

Night Visions

2019 April Issue

Newsletter of the Baton Rouge Astronomical Society

Monthly Meeting April 8th at 7PM at HRPO

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

Speaker: Merrill Hess will speak on "The life cycle of stars."

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President's Message

As we move into spring hopefully the run of cloudy nights we had this winter will end.

At the last meeting we finally did the drawing for the Meade ETX 90EC, which was won by Joel Tews. Congratulations and thanks to all who bought raffle tickets.

I would like take this moment to congratulate Coy Wagoner on being published in the March 2019 Reflector.

BRAS CRAWFISH BOIL There will be a crawfish boil on May 18, 2019 at the home of Michele and John. Club will provide the crawfish and trimmings, with side dishes by attendees. Put it on your calendar now, please. We will need a head count to know how many crawfish to buy. More details and a map will follow in next month's newsletter.



Raffle winner was Joel Tews

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

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

UPCOMING BRAS MEETINGS:

Light Pollution Committee - HRPO, Wednesday, April 3, 6:15 P.M.

Business Meeting – HRPO, Wednesday, April 3 7 P.M.

Monthly Meeting – HRPO, Monday, April 8, 7 P.M.

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

SALE: BRAS is having a surplus telescope/equipment.

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

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

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

BRAG: Check below for BRAG's scheduled meetings.

Clear Skies

A handwritten signature in black ink that reads "Steven M. Tilley".

Steven M. Tilley, President



Secretary's Summary of March Meeting

- President, Steven Tilley, calls the meeting to order at 7pm.
- 24 members in attendance.
- Steven thanks the club for attending the meeting and introduces Thomas Halligan as the Vice President Pro Temp.
- Thomas asked for programs ideas and if anyone has any to please see him.
- Steven gives the floor to Don Weinell for the monthly talk. The topic was “What is Science?” The talk went over fact vs truth and the scientific method.
- Steven thanked Don for giving the monthly talk.
- Merrill Hess takes the floor to discuss Spring Scrimmage. It will take place at White Horse Christian Retreat in Sandy Hook, MS just like the DSSG. The date has moved up to April 4-7th.
- Steven asks if there are any new members in attendance. One new member, Brian Fontenot, introduced himself.
- Coy Wagoner talked about his article in the March issue of Reflector on how social media can be used during outreaches.
- John Nagle gave Scott Cadwallander recognition for completing the NASA Observing Challenge-InSight and the Stellar Outreach awards.
- Raffle for the Meade ETX was held. The winner was Joel Tews. Consolation prize winners were Chris Desselles and Roslyn Readinger.
- Chris Kersey gave upcoming HRPO announcements.
- Meeting adjourned 7:58pm.

Submitted by Krista Reed, BRAS Secretary



Dinosaur Horror Movies

2019 Officers:

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

BRAS Liaison for BREC:

Chris Kersey

BRAS Liaison for LSU:

Greg Guzik

Committees/Coordinators:

Light Pollution:

John Nagle

Newsletter:

Michele Fry

Observing Notes:

John Nagle

Outreach:

Ben Toman

Webmaster:

Frederick Barnett



BRAS Outreach Report

Hi Everyone,

We had a few great outreaches this past month. First was the STEAM night at Westdale Heights Academic Magnet. I was unable to attend that one, but I heard there were a lot of interested kids and parents. We always have a great time there!

We also made it out to a STEM night at McKinley Middle Magnet and that was a great time, too. We were engaged with kids and parents the whole time. Unfortunately, that same night should have been Sidewalk Astronomy at Perkins Rowe. The weather forecast called for 80% or more cloud cover so we cancelled. Of course, it ended up being a pretty nice night. It's so hard to make those judgement calls. We certainly don't want to disappoint people, but at the same time we don't want to waste the time of our volunteers.

Fortunately, we were also able to have another great day at the Rockin' At The Swamp event. It was quite windy this year and our canopy even blew away a couple of times! The Sun decided to peek out from behind the clouds for a bit, though, so Chris R. was able to show off the Sun to some folks in addition to our collection of demos/displays.

We have more events on the horizon. (One is happening very soon!) Be sure to take a look at the list below and let me know ASAP if you can give us a hand. Come join in the fun!

Upcoming Outreach Events:

Sunday, April 7th ** NEED HELP ******

9:30am-5:00pm

Zippity Zoo Fest at Baton Rouge Zoo

Demos/exhibits and solar scopes

(6 or more volunteers needed for shifts throughout the day)

Tuesday, April 16th

7pm-9pm

Sidewalk Astronomy at Perkins Rowe

Thursday, April 25th

5:30pm-7:30pm

West Baton Rouge Parish Library's STEAM Fair

Demos/exhibits and possible telescope observing (maybe solar?)

(3 or more people needed)

Friday, May 10th

6pm-10pm

Hot Art Cool Nights at Mid City Maker's Market

Telescopes

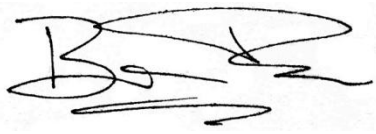
(3 or more people needed)

Tuesday, May 14th

7pm-9pm

Sidewalk Astronomy at Perkins Rowe

Clear skies,



Ben Tomen, Outreach Chairperson



Some Outreach Photos for March, by Ben



WHAM event.
Roz, Merrill and Craig working the demos



WHAM event.
Roz, Merrill, Chris and Craig working it!



Rockin' at the Swamp :
Craig, James and John showing off our wares



Rockin' at the Swamp:
Chris R. showing off the Sun!



BRAS Light Pollution Committee Report

This committee meets at 6:15, same day as the 7:00 BRAS Business Meeting
(normally on Wednesday before the Monthly Meeting)

Everyone is welcome to join in..

Meeting called to order by John Nagle
No new members, with 8 members in attendance
February minutes were published in newsletter

Old Business:

1. Reported that the front page of the new Dark Sky Advocacy web pages is now up with a link to it on the BRAS web page.
2. Discussed what else to put on the DSA pages. Some suggestions were definitions, such as light trespass, Glare, Bortle chart, links to other sites for the health aspects of light pollution, etc.

New Business:

1. Report on attending the Council District 8 public meeting with councilwoman Denise Amoroso, BRPD Chief, EBR Sheriff, representatives from Garbage and Recycling, and the Office of the Mayor/President, The Director of Transportation and Drainage for EBR Parish and the Director of the Planning Commission for EBR Parrish.
2. Discussed a light and environmental STEM kit "Turn on the Night"
3. Discussed Light Pollution with Christie Matherne of Country Roads Magazine – a future article (sometime in the summer).
4. Discussed what the LPC would do if the city of St. George incorporates.

Minutes of this meeting read and approved
Meeting adjourned.

Submitted by John Nagle, Chairman

P.S. Every year BRAS presents a Good Lighting Award to a company that uses BEST outdoor lighting practices. If you notice a business in EBRP that uses Full Cutoff lighting fixtures, please jot down and send their business name, address, date and description to me at jonagle@cox.net. This would be much appreciated.



Globe At Night

(report has been moved here (to LPC from HRPO))

**March 27th through April 5th, and April 25th through May 4th –
Leo is the constellation to be observed.**





BRAS Astrophotography Group (BRAG)

The Baton Rouge Astrophotography Group met Friday March 21 at Scott Louque’s house. Charles Genovese brought his 6” refractor and 8” SCT, Scott Cadwallander brought his 8” SCT, Chelsea Wall brought the 90mm SkyAlign and Scott Louque had his 6” reflector. Each one of us setup to image different objects but all ran into problems to start off. In the end Scott Cadwallander is the only one who managed to get an image of the Crab Nebula. For further information, contact me, Scott Louque, at slouque at att dot net.



Free The Milky Way Campaign

used to be the 20/20 Vision Campaign, recently renamed by the Light Pollution Committee.

This campaign’s goal was to raise the SQM measurement at HRPO’s back viewing pad to 20.0 by HRPO’s 20th anniversary. That date past, we decided to keep the effort going until the goal is reached, however long that takes.



Recent Entries in the BRAS Forum

Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 5800 posts.

[Deep South Spring Scrimmage](#) Dates Chosen
[G2 Activity](#) Brews on Sun

[Massive Twin Stars](#) Found Extremely Close Together
[Milky Way’s Mass](#) More Accurately Measured





Members' Corner

Here's where we feature articles and photos about BRAS members' astronomy-related accomplishments and adventures outside of BRAS activities (as if there were any spare time for such things!)
Send your contributions to Michele at newsletter@brastro.org

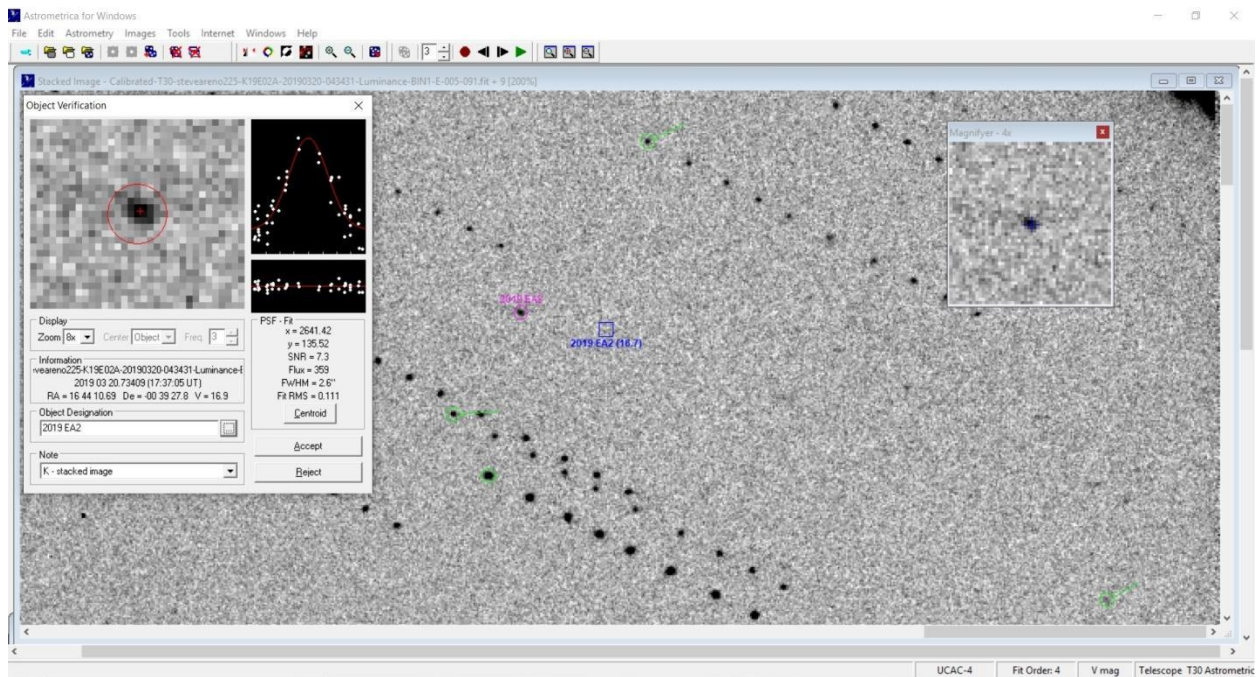
Flying "Rocks" and "Dirty Snowballs":

Asteroid and Comet News

April 2019

Volume 1. Issue 4.

One of asteroids that was covered by mainstream media was the NEO[Aten] 2019 EA2. This asteroid had Estimated Diameter of 18 m - 41 m suggesting it could be a little larger than the Chelyabinsk meteor. 2019 EA2 made a close approach on 2019-Mar-22 of 0.80(LD). Make this asteroids more for about eleven days is was listed on the risk Pages(NASA/JPL Sentry and NEODyS CLOMON2). With observations from around the World impacts over the next 100 year can be ruled out.



A Screenshot of Astrometrica - the NEO[Aten] 2019 EA2 on 2019-03-20 Siding Spring Observatory, Coonabarabran, NSW, Australia. (MPC Q62) a stack of 10-05 second luminance BIN2 images taken with iTelescope.net's (T30) by Steven M. Tilley



Another asteroid [still] in the news is 6478 Gault (1988 JC1). This is the asteroid that grew two comet like tails. In write up from the Institute for Astronomy at the University of Hawai'i at Mānoa "Hawai'i Team Catches Asteroid As It Self-Destructs" (http://www.ifa.hawaii.edu/info/press-releases/Gault_Mar2019/) states 6478 Gault spinning at "a two-hour rotation period" this could cause it to "break up"



The asteroid 6478 Gault with its comet like tails imaged with the NASA/ESA Hubble Space Telescope
Credit: NASA, ESA, K. Meech and J. Kleyana (University of Hawaii), O. Hainaut (European Southern Observatory)

(see <https://www.spacetelescope.org/images/heic1906a/>)

[JPL Close Approach Data](#) from February 26, 2019 to March 27, 2019 Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal LD (AU)	H (mag)	Estimated Diameter
(2019 EH1)	2019-Mar-01	0.06 (0.00016)	30.1	2.5 m - 5.7 m
(2019 EN2)	2019-Mar-13	0.86(0.00221)	27.6	8.0 m - 18 m
(2019 FA)	2019-Mar-16	0.60 (0.00154)	28.7	4.9 m - 11 m
(2019 EA2)	2019-Mar-22	0.80 (0.00205)	25.8	18 m - 41 m
(2019 FQ)	2019-Mar-23	0.86(0.00220)	27.1	10 m - 23 m

As of 2019-03-28 there is

789,069 discovered asteroids (MPC) <https://www.minorplanetcenter.net/>)

19,883 discovered Near-Earth Objects (MPC) <https://www.minorplanetcenter.net/>)

4,056 discovered Comets (MPC) <https://www.minorplanetcenter.net/>)

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

2,256 objects have been removed from Sentry(JPL) <https://cneos.jpl.nasa.gov/sentry/removed.html>)

For more information read Jon Giorgini's "Understanding Risk Pages" (

<http://www.hohmanntransfer.com/by/giorgjion.htm>) (i.e. "A risk-page listing is not a *prediction* of impact")

The following objects were removed from NASA JPL's Sentry: Earth Impact Monitoring list from 2019-02-24 to 2019-03-22

Object Designation	Removed (UTC)
2019 EA2	2019-03-21 14:47:15
2019 EW2	2019-03-21 14:41:07
2019 ET1	2019-03-17 15:47:30
2019 DW1	2019-03-11 15:29:48
2019 ED	2019-03-10 16:19:47
2019 CM4	2019-03-09 16:08:21
2019 CE4	2019-03-02 15:55:11
2019 DE	2019-02-28 15:55:42

Useful Links:

Guide to Minor Body Astrometry (<https://www.minorplanetcenter.net/iau/info/Astrometry.html>)

How Are Minor Planets Named? (<https://www.minorplanetcenter.net/iau/info/HowNamed.html>)

New- And Old-Style Minor Planet Designations (<https://www.minorplanetcenter.net/iau/info/OldDesDoc.html>)

The Tracking News

<http://www.hohmanntransfer.com/news.htm>

Accessible NEAs

<https://cneos.jpl.nasa.gov/nhats/intro.html>



<https://docs.google.com/document/d/1-xj5WOF4UHTYUVkyMnNBnO5LuxiRaeefZRUpxjkvajQ/edit?usp=sharing>





Messages from HRPO

Highland Road Park Observatory



SCIENCE ACADEMY

Saturdays from 10am to 12pm

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

6 April: “Spring Day”

13 April: “Maritime Engineering”

20 April: “Surveying the Earth”



FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

5 April: “Wonders of the [Spring Sky](#)” The temperature is mild as April’s constellations settle high overhead early in the night. HRPO Education Curator Amy Brouillette takes the audience on a fascinating tour of Baton Rouge's summer season. She highlights the celestial gems that will sparkle throughout the next three months—gems that visitors will be able to see live if they continue to visit HRPO!

12 April: “[Titanic](#)—Fire and Ice” Amy Brouillette returns with an update of her *Titanic* anniversary talk, presenting new data and information that sheds light on the infamous night .

26 April: “Insight into Apollo” In the midst of these celebrations, there are those around town with personal stories to tell. Baton Rouge Amateur Radio Club Treasurer Tom Harrell (KE5LVQ) provides a novice engineer’s perspective on the Apollo missions during this anniversary season.



SPECIAL SATURDAY PRESENTATION

13 April: “Skygazing—A Pursuer’s Guide” This special early lecture aimed toward students and families introduces the science hobby and outlines how print and online resources, and HRPO and B.R.A.S., can support a lifetime of intellectual and aesthetic fulfillment.

ONE-TIME CALLS FOR VOLUNTEERS

*Saturday 13 April, 7pm to 10pm. *Three or four volunteers.* **Evening Sky Viewing Plus.** Front desk greeting; physical science demonstrations; marshmallow roast; telescope operation. Low to moderate difficulty.

*Saturday 20 April, 12pm to 2pm. *Two or three volunteers.* **Solar Viewing.** Telescope operation for Sun viewing; front desk staffing. Moderate difficulty.

*Saturday 11 May, 3pm to 11pm. *Fifteen volunteers.* **International Astronomy Day.** HRPO's largest public offering. Front desk duty, telescope operation, physical science demonstrations, children's ride monitoring, relaying messages, welcome table. Low to high 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.

SPECIAL ALERT: DAYLIGHT TIME DISCUSSION

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



INTERNATIONAL ASTRONOMY DAY

Saturday 11 May from 3pm to 11pm

Thirteenth Consecutive Year!

Volunteers needed! HRPO will be calling!

RAFFLE TICKETS, \$5 EACH

EXPECTED EXHIBITORS...

American Institute of Aeronautics and Astronautics
Baton Rouge Amateur Radio Club
Baton Rouge Metropolitan Airport
Baton Rouge Mosquito Abatement
Baton Rouge Zoo
Bluebonnet Swamp Nature Center
Civil Air Patrol
LIGO
Saint Joseph's Academy

POTENTIAL RIDES...

18" Dry Slide
Spacewalk
Obstacle Course
Hamster Ball

OTHER...

Adventure Quest
Face Painting

Homemade Comet
Scope-on-a-Rope

Early volunteer sign-up is needed. It is extremely difficult to schedule a volunteer if that person reveals his availability with only two or three days to go. Sign-up now, please!



American Radio Relay League Field Day

Saturday 22 June from 2pm to 10pm

No admission fee. For ages eight and older.



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!





Observing Notes: April

by John Nagle

Cancer – The Crab

Position: RA 07 55 to 09 22, Dec. +33° to 6.4°

Note: For six years I have been writing these Observing Notes, featuring the 60 constellations we can see before midnight from Baton Rouge, that contain objects above magnitude 10. Beginning with the February 2019 newsletter, I began to recycle and update the constellations, but the Sky Happenings calendar and associated information will be new each month.

Named Stars

Acubens (Alpha Cnc), “Al Zubanah”, “Claws”, “Sertan”, “the Crab”, mag. 4.26, 08 58 29.20 +11 51 28.0, is a multiple star system. The primary is a close binary with both stars being white main sequence dwarf stars, with the primary at magnitude 4.25 and the companion at 12th magnitude. The two stars are separated by 0.1 arc second (5.3 au), and an orbital period of six years. The secondary star, at magnitude 11.8, is also a binary composed of two main sequence stars, most likely red dwarf stars that are separated by 10.5 arc seconds (600 au) and has an orbital period of 6300 years from the primary pair of stars.

Al Tarf (Beta Cnc), “The Eye”, mag. 3.53, 08 11 30.95 +09 11 08.4, is a binary star with the main component being an orange star, having two 14th magnitude companion stars. One is a red dwarf star at a separation of 29 arc seconds and an orbital period of 76,000 years, while the second star has a separation of 70 arc seconds from the primary star.

Asellus Borealis (Gamma Cnc), “The Northern Ass (Donkey)”, mag. 4.66, 08 43 17.21 +21 28 06.9, is a white hued sub-giant star.

Asellus Australis (Delta Cnc), “The Southern Ass (Donkey)”, mag. 3.94, 08 44 41.11 +18 09 17.5, is an orange hued giant star that holds the record for the longest name,

Arkūsharangarushashūtu, from the **Babylonian** meaning “the southeast star in the crab”.

Meleph (Epsilon Cnc), “Al Ma’laf”, “The Stall”, mag. 6.29, 08 40 27.03 +19 32 41.4. is in the **Beehive Cluster (M44)**.

Piautos (Lambda Cnc), mag. 5.92, 08 20 32.15 +24 01 32.15, a blue-white main sequence dwarf star.

Nahn (Xi Cnc), mag. 5.16, 09 09 21.53 +22 02 43.6, is a spectroscopic binary star. **Xi Cancrī A** is a yellow giant star at magnitude 5.16, and **Xi Cancrī B** – the companion star – has a separation of only 0.1 arc seconds, and an orbital period of 4.66 years.

Copernicus (Rho¹ Cnc), (**55 Cancrī**), mag. 5.96, 08 52 36.13 +28 19 53.0, is a binary star with five planets in orbit around it. The star was named in a competition held by the **IAU (International Astronomical Union)** in 2010. The double star is made up of a yellow main sequence dwarf star, and a 13th magnitude red dwarf star. The two are separated by 85 arc seconds. **Rho¹ Cancrī**, the primary star, has five planets in orbit, with the planet closest to the star is believed to be a terrestrial planet with a mass similar to **Neptune**, with the other four planets being gas giants. The secondary red dwarf star is also suspected to be a binary star. **Rho¹ Cancrī** is a rare “*super metal rich star*”. **55 Cancrī** is located 1.2° east-southeast of **Iota Cancrī**.



Deep Sky:

M44 (NGC 2632), “The Beehive Cluster”, “Praesepe”, “The Manger”, Cr 189, Mel 88, Raab 75, Lund 468, mag. 3.1, 08 40 24 +19 40 00, 1.7° in size, is an open cluster; detached, weak concentration of stars; moderate range in brightness; magnitude of brightest star is 6.3; very large, very bright.

Praesepe contains probably 1000 stars with more than half of them (63%) being red dwarf stars, and about 1/3 (30%) are Sun like. **Epsilon Cancri** is the brightest star in the cluster at magnitude 6.3. The cluster is estimated to be about 400 million years old. Near the center of the cluster is the multiple star system **HD 73710**. Two planets are found in the cluster; a **Jupiter** mass planet in orbit around the star **Praesepe 0201**, magnitude 10.3, 08 41 43.8 +20 13 36, with a 4.4 day orbital period; and **Praesepe 0211**, magnitude 12.2, 08 42 11.54 +19 16 37, mass of 1.84 times **Jupiter**, orbital period of 2.14 days. On the eastern edge of the cluster is **NGC 2647**, magnitude 14.3, 08 42 43 +19 39 02, 48” in size, 39’ from the center of the cluster.

M67 (NGC 2682, “King Cobra”, Cr 204, Mel 94, Raab 81. Lund 490, mag. 6.9, 08 51 18 +11 48 00, 25’ in size, is an open cluster of 500+ stars; detached, weak concentration of stars; moderate range in brightness; very bright, very large; magnitude of brightest star is 9.7. **M67** is believed to be one of the oldest of all galactic clusters, with the estimates being between 4 and 5 billion years of age. **M67** is located 1.8° west of **Alpha Cancri** and about 9° south of **M44**.

NGC 2775, **C48**, at mag. 10.4 is of interest. At RA 09 10 20.4, Dec +07 02 16.5, 4.3’x3.3’ in size, is also known as **PGC 25861**, **UGC 4820**, and **MCG 1-24-03**, is located about 4° northeast of **Zeta Hydrae**. It is part of the asterism making up the pentagonal head of the **Hydra**. It’s extremely smooth, elliptical-like bulge and its surround of tightly wound arms, which are made up of individual segments that can’t be traced for more than 20° to 30° around the disk. **NGC 2755** lies in a field of quasars, one of which (0907+072) is just 3.4’ south-southeast of the core of **NGC 2755**. There is also an X-ray source (**NGC 2775X4**) lying 3.5’ east-northeast of the core. **NGC 2775** is paired with **NGC 2777**.

Beyond magnitude 10 there are objects as follows: 125 NGC; 73 IC; 119 UGC; 97 MCG; 53 CGCG; 16 3C items; 8 ZwG; 8 Arp; 5 (CV98) items; 3 PNG; 4 Quasars; 2 Mrk; 2 Abell; 2 AGC; 2 HCG; 1 B2; 1 EGB; 1 Sal; 1 Cou; 1 Per; 1 NPM1G; 1 OJ; 2 S; 3 Flat Galaxies; 1 galaxy Trio; 3 Galaxy Super Clusters; and Tully’s Cancer-Leo Cloud (32 Galaxies).

Other Stars:

RS Cnc, mag. 6.04, 09 10 38.8 +30 57 47.6, is a *Technetium Star* (43 element is **Technetium**).

HD 73710, mag. 6.42, 08 40 22.11 +19 40 11.9, is a multiple star system in **M44 (Beehive Cluster)**.

Component **A**, magnitude 6.4; component **B¹**, magnitude 10.3 with a separation of 20.4” from **A**; component **B²**, magnitude 15.1 with a separation of 18” from **B¹**; component **C**, magnitude 7.6 with a separation of 63.4” from **A**; component **D**, magnitude 9.2 with a separation of 82.7” from **A**; and component **E**, magnitude 12.5 with a separation of 16.2” from **A**.

40 Cnc, mag. 6.61, 08 40 11.47 +19 58 16.2, is a **Blue Straggler** star in **M44 (Beehive Cluster)**.

HD 72490, mag. 7.8, 08 33 36.6 +13 33 03, has one planet in orbit.

HD 79498, mag. 8.03, 09 15 09 +23 22 32, has one planet in orbit with a separation of 3.13 au, and an orbital period of 1800 days.

HD 73534, mag. 8.24, 08 39 15.80 +12 57 37.3, has one planet in orbit.

HD 77065, mag. 8.8, 09 00 47.0 +21 27 13, has one planet in orbit.

HIP 41378, mag. 8.9, 08 26 28.0 +10 04 49, has five planets in orbit.

G9-38, 08 58 15.19 +19 45 47.1, is a flare star.

PSR B0823+26, 08 26 51.44 +26 37 22.8, is a pulsar.

Stars of interest beyond magnitude 10 are as follows:

HAT-P-31, mag. 11.66, 08 06 09 +26 25 36, has one transiting planet.

WASP-65, mag. 11.9, 08 53 18.04 +08 31 23, has one transiting planet.

HAT-P-43, mag. 13.36, 08 35 42.0 +10 12 24, has one transiting planet.



YBP 1194, mag.; 14.61, 08 51 00.81 +11 48 52.8, is a solar twin with 3 planets in orbit, and is in **M67**.
DW Cnc, mag. 17.5, 07 58 53.05 +16 16 45.2, is a dwarf nova star.
AZ Cnc, mag. 17.59, 08 40 29.75 +18 14 09.2, is a flare star.
GY Cnc, mag. 17.8, 09 09 50.55 +18 49 47.5, is a dwarf nova star and an eclipsing binary star.
Beyond magnitude 10 some of the stars are as follows: 22Σ; 30Σ; 3 OΣΣ; 1 β; and 1 A.

Sky Happenings: April, 2019

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

- April 1st** - The **Moon** passes 3° south of **Venus** at 11PM CDT.
April 2nd - **Mercury** passes 0.4° north of **Neptune** at 2 PM CDT,
The **Moon** passes 3° south of **Neptune** at 6 PM CDT,
The **Moon** passes 4° south of **Mercury** at 6 PM CDT.
April 5th - **New Moon** occurs at 3:50 AM CDT,
Asteroid **Iris** is at opposition at 4 AM CDT.
April 6th - The **Moon** passes 5° south of **Uranus** at 8 AM CDT.
April 8th - Dwarf planet **Ceres** is stationary at 4 PM CDT,
Evening: The waxing crescent **Moon**, **Aldebaran**, **Mars**, and the **Pleiades** form a diamond in **Taurus**.
April 9th - The **Moon** passes 5° south of **Mars** at 2 AM CDT,
Evening: The **Moon** has leapfrogged over **Aldebaran** and now sits some 5° above it,
Asteroid **Pallas** is at opposition at 8 PM CDT,
Venus passes 0.3° south of **Neptune** at 11 PM CDT.
April 10th - **Jupiter** is stationary at 12 Noon CDT.
April 11th - **Mercury** is at greatest western elongation (28°) at 3 PM CDT,
Evening: **Mars** approaches **Aldebaran** and will be less than 7° from it for the next seven nights.
April 12th - **First Quarter Moon** occurs at 2:06 PM CDT.
April 13th - Evening: The waxing gibbous **Moon**, in **Cancer**, is but 2° from the **Beehive (M44)**.
April 14th - Evening: The waxing **Moon**, in **Leo**, is about 5° from **Regulus**.
April 16th - **Mars** passes 7° north of **Aldebaran** at 5 PM CDT,
The **Moon** is at perigee (226,306 miles or 364,205 km from **Earth**) at 5:05 PM CDT.
April 17th - Dawn: **Mercury** and **Venus** are 4° apart low in the dawn sky.
April 18th - **Venus** is at aphelion.
April 19th - **Full Moon** occurs at 6:12 AM CDT.
April 22nd - Morning: The **Moon**, by the claws of **Scorpius**, is some 7° from **Antares**,
Uranus is in conjunction with the **Sun** at 6 PM CDT.
April 22nd/23rd - **Lyrid Meteor Shower** peaks. The full **Moon** will wash out the weaker meteors, reducing the amount of meteors seen.
April 23rd - The **Moon** passes 1.6° north of **Jupiter** in the predawn sky,
Night: The thinning **Moon**, retrograde **Jupiter**, and the star **51 Ophiuchi** form a tight triangle from when they rise shortly before midnight to sunup.
April 25th - **Pluto** is stationary at 4 AM CDT,
The **Moon** passes 0.4° south of **Saturn** at 9 AM CDT,
The **Moon** passes 0.07° north of **Pluto** at 3 PM CDT.
April 26th - **Last Quarter Moon** occurs at 5:18 PM CDT.
April 28th - The **Moon** is at apogee (251,396 miles or 464,582 km from **Earth**) at 1:20 PM CDT.
April 29th - **Saturn** is stationary at 9 PM CDT.
April 30th - The **Moon** passes 3° south of **Neptune** at 3 AM CDT.



Planets:

Mercury – As April opens, **Mercury** (shining at only magnitude +0.9) rises about an hour before the **Sun**, and as the month ends, only about 40 minutes before the **Sun** (**Mercury** will brighten to magnitude -0.3). **Mercury** reaches greatest western elongation (28°) from the **Sun** on April 11th. **Mercury** and **Venus** will both rise during morning twilight this month, but they are quite low in the east-southeast, with **Mercury** never higher than about 5° at civil twilight, with **Venus** rising first. On the 1st of April, the two planets are about 10° apart. The gap between them shrinks pretty rapidly, but **Mercury** will fall back towards the **Sun** before **Venus** can catch it and have a conjunction. On April 2nd, **Mercury** will have a close conjunction with **Neptune** – less than ½° separation. On April 16th, there will be a “quasi-conjunction” – a pairing of less than 5° separation that occurs without a true conjunction – the first between the planets in almost 3 years, when **Mercury** and **Venus** are 4.5° apart.

Venus – **Venus** remains in the waxing gibbous phase as it recedes from **Earth**. It remains low in the morning sky for **Northern Hemisphere** observers. **Venus** will rise before **Mercury** in the morning twilight, at magnitude -3.9, with a disk diameter of 12” across, and at 88% illuminated by month’s end.

Mars – **Mars** stands quite high in the west after darkness falls, in the star-studded backdrop of **Taurus**. The planet, at magnitude 1.5, treks eastward through the constellation during April. During the first week of the month, the planet is between the **Pleiades** and the **Hyades** star clusters. On April 1st, the planet will be 3° south of the **Pleiades** (M45), and some 3 times farther northwest of the V-shaped **Hyades**. A waxing crescent **Moon**, on the 12th, will be 6° south of **Mars**, and 8° west of **Aldebaran**. On the following night, a fatter crescent **Moon** will stand 6° east of **Aldebaran**. On the 16th, during the planet’s eastward march, it passes 7° due north of **Aldebaran** and transverses the open cluster **NGC 1746** on the 26th. By the end of April, the planet will form an isosceles triangle with **Beta** and **Zeta Taurii** (**The Bull’s Horns**). **Mars** will show a featureless disk of less than 5” in diameter all month, and does not set until after 11 PM local time all month.

Jupiter – **Jupiter** rises above the southeastern horizon shortly before 1:30 AM local daylight time in early April, and two hours earlier by month’s end. Gleaming at magnitude -2.3, it appears unmistakably against the backdrop of southern **Ophiuchus** and the central **Milky Way**. On April 10th, **Jupiter** will begin retrograde motion, at 6.5° west of the **Trifid Nebula** (M20) in **Sagittarius**. On April 23rd, the waning gibbous **Moon** passes within 2° of the planet. During the month, the planet’s disk will swell from 40” on the 1st to 43” on the 30th, with the magnitude increasing from -2.3 to -2.5. On April 2nd, double shadow transits start at 2:25 AM CDT, on the 9th at 4:19 AM CDT, on the 18th at 12:41 AM CDT, and on the 25th at 2:34 AM CDT. **Europa** has only one well-timed event in April - you can see its shadow first touch **Jupiter**’s clouds at 2:33 AM CDT on the 26th, with the moon itself starting a transit nearly two hours later. On the morning of the 12th, **Ganymede** will start to emerge from **Jupiter**’s shadow at 3:02 AM CDTR, but the moon is so large that it takes 15 minutes for it to return to full sunlight. The brightening dot will appear 22’ west-southwest of the planet’s limb at 5:43 AM CDT. You can see **Callisto** near the planet’s south pole on the 6th as **Jupiter** rises, and on the 14th around dawn. All the phenomena of **Jupiter**’s moons during April are listed on page 51 of the April issue of *Sky and Telescope*, and on pages 232 and 233 in the **USA Edition** of the *RASC Observers Handbook*.

Saturn – **Saturn** rises shortly after 3 AM local daylight time, in the southeast, on April 1st, and by the 30th it clears the horizon by 1:15 AM in the south-southeast. The planet will shine at magnitude 0.5 among the fainter background stars of eastern **Sagittarius**. On the 29th, **Saturn** begins retrograde motion. The ring system spans 38” and tilt at 24° to our line of sight in mid April, while the planet measures 17” across. The moon **Titan** shines at 8th magnitude, and can be found 1.1’ south of the planet on the 2nd and on the 18th, and 1.1’ north of the planet on the 10th and 26th. You can find a trio of 10th magnitude moons – **Tethys**, **Dione**, and **Rhea** – circle the planet inside of **Titan**’s orbit. You will need a four-inch or larger telescope to pick them out. Distant **Iapetus** will stand 1.1’ south of the planet on the 7th, glowing at 11th magnitude, brightening to 10th magnitude by the time it reaches greatest elongation on the 28th, when it will then be 9’ from the planet and will be harder to identify.

Uranus – Low in the west after sunset on the 1st of April, **Uranus** is set against the back ground stars of southern **Aries**, setting just as twilight fades into darkness. The planet, at magnitude 5.9, appears as a faint dot through binoculars or a telescope. **Uranus** will disappear from view after the first few days of April,

heading toward a conjunction with the **Sun** on the 22nd. The planet will return to view before dawn in late May.

Neptune – **Neptune** is just emerging from the solar glare at dawn in April. On the 2nd, **Mercury** will be 0.4° north of **Neptune** at 2 PM CDT, with the **Moon** passing 3° south of the planet at 6 PM CDT. On the 9th, the 8th magnitude planet will be 3° from **Venus** at 11 PM CDT. In the morning twilight of the 10th, both planets will be low in the east-southeast, standing about 7° high a half-hour before sunrise.

Pluto – **Pluto**, on April 15th, will be at the following co-ordinates: RA 19 38.9, Dec -21 46 (about 2° to 3° north of **Chi³ Sagittarii**), at magnitude 14.3 and having an angular size of 0.1”.

Moon – The **Moon**, a very thin waning crescent, is some 8° to the right of **Venus** on April 1st at dawn. On the 7th, the waxing lunar crescent is far below **Mars** and the **Pleiades** in the evening, but on the next night it will form a quite compact and almost equilateral triangle with **Mars** and the **Pleiades**. The **Moon** is 5° above **Aldebaran** on the 9th, and the waxing gibbous **Moon** is 5° to 6° from **Regulus** on the night of the 14th/15th. The waning gibbous **Moon** is 1° from **Jupiter** on the morning of April 23rd, and 2° to the lower right of **Saturn** on the morning of the 25th. *Favorable Librations:* **Pascal Crater** on the 2nd; **Hale Crater** on the 18th; **Helmholtz Crater** on the 19th; and **Lyot Crater** on the 20th.

Asteroids – Asteroid **2 Pallas**, at 8th magnitude, will be within 5° of magnitude 0.0 star **Arcturus** (in **Boötes**) this month. On April 9th, **Pallas** reaches opposition, and on the evening of the 10th it will pass just 2’ east of **Eta Bootis** – you should be able to detect its motion in as little as 30 minutes. **Pallas** will approach a wide pair of 9th magnitude stars on the 29th. Positions of **Pallas**, *by my estimates*, are as follows: on April 1st – about 3° east of **Nu Boo**; on the 6th – about 2½° east of **Tau Boo** (at about 23° above the eastern horizon around 9 PM LDT); on the 11th – about ½° north of **Eta Boo**; on the 16th – about 2° north-northwest of **Eta Boo**; on the 21st – about 1° west of **6 Boo**; on the 26th – about 2° northwest of **6 Boo**; and on May 1st – almost 3° to 3½° northwest of **6 Boo** (about ½° east of the **Boötes/Coma Berenices** border).

Asteroid **7 Iris**, with a diameter of 200 km, reaches opposition on April 5th, curling through northeast **Corvus**, headed toward **Virgo**. At opposition, **Iris** will shine at only magnitude 9.4, becoming visible to us in mid-evening, reaching an altitude of 20° in the southeast before 10 PM LDT, and is highest (around 35°) in the hour after midnight. **Iris**’s positions, by my estimates, are as follows: On April 4th – 1.6° to 1.8° east and a little south of the star **Σ 1699** (about 4° north-northeast of **Eta Crv**); on the 7th – just over 0.1° north of **Σ 1669**; on the 9th – about 1° due south of **M104** in **Virgo**; on the 14th – about 1.6° northwest of **Σ1669** or about 1° southwest of **M104**; on the 17th – about 1.7° due west of **M104**; on the 22nd – about 2.6° west-northwest of **M104**; and on the 29th – about 4° northwest of **M104**.

Comets – Comet **C/2017 M4 (Atlas)** is at 13th magnitude all month. A large telescope will be needed to find this comet. There is a fine comet imposter, **NGC 1931**, in **Auriga**. The nebula and the embedded star cluster is 1° west of the open cluster **M36**. At low power, **NGC 1931** looks remarkably like a comet. At about 200x, the comet’s head turns out to be four closely spaced stars embedded in a cocoon of pale light (**NGC 1931** is a reflection nebula).

Meteor Showers – The **Lyrid Meteor Shower** peaks on the night of April 22nd/23rd. Unfortunately, the **Moon** is just 3 days past full when the shower peaks, and will drown out fainter **Lyrids**. Lucky observers could see up to five meteors per hour.

When to View the Planets:

Evening Sky

Mars (west)
Uranus (west)

Midnight

Morning Sky

Mercury (east)
Venus (east)
Jupiter (south)
Saturn (east)
Neptune (east)



DARK SKY VIEWING · PRIMARY ON APRIL 6TH, SECONDARY ON APRIL 13TH

Mythology

Cancer – The Crab

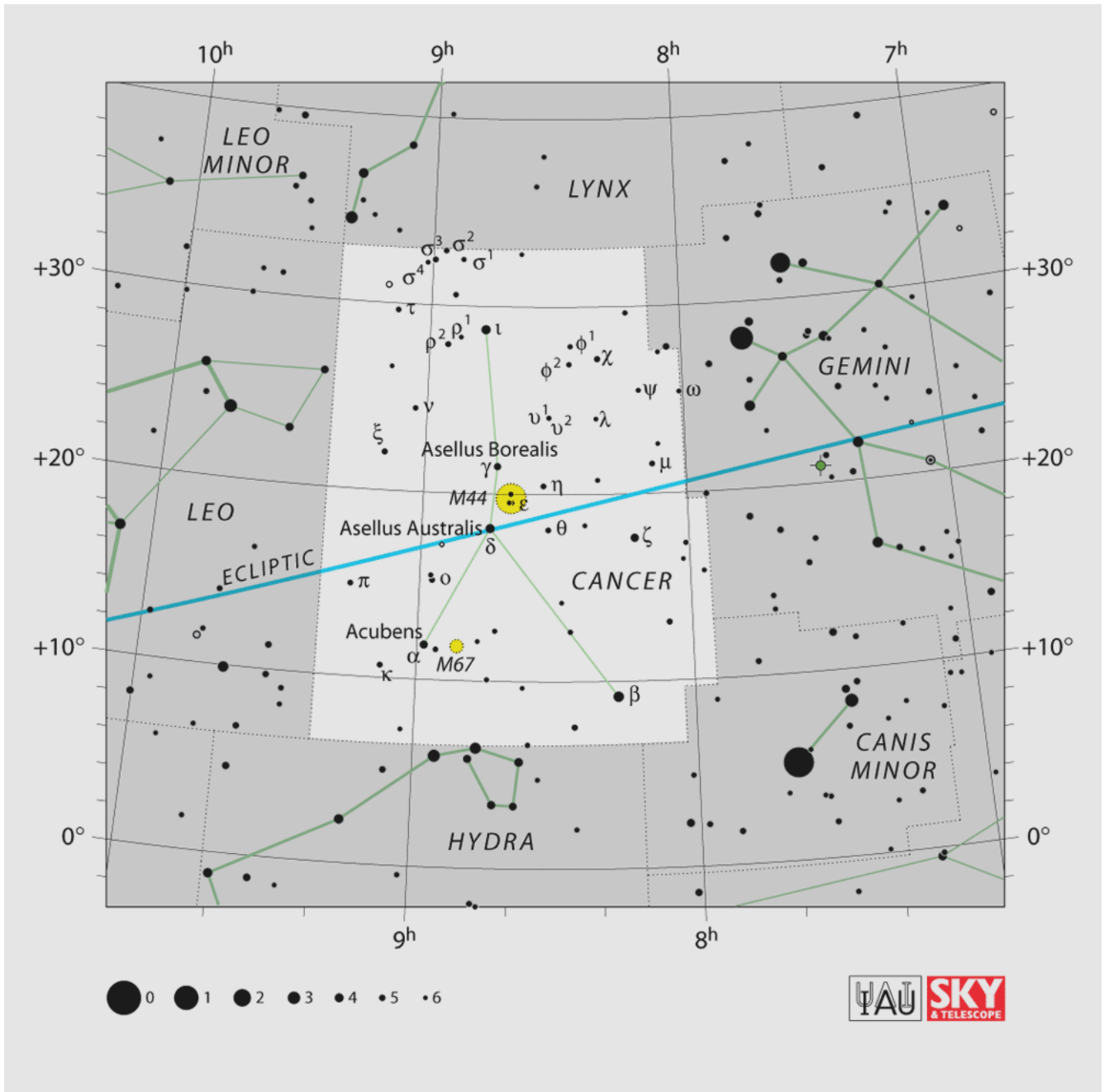
The Crab is a minor character in one of the **Labors of Heracles**. While **Heracles** was fighting the multi-headed **Hydra** in the swamp of **Lerno**, the crab emerged from the swamp and added its own attack by biting **Heracles** on the foot. **Heracles** angrily stamped on the crab, crushing it. For this modest contribution to history, we are told the goddess **Hera**, the enemy of **Heracles**, put the crab among the stars of the zodiac. Fittingly enough for such a small character, it is the faintest of the zodiacal constellations, with no star brighter than 4th magnitude. The star **Alpha Cancri** is named **Acubens**, from the Arabic meaning “*claw*”.

Two stars in the constellation are named **Asellus Borealis** and **Asellus Australis**. These are the **Latin** names, meaning the “*northern ass*” and the “*southern ass*”, and they have their own legend. According to **Eratosthenes**, during the battle between the gods and the giants that followed the overthrow of the **Titans**, the gods **Dionysus**, **Hephaestus**, and some companions came riding donkeys to join the fray. The giants had never heard the braying of donkeys before, and they took flight at the noise, thinking that some dreadful monster was about to be unleashed upon them. **Dionysus** put the asses

in the sky, on the either side of a cluster of stars which the Greeks called **Phatne**, the manger, from which the asses seem to be feeding. **Ptolemy** described **Phatne** as “the nebulous mass in the chest”. Astronomers now know this star cluster by the **Latin** name **Praesepe**, but it is popularly termed the “**Beehive**” (M44) – **Praesepe** can mean both manger and hive.

The **Tropic of Cancer** is the latitude on **Earth** at which the **Sun** appears overhead at noon on the summer solstice, June 21st. In the time of the ancient **Greeks**, the **Sun** lay among the stars of **Cancer** on that date, but the wobble of **Earth** on its axis, called *precession*, has moved the summer solstice to a point on the borders of **Gemini** and **Taurus**.





The End

