



Newsletter of the Baton Rouge Astronomical Society

Next Meeting: Monday, May 8th at 7PM at HRPO
(2nd Mondays, Highland Road Park Observatory)

**Presenter: Club member Don Weinell,
“My 4 Year Bicycle Trip Over The Oregon Trail, with slides.”**

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& Mythology



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

President's Message

International Astronomy Day 2017 brought winds strong enough to force cancellation of some rides/events. Considering this, I believe it was a success.

The last Sidewalk Astronomy for this season was held on May 2nd at Perkins Rowe. Even with the Sun setting late, I would consider it a success also. Thank you to all who have participated in this season's Sidewalk Astronomy, and contributed to its success.

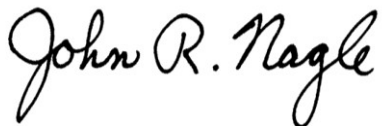
This month's BRAS meeting will have as our speaker club member Don Weinell, and his talk will be about his bicycle trip over the entire Oregon Trail (completed in sections between 2012 and 2016). Don kept a journal of his trip, and upon re-writing it into a better format, a publisher is publishing it – release is this month! Don will talk about the trip and has a lot of pictures to show. Come to the meeting and support Don!

The Light Pollution Committee, with Thomas Halligan as chair, has finished composing the letter to be sent to the Mayor of Baton Rouge, and to Entergy in regards the Valhalla project. Final approval of the letters will be given by the committee at the May 8th meeting, 6:15 at HRPO, before the membership meeting. The committee meeting is open to all – support BRAS efforts to fight light pollution!

Chris Kersey will have the Friday night talks during May to be under the umbrella subject of “Star Gazing with BRAS”, helping to promote BRAS membership and public participation. Come to the Friday talks and support Chris!

You can see some drone video of the 2017 Hodges Gardens Star Party on the You Tube channel “Deep Sky Dude”. There is also video of some previous Hodges Garden Star Parties and other star parties. If you haven't been to one of our star parties, see what you have missed.

Clear Skies,



John R. Nagle
President of BRAS and Observing Chairperson

P.S. On this page our Editor has placed yet another riddle. The first 3 members to find and email me the exact answer hidden somewhere in this newsletter (hidden rather well this time), will receive one FREE \$1 raffle ticket to spend at the next meeting. (Must attend meeting to qualify.) Email me at jonagle@cox.net if you find it.

Riddle:

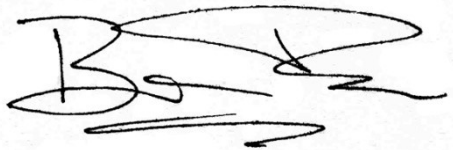
Where are Black Holes most commonly found?



Secretary's Summary of April Meeting

- ✚ Meeting opened by our President, John Nagle, who introduced Dr. Brad Schaefer who, in turn, introduced our guest speaker, **Dr. Tabetha Boyajian.**
- ✚ She gave a presentation on **Planet Hunters** and the state of her research on "**Tabby's Star.**"
- ✚ Don Weinell gave an account of this year's Hodges Gardens Star Party
- ✚ Craig Brenden thanked club members for their attendance at the memorial service held for Wally Pursell
- ✚ Merrill Hess spoke about scope optics that are available online
- ✚ Thomas Halligan spoke about the Light Pollution Committee activities and the current Globe at Night dates
- ✚ Raffle held
- ✚ Meeting adjourned

Clear Skies,



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

2017 Officers:

President: John Nagle
Vice-President: Craig Brenden
Secretary: Ben Toman
Treasurer: Trey Anding

BRAS Liaison for BREC:

Chris Kersey

BRAS Liaison for LSU:

Greg Guzik

Committees/Coordinators:

Outreach:

Ben Toman

Observing:

John Nagle

Light Pollution:

Thomas Halligan

Webmaster:

Frederick Barnett

Newsletter:

Michele Fry

Observing Clubs & How To Earn Awards

(excerpt from our website) www.brastro.org

"Astronomical observing is the primary activity of most amateur astronomers. . . . In order to bolster interest . . . and provide some observing goals for novice and advanced observers alike, the **Astronomical League**, of which all B.R.A.S. members are a part of, offers their **Observing Club Awards**.

Inspired by their idea, **B.R.A.S. is now offering our own Observing Club Awards.** Many of these clubs are simply scaled down versions of the same clubs offered by the Astronomical League. By following the same guidelines and recording procedures outlined by the AL clubs but requiring fewer observations, obtaining an Observing Award from B.R.A.S. should be within reach of even the busiest part-time observer. Also, in most cases, any observations made towards a B.R.A.S. Observing Award will count toward the same award for the Astronomical League."

Want to get started? Check out **Observing Clubs** on our website menu.



BRAS Outreach Report

Hi Everyone,

We had a great April for outreach. A fun time was had at Zippity Zoo Fest and we had another successful Sidewalk Astronomy event at Perkins Rowe. Chris Kersey started off the library outreaches that will continue for much of the summer at various library locations throughout the community. Finally, by the time you read this, we will have had our International Astronomy Day event at the Highland Road Park Observatory.

We've got a great list of volunteers to thank this month and here it goes: John Nagle, Chris Kersey, Scott Louque, Scott Cadwallader, Susan Miller, Roz Readinger, Cathy Gable, Charles Edwards, and Ben Toman. Thank you all for your efforts!

We have an outreach request coming up in a couple of weeks. This one is again at the Bluebonnet Swamp and Nature Center and is for their 20th anniversary. They will be promoting it as FAE Fest which has to do with fairy folk. It sounds like a lot of fun and will be very nature oriented. We will once again be providing solar observing and information about light pollution and our club. Due to the longer hours, we could really use your help. We'll need 6-8 people at least, for shifts.

Saturday, May 13th

9am-5pm

FAE Fest

Bluebonnet Swamp and Nature Center

6-8 volunteers needed

solar observing, light pollution/club info

At this time, I will also put out the call for all of the library outreaches happening this Summer. Chris Kersey leads each of these, but he could always use an extra hand or two to assist whenever possible. We know it can be difficult for some to help out with these because they are on weekday afternoons, but if you have the kind of schedule that allows for it, we'd love to have you along.

Each of the following events takes place from 2:00pm-3:30pm

Wednesday, 31 May, Baker Community Library, 3501 Groom Road

Thursday, 1 June, Goodwood Library, 7711 Goodwood Boulevard

Monday, 5 June, Pride-Chaneyville Community Library, 13600 Pride-Port Hudson Road

Thursday, 8 June, Zachary Community Library, 1900 Church Street

Monday, 12 June, Greenwell Springs Regional Library, 11300 Greenwell Springs Road

Thursday, 15 June, River Center Community Library, 447 Third Street

Monday, 19 June, Fairwood Community Library, 12910 Old Hammond Highway

Thursday, 22 June, Jones Creek Regional Library, 6222 Jones Creek Road

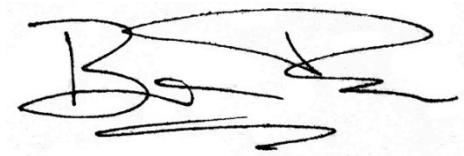
Monday, 26 June, Central Community Library, 11260 Joor Road

Thursday, 29 June, Delmont Gardens Community Library, 3351 Lorraine Street
Monday, 3 July, Scotlandville Community Library, 7373 Scenic Highway
Thursday, 6 July, Eden Park Community Library, 5131 Greenwell Springs Road
Monday, 10 July, Carver Community Library, 720 Terrace Street

Thursday, 13 July, Bluebonnet Regional Library, 9200 Bluebonnet Boulevard
As always, please think about coming out to help with one or more of these events. No experience is necessary. In fact, these kinds of outreach events are great ways to gain experience and learn more about astronomy yourself. If you'd like to help out, just let me know!

Clear Skies,
Ben Toman
Outreach Chairperson

Clear Skies,



Ben Toman
Outreach Coordinator



Pics from April Outreach Events

Zippity Zoo Fest
(Chris, Roz and Susan)



Sidewalk Astronomy at Perkins Rowe
(John, Ben, Scott L., Scott C.)





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 are on the agenda, including how to achieve in 2017 the goal of 200 GaN measurements that was *not* reached in 2016.

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.



Recent Entries in the BRAS Forum

Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 4600 posts.

John Glenn Buried at [Arlington](#)
Peggy Whitson Breaks Record for [Cumulative Days on ISS](#)
[Cassini's Grand Finale](#) Begins
[Saturn](#) Closes in on Sagittarius
Goldstone Radar Images [Asteroid 2014 JO25](#)
[Astrosystems Telekit](#) For Sale





BRAS's 20/20 Vision Campaign

GLOBE at Night: 17 to 26 May [Leo]

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.

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 28 April.



FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

5 May: “Moon Watching” Earth’s closest celestial neighbor yields a wealth of optical delights. Ten or so maria with the unaided eye; dozens of binocular features; and untold amounts of mountains, dome fields and “ghost craters” revealed by the telescope. This presentation provides a checklist of basic named lunar locations along with tips and tricks to track down each one!

12 May: “Constellation Learning” The standardization of the sky into eighty-eight distinct named areas occurred in the early twentieth century, but some of these sections have their origins in antiquity! Patrons will learn the constellations that grace the Baton Rouge sky and receive advice on sketching these areas as a memory tool.

19 May: “Meteor Searching” Many patrons who have visited HRPO for the Perseid and Geminid shower events have been bitten by the meteor bug! Happily there’s no need to wait for those strict time spans. This presentation provides a list of steps to take to increase the chance of spotting sporadic meteors, meteors associated with lesser showers...and even the visually-stunning fireballs!

26 May: “Reclaiming the Dark Sky” The last six months of the 20/20 Vision Campaign will climax with HRPO’s first Natural Sky Conference in November. This presentation will provide patrons with a set of tasks for helping the “major players” in town continue to understand and correct the problem.

SCIENCE ACADEMY

Saturdays from 10am to 12pm

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

6 May: “Galaxies”

13 May: “Constellations”

20 May: “Life Cycle of a Star”

27 May: “Expedition 5”

ONE-TIME CALLS FOR VOLUNTEERS

***Saturday 27 May, 7pm to 10pm.** *One or two volunteers.* **Evening Sky Viewing Plus.** Telescope operation, physical science demonstrations, front desk duty. Easy 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”. We are asking any members with the time to do so to assist. Thank you.





American Radio Relay League Field Day

Saturday, 24 June from 2pm to 10pm

No admission fee. For ages eight and older.

Answer to Riddle: In black socks!

The Baton Rouge Amateur Radio Club will take part in an exciting nationwide emergency exercise. Temporary stations will be set up at HRPO as BRARC joins similar clubs across the continent in an exciting emergency exercise. Some clubs use strictly battery power and solar power. Some clubs use low power outputs (five watts or less) to make contact with other stations all over North America. Field Day is a twenty-four-hour endurance session of skill and suspense.

The Amateur Radio Service, founded decades ago, is the original “social medium!” Ten of thousands of licensed hams—including high schoolers, college kids, parents and grandparents—communicate day after day from coast to coast.

What can people do in the Amateur Radio Service?

- Talk around the world without the Internet or cell phones.
- Send a message to another country using less electricity than a nightlight.
- Transmit your communication in code—Morse code!
- Speak to astronauts on the International Space Station.

What can adults do in the Amateur Radio Service?

- Earn various awards.
- Have more peace of mind knowing that, unlike the internet, federal law mandates sending identifying information during any communication.
- Increase the chances of their families having contact with the outside world during an emergency, simply by connecting radio equipment to a car battery.
- Collect weather and flight data from a launched balloon.

What can kids do in the Amateur Radio Service?

- Work toward specialized merit badges and patches.
- Steer radio-controlled cars and airplanes, or control robots, using ham-only frequencies.
- Keep a hand-held remote transceiver during camping trips.

Come learn more about amateur (or “ham”) radio at this fantastic annual event. Remember, if you like what you see at Field Day, there will be plenty of friendly “hams” around to tell you exactly what you need to do to obtain your own amateur radio license and start transmitting!

NOTE: At these times telescope viewing will take place...

*2:30pm to 4:30pm, The Sun (with safety equipment)

*8:15pm to 9:45pm, Jupiter (in twilight and darkness)

*8:45pm to 9:45pm, Saturn (mostly in twilight)

Also, spot The Summer Triangle after 9:30pm!





Observing Notes:

by John Nagle

Libra – The Scales

Position: RA 15 Hours, Dec. -15°

Named Named Stars:

Zuben el Genubi (Alpha Lib), “The Southern Claw”, also called “Kiffa Australis”, “the southern Pan of the scales”, is a binary star. **Alpha Lib¹**, mag. 5.15, 14 50 41.26 -15 59 49.5, is a white spectroscopic binary star with an orbital period of 5,870 days, and is separated from its companion by 0.383 arc seconds (10 au). **Alpha Lib²**, mag. 2.75, 14 50 52.78 -16 02 29.8, is a blue-white star and is also a spectroscopic binary separated from **Alpha Lib¹** by about 5,400 au. The star **KU Lib** might be a fifth component in the **Alpha Librae** system – it lies at a separation of 2.6° and shares a similar proper motion with the other components.

Zubeneschamali (Beta Lib), “The Northern Claw”, also called “Lanx Borealis”, “the northern pan of the scales”, mag. 2.61, 15 17 00.47 -09 22 58.3, is a blue-white dwarf star that shows a small, periodic variation in luminosity (0.03 magnitude), which indicates the presence of a companion star.

Zuben el Akrab (Gamma Lib), “Shears of the Scorpion”, mag. 3.91, 15 35 31.54 -14 47 22.4, is an orange giant star.

Zubin el Akribi (Delta Lib), “The Claws of the Scorpion”, mag. 4.91, 15 00 58.39 -08 31 08.2, is a blue-white eclipsing variable star with a period of 2 days, 8 hours with a minimum magnitude of 5.9, and a maximum magnitude of 4.9.

Zubin Hakrabi (Eta Lib), mag. 5.41, 15 44 04.42 -15 40 21.6.

Zubin Hakrabim (Nu Lib), mag. 5.19, 15 06 37.62 -16 15 24.3.

Brachium (Sigma Lib), “Arm”, or “Cornu”, “Horn”, or “Zubonalgubi”, “Southern Claw”, mag. 3.25, 15 04 04.26 -25 16 54.7, this star was previously designated as **Gamma Scorp** until 1851, when it was changed to **Sigma Lib**. It is a red giant star, and is a semi-regular variable star also.

Deep Sky:

There are no Messier Objects in Libra.

NGC 5897, Mel 132, H19-6=H8-6, mag. 8.4, 15 17.4 -21 01, 10' in size, has a low concentration of stars in a large, pretty faint, but very well resolved globular cluster. Located about 1.7° to the northwest of **Iota Librae**.

There are 9 IC, 40 NGC, 8 Herschel, and 2 Arp objects below magnitude 10 to magnitude 15. If you want the data, see me.

Other Stars:

Iota Lib (24 Lib), mag. 4.54, 15 12 13.31 -19 47 29.9. This is a complex multiple star. **Iota Lib¹** is a pair consisting of a blue-white sub-giant star at mag. 4.5, and a dwarf star, separation is 0.13 arc seconds with an orbital period of 23.469 years. The secondary star, **Iota Lib²**, has a magnitude of 9.5 and is a binary with two components at magnitudes 10 and 11, and a separation of about 1.9". Separation between 1 and 2 is 58.6". Separations: AB=8 au; CD=150 au; AB-CD=4600 au.



Mu Lib (7 Lib), mag. 5.32, 14 49 19.09 -14 08 56.3, is a binary star with the primary at mag. 5.7 and the secondary at mag. 6.8.

FX Lib (48 Lib), mag. 4.95, 15 58 11.38 -14 16 45.5, is a shell star – a blue supergiant star with irregular variations caused by an abnormally high speed rotation – this ejects gas from the star’s equator (rotational speed is some 240 miles/sec at the equator).

23 Lib, mag. 6.45, 15 13 28.93 – 25 18 33.0, is a yellow dwarf star with two planets in orbit.

HD 141937, Mag. 10.55, 15 19 26.82 -07 43 20.2, is a yellow dwarf star with one planet in orbit.

Gliese 570 (33 G Librae), mag. 6.79, is a triple star system. The primary is an orange dwarf star at mag. 6.79, and is an X-ray source. The other two are a pair of red dwarf binary stars, both emitting X-rays. In January of 2001, a brown dwarf star was discovered orbiting in the system. **Gliese 570** is located southwest of **Alpha Lib** and northwest of **Sigma Lib**.

Gliese 581 (HO Librae), mag. 10.55, 15 19 26.82 -07 43 20.2, is a red dwarf variable star, and has at least 6 planets in orbit. In November 2012, the **European Space Agency (ESA)** found a comet belt in the system with at least 10 times as many comets as our solar system. **Gliese 581** is located about 2° north of **Beta Librae**.

HD 140283, sometimes called **Methuselah**, mag. 7.223, is a very metal poor sub-giant star that is the oldest known star in the universe, believed to have been created shortly after the “**Big Bang**” – the star’s age is estimated to be 14.46 billion years old.

Sky Happenings: May 2017

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



- May 2nd -** **Mercury** is stationary at 9 AM CDT,
First Quarter Moon occurs at 9:47 PM CDT.
- May 4th -** The **Moon** passes 0. 5° south of **Regulus** at 5 AM CDT.
- May 5th/6th** The **Eta Aquarid** meteor shower peaks before dawn, and should be at its best before dawn on both days. Few or no **Aquarids** are visible for mid-northern latitudes.
- May 5th -** Dusk – **Mars** gleams 6° north of **Aldebaran**, low in the west-northwest.
- May 7th -** **Mars** passes 6° north of **Aldebaran** at 2 AM CDT,
The **Moon** passes 2° north of **Jupiter** at 4 PM CDT,
Mercury passes 2° south of **Uranus** at 6 PM CDT,
Night: Look for **Jupiter**’s yellow-white light about 3° to the right of the nearly full **Moon**. Blue-white **Spica** twinkles some 9° below or to the lower left of the pair.
- May 8th -** Asteroid **Juno** is stationary at 3 AM CDT.
- May 10th -** **Full Moon** occurs at 4:42 PM CDT.
- May 12th -** The **Moon** is at apogee (252,407 miles from **Earth**) at 2:51 PM CDT.
- May 13th -** The **Moon** passes 3° north of **Saturn** at 6 PM CDT.
- May 17th -** **Mercury** is at its greatest western elongation (26°) at 6 PM CDT.
- May 18th -** **Last Quarter Moon** occurs at 7:33 PM CDT,
Night: A double shadow transit occurs on **Jupiter** from 10:53 PM CDT to 11:43 PM CDT.
- May 20th -** The **Moon** passes 0.5° south of **Neptune** at 1 AM CDT.
- May 22nd -** Dawn: The waning crescent **Moon** hangs about 3° to 4° to the lower right of **Venus**,
The **Moon** passes 2° south of **Venus** at 8 AM CDT.
- May 23rd -** The **Moon** passes 4° south of **Uranus** at 12 Midnight CDT,
The **Moon** passes 1.6° south of **Mercury** at 8 AM CDT.
- May 25th -** **New Moon** occurs at 2:44 PM CDT,
The **Moon** is at perigee (221,958 miles from **Earth**) at 8:21 PM CDT,
Night: A double shadow transit occurs on **Jupiter** from 8:47 PM CDT to 10:20 PM CDT.

- May 26th** - The **Moon** passes 5° south of **Mars** at 9 PM CDT.
- May 29th** - Evening: Go out at dark to seek the waxing crescent **Moon** in the west. The **Beehive Cluster** (M44) sparkles about 3° to the **Moon**'s upper right.
- May 31st** - The **Moon** passes 0.3° south of **Regulus** at 12 Noon CDT,
Evening: The almost first quarter **Moon** is high in the southwest at sunset. As twilight deepens, look for the bright spark of **Regulus** 5° or 6° to the right of the **Moon**.
- June 1st** - **First Quarter Moon** occurs at 7:42 AM CDT.
- June 2nd** - **Venus** passes 1.8° south of **Uranus** at 10 AM CDT.
- June 3rd** - **Venus** is at greatest western elongation (46°) at 8 AM CDT,
The **Moon** passes 2° north of **Jupiter** at 7 PM CDT,
Night: A double shadow transit of **Jupiter** occurs from 9:22 PM CDT to 11:22 PM CDT.
- June 5th** - Dwarf planet **Ceres** is in conjunction with the **Sun** at 7 PM CDT.

Planets:

Mercury – **Mercury** is lost in the glare of sunrise until around the time of its May 17th greatest western elongation. **Mercury** then lies 26° west of the **Sun**, and climbs 4° high in the east a half-hour before sunup. **Mercury** will shine at magnitude 0.5 and will be tough to find with the naked eye, but will become easier to find late in the month as it brightens to magnitude -0.3, while maintaining its pre-dawn altitude.

Venus – **Venus** rises about two hours before the **Sun**. **Venus** is at its greatest morning brightness for the year (maximum illuminated extent) on April 30th and reaches greatest western elongation (46°) from the **Sun** on June 3rd. In early May, **Venus** is at magnitude -4.7, but will dim only 0.2 magnitudes to a still impressive -4.5 magnitude at the end of May. On May 1st, **Venus** shows an apparent diameter of 38" across and about ¼ illuminated. By May 31st, **Venus** will show a diameter of about 25" across and will be nearly ½ lit. On May 22nd, the **Moon** will slide 2° south of **Venus**. Due to the ecliptic tilting at a shallow angle to the horizon at spring sunrises, **Venus** will appear only about 23° high at sunrise, even as **Venus** nears greatest elongation.

Mars – **Mars** will appear slightly lower in the evening twilight each week, and the interval between sunset and **Mars**-set shrinks from just over two hours to about 1 hour and 20 minutes during May. **Mars** can be found in the western sky soon after the **Sun** goes down, glowing at magnitude 1.6 against the backdrop of **Taurus**. **Aldebaran**, **Alpha Taurii**, will shine at magnitude 1.1 at about 7° to the left of **Mars**. On the evening of May 6th, **Mars** will pass 6° due north of **Aldebaran**. **Mars** will appear as a featureless orange dot less than 4" across, and its magnitude dims from +1.6 to +1.7 during May. On the **American** evening of May 26th, **Mars** is 5° or 6° to the upper right of a very slender lunar crescent. That evening, binoculars will show **Mars** 10° high about ½ hour after sunset – look just a few degrees to the right, or upper right, of **Mars**, in the darkening sky to find the equally bright **Beta Taurii**. May is the last full month of 2017 that **Mars** is visible – it will be lost in the solar glare for almost the entire summer.

Jupiter – **Jupiter** dominates the evening sky. On May 1st, **Jupiter** stands 35° above the southeast horizon an hour after sundown, and does not set until morning twilight starts. **Jupiter** starts May at magnitude -2.4, and ends the month at only 0.1 magnitude lower, at -2.3. **Jupiter**'s apparent diameter shrinks from 43" to 41" during May. **Jupiter** spends the month of May among the background stars of **Virgo**, some 10° northwest of 1st magnitude **Spica**, but it will pull away from **Spica** over the course of the month, also moving away from the much dimmer **Theta Virginis** and closer to **Gamma Virginis** (the famous double star called **Porrima**). On May 7th, **Jupiter** will be 2° to the right of a bright gibbous **Moon**. **Jupiter**'s disk, at midmonth, will span 42". Typically, **Jupiter**'s four large moons appear in a straight line because all of them orbit in the planet's equatorial plane. But the planet currently tilts enough so that the two outer moons, **Ganymede** and **Callisto**, can appear oddly out



line. On the night of May 9th/10th, **Io**, **Ganymede**, and **Callisto** appear on a straight line angled some 40° to **Jupiter**'s equator. The closest alignment occurs between roughly midnight and 12:30 AM CDT. A telescope view in the early evening on this date will reveal only three satellites because the planet's shadow completely engulfs **Ganymede**. **Ganymede** will emerge from this eclipse at 9:55 PM CDT some 30" southeast of **Jupiter**'s limb. Also note that **Europa** is slightly west of **Jupiter**, and will pass behind the planet's limb at 10:45 PM CDT. Following the odd lineup of **Callisto**, **Ganymede**, and **Io**, **Callisto** coasts north of **Jupiter** while **Io** sets its sights on the planet's midsection. **Io** will cast a shadow on the planet's cloud tops starting at 2:03 AM CDT. Six minutes later, **Europa** exits **Jupiter**'s shadow some 20" off the southeastern limb. The night's final events come when **Io** leaves **Jupiter**'s disk at 3:58 AM CDT, followed by its shadow at 4:41 AM CDT. **Jupiter** will set in the eastern half of **North America** before the conclusion plays out. A fine double shadow transit occurs on the night of May 18th/19th. The event begins at 10:53 PM CDT, when **Io**'s shadow joins **Europa**'s, already making its way across **Jupiter**'s disk. Both shadows are visible for less than an hour – until 11:42 PM CDT, when **Europa**'s shadow slips off the planet's western limb. As the action gets underway, **Jupiter** is about 40° up from the horizon. On May 26th, the shadow of **Io** and **Europa** again transit **Jupiter**'s disk. This time the event lasts from 12:47 AM CDT to 2:19 AM CDT. Lastly, on the night of June 3rd, the larger shadow of **Ganymede** travels across **Jupiter** along with the shadow of **Io**. This double transit lasts from 9:21 PM CDT to 11:21 PM CDT.

Saturn – **Saturn** rises shortly before 11:30 PM local daylight time at the beginning of May and some two hours earlier by the end of the month. During May, **Saturn** will brighten from magnitude +0.3 to +0.1, with its globe growing slightly from 17.8" to 18.3" in equatorial diameter. The rings span 41" in their long axis, remaining virtually at their most open, 26° from edge on. **Saturn** starts May in **Sagittarius**, and drifts slowly westward, crossing into **Ophiuchus** on May 18th. You will see the **Trifid Nebula (M 20)** and its neighbor, the open star cluster **M21**, some 5° east of **Saturn**. The **Lagoon Nebula (M 8)** lies less than 2° south of these deep sky objects. Also look for the open cluster **M 23** about 5° northeast of **Saturn**. Avoid the mornings of May 13th and 14th, when a bright gibbous **Moon** passes a few degrees from **Saturn**. On May 9th, the moon **Iapetus** reaches a favorable greatest western elongation, when it stands 9' from **Saturn**. **Iapetus** then shines at 10th magnitude as its brightest hemisphere faces **Earth**. **Iapetus** fades slowly as it heads eastward along its 79 day orbit. On May 29th, **Iapetus** will glow at 11th magnitude when it passes 2' north of **Saturn**. Look for the moon **Titan** due north of **Saturn** on May 7th and 23rd, and due south on May 15th and 31st.

Uranus – **Venus** is a guide to **Uranus**. Wait until the end of May, when the two planets rise together, just as morning twilight begins. On May 31st, **Uranus**, at magnitude 5.9, lies 3° to the left of **Venus**. In a telescope, **Uranus** will show a 3.4" diameter disk.

Neptune – **Neptune** resides in **Aquarius**, and pokes above the eastern horizon around 3 AM local daylight time in mid-May. To find **Neptune**, find magnitude 3.8 **Lambda Aquarii**, and then scan 2.2° east-northeast to the 6th magnitude star **81 Aquarii**. **Neptune** spends the month within 20' of this star and passes 9' due south of it on the 14th. You will need a telescope to see **Neptune**'s 2.3" diameter disk.

Pluto – On May 15th, **Pluto**, at magnitude 14.2, will be at RA 19 21.8, Dec. -21 15, just west of the "steam" from the "Teapot" asterism in **Sagittarius**.

Moon – The waxing gibbous **Moon** is 3° to 4° to the right of **Regulus** on the evening of May 3rd. At nightfall on May 7th, the **Moon** beams about 3° to the lower left of **Jupiter** and 9° above **Spica**. The waning gibbous **Moon** shines 7° or 8° to the right of **Saturn** at dawn on May 13th, and 5° or 6° to the upper left of **Saturn** on May 14th. On the 22nd, the waning lunar crescent will be about 4° to the lower right of **Venus** at dawn, and will be below it the next morning. On May 26th, look in the evening twilight, the waxing lunar crescent bows to the lower right of **Mars**, very low in the west-southwest. That evening **Mars** is between **Beta** and **Zeta Taurii**, the horn tips of **Taurus**. On May 29th, the waxing lunar crescent hangs 3° to the lower left of **M 44**, the **Beehive Cluster**. On May 30th, the thicker **Moon** hangs 8° to the lower right of **Regulus**. By the next night, the first quarter **Moon** has moved 5° to the left of **Regulus**. Favorable librations: **Gauss Crater** on May 1st; **Mare Smythii** or



May 4th; **Boussingault Crater** on May 11th; and **Montes Cordillera** on May 18th.

Asteroids – Asteroid **4 Vesta** can be found by starting at **M 44** (the **Beehive Cluster**) in **Cancer**. Then slide north to magnitude 4.7 **Gamma Cancr**i, the brightest star close to the asteroid in May. **Vesta** reflects nearly 40% of the sunlight that strikes it, making it one of the shiniest asteroids in the solar system, and one of the brightest. **Vesta**, although now fading from its peak, still registers at 8th magnitude. During May's first week, **Vesta** plies the empty space between 6th magnitude stars **Psi** and **Lambda Cancr**i. In mid-May, **Vesta** glides just south of a zigzag line of stars anchored by magnitude 5.7 **Upsilon Cnc**. **Vesta** will outshine everything in its vicinity during the month's final week, so identifying it should be easy.

Comets – Comet **41P/Tuttle-Giacobini-Kresak** is perfectly placed for **Northern Hemisphere** observers this month. The comet remains visible from dusk to dawn as it slides southward through eastern **Hercules**. The comet appears in the vicinity of brilliant **Vega**. Astronomers expect **41P** could reach 6th magnitude in early May. The comet's brightest part should be slightly oval, yellow-white ball of gas and dust, known as the coma, or head. Look for a greenish gas trail extending from the coma. Comet **41P** should be a finalist for comet of the year, but if the nucleus cracks as it did in 2001, it may rank as the comet of the decade. On May 8th, **41P** will be about 2° west of **Theta Her**, and on the 17th about 1° to 1½° west of **Omicron Her**.

Comet **Johnson (C/2015V2)**, at 6th magnitude, treks south through eastern **Boötes** this month, and also remains in view all night. This first time visitor to the inner solar system should deliver a nice show for both visual observers and astro imagers as its tail transforms from a wedge shape into a knife-edged saber in a few weeks.

Comet **PANSTAARS (C/2015ER61)**, at 7th magnitude, lies low in the east before dawn, just a few degrees from **Venus**.

Meteor Showers – May's annual gift is the **Eta Aquariid** meteor shower, that peaks on the night of May 5th/6th, but it typically produces at least half of its maximum rate (50 meteors/hour) from May 3rd to 10th. Although the waxing gibbous **Moon** interferes this year, observers will have a clear shot once the **Moon** sets at around 4 AM local daylight time on May 6th and an hour earlier each day before then.

When to View the Planets:

Evening Sky

Mars (northwest)
Jupiter (southeast)

Midnight

Jupiter (southwest)
Saturn (southeast)

Morning Sky

Mercury (east)
Venus (east)
Saturn (southwest)
Uranus (east)
Neptune (southeast)

DARK SKY VIEWING • PRIMARY ON MAY 21, SECONDARY ON MAY 6



Mythology:

Libra – the Scales

In ancient Greek times, the one area of the sky we know as **Libra** was occupied by the claws of the scorpion, **Scorpius**. The Greeks called this area *Chelae* (Χηλαι), literally meaning ‘claws’, an identification that lives on in the names of the individual stars of **Libra**. As things have worked out, **Libra** is now a slightly larger constellation than **Scorpius**, but is much less conspicuous.

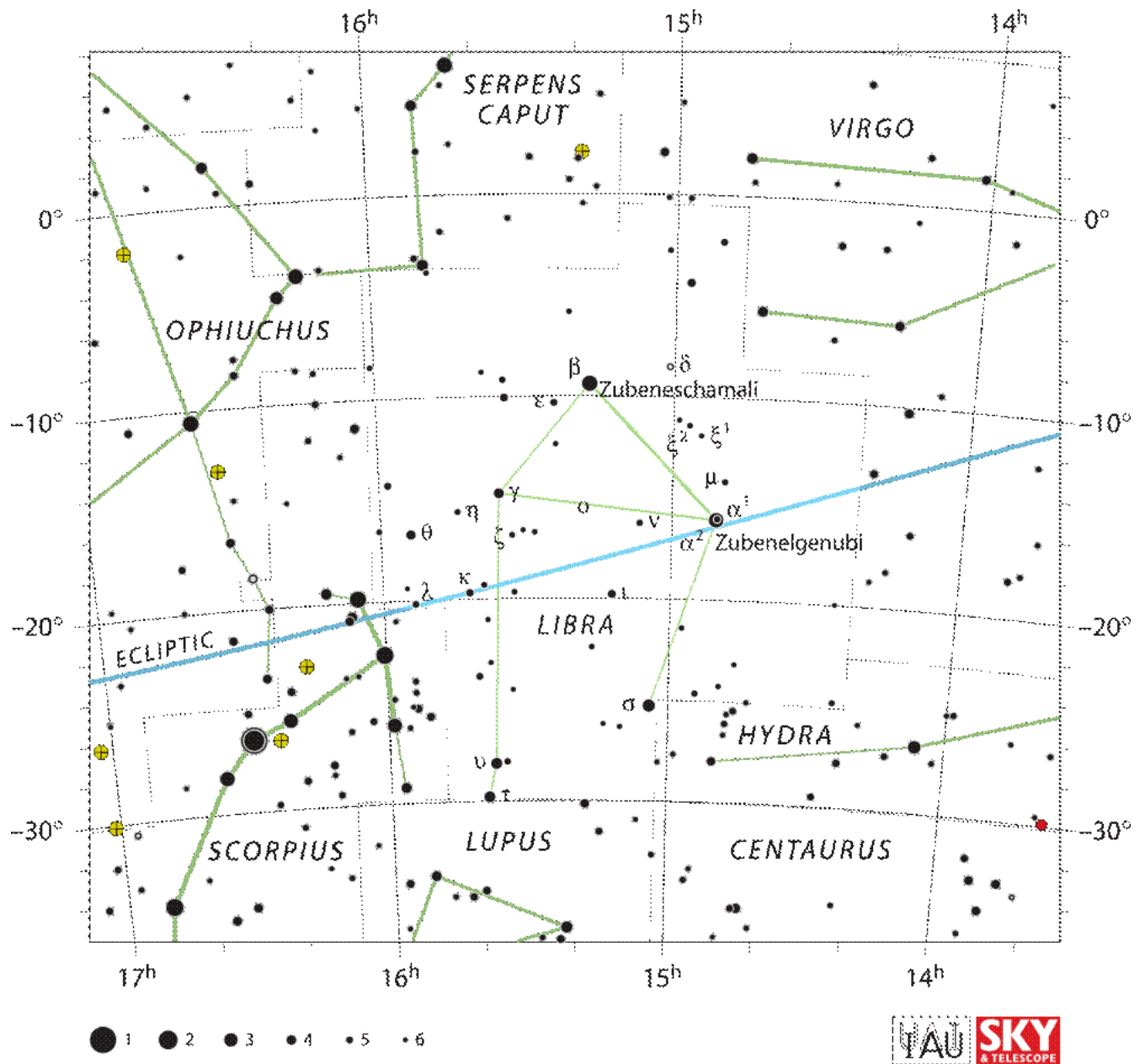


The identification of this area a ‘balance’ became established in the first century BC among the Romans, although exactly when it was introduced and by whom has been lost in the mists of history. Ptolemy, in the *Almagest*, written around 150 AD, continues to refer to this constellation as ‘the Claws’, preferring to follow Greek tradition even though it was by the superseded.

To the Romans, **Libra** was a favored constellation. The **Moon** was said to have been in **Libra** when Rome was founded. The Romans visualized the constellation as a balance because the **Sun** lay there at the autumn equinox, when day and night are equal. But the idea of a balance in this area did not originate with the Romans. The Babylonians knew this area as **ZIB.BA.AN.NA**, the balance of heaven, around 1000 BC. Hence it seems that the Romans revived a constellation that existed even before Greek times.

Libra is the one constellation of the zodiac to represent an inanimate object; the other 11 zodiacal constellations represent animals or mythological characters. Once the identification of **Libra** with a pair of scales became established, it was natural to divorce it entirely from **Scorpius** and to associate it instead with the other flanking zodiacal figure, **Virgo**, who was identified with **Nike** or **Astraea**, the goddess of justice. **Libra** thus became the scales of justice held aloft by the goddess.





The End

