

Night Visions

January 2017 Issue

Newsletter of the Baton Rouge Astronomical Society

Next Meeting: Monday, February 13th at 7PM at HRPO
(2nd Mondays, Highland Road Park Observatory)

The first eclipse over the USA is only 6 months away, on August 21, 2017.
Merrill Hess will speak on what to expect, how to prepare for it,
best places to observe it, travel plans, etc. Come get his expert advice.

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President's Message

By now, most BRAS members know that the weekend retreat at Rockefeller Refuge was cancelled by the State because of ongoing major construction and cannot be used this month.

Our first Sidewalk Astronomy, for 2017, held at Perkins Rowe in January, saw about 170 people looking through our telescopes. Our second Sidewalk Astronomy is scheduled for February 7th, a Tuesday, at Perkins Rowe again. See the report, notices and photos by our Outreach Coordinator, Ben Toman.

Our own BRAS Member, Dr. Brad Schaefer, now has a "Great Courses" available, titled

"The Remarkable Science of Ancient Astronomy"

.I have not watched the 24 lectures yet, but I have read the Course Guidebook. I definitely recommend this course to anyone who is interested in Astronomy and its history. I plan to re-read the guide book as I watch the lectures. BRAS has obtained its own copy of this course – come to the meeting to find out more!

In April, the annual IAD (International Astronomy Day) is happening. To volunteer, see Chris Kersey. There will be many opportunities to help out this year – and help BRAS spread the love of the night sky and astronomy – volunteer when you can.

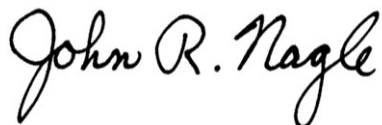
The Legacy page for Wally Pursell now has a permanent presence on the web, thanks to BRAS members who, at the January meeting, donated enough money to make this happen. You can view comments/pictures, add your own comments and/or pictures at

Wallace Pursell's Legacy Page

<http://www.legacy.com/guestbooks/theadvocate/wallace-pursell-condolences/183224987>

A moving tribute to Wally appears in this issue, penned by Chris Kersey, followed by just a few testimonies. You are encouraged to add your own tributes to his Legacy Page as you think of them. These will remain online and be read and reviewed thru time, treasured by BRAS members, family and friends.

Clear Skies,



John R. Nagle
President of BRAS
and
Observing Chairperson



In Memory of Wally Pursell

by Christopher Kersey

Mr. Wally passed away on 27 December. He had been in the hospital but was expected to go home. However, infection set in.

The impact Mr. Wally had on local amateur skygazing is incalculable. Spending a great deal of his earlier life in Ohio and California, and having obtained a degree in geology, he arrived in Baton Rouge with his wife Zoe in the early 1970s. He was a Sales Manager for the Stupp Corporation for several years.



Wally and Henry

During a trip to the now-defunct observatory in Clinton, he met Craig Brenden. Both agreed it was time for a Baton Rouge astronomy club (there had been a short-lived one decades earlier). They founded the Baton Rouge Astronomical Society in 1981 and were joined within the first few years by valuable members Bob Sinitiere (BRAS' longest-serving Treasurer), Merrill Hess and Walt Cooney. Wally helped draft the Society's first bylaws, and took part in BRAS' well-attended public viewing of Halley's Comet during its last return in 1986. Wally also gave important support to BRAS' successful request for 501(c)(3) status from the IRS. In 1987 Wally (along with Merrill and David Taylor) fashioned a new type of photographic platform that facilitated the acquisition of space images.

The idea for a permanent, in-town, professional-grade astronomical observatory had its genesis in a phone call between BRAS member Melanie Hair and LSU astrophysicist Greg Guzik. The idea was pursued by Merrill, Walt and Greg after Melanie moved away. For the initial purchase of the fifty-centimeter reflecting telescope from Pennsylvania-based Optical Guidance Systems, Greg obtained state monies (I believe from the Board of Regents) earmarked for what we now call STEM. The trio approached then-BREC Superintendent Eugene Young with the proposal to place the observatory on Highland Road Park property from which BRAS already had permission to observe. Mr. Young had recently received a building donation from a businessman who had used the structure as a golf pro shop.

So it can be seen easily that the Highland Road Park Observatory, with all its regular programs, its now-famous special events (the 2003 very close pass of Mars, the 2012 Transit of Venus) and the asteroid discoveries (mainly by Walt), has a lineage directly traced to the enthusiasm held by Wally and Mr. Craig.



But Wally's involvement with HRPO didn't stop there. For several years he served as Nighttime Center Supervisor during public viewing times on the weekends. Before that, he hosted twice-monthly solar viewings on Saturdays using his own telescope (this was back before HRPO had the Coronado Solar Max II). He was very vocal in his disapproval of the IAU's decision to create a separate category of "dwarf planet" and to move Pluto to that list. His tongue-in-cheek tombstone for Pluto can still be seen on the north wall of HRPO's main floor.

He created a compass on HRPO's front viewing pad to assist newcomers and beginners not familiar with Polaris and the Big Dipper. He was a volunteer for countless public offerings at HRPO. He also volunteered enthusiastically for BRAS at events such as Earth Day, Rockin' at the Swamp and the Balloon Festival (originally sponsored by Pennington). He showed support in person when BRAS approached local governmental entities such as the Baker City Council and the Federation of Civic Associations, arguing for the changeout to full-cut-off streetlamps and porch lights (which would save taxpayer money and fossil fuels and diminish the degradation of the natural night sky). He also enthusiastically backed BRAS member Trevor McGuire's idea to donate an Orion XT6 Dobsonian telescope to the East Baton Rouge Parish Library. He even assisted with science fair projects, showing students the safe and accurate way to construct different sections of a homemade telescope.



Mr. Wally was a proud Eagle Scout who kept both his and his father's badges and awards in pristine condition, and encouraged other young men to earn as many Scout badges as they could. At least one year he was part of the Mary Bird Perkins Cancer Center "Samaritan's Circle". He also had a mug collection with dozens (if not hundreds) of mugs.

His last of several golden retrievers, Henry (pictured above), was the unofficial HRPO mascot for several years.

Editor's Note: Below are a few personal testimonials that I have been able to gather. Feel free to visit Wally's online Legacy Page to read more farewell comments and add your own:

Wallace Pursell's Legacy Page

<http://www.legacy.com/guestbooks/theadvocate/wallace-pursell-condolences/183224987>





**Wally helps BRAS celebrate
it's 35th Birthday 11/14/16**

very lucky to have known him and even luckier to have called him friend. We'll miss you, Wally.

Merrill Hess: *It's a sad day for me as 2016 takes another one of my best and oldest friends, Wally Poursell passed away at dawn this morning after some time in a hospital. Wally was a founding member of the Baton Rouge Astronomical Society (BRAS). I first met him in 1985 and we became instant friends. He lost his lovely wife Zoe to cancer a few years later. I used to tease him, asking how such a curmudgeon could attract such a charming and attractive woman. He never remarried. Although*

He grew up in Berkeley, CA and was a Korean War veteran. His father was an avid outdoorsman who taught Wally to love bird-watching and geology. To the end, Wally used his dad's pre-WWII Zeis-binoculars with the mysteriously superior glass formula that was lost when the factory was bombed in the War. His father was friends with many famous people. Wally told stories of hob-knobbing with Ansel Adams and flying with Amelia Earhart as pilot.

Many in Baton Rouge will remember him for his love of the night sky and all the years of eagerly showing things to people through his binoculars and telescopes. He was always one of the most active leaders in BRAS. For many Wally was like the heart and soul of BRAS. Known for his story-telling and wit, he will be sorely missed. Godspeed, Wally

Personal testimonies:

Chris Kersey: *Mr. Wally always had excellent advice and encouragement for me in my pursuit to help promote skygazing and responsible nighttime lighting. He cannot be replaced but I know he wants the hobby of astronomy to continue for decades to come. So, that will continue to be my goal.*

John Nagle: *Wally and I had many interests in common, and had many a talk about a wide range of subjects. He was mentor to many, myself included, and I'll miss the depth of knowledge he was always willing to share. He was a fixture at the observatory, volunteered for everything and was always a pleasure to work with. He will be sorely missed.*

Ben Toman: *My wife and I have had Wally as a dear friend for almost as many years as we've lived here in Baton Rouge. This man had so many awesome life stories and was a wealth of information on almost any subject. Even though we were brought together by our common love of astronomy, it was most often music that we talked about, and he turned us on to a lot of performers and songs from back in the day. I love this picture because I don't think he ever looked happier than when he would be hugging a pretty girl. We were*

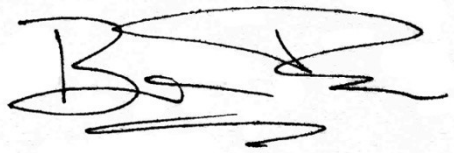


Secretary's Summary of January Meeting

- ✚ John Nagle, presiding
- ✚ -Meeting opened. 29 people in attendance
- ✚ -Moment of silence for Wally Pursell and astronaut John Glenn observed
- ✚ -More of a memorial for Wally will take place at the February meeting
- ✚ -Don Weinell spoke about Rockefeller Retreat and Hodges Gardens Star Party
- ✚ -Ben Toman spoke about the Sidewalk Astronomy event in January (see photos below)
- ✚ -Thomas Halligan spoke about endeavors of the Light Pollution committee
- ✚ -Chris Kersey spoke about upcoming HRPO events
- ✚ -Brad Schaefer gave a talk on the Carrington Event
- ✚ -Next business meeting is February 8th at 6:30pm at the HRPO
- ✚ -Next club meeting is February 13th at 7:00pm at the HRPO. Light Pollution meeting preceding it at 6:15pm
- ✚ -Raffle was held
- ✚ -Meeting adjourned

I know I don't include much detail, but I'm not a good note taker. I'm just the only person that will do the Secretary job at this time! If people want to know more details, they'll just have to come to the meetings, darn it :)

Clear Skies,



Ben Toman
Secretary





BRAS Outreach Report

Hi Everyone,

2017 is off to a great start! Our Sidewalk Astronomy event at Perkins Rowe was wildly successful. Not only for the number of people that looked through our scopes, but the number of volunteers we had to help out. Thanks to the following volunteers: John Nagle, Krista Reed, Chris Kersey, Trey Anding, Sean Malory, Ben Toman, Scott Louque and Rick Wright. We had plenty of scopes and even a couple of people to just chat with the crowd about our club and the Observatory.

The management company at Perkins Rowe is very excited to have us doing our events there. They are going to start using their own social media outlets to get the word out, as well. Make sure to tell your friends about it, too!

We have a couple of events upcoming for you to consider. Check them out:

Tuesday, February 7th

Sidewalk Astronomy, 6:30pm-8:30pm
Perkins Rowe Shopping Center
Telescopes and info

Thursday, February 9th

Sidewalk Astronomy Make Up Date (Only if weather forces cancellation Tuesday)
Details same as above

Saturday, March 11th

Rockin' at the Swamp, 9am-4pm
Bluebonnet Swamp and Nature Center
Solar observing, demos and info
8 people needed for shifts throughout the event

Saturday, March 25th

100th Anniversary of the Boy Scouts Time, 9am-5pm and they are expecting 4000-5000 people!!!
That is the last day of Hodges Gardens, but maybe some folks will be in town that can volunteer.
State Fairgrounds on Airline Hwy
Solar observing; 2-4 volunteers needed

As you can see, we'll be back for more Sidewalk Astronomy and of course, Rockin' at the Swamp is always a good time. (Hey, that's how we met Chris Raby just last year!) I hope you will consider helping out with some of these events. The more help we have, the easier it is to do them.

Clear Skies,

A handwritten signature in black ink, appearing to read 'Ben Toman', written over a light blue grid background.

Ben Toman
Outreach Coordinator



Sidewalk Astronomy at Perkins Rowe – January 3, 2017

6:30-9 p.m., about 170 people lined up to see the moon, Venus and Mars
Volunteers included John Nagle, Krista Reed, Chris Kersey, Trey Anding, Sean Malory, Ben Toman, Scott Louque and Rick Wright

photos by Ben Toman (lots more pics on his Facebook page)



This Moon pic was taken by one of the passersby, Paiton Hebert, using his cell phone as Ben held it up to his 10" Dob. Paiton shared it to BRAS's Facebook page after the event.





BRAS Light Pollution Committee Report

2nd Mondays, from 6:15 pm to 7:00pm, before the BRAS public meeting.

One does not need to be a BRAS member to attend.

Several items will be on the agenda during this meeting, including how to achieve in 2017 the goal of 200 GaN measurements that was *not* reached last year.

This meeting will...

- introduce the general public to the LPC
- explain the LPC's benefit to amateur astronomers, nature lovers, homeowners and taxpayers
- summarize the accomplishments of BRAS in this endeavor

A handwritten signature in black ink that reads "Thomas J. Halligan". The signature is written in a cursive, flowing style.

Thomas Halligan
Light Pollution Chairperson

Space is right overhead—double stars, nebulae, the Milky Way Galaxy and other galaxies. We can see it if we let it through.

Question:
Why shouldn't you
trust atoms?
(answer on another page)





Recent Entries in the BRAS Forum

Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 4300 posts.

[Eugene Cernan Dies](#)
[Baton Rouge Amateur Radio Club Turns Eighty](#)
NASA Observes [Day of Remembrance](#)
Commercial Crew Receives [Cutting-Edge Spacesuit](#)
[Venus Shines Brilliantly](#) in the Southwest
JAXA's [HTV-6](#) Disconnects from ISS
[Moon May be Older](#) than Previously Thought
Will [Comet 45/P](#) Brighten?
[Capella and "Kids"](#) Shine in Northeast
[Milky Way](#) May have Stolen Stars from Other Galaxy
[New Mass Estimate](#) for Milky Way
Cosmologists Refine [Value of the Hubble Constant](#)



"What the...??? We've been gazing up at poorly hit golf balls this whole time?"





BRAS's 20/20 Vision Campaign

GLOBE at Night: January Dates TBA

OBSERVATIONS NEEDED FOR Shera's 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.

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.





Messages from HRPO

The Highland Road Park Observatory will be closed on 24 June.



FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

3 February: “2016—The Space Year in Review” The [death of a legend](#)...an [arrival at Jupiter](#)...the detection of [further proof of relativity](#). Which was your favorite story of 2016? Which was the most profound?

17 February: “Supernova 1987A” The light from one of the most astounding events witnessed by modern people reached Earth thirty years ago. We’ll celebrate this [jawdropping spectacle](#) by reliving the story of its discovery and hopefully inspire others to go out and look for new happenings in the sky.

24 February: “Jupiter” The characteristics and moons of [Jupiter](#) will be highlighted. Then an overview of the upcoming evening apparation for this year will be shown.

SCIENCE ACADEMY

Saturdays from 10am to 12pm

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

4 February: : [“Calendars and Time Keepers”](#)

11 February: [“Expedition 2”](#)

18 February: “Mercury and Gemini”

25 February: [“Apollo”](#)

ONE-TIME CALLS FOR VOLUNTEERS

***Friday 10 February, 5:30pm to 7:30pm.** *Two or three volunteers.* **Penumbral Lunar Eclipse.** Helping explain to patrons what the eclipse is and how to see it. Low difficulty.

***Saturday 18 February, 7pm to 10pm.** *Two or three volunteers.* **[Evening Sky Viewing Plus.](#)** Telescope operation, physical science demonstrations, front desk duty. Low to 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”. Also, we would more than welcome any who can help for at least one or two hours anytime during Winter Rocket Camp. We are asking any BRAS volunteers with time to assist. Thank you.

Answer:
They make up everything!





Observing Notes:

by John Nagle

Gemini – The Twins

Position: RA 7, Dec. +20°

Named Stars:

Castor (Alpha Gem), “the Horseman”, “Al-Ras al-Taum al-Muqadim”, “The Head of the Foremost Twin”, mag. 1.58, 07 34 36.00 +31 53 19.1, is a multi star system. **Castor A** is a white dwarf visual binary, having a faint companion (that is also a binary star) – all three stars are spectroscopic binaries. **Castor A**’s companion is separated by four million miles and has an orbital period of 9.2128 days. **Castor B**, a red dwarf at mag. 2.88, 07 34 36.00 +31 53 19.0, has a companion with an orbital period of 2.98283 days, and a separation of less than three million miles. **Castor C**, a red dwarf at mag. 9.3, also designated as **YY Gem**, is a variable star and an eclipsing binary star with a period of 19.5 hours. **Castor A-B** separation is 6” and has a period of 470 years, and **Castor A-C** separation is 72”.

Pollux (Beta Gem), “Al-Ras al-Taum al Mu’ahar”, “The Head of the Second Twin”, from the Greek “The Boxer”, of “The Pugilist”, mag. 1.16, 07 45 19.36 +28 01 34.7, is an orange giant star located about 4½° south-southeast from **Castor**. An exo-planet was confirmed in June 2006. **Pollux b** has an orbital period of 590 days.

Alhena (Gamma Gem), “Al Han’ah”, “The Brand”, sometimes called “Al Maison”, “The Shining One”, mag. 1.93, 06 37 42.70 +16 23 57.9, is a white sub-giant star.

Wasat (Delta Gem), “Middle”, mag. 2.22, 07 20 07.39 +21 58 56.4, is a yellow-white sub-giant star and is a triple star system. **Delta Gem**’s companion, an orange dwarf star at mag. 8.2, is a spectroscopic binary, orbiting the primary with a period of 6.1 years. The third star has a period of over 1200 years.

Mebuta (Epsilon Gem), “The Outstretched Paw” (also containing **Melboula** and **Meluda** in the Paw), mag. 3.06, 06 43 45.93 +25 07 52.2, is a yellow super-giant star, with an optical companion at mag. 9.2 and a separation of 110”, marking **Castor**’s outstretched right leg.

Mekbuda (Zeta Gem), “The Lion’s Folded Paw”, mag. 4.01, 07 04 06.54 +20 34 13.1, is a variable yellow super-giant double star, magnitude varies from 3.68 to 4.16 over a period of 10.148 days. The companion star has a magnitude of 7.6.

Praepes (Eta Gem), “Tejat Prior”, mag. 3.31, 06 14 52.70 +22 30 24.6, is a triple star system consisting of a spectroscopic binary and a dwarf star orbiting them. Primary star is a red giant semi-regular variable star with a period of 234 days, and a secondary, also a red giant star, orbiting the primary with a period of 8.2 years and a magnitude of 6.0.

Tejat (Mu Gem), “Tejat Posterior”, “back foot”, “Calx”, “heel”, mag. 2.87, 06 22 57.59 +22 30 49.9, is an irregular variable red giant star with a period of 72 days.

Alzir (Xi Gem), “The Button”, mag. 3.35, 06 45 17.43 +12 53 45.8, is a yellow-white sub-giant star suspected to be a spectroscopic binary. Marks one of the four feet of the **Gemini Twins**.

Propus (Iota Gem), “The Forefoot” in Latin, mag. 3.78, 07 25 43.68 +27 47 53.8.

Deep Sky:

M 35 (NGC 2168), is an open cluster at mag. 5.30, 06 08.9 +24 20, 30’ in diameter, extending 23 ly.

Contains about 200 stars, with the brightest star being mag. 8.2. **M 35** is located 2° north and 1½° west of **Eta Gem**.

CR 89, mag. 5.7, 06 18.0 +23 38, 34' in size, 15 stars, of moderate brightness range; involved in nebulosity.

NGC 2129, mag. 6.7, 06 01.0 +23 18, 7' in size, is an open cluster of 40 stars with the magnitude of the brightest star being 7.4.

Medusa Nebula, Sharpless 2-274, Abell 21, PK 205+14.1, mag. 7.68, 07 29.0 +13 15, 10.2' in size, is a planetary nebula (believed to be a supernova remnant until the 1970's) near the border with **Canis Major**. The filaments of glowing gas are evocative of the serpent hair of the **Gorgon Medusa**. Its surface brightness is between mag. 15.99 and 25.0, and will take at least an 8-inch telescope with an OIII filter to find it.

NGC 2395, mag. 8.0, 07 27.1 +13 35, 12' in size, 30 stars, detached, brightest star is mag. 10.0.

NGC 2420, mag. 8.3, 07 38.5 +21 34, 10' in size, 100 stars, detached, strong concentration of stars, brightest star is mag. 11.1.

IC 2157, mag. 8.4, 06 05.0 +24 00, is an open cluster.

NGC 2321, mag. 8.5(photo), 07 07.2 +27 21, 18' in size, 30 stars with the brightest star being mag. 9.0(photo).

NGC 2158, mag. 8.6, 06 07.5 +24 06, 5' in diameter, is an open cluster; a rich, detached, weak concentration of stars. It is a wedge shaped cluster with the brightest star at mag. 12.4. Located about 0.4° southwest of **M 35**.

NGC 2392, Caldwell 39, PK 197+17.1, "The Eskimo Nebula", "the Clown Face Nebula", mag. 9.2, 07 29.2 +20 55, 19.5" in size; a planetary nebula, in a bipolar double shell, with a central star at mag. 10.5. Has a faint halo and features resembling a human face wearing a parka. Located about midway between stars **Kappa Gem** and **Lambda Gem**. Has a bluish-green tint of ionized oxygen.

NGC 2266, mag. 9.5, 06 43.2 +26 58, 6' in size, 50 stars, detached, brightest star is mag. 11(photo).

NGC 2355, mag. 9.7, 07 16.9 +13 47, is an open cluster.

IC 443, Sharpless 248, The Jellyfish Nebula", 06 16.9 +22 47, 50'x59' in size, is a galactic supernova remnant near **Eta Gem**. Faint, crescent shaped, and appears filamentary and wispy. Created a neutron star, and is believed to be a **Type II Supernova**

IC 444, 06 19.4 +23 16, 7'x4' in size, is a large, faint, glowing nebula lit by **12 Gem** (mag. 7.0).

Sh2-247, 06 08.5 +21 37, 10' in size, circular shaped.

Other Stars:

Kappa Gem, mag. 3.57, 07 44 26.87 +24 23 53.3, is a binary star. The primary is a yellow giant star and the secondary is at mag. 8.0. Because of the discrepancy in brightness, only large amateur instruments are able to divide them.

Mu Gem, mag. 4.13, 06 28 57.79 +20 12 43.8, is a double star divisible with binoculars, with the secondary star at mag. 8. The primary star is a blue giant.

Tau Gem, mag. 4.41, 07 11 08.39 +30 14 43.0, an orange giant star, has a brown dwarf in orbit.

HD 59686, mag. 5.45, 07 31 48.37 +17 05 10.4, has one planet in orbit.

50 Gem, mag. 6.46, 07 12 49.08 +27 13 30.2, is a spectroscopic binary star.

HD 50554, mag. 6.86, 06 54 42.83 +24 14 44.0, has a transiting planet.

U Gem is a white dwarf star orbiting a red dwarf star. Roughly every 100 days it undergoes an outburst that greatly increases its brightness (combined apparent magnitude varies between 14.0 and 15.1; however during an outburst, the star can brighten to 9th magnitude). Although the average interval is 100 days, the period is in fact highly irregular, varying from as little as 62 days to as long as 257. The two stars have an orbital period of 4 hours and 11 minutes.

Four more stars, beyond mag. 10.0, have planets in orbit.

Geminga, "gh'e minga", "it's not there", is a neutron star, the result of a supernova about 300,000 years ago. The name is also short for "Gemini gamma-ray source". **Geminga** has an apparent

magnitude of 25.5. It is the first unidentified gamma-ray source to be discovered, as well as the first example of a radio-quiet pulsar.

There are over 110 double/multiple stars, over 45 variable stars, and 15 star clusters/nebulæ/galaxies in the Gemini constellation.

Sky Happenings: July, 2016

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



- Feb. 1st** - **Jupiter** and **Spica** are separated by 3.6°, highest in the south about 2½ hours before sunrise. They remain about this close all month.
- Feb. 2nd** - The **Moon** passes 3° south of **Uranus** at 2 AM CST, The **Moon** passes 1° north of dwarf planet **Ceres** at 8 PM CST.
- Feb. 3rd** - **First Quarter Moon** occurs at 10:19 PM CST.
- Feb. 5th** - The **Moon** passes 0.2° north of **Aldebaran** at 4 PM CST.
- Feb. 6th** - The **Moon** is at perigee (229,172 miles from **Earth**) at 8:02 AM CST, **Jupiter** is stationary at 1 PM CST and then begins retrograde motion.
- Feb. 10th** - Penumbral eclipse of the **Moon** starts at 5:14 PM CST, mid-eclipse occurs at 6:44 PM CST, and the last of the eclipse occurs at 8:14 PM CST. None of the **Moon** will go dark, the penumbral shading will be plain to see, **Full Moon** occurs at 6:33 PM CST.
- Feb. 11th** - The **Moon** passes 0.8° south of **Regulus** at 8 AM CST.
- Feb. 15th** - Morning – the waning gibbous **Moon**, **Jupiter**, and **Spica** form a shallow arc 6° to 8° long, The **Moon** passes 3° north of **Jupiter** at 9 AM CST.
- Feb. 17th** - **Venus** is at greatest brilliancy (mag. -4.8) at 1 AM CST, **Jupiter** is at aphelion (507.2 million miles from the **Sun**) at 1 AM CST.
- Feb. 18th** - Asteroid **Irene** is at opposition at 1 PM CST, **Last Quarter Moon** occurs at 11:33 PM CST, The **Moon** is at apogee (251,268 miles from **Earth**) at 3:14 PM CST.
- Feb. 20th** - Asteroid **Eunomia** is at opposition at 5 AM CST, The **Moon** passes 4° north of Saturn at 5 PM CST.
- Feb. 21st** - Asteroid **Métis** is at opposition at 8PM CST.
- Feb. 23rd** - **Jupiter** passes 4° north of Spica at 10 AM CST.
- Feb. 26th** - **New Moon** occurs at 8:15 AM CST, Observers along a narrow path that cuts across **South America** and **Africa** will see an annular solar eclipse.
- Feb. 27th** - **Mars** passes 0.6° north of **Uranus** at 2 AM CST.
- Feb. 28th** - The **Moon** passes 10° south of **Venus** at 2 PM CST, The waning crescent **Moon** in a 10° triangle with **Venus** and **Mars** in the early evening sky.

Planets:

Mercury – **Mercury** lies on the opposite side of **Sagittarius** in early February and appears low in the southeast during the morning twilight. On Feb. 1st, **Mercury** climbs just 5° above the horizon a half-hour before sunrise. A telescope will show **Mercury**'s disk spanning 6", and appearing 81% lit. **Mercury** stays low all month until it is lost in the **Sun**'s glare in the final days of February.

Venus – On February 1st, the **Moon** lies 17° from **Venus**, while **Mars** stands 5° from **Venus**. **Venus** itself resides just east of the **Circlet Asterism** in **Pisces the Fish**. On Feb. 1st, **Venus** spans 31.3' and shows a 39% lit disk. On the night of Feb. 16/17th, **Venus** reaches greatest brilliancy when it shines at magnitude -4.8, but it doesn't dip below mag. -4.7 all month. On Feb. 15th, **Venus**'s disk has grown to nearly 25% and to 38.3' in diameter, while its phase has shrunk

to 28% lit. On Feb. 28th, The disk will measure 46.9' across while the **Sun** illuminates it just 17%.

Mars – **Mars**, easy to find to the upper left of **Venus**, fades from mag. +1.1 to +1.3 in February, while its disk dwindles from 5.1' to 4.6' at month's end. **Venus** reaches a minimum separation of 5.4° west of **Mars** on Feb. 1st, and are 12° apart at month's end. **Mars** is in **Pisces the Fish** all month, heading eastward. On Feb. 26th, **Mars** passes just 0.6° to the north-northwest of 6th magnitude **Uranus**. At 3.4" wide, **Uranus** appears smaller than **Mars** in a telescope. On Feb. 27th, **Uranus** is only 0.9° separated from **Mars**.

Jupiter – **Jupiter** rises by 11:30 PM local time on February 1st, and some two hours earlier by month's end. **Jupiter** appears nearly motionless against the backdrop of **Virgo the Virgin** this month, remaining 4° due north of first magnitude **Spica**. **Jupiter** shines at mag. -2.1 to mag. -2.3 at month's end as its disk grows from 39" wide to 42" wide. On Feb. 6th, **Jupiter** halts its eastward motion in **Virgo** and begins retrograde (westward) motion; bringing **Jupiter** to 4° north of **Spica** on Feb. 23rd. **Jupiter**'s four bright moons orbit it in periods that range from 1.8 to 16.7 days. **Ganymede**, the solar system's largest moon, transits **Jupiter** on Feb. 2nd, its shadow on **Jupiter**'s cloud tops at 12:51 AM CST. The shadow crosses the planet's central meridian around 2:15 AM CST. **Ganymede** itself is a bright dot less than a planet's diameter to the east of **Jupiter**. The shadow transit ends around 3:25 AM CST, while **Ganymede** itself crosses into **Jupiter**'s north polar region at 5:43 AM CST. On the morning of Feb. 9th, **Ganymede** performs a similar sequence of events, although it works out better for western **North American** observers. The remaining **Jupiter** events in Feb. cannot be seen from **North America**.

Saturn – **Saturn** rises shortly after 3 AM CST in early February, and by 1:30 AM CST at month's end. **Saturn** lies near the border between **Ophiuchus** and **Sagittarius**, and crosses the border into **Sagittarius** on Feb. 23rd. By the 28th, **Saturn** is within 4° of the **Triffid Nebula (M 20)**. **Saturn** shines at magnitude 0.5 all month, and any telescope reveals the ring system, which spans 36" in mid Feb., wrapped around the planet's 16" diameter disk – the rings tilt 27° to our line of sight.

Uranus – On February 25th, **Mars** and **Uranus** appear 0.9° from each other. On the 26th, **Mars** passes 34' north of **Uranus**, with the gap widening to 0.9° again on the 27th. **Mars** shows a disk of 4.6", while **Uranus** shows a disk of 3.4". To find **Uranus** first locate magnitude 4.3 **Epsilon Piscium**, which lies 14° southeast of mag. 2.8 **Gamma Pegasi**, the star at the **Great Square of Pegasus**'s southeast corner. From **Epsilon Piscium** head 2.7° east to the mag. 5.2 **Zeta Psc**. **Uranus** lies 1° east of **Zeta Psc** on Feb. 1st and 2° east by the 28th. **Uranus** glows at mag. 5.9.

Neptune – **Neptune** lies about 10° above the horizon in the west-southwest. **Neptune**, at magnitude 8.0, is found among the background stars of **Aquarius**, and is 1.2° southwest below mag. 3.8 **Lambda Aquarii**. **Neptune** descends into twilight and out of view after the first week of Feb., returning to view before dawn in April.

Asteroids – Asteroid **4 Vesta** passes near 1st magnitude **Pollux**. To find the asteroid, first locate **Gemini**'s twin stars **Castor** and **Pollux**. **Pollux** shines a bit brighter than **Castor** and resides closer to **Procyon**. **Vesta** will lie about ½ a binocular field from **Pollux**. **Vesta** begins February 3° south of **Pollux** and ends the month 4° to its southwest. My estimates say **Vesta** will be about ½° north of **Kappa Gem** on February 3rd, 1° south of **76 Gem** on the 4th, and about 2° south of **Upsilon Gem** on the 17th.

Comets – Comet **2P/Encke** starts the month in **Pisces** just a few degrees northwest of **Venus**. **Encke** shadows **Venus** during the first half of February, and lies about 5° west of **Venus** and near magnitude 4.0 **Omega Psc** in mid Feb. **Encke** should be glowing at around 8th to 9th magnitude some 20° above the western horizon as twilight fades to darkness.



Meteor Showers – Meteor activity remains low during February. The best shower this month is the minor **Alpha Centaurids**, which peak before dawn on Feb. 8th – but this is a strictly southern hemisphere event.

When to View the Planets:

Evening Sky

Venus (west)

Mars (west)

Uranus (southwest)

Neptune (west)

Midnight

Jupiter (southeast)

Morning Sky

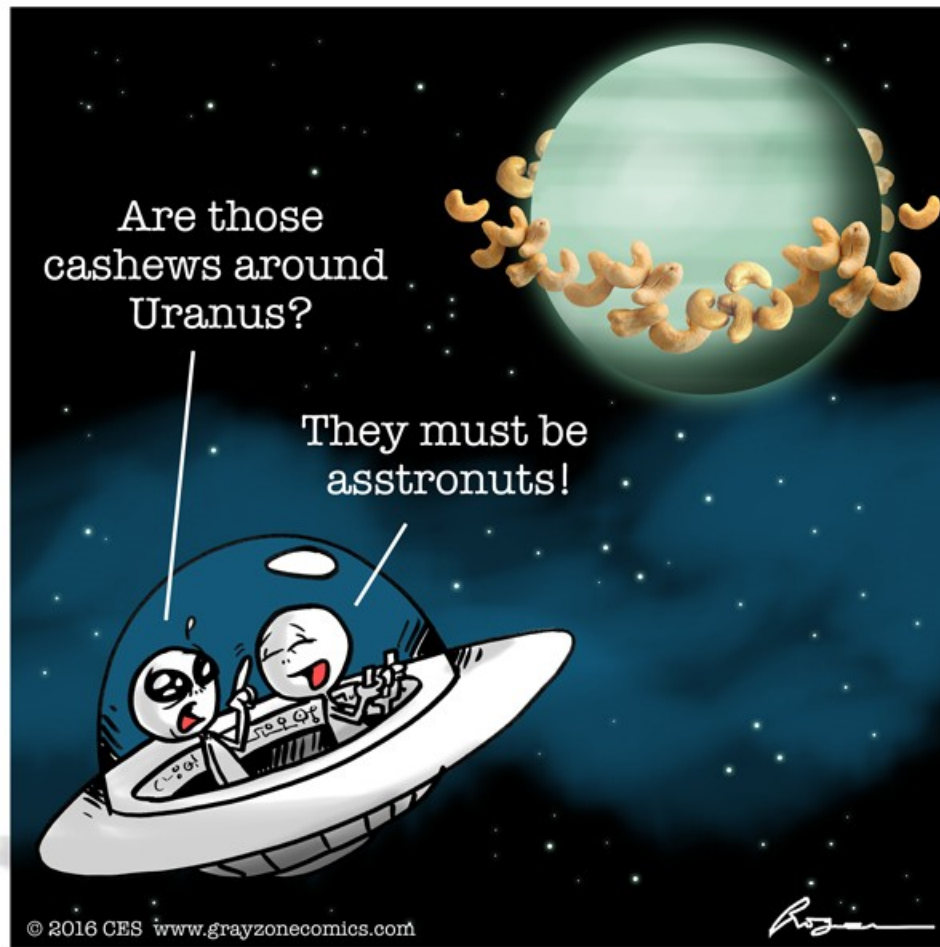
Mercury (southeast)

Jupiter (southwest)

Saturn (southeast)

DARK SKY VIEWING - PRIMARY ON FEB 4TH, SECONDARY ON FEB 25TH

Astro-nuts!



Mythology:

Gemini – The Twins

Gemini represents the twins Castor and Polydeuces (Pollux is the Latin form of his name); they were known to the Greeks as the Dioscuri, literally meaning ‘sons of Zeus’. However, mythologists disputed whether both really were sons of Zeus, because of the unusual circumstances of their birth. Their mother was Leda, Queen of Sparta, whom Zeus visited one day in the form of a swan (now represented by the constellation Cygnus). That same night she slept with her husband, King Tyndareus. Both unions were fruitful, for Leda subsequently gave birth to four children. In the most commonly accepted version, Polydeuces and Helen (later to become famous as *Helen of Troy*) were children of Zeus and hence immortal, while Castor and Clytemnestra were fathered by Tyndareus, and hence were mortal.



Castor and Polydeuces grew up the closest of friends, never quarrelling or acting without consulting each other. They were said to look alike “and even to dress alike”, as identical twins often do. Castor was a famed horseman and warrior who taught Heracles to fence, while Polydeuces was a champion boxer.

The inseparable twins joined the expedition of Jason and the Argonauts in search of the Golden Fleece. The boxing skills of Polydeuces came in use when the Argonauts landed in a region of Asia Minor ruled by Amycus, a son of Poseidon. Amycus, the world’s greatest bully, would not allow visitors to leave until they had fought him in a boxing match, which he invariably won. He stamped down to the shore where the Argos lay and challenged the crew to put up a man against him. Polydeuces, stirred by the man’s arrogance, accepted at once and the two pulled on leather gloves. Polydeuces

easily avoided the rushes of his opponent, like a matador side-stepping a charging bull, and felled Amycus with a blow to the head that splintered his skull.



On the Argonauts homeward trip with the Golden Fleece, Castor and Polydeuces were of further value to the crew. Apolonius Rhodius tells us briefly that during

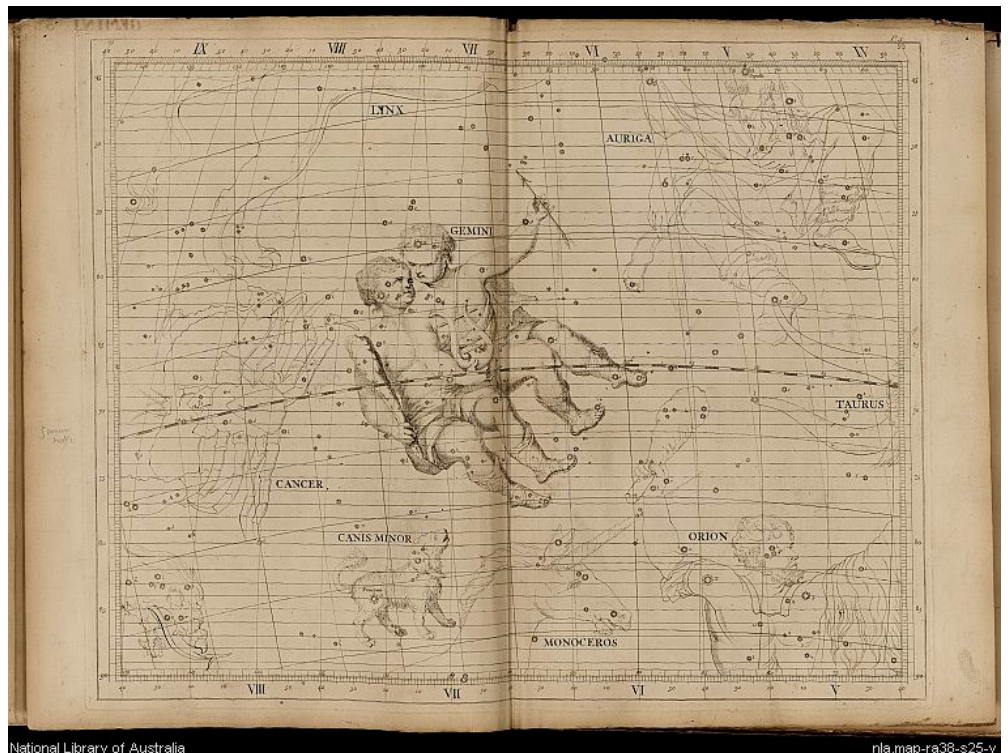
the voyage from the mouth of the Rhone River to the Stoechades Islands (the present day Iles d’Hyeres off Toulon); the Argonauts owed their safety to Castor and Polydeuces. Presumably a storm was involved, but he does not elaborate on the circumstances. Ever since this episode, says Apollonius – and he assures us there were other voyages on which they were saviors – the twins have been the patron saints of sailors. Hyginus said that the twins were given the power to save shipwrecked sailors by Poseidon, the sea god, who also presented them with the white horses they often rode.

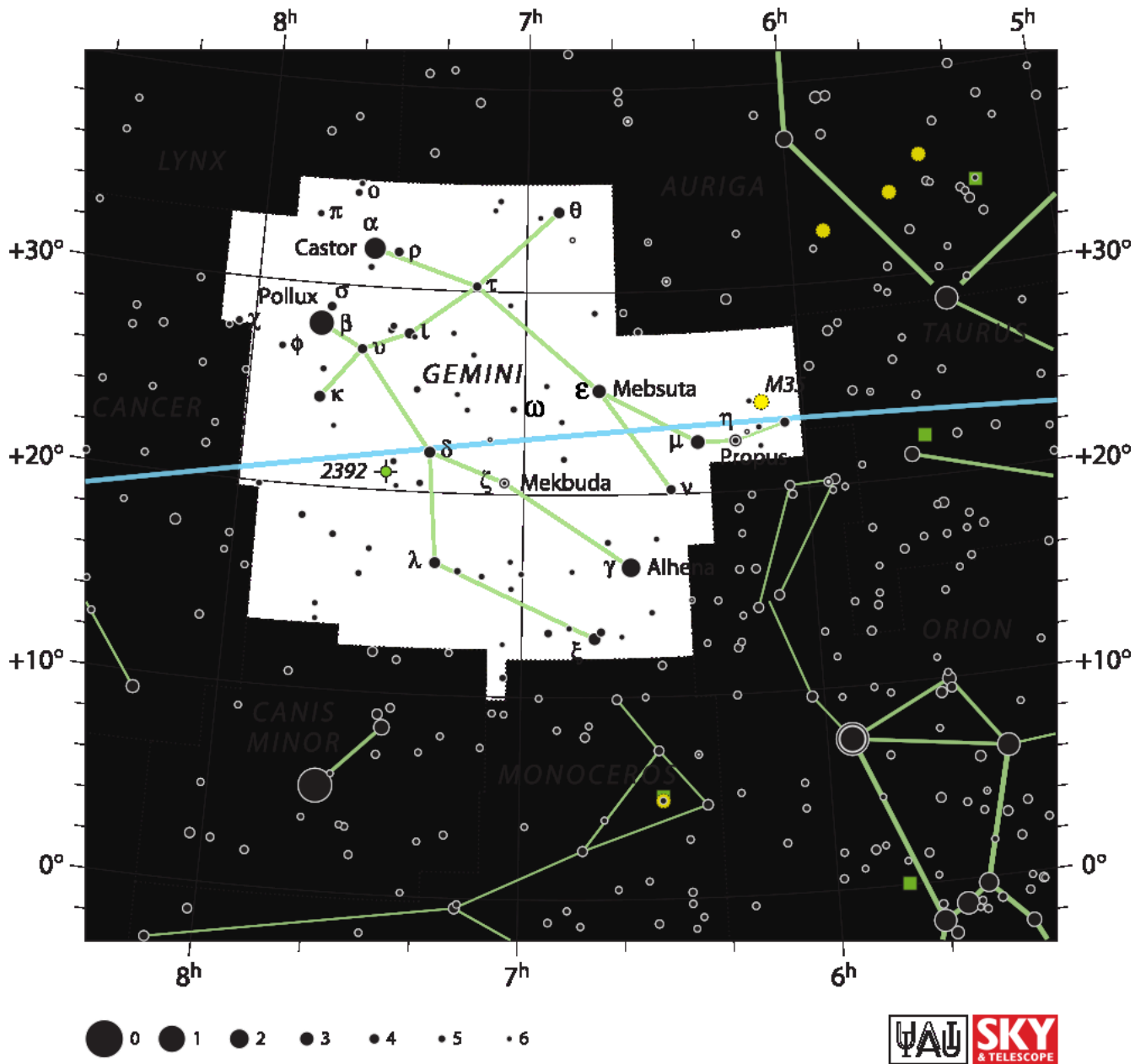
Mariners believed that during storms at sea the twins appear in a ship’s rigging in the form of the electrical phenomenon known as *St. Elmo’s Fire*, as described by Pliny, the Roman writer of the first century AD, in his book ‘Natural History’: “On a voyage stars alight on the yards and other parts of the ship. If there are two of them, they denote safety and portend a successful voyage. For this reason they are called Castor and Pollux, and people pray to them as gods for aid at sea.” A single glow was called a Helen and was considered a sign of disaster.

Castor and Polydeuces clashed with another pair of twins, Idas and Lynceus, over two beautiful women. Idas and Lynceus (who were also members of the Argo’s crew) were engaged to Phoebe and Hilaira, but Castor and Polydeuces carried them off. Idas and Lynceus gave pursuit and the two sets of twins fought it out. Castor was run through with a sword thrust from Lynceus, where upon Polydeuces killed him. Idas attacked Polydeuces but was repulsed by a thunderbolt from Zeus.



Another story says that the two pairs of twins made up their quarrel over the women, but came to blows over the division of some cattle they had jointly rustled. Whatever the case, Polydeuces grieved for his fallen brother and asked Zeus that the two should share immortality. Zeus placed them both in the sky as the constellation Gemini, where they are seen in close embrace, inseparable to the last.





The End

