
# Next Meeting: Monday, November 13th at 7PM at HRPO

**(2nd Mondays, Highland Road Park Observatory).**

**Program:** Connor Matherne, an LSU student and published author, does widefield along with solar system imaging. He will talk about sedimentology and its relationship to astronomy.

# What's In This Issue?



**Like this newsletter? See past issues back to 2009 at**
**http://brastro.org/newsletters.html**

# President's Message

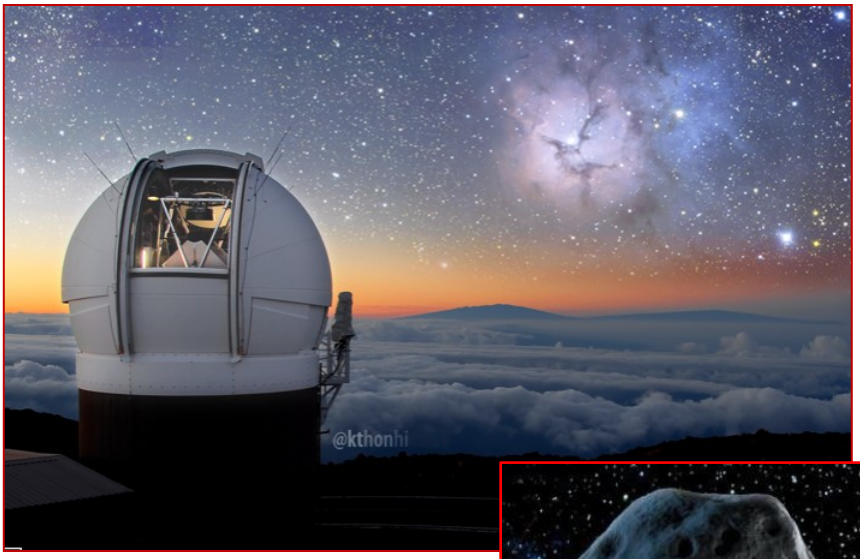
The holiday season is upon us, and that means the election of new officers is almost upon us. BRAS needs more members to volunteer and serve, or we cannot accomplish our objectives. Outreach opportunities are listed in every newsletter. Nominations are open at the November and December meetings, with the vote for new officers during the December meeting.

A copy of the revised By-laws should be reaching you by mail in the next week. BRAS will vote on the acceptance of the revised By-Laws at the December meeting. If you, the Membership, want to propose any changes from the copy you receive, I must submit your suggestions to me before the November 13th meeting to be presented with the final product for vote.

The first Natural Sky Conference, sponsored by HRPO and the BRAS Light Pollution Committee, will take place on Friday, November 17th, at HRPO.

HRPO's 20th Anniversary will take place on Saturday, November 18th, at HRPO. Come out on Saturday Night and support HRPO on its anniversary.

What appears to be our first inter-stellar visitor, a comet less than 400 meters in diameter, designated **A/2017 U1** (discovered by **PanSTARRS-1** on October 19th) has appeared coming from the vicinity of Lyra, travelling at 15.8 miles per second. After rounding the Sun, the comet (with speed boosted to 27 miles per second) is now headed toward Pegasus. Within this newsletter Michele has posted a link to more information about this inter-stellar visitor.




**PanSTARRS-1 telescope, in Maui, Hawaii**

**A/2017 U1**

Clear Skies, and Happy Thanksgiving to all.

John R. Nagle

John R. Nagle
President of BRAS and Observing Chairperson

P.S. There's another Tom Swifty joke hidden in this newsletter. HINT: The joke contains the word "Tom" – but don't try to do a Search to find it. You won't. The point is for you to actually read the newsletter, copy it exactly, and send it to me (jonagle@cox.net). Most of you know the drill: 1st 3 entries I receive who also come to this month's BRAS meeting get a free raffle ticket). HINT: A **Tom Swifty** is a joke, kind of a play on words. Like, *"Can you find the hidden joke, Tom asked searchingly."*

# Secretary's Summary of October Meeting

Meeting opened by President John Nagle

- John announces new draft of by-laws will be mailed to all members
- The telescope we won from the A.L. arrived and will be modified as per instructions before donation to library
- Ben talked about past and upcoming outreach
- The three partners (LSU, BREC, BRAS) held a meeting to update the MOU or replace it with a new agreement. More to come.
- Chris Kersey talked about the upcoming Spooky Spectrum
- John mentioned the Natural Sky Conference upcoming at HRPO
- Dues are being taken for 2018
- Officers are needed for 2018
- Another telescope was donated to BRAS. It will be looked over to determine what to do with it.
- State of the BRAS closet was discussed. The possibility of a rummage sale was brought up
- Don Weinell talked about the Night Sky Festival he attended in Maine
- John gave his presentation on how he puts together the Observing notes each month for the newsletter
- Raffle was held
- Meeting adjourned

Ben Toman, BRAS Secretary (For all the good I'm worth!)


# BRAS Outreach Report

Hi Everyone,

We had another successful Sidewalk Astronomy session this past month at Perkins Rowe. The weather was beautiful and the Moon and Saturn were great. We're even starting to get people coming out just because they saw we were going to be there!

We also took part in another Mini Maker Faire at the Main Library. According to the thank you email all the participants received, there was a pretty big crowd despite a downpour in the afternoon. That's always a fun event.

Thanks to our volunteers for these events: John Nagle, Charles Edwards, Scott Cadwallader, Craig Brenden, Chris Kersey, Roz Readinger, Ben Toman, Coy Wagoner and Connor Matherne.

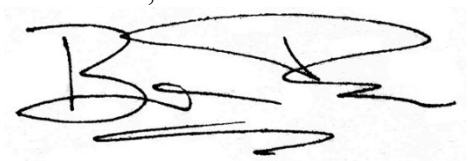
If you would like to add your name to this list and have it immortalized in an upcoming newsletter, I have great news for you! We have some upcoming outreach opportunities in November. If you would like to help out, please let me know. Again, you don't have to have experience. This is where you will get it.

## Upcoming Outreach

**Saturday, November 18th**
Carruth Boy Scout Preserve (Port Allen, LA)
7pm-9pm (tentative...we can talk about times)
Stargazing and info on constellations, etc.
2 or more volunteers needed if possible
*(We received this request via our Facebook page. Could be a fun outreach!)*

**Tuesday, November 28th**
Sidewalk Astronomy Perkins Rowe
6:30pm-8:30pm
Telescope viewing

Clear Skies,



Ben Toman
Outreach Coordinator


# BRAS Light Pollution Committee Report

Meeting now takes place at 5:45, same day as the 6:30 BRAS Business Meeting (see minutes below)
Everyone is welcome to join in.

Thomas calls meeting to order.
No new members with 5 members in attendance.
Previous meeting's minutes were read.

**Old Business-**

- Globe at Night, still off pace for the 200 sky measurements. Statewide, Louisiana has 44 observations. Oct. 12 will start again with Cygnus.
- Sam's Club update. Still need photos.
- Thomas called St Gabriel today (10-4-17) and is awaiting response. Christopher suggested driving through the city at night.
- 2 volunteers are needed for the Natural Sky Conference. 3 invitations have been sent out. (LEAN, Federation of Civic Associations, and the Audubon Society) The committee suggested other entities to be invited. There will be a pre-conference meeting to discuss a plan of action for the event in early November.
- Good Lighting Award requirements were discussed by the committee. This needs to be refined, and added to the Dark Sky website. The requirements need to be voted on before next meeting.

**New Business-**

- Thomas announced he has decided that he would like to step down next year as LPC chair. A new LPC chair will be decided on at an upcoming B.R.A.S. meeting.

Motion to close meeting was made and passed.
Meeting Adjourned.
Submitted by Krista Dison, Secretary

Thomas J. Halligan

Chairman, Thomas J. Halligan

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# Recent Entries in the BRAS Forum

***Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 4900 posts.***

Discussion of the Losmandy G11 and Gemini 2
Three Days in Past Months with Predicted Geomagnetic Storm Activity
Fireball Reported on 11 October
Orionid Meteor Peak Unseen Due to Inclement Weather

# 20/20 Vision Campaign

***GLOBE at Night: 11 to 20 October [Cygnus]***

OBSERVATIONS NEEDED FOR SCHOOL PROJECT

BRAS is in the process of assisting yet another student at St. Joseph's Academy acquire raw data. This young lady (named Shreya) will need data concerning how light pollution effects the view of certain variable stars while they are at their minima.

Below is our suggested list of variable stars for Shreya. Dates are the times during which the star is at least thirty degrees above the horizon at 9pm Standard Time and 10pm Daylight Time. All periods (time from maximum to maximum) are fewer than ninety days. All chosen stars have a difference of at least 1.0 between maximum and minimum magnitude.

**Shreya probably has to turn in data to her instructor very soon! If you have not done so, please take a measurement and send it in as soon as possible.**

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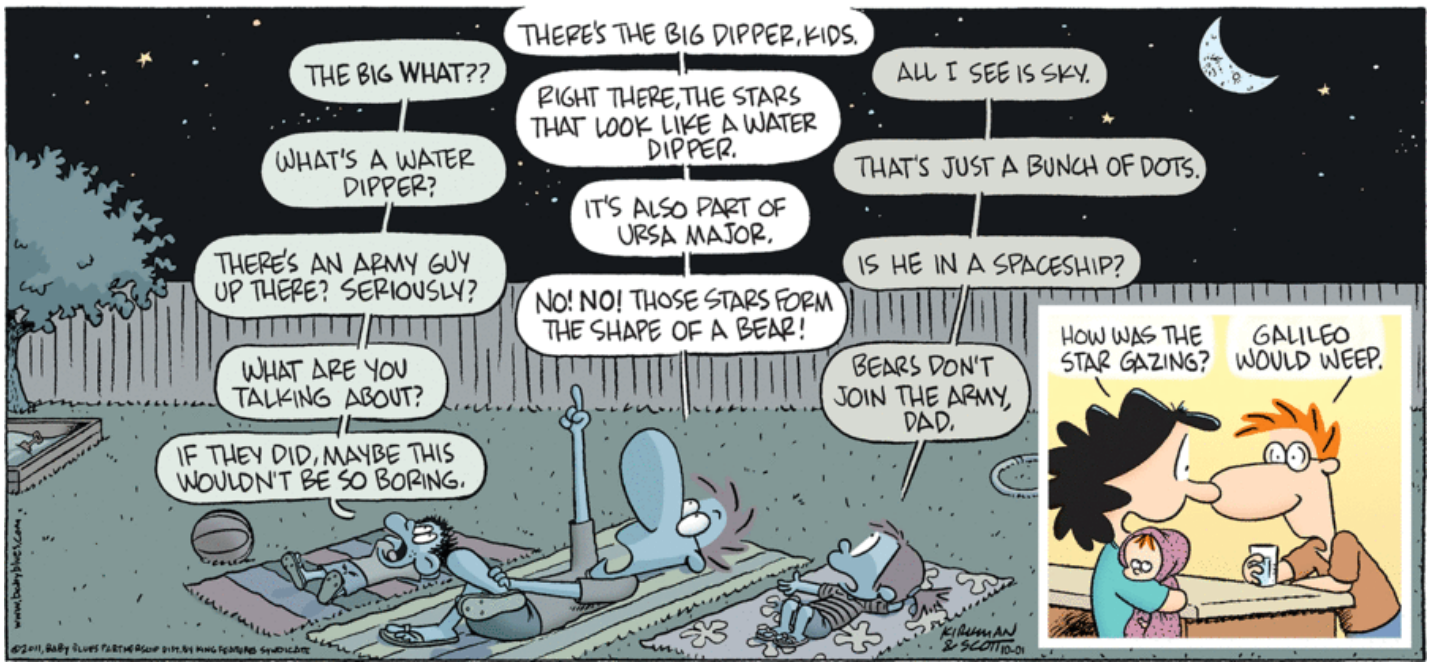
***RX Leporis***
Magnitude Range: 5.4 to 7.4 Period: 75 days Class: K
Dates: 11 December to 9 March
***T Monocerotis***
Magnitude Range: 5.6 to 6.6 Period: 27 days Class: G
Dates: 14 December to 12 April
***S Leporis***
Magnitude Range: 6.0 to 7.6 Period: 89 days Class: K
Dates: 12 January to 4 March
***ST Ursae Majoris***
Magnitude Range: 6.0 to 7.6 Period: 81 days Class: M
Dates: 12 February to 15 July
***g Herculis***
Magnitude Range: 4.4 to 6.0 Period: 80 days Class: M
Dates: 29 April to 28 September
***R Lyrae***
Magnitude Range: 3.9 to 5.0 Period: 46 days Class: M
Dates: 5 June to 6 November
***Sheliak***
Magnitude Range: 3.3 to 4.4 Period: 12.9 days Class: B
Dates: 8 June to 31 October
***X Cygni***
Magnitude Range: 5.9 to 6.9 Period: 16.4 days Class: F
Dates: 5 July to 29 November
***Algol***
Magnitude Range: 2.1 to 3.4 Period: 2.87 days Class: B
Dates: 9 October to 9 March


**Observations should only be made when the Moon is below the horizon. Each observation should include the location's GLOBE at Night measurement or SQM measurement. Use all of these parameters to report your results to observatory@brec.org.**

Would you care for some condiments with your turkey and dressing?" asked Tom, with relish.



# Messages from HRPO

*Highland Road Park Observatory*

## FRIDAY NIGHT LECTURE SERIES

***all start at 7:30pm***

3 November: "Buying Your First Telescope" Please don't buy a scope (especially as a gift for another) without doing some research first. Whether a scope is a good first telescope for someone depends on that person's age and what he or she will tend to view most (the Moon and planets, or star clusters and nebulae). In almost every situation, a good scope will have to be mail-ordered. HRPO's annual discussion of this issue increases the patron's chance of getting the best deal for the money, and increases the chance of the gift being used on a regular basis.

## SCIENCE ACADEMY

***Saturdays from 10am to 12pm***

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

**4 November**: "Expedition 9"

**11 November:** "Uranus and Neptune"

## ONE-TIME CALLS FOR VOLUNTEERS

***Friday 10 November, 4:45pm to 6:45pm**. *One or two volunteers.* **The Edge of Night.** Assistance with pointing out planets, brightest stars and visible passes during twilight. Low difficulty.

***Saturday 11 November, 12pm to 2pm.** *One or two volunteers.* **Solar Viewing.** Telescope operation, physical science demonstrations, front desk duty. Low to moderate difficulty.

***Friday 17 November, 5:30pm to 8:30pm**. *Three or four volunteers.* **Natural Sky Conference.** Networking with exhibiting "powers-that-be" and long-term HRPO parents, explaining the importance of eradicating the area's light pollution. Low difficulty.

***Saturday 18 November, 6pm to 9pm**. **HRPO 20th Anniversary Retrospective.** *Three to four volunteers.* Networking with long-time public supporters of HRPO. Standing up and reciting anecdotes regarding HRPO. Low difficulty.

***Monday 20 November, 5pm to 6pm. Twilight Triple Conjunction.** *Two or three volunteers.* Disseminating information about the planets; possible scope operation. Moderate difficulty.

## ONGOING CALL FOR VOLUNTEERS

HRPO periodically needs BRAS volunteers for crafting (gluing, cutting, painting, etc.); training is offered for these easy to moderate tasks. We also have plenty of "grunt work". We are asking any members with the time to do so to assist. Thank you.

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# *GLOBE at Night*

***10 to 19 November Pegasus***

# The Edge of Night

***Friday 10 November from 4:45pm to 6:45pm***

***No admission fee. For ages fourteen and older.***

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? There is no other time like twilight. Bring it into your life!

4:45pm to 5:15pm = Mercury
5:45pm to 6:45pm = Saturn
5:58pm to 6:26pm = three predicted visible passes
after 6:30pm = Albireo

# Natural Sky Conference

***Friday 17 November from 5:30pm to 8:30pm***

***No admission fee. For ages fourteen and older.***

Although open to the general public the Conference will be aimed at those individuals and organizations in town that have a direct ability to quelch the light pollution in the area. HRPO anticipates having the Conference at least through the end of twilight, so participants can see damage currently being caused by the light pollution in the area. The theme of the Conference will the invitees answering questions (seen beforehand) asking them what they will be actively doing within the next twelve months to lessen the light pollution in the area.

# HRPO 20TH Anniversary

***Saturday 18 November from 6pm to 9pm***

***No admission fee. For all ages.***

The idea to bring a public telescope to East Baton Rouge Parish came from a phone call between LSU astrophysicist Greg Guzik and Melanie Hair. Melanie was a member of BRAS, which was founded by Craig Brenden and Wally Pursell in 1981. The Department of Physics and Astronomy at LSU secured the funding for a 50cm (20in) professional-grade reflector from the Optical Guidance Systems company. Greg ultimately became, and remains, HRPO's official LSU liaison. BREC (under then-Superintendent Eugene Young) agreed to provided grounds, a building, staff and an operating budget.

BRAS members (mainly Walt Cooney) have used the 20OGS reflector to discover over three dozen asteroids, the first of which was named after HRPO's home city of Baton Rouge. More of the asteroids have been named for Greg, Craig, Wally, and BRAS members Frank Conrad and Merrill Hess.For twenty years 13800 Highland Road has been the site of asteroid discoveries, comet apparitions, elongations, conjunctions, oppositions, transits, eclipses and fireballs. Come celebrate with us and we fondly remember the past and look to the future with renewed resolve to continue to bring to space enthusiasts, taxpayers, students and the curious an unhindered views of the beauty of the heavens.

# Twilight Triple Conjunction

***Monday 20 November from 5pm to 6pm***

***No admission fee. For all ages.***

***Components: 2.3 day-old Moon, Mercury, Saturn***

The three will be setting together in the east (Mercury and the Moon in Ophiuchus, Saturn in Sagittarius).

Here are the separations…

Moon and Mercury, fewer than 8° the whole time

Moon and Saturn, fewer than 2°75' the whole time

Mercury and Saturn, fewer than 7°25' the whole time

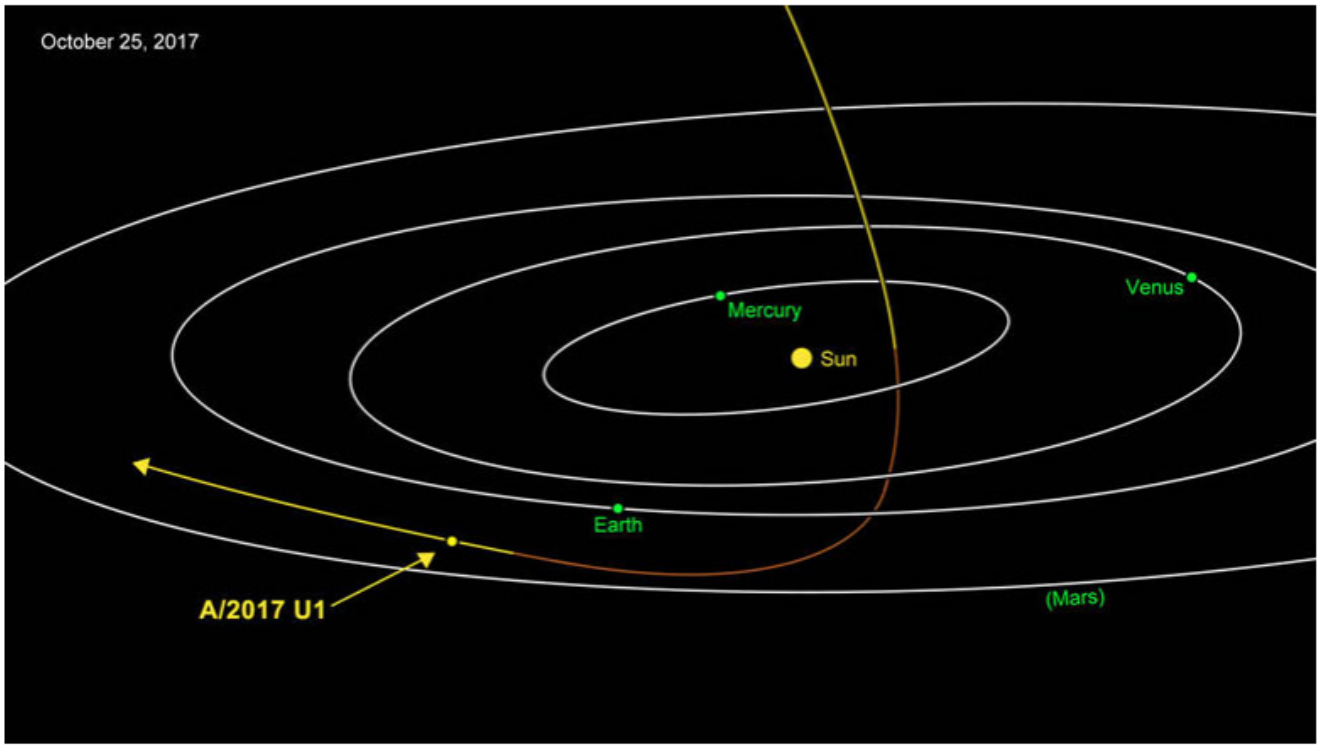
This astounding sight is a "one night only" thrill…but it is impossible to see it without a clear western horizon. HRPO personnel will be at the Burbank Soccer Complex with scopes and binoculars. The viewing location will be in the back of the Complex between the dog park and the lake.

# A/2017-U1

**SciTechDaily** has posted an awesome writeup and animation of this new "comet" that has been travelling through our solar system these past few months.

***C H E C K  I T  O U T ! ! ! !***

https://scitechdaily.com/a-small-object-a2017-u1-from-deep-space-enters-our-solar-system/




A/2017 U1 is most likely of interstellar origin. Approaching from above, it was closest to the Sun on September 9. Traveling at 27 miles per second (44 kilometers per second), the comet is headed away from the Earth and Sun on its way out of the solar system. NASA/JPL-Caltech

# Observing Notes:

by John Nagle

# Triangulum – The Triangle

**Position: RA 01 33 50.02, Dec. +30 39 36.7**

## *Named Stars:*

**Caput Trianguli (Alpha Tri), "Ras al Muthallah", "the head of the triangle",** mag. 3.42, 01 53 04.90 +29 34 45.8, is a spectroscopic binary star, having a close companion star and the primary is a yellow-white sub-giant star, and a rapid rotator. The orbital period is 1.736 days, and the separation is less than 4 million miles.

**Deltatum (Beta Tri), named after the Greek letter delta,** mag. 3.0, 02 09 32.52 +34 59 14.6, is a main sequence white giant star and is also a spectroscopic binary star. The secondary star is calculated to be a yellow-white main sequence star at about 1.4 solar mass. The separation is less than 5 AU, and the orbital period is 31.39 days. The binary shows an excess of Infrared radiation.

## *Deep Sky:*

**M33 (NGC 598), MCG+5-04-069, UGC 1117, PGC 5818, "Pinwheel Galaxy", "Triangulum Galaxy",** mag. 5.7, 01 33 50.02 +30 39 36.7, is the third largest galaxy in the local group (40% the size of the **Milky Way Galaxy**, containing about 40 billion stars, and has at least 54 large globular star clusters in it. **M33** is a source of **$H_2O$** maser emission, and has a source of ultra-luminous X-ray – the most luminous in the local group of galaxies (the **M33-X7** black hole). There are four bright **H II** regions – **NGC 588, 592, 595**, and **604. M33** is a very large and very faint; visible to the naked eye in exceptionally dark skies; spiral arms may be seen in a telescope.

**Cr 21**, mag. 8.2 (photo), 01 50.2 +27 05.6, is composed of 20 stars; detached, weak concentration of stars; medium brightness range. Might be an asterism and not a true cluster.

## *Other Stars:*

**Iota Tri (HD13480), (6 Tri),** mag. 4.94, 02 12 22.32 +30 18 11.6, is a double star with a separation of 3.8". A medium size telescope separates them into a strong yellow star (5$^{th}$ magnitude) and a contrasting pale blue star (7$^{th}$ magnitude dwarf star). Both of these stars are themselves close binary stars. The primary pair (a giant star and a dwarf star) has an orbital period of 14.732 days. The secondary pair has an orbital period of 2.236 days and a separation of 0.05 AU.

**Delta Tri**, mag. 4.84, 02 17 02.42 +34 13 29.4, is a spectroscopic binary star composed of a yellow dwarf star and an orange dwarf star. The separation is estimated to be 0.106 AU, with an orbital period of 10.02 days.

**R Tri,** mag. 5.40, 02 37 02.50 +34 15 50.0, is a long period red giant variable star with its magnitude ranging from 5.4 to 12.6 every 266.9 days.

**HD 13189,** mag. 7.57, 02 09 40.17 +32 18 59.2, is an orange giant star with a planet or brown dwarf star as a companion. The pair has an orbital period of 472 days, with a separation of 1.85 AU.

**HD 9446,** mag. 8.35, 01 33 20.18 +29 15 54.5, is a yellow main sequence dwarf star. Two planets are in orbit. **HD 9446$^{b}$** has a mass of 0.7 of Jupiter's, and an orbital period of 30.052 days. **HD 9446$^{c}$** has a mass of 1.82 of Jupiter's, with an orbital period of 192.9 days.

**HD 12545,** mag. 8.42, 02 03 47.11 +35 35 28.7, is an orange giant star with a huge starspot larger than

the diameter of the **Sun** that was detected on its surface in 1999.
**M33 X-7,** mag.18.70, 01 33 34.13 +30 32 11.3, is a black hole with a mass of about 15.7 times of the Sun. It orbits a companion star and eclipses it every 3.45 days. The companion star has a mass of about 70 times the **Sun**'s, which makes it the most massive companion star known in a binary system containing a black hole. This is also an X-ray binary system.
**There is one star beyond magnitude 10 with a planet in orbit.**
**There are 5 stars that are luminous blue variable stars (ranging from mag. 15.40 to 18.2), all of which are one of the most luminous stars known (Var 83, Var B, Var C, Var A, and Var 2).**

# *Sky Happenings:*

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


**Nov. 1st -** **Venus** passes 4° north of **Spica** at 10:00 AM CDT.
**Nov. 2nd -** The **Moon** passes 4° south of **Uranus** at 8 PM CDT.
**Nov. 3rd -** Asteroid **Nysa** is at opposition at 1 AM CDT.
**Nov. 4th -** **Full Moon** occurs at 12:23 AM CDT,
Dawn: **Spica** shines 4° to the right of **Venus**, very low in the east-southeast. Faint **Mars** gleams some 16° above **Spica.**
**Nov. 5th -** **STANDARD TIME** begins at 2:00 AM,
The **Moon** is at perigee (224,587 miles from **Earth**) at 6:10 PM CST,
The bright limb of the waning gibbous **Moon** will occult the star **Aldebaran** (mag. 0.9) around 7:18 PM CST, and **Aldebaran** will re-appear around 8:05 PM CST.
**Nov. 10th -** **Last Quarter Moon** occurs at 2:36 PM CST.
**Nov. 11th -** Morning; **Regulus** is about 3° to the lower left of the just-past-**Last Quarter Moon**,
Dawn; You will find **Jupiter** 2° below the blazing **Venus**, barely above the east-southeast horizon about 45 minutes before sunrise,
The **Moon** passes 0.4° north of **Regulus** at 11 AM CST.
**Nov. 12th -** **Mercury** passes 2° north of **Antares** at 9 AM CST.
**Nov. 12/13** **Venus** passes 0.3° north of **Jupiter** at 12 AM CST – midnight.
**Nov. 14th -** The **Moon** passes 3° north of **Mars** at 7 PM CST.
**Nov. 16th -** The **Moon** passes 0.4° south of asteroid **Vesta** at 3 AM CST,
Dawn: The very slim waning crescent **Moon** hangs about 6° above **Jupiter** and 17° below modest **Mars**. Brighter **Venus** is 3° to the lower left of **Jupiter**,
The **Moon** passes 4° north of **Jupiter** at 3 PM CST.
**Nov. 17th -** The **Moon** passes 4° north of **Venus** at 12 midnight,
The annual **Leonid** meteor shower peaks under a **Moon** free sky before dawn,
Dawn: The hairline **Moon**, one day from **New Moon**, forms a loose trio with **Jupiter** and **Venus**, quite low in the east-southeast.
**Nov. 18th -** **New Moon** occurs at 5:42 AM CST.
**Nov. 20th -** The **Moon** passes 7° north of **Mercury** at 3 AM CST,
The **Moon** passes 3° north of **Saturn** at 6 PM CST,
Dusk: The waning crescent **Moon** poses nicely to the right of **Saturn** before they set in the southwest, with **Mercury** 7° or 8° below the pair no more than 30 minutes after sunset.
**Nov. 21st -** The **Moon** is at apogee (252,358 miles from **Earth**) at 12:53 PM CST.
**Nov. 22nd -** **Neptune** is stationary 38 arc minutes below **Lambda Aquarii** at 3 PM CST.
**Nov. 23rd -** **Mercury** is at greatest eastern elongation (22°) at 6 PM CST.
**Nov. 26th -** **First Quarter Moon** occurs at 11:03 AM CST,
The **Moon** passes 1.2° south of **Neptune** at 11 PM CST.
**Nov. 27th -** **Mars** passes 3° north of **Spica** at 6 PM CST.
**Nov. 28th -** **Mercury** passes 3° south of **Saturn** at 3 AM CST,
Dusk: low in the southwest you can find **Mercury** and **Saturn** just 3° apart.


**Nov. 29th -** **Mars** is 3° north-northeast of **Spica** in the morning sky.
**Nov. 30th -** The **Moon** passes 4° south of **Uranus** at 4 AM CST.

# *Planets:*

**Mercury – Mercury** comes into view starting in mid-November. On the 15th, it stands 5° above the horizon a half-hour after sunset. At magnitude -0.3, the planet is bright enough to pierce the twilight glow. The view of **Mercury** improves during the next 10 days. **Mercury** reaches greatest eastern elongation on November 23rd, when it lies 22° east of the **Sun** and appears 7⅔ above the horizon 30 minutes after sundown. **Mercury** will fade to magnitude -0.2 by the end of the month. On the 15th, the planet's disk measures 5.7" across and is 80% lit. By the 30th, the planet will span 7.6" and will be 44% lit at magnitude -0.2.

**Venus – Venus** rises about 90 minutes before the Sun at the start of November, but only about 45 minutes before the **Sun** by month's end. **Venus** blazes at magnitude -3.9, about 4° from **Spica,** from November 2nd through 4th. The pair is low, less than 10° above the east-southeast horizon 45 minutes before sunrise. On November 13th, **Venus** passes less than 0.3° from **Jupiter** in bright morning twilight at the border of **Virgo** and **Libra.**

**Mars – Mars** rises nearly three hours before the **Sun** and almost four hours before sunrise on the 30th. As it glides across a section of **Virgo**, it remains dim and far away, its ruddy glow no brighter than magnitude 1.7. **Mars** starts November 1° southeast of magnitude 3.9 **Eta Virginis**, passes 1.8° south of magnitude 2.8 **Gamma Vir** on the 9th, and 3.3° north of magnitude 1.0 **Spica (Alpha Vir)** on the 28th. Views through telescopes remain disappointing, with a diameter of only 4", it shows no detail. The July 2018 opposition of **Mars** will be the best in 15 years.

**Saturn – Saturn**, at magnitude +0.5, starts the month moderately well up in twilight, setting about 2½ hours after the **Sun**. By the end of November, the planet drops below the horizon a little more than an hour after the **Sun**. On the 1st, **Saturn** hangs 15° above the southwest horizon, an hour after sunset, and is still 10° high at twilight's close. **Saturn** is in its home constellation, **Ophiuchus**. With binoculars, under a haze free sky, you also should be able to see the faint glow of the **Lagoon (M8)** and **Trifid (M20)** nebulae some 6° east of **Saturn**. The planet will cross into **Sagittarius** on the 19th. On the 1st, **Saturn**'s disk appears 15" across while the rings span 35" and tilt 27° to our line of sight. On the 20th, a crescent **Moon** stands 3° to the planet's upper right and 8° above **Mercury**. On the 27th, **Mercury** passes 3° due south of **Saturn**. The planet will be in conjunction with the **Sun** on December 21st, placing it out of sight for part of November and most of December. **Saturn** will re-appear in the morning sky in January.

**Uranus – Uranus** was at opposition in October, and is now highest in the late evening in **Pisces**. The planet appears in the east as darkness falls, and reaches its peak around 10 PM local time in mid-November. It then will be two-thirds of the way to the zenith. To find **Uranus**, locate magnitude 2.8 **Algenib (Gamma Pegasi),** the star at the southeastern corner of the **Great Square of Pegasus**. Then, look 43° east-southeast for magnitude 2.5 **Menkar (Alpha Ceti). Uranus** lies midway between these conspicuous stars. On November 1st, the planet is 2.3° west of **Omicron Ceti,** with the planet's motion carrying it to a position 3.2° west of **Omicron Ceti** by month's end. **Uranus** displays a 3.7" diameter disk, and has a distinct blue-green hue.

**Neptune – Neptune** reached opposition in September, and is now highest in the early evenings. **Neptune**, at magnitude 7.9, shows up nicely through binoculars against the backdrop of **Aquarius,** where the planet spends the month of November just 0.6° south of **Lambda Aquarii**. **Neptune** will show a disk which appears 2.3" across, and shows a subtle blue-grey color.

**Pluto –** On November 15th, **Pluto** (mag. 14.3, 100% illuminated) will be at RA 19 41.1 and Dec. -21 49.

**Moon –** The **Moon**, just past full, occults **Aldebaran** on the evening of November 5th for much of **North America**. The waning crescent **Moon** is some 7° above **Mars** on the morning of November 14th. The next morning the **Moon** forms a pretty triangle with **Mars** and **Spica**, with **Venus** and **Jupiter** to the lower left of them. At dawn on November 16th, the slimmer **Moon** is about 6° above **Jupiter,** which is then about 3° to the upper right of **Venus.** In the evening sky, the thin waxing crescent **Moon** is 8° or 9° to the right of **Mercury** on November 19th, and just 3° to the right of **Saturn** on the 20th.

***Asteroids*** – Asteroid **7 Iris** reached opposition in late October, and it begins this month at its peak brightness of magnitude 6.9. Although it fades to magnitude 7.7 by the end of the month, **Iris** remains bright enough to pickup through binoculars from the suburbs**. Iris** resides in **Aries,** which appears half-way to the zenith in the eastern sky once darkness settles in, and climbs highest in the south around 10 PM local time. **Iris** begins the month 2° east of magnitude 2.7 **Beta Arietis** before heading southwest towards magnitude 3.9 **Gamma Ari**. **Iris**, on November 12th through 15th, slides within 0.4° of **Gamma Ari**. During the final few days of November, the asteroid passes 0.5° east of the magnitude 5.9 star **4 Ari**. **Iris** will not reach 7th magnitude again until 2028.

***Comets*** – Comet **PANSTARRS (C/2016 R2)** should glow around 10th or 11th magnitude in November. The comet will be a delicate sight silhouetted against the backdrop of **Orion. PANSTARRS** begins the month just 1° north-northwest of magnitude 2.2 **Mintaka (Delta Orionis),** the westernmost star in **Orion**'s belt. It heads northwest from there, passing 1° north of magnitude 4.5 **Rho Ori** at the start of November's 4th week. You might not see it at low power, so bump up the magnification to 100x or more.

Comet **ASASSN1 (C/2017 O1)** was discovered by the **All-Sky-Automated-Survey for Supernovae** on July 19th at 15th magnitude. The comet spends November trekking north through the dim polar wastes of **Camelopardalis** and northern **Cepheus.** The comet has a green color, caused by hot diatomic carbon ($C_2$) fluorescing in the ultra-violet sunlight. By my estimates, the comet will be about 2½° north and slightly east of **Alpha Cam** on November 1st, 5° west and slightly north of **Gamma Cam** on November 5th, and on November 25th through December 3rd it will be south of **Polaris** moving from 5° to 3½° from **Polaris** during those days. Comet **ASASSN1** should be at about magnitude 7 during November.

***Meteor Showers*** – The **Leonids** will peak on November 17th with no **Moon** in the sky. Observers under dark skies can expect to see up to 10 meteors per hour. The meteors appear to radiate from a point in the **Sickle** asterism of **Leo**. This region rises late in the evening and climbs high in the southeast before dawn. The meteors enter **Earth's** atmosphere at 44 miles per second, the fastest of any meteor showers. The high speeds mean they produce a higher percentage of fireballs than most showers.

The **Taurids** shower is unusual for several reasons. It is divided into two sub-branches, the **Southern** and **Northern Taurids**, with large, poorly defined radiants about 6° apart. The **Taurids** are sparse at all times, with zenithal hourly rates reaching only about 5 meteors per hour, even under ideal conditions. The **Taurids** peak, are sometimes listed as November 5th and 12th, but both branches are long lasting.

## *When to View the Planets:*

| **Evening Sky** | | **Midnight** | | **Morning Sky** | |
|---|---|---|---|---|---|
| Mercury | (southwest) | Uranus | (southwest) | Venus | (east) |
| Saturn | (southwest) | Neptune | (west) | Mars | (southeast) |
| Uranus | (east) | | | Jupiter | (east) |
| Neptune | (southeast) | | | | |

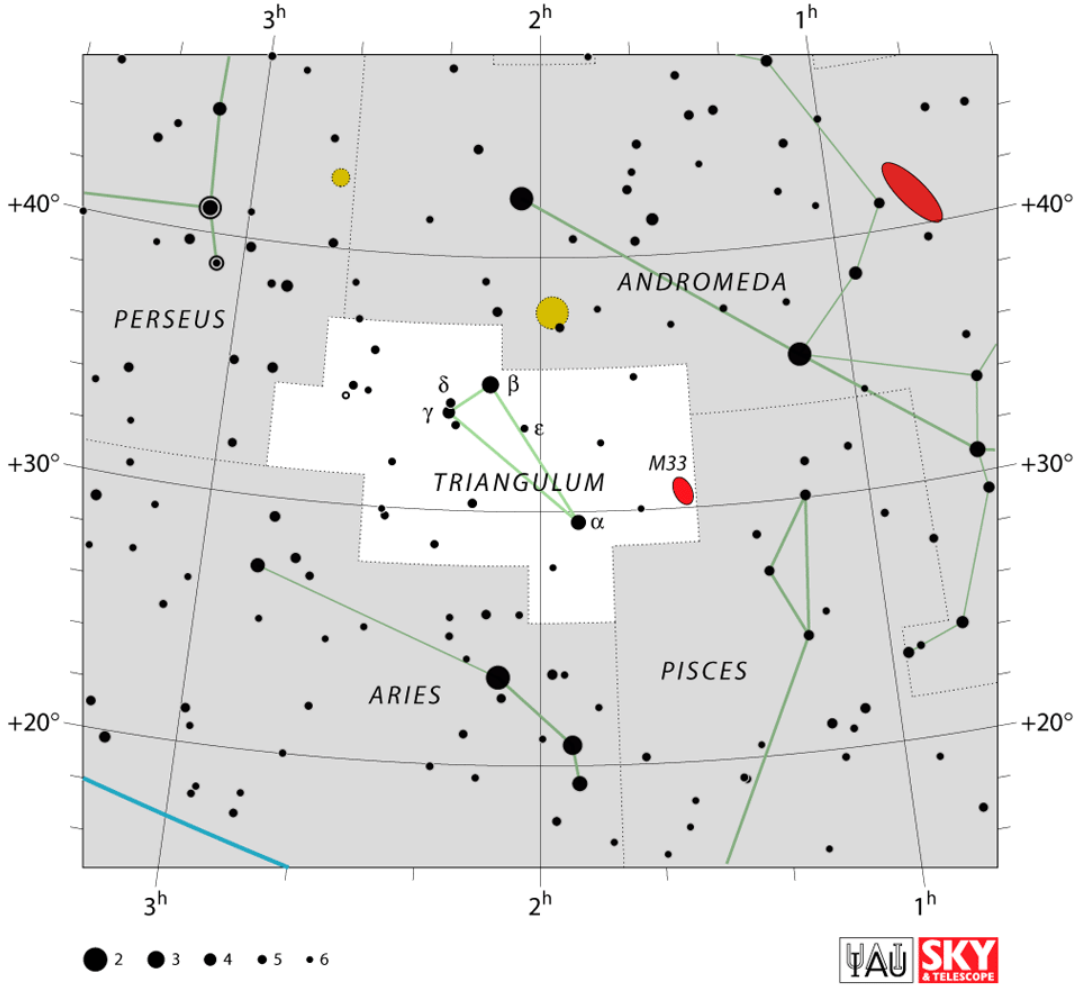

**DARK SKY VIEWING - PRIMARY ON NOVEMBER 18TH, SECONDARY ON NOVEMBER 25TH**

# Mythology:

## Triangulum – the Triangle

Since only three points make up the corners of a triangle, it is unsurprising, if somewhat unimaginative, to find a triangle among the constellations. Triangulum was known to the Greeks, who called it Deltoton, for its shape resembled a capital delta. Aratus described it as an isosceles triangle, having two equal sides and a shorter third side. Eratosthenes said that it represented the Nile river delta. According to Hyginus, some people also saw it as the island Sicily, which was originally known as Trinacria because of the three promontories. Trinacria was the home of Ceres, the goddess of agriculture. Triangulum contains M33, a galaxy in our local group, visible in binoculars.

A smaller triangle, Triangulum Minor, was introduced in 1687 by a Polish astronomer Johannes Hevelius from three stars next to Triangulum. Triangulum Minor was shown in some maps, but has since fallen into disuse.




The End

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