers in **Baton Rouge** to see and its magnitude would require a quite large telescope to see. Its positions, per **ALPO**, are as follows: On February 10th – 12 57.6 -59 04 (mag. 16.1); and on the 20th – 12 56.4 -62 48 (mag. 16.3).

Meteor Showers – This month is a lull in the meteor calendar. There are two minor showers this month: the **Alpha Aurigids** and the **Delta Leonids**. Both peak on February 5th. There are three more very minor showers this month: the **Alpha Centaurids** that peak on the 8th; the **Theta Centaurids** that peak on the 10th; and the **Chi Capricornids** that peak on the 13th.

When to View the Planets:

Evening Sky

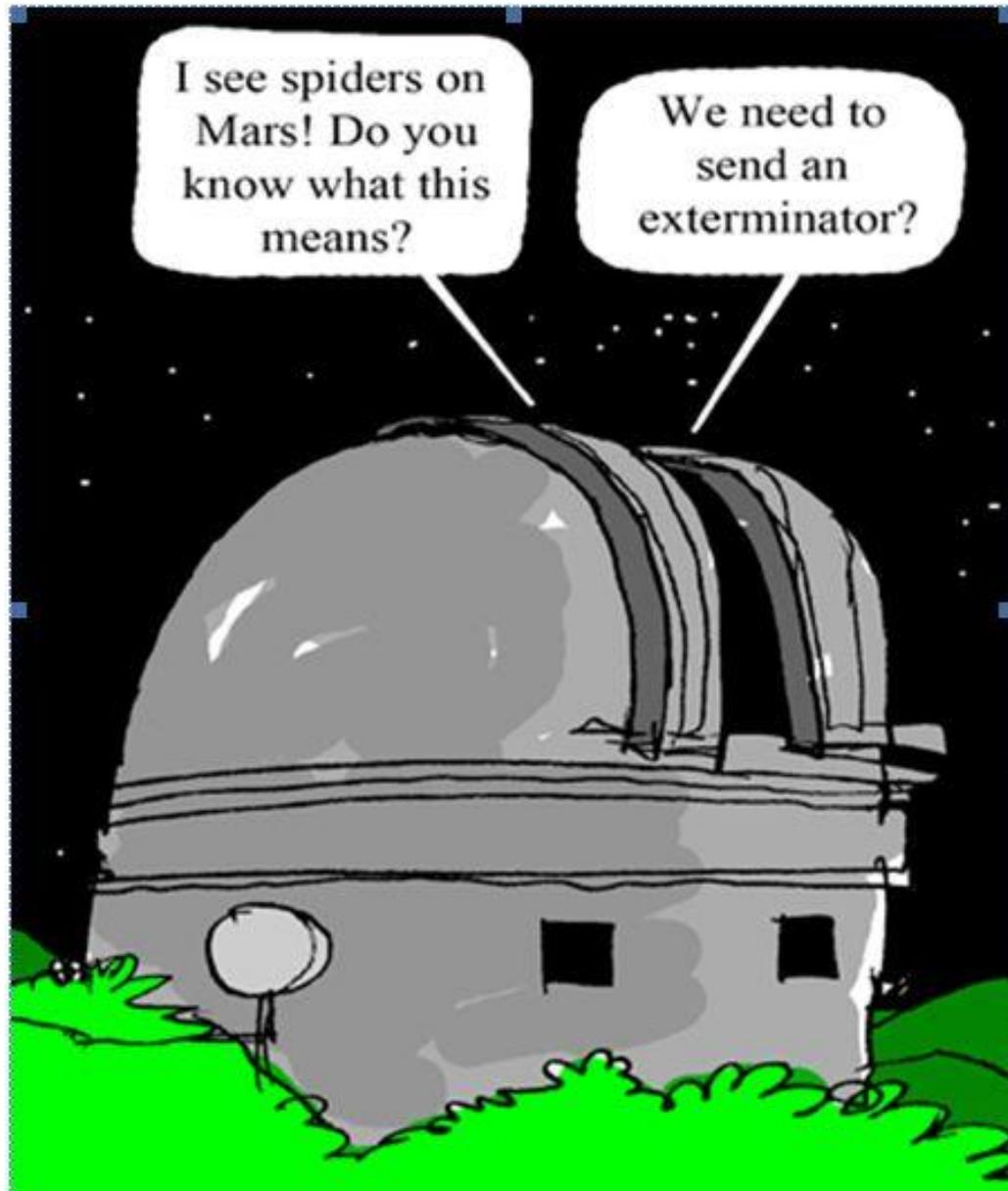
Mercury (west)
Venus (west)
Uranus (southwest)
Neptune (west)

Midnight

Morning Sky

Mars (southeast)
Jupiter (southeast)
Saturn (southeast)

DARK SKY VIEWING - PRIMARY ON FEBRUARY 22ND, SECONDARY ON FEBRUARY 29THTH



Mythology

Monoceros – The Unicorn

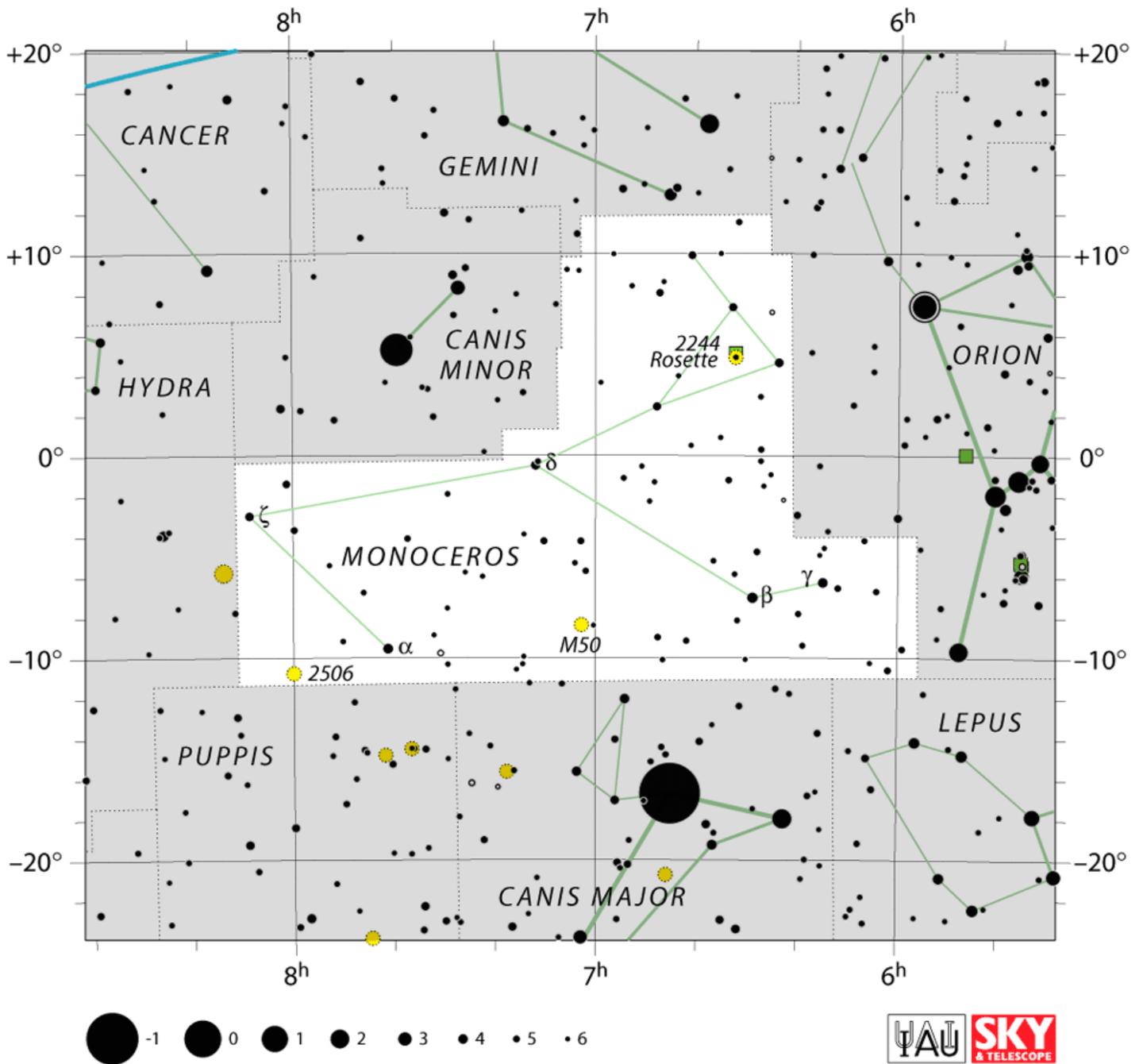
Unicorns, horses with a single horn protruding from their forehead, are legendary magical creatures whose blood can supposedly render immortality upon the drinker. However, to slay a Unicorn was said to condemn one's soul to eternal damnation (shades of Harry Potter and "He Who Must Not Be Named").

In ancient Babylon, the cradle of civilization, people worshiped the Unicorn as far back as 3500 BC. The most widely accepted reason for the Unicorn's extinction was that they preferred to play in the rain rather than accept Noah's invitation to board the Ark. Consequently, none were saved to repopulate the Earth after the Great Flood.

A Unicorn (depending on the translation) is mentioned in the Old Testament of the Bible. Because of this, the Dutch cartographer Petrus Plancius (1552-1622) is credited with introducing the constellation Monoceros. Johann Bayer (1572-1625) included Monoceros in his *Uranometria*, a 1603 sky atlas.



Amalthea was the she-goat which nourished Zeus; hence its horn became proverbially used for nourishment and abundance. This modern constellation, Monoceros, is a likely representation of the "horn of plenty", the Cornucopia, which Zeus broke off his goat-nanny nurse, Amalthea, while playing with her as a baby; Amalthea, herself, was placed amongst the stars as Capra, the star Capella on the arm of the constellation Auriga, the Charioteer. The position of the horn is not known. It is suggested that "... the sacred goat, having broken off one of her horns, Amalthea filled it with flowers and fruits, and presented it to Zeus, who placed it together with the goat amongst the stars, although the one-horned goat was not identified with the Unicorn by the Greeks...". Ovid relates, "When he controlled the sky and sat upon his father's throne Jove (Jupiter, Zeus), he made stars of the nurse and the nurse's fruitful horn, which bears even now its mistress name".



The End