Newsletter of the Baton Rouge Astronomical Society

Next Meeting: Monday, June 14th at 7PM at HRPO

(2nd Mondays, Highland Road Park Observatory)

What's In This Issue?

President's Message

Summer is here, officially on June 20th at 5:54 PM CDT, the summer solstice, ushering in short nights. There will not be many night time outreach requests due to it not getting dark until 8 PM to 9 PM (thanks to Daylight Savings Time). There are a few outreach requests – June 4th at the LASM, and on June 11th and 15th in Bunkie, La., for a military kid's camp and with the National Guard. We need volunteers, so step up and volunteer.

At the May meeting, the Light Pollution Discussion Committee was approved to be a standing committee for BRAS. The committee needs a chairperson and a recorder/secretary for minutes of the meetings. Again, volunteers are needed.

Why volunteer for BRAS activities? It took me several years before I did any serious volunteering. I always volunteered for the annual "Learn to Use Your Telescope" classes, Galileo Telescope Night at Westdale Heights Academic Magnet School, International Astronomy Day (IAD), The Transit of Venus, The Transit of Mercury, and Earthday this year, and other Observatory/Bras events. The first "serious" volunteer work was becoming the "Observing Chairperson", writing the "Observing Notes" in the monthly newsletter "Night Visions", and I am halfway through my 4th year doing this. This year I am serving as President of Bras also.

BRAS cannot "carry on" like normal with just the same volunteers plus some occasional volunteers. We need "new Blood" with their new ideas and energy. Please volunteer for some of the open positions in BRAS, such as Outreach Chairperson – Ben Toman has been "acting chairperson" for more than a year, so let us give him a break, as mentioned above – Chairperson and Recorder/Secretary for the Light Pollution Committee. Volunteer for outreach requests, we have had to turn down some due to the lack of volunteers. Remember, BRAS is a non-profit organization. We need to go out more and educate the public on all aspects of Astronomy! Please, Volunteer!

BRAS owes a big "Thank You" to the IDA (International Darksky Association) for the light pollution banners they loaned us for IAD (International Astronomy Day) this year. We were able to obtain 3 of 6 different banners in their "loan" program. The IDA also loans/sells brochures, flyers, information cards, and also available are high-resolution downloads of the material so you can print your own. The IDA certifies, around the world, dark sky parks, preserves, and sites, relatively free of light pollution. BRAS will try to get banners again for major events at HRPO and major outreach events.

Thank You IDA!

Clear Skies,
John R. Nagle
President of BRAS
Observing Chairperson

Scattered throughout this newsletter are pictures of the 3 posters lent to BRAS by the IDA for display during our International Astronomy Day event.
Photos courtesy of Michele Fry

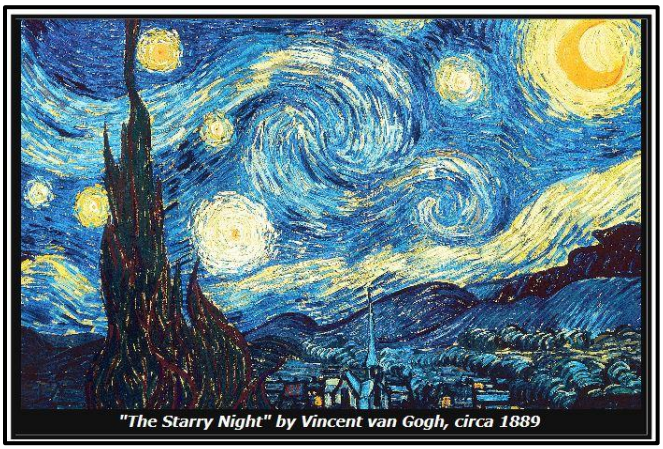
Secretary's Summary from May BRAS Meeting

John Nagle, presiding

- John started off by reminding everybody about International Astronomy Day on May 14th.
- John mentioned that Ben had requested to get the PA system going. Ben had found a wireless headset for $70 for this and was wondering if the club was interested. This passed with a show of hands.
- John's wife Michele has been compiling the newsletter for the club recently and was asking about a light pollution committee; John proposed that the current light pollution meeting become a light pollution committee. This was voted on and passed with a show of hands. A chairperson for this will be announced at a later date.
- At the Astronomical League website under Outreach, there is a 1st Time Telescope Certificate for kids. This is given at outreach events for kids who are looking through a telescope for the first time. John had a sample of this on the front table.
- John reminded everyone about the Transit of Mercury that had taken place earlier in the day. He had a list of the Astronomical League specifications to obtain the awards (pin and certificate) on the front table.
- Chris spoke briefly about the Transit of Mercury and then outlined some of the events and groups coming up for International Astronomy Day. He is expecting 600 – 900 people to show up for Saturday.
- John announced that the BRAS closet had been cleaned out; items looking for a home were arrayed on one of the side tables for anyone to pick up after the meeting.
- Christopher B. Johnson from LSU presented the lecture for the evening on "Variability of Optical Counterparts to Selected X-Ray Sources in the Galactic Bulge". This was based on his research for his doctor's dissertation.
- Brownies & coffee were the refreshments for the evening.
- People were encouraged to participate in raffle for International Astronomy Day.

Roslyn Readinger
BRAS Substitute Secretary

This space is reserved for the new **Light Pollution Committee Report**


"The Starry Night" by Vincent van Gogh, circa 1889


"Starry Night" by Alex Ruiz, digital painting, circa 2011?

BRAS Outreach Report

Greetings Everyone,

As if we haven't been busy enough over the last couple of weeks, the Summer is about to unload on us! Please take a look at the following list of requests. As you can see, we are in demand and we could use as many members as possible to help out so we can have a chance of meeting all of these requests. Remember, educational outreach is one of the reasons our club exists and is the reason we enjoy 501(c)3 status.

- **Dino Days :**This is coming up soon on **June 4th at the LASM (Louisiana Arts and Science Museum)**. It is a new event to help celebrate their newest visitor, the Triceratops skull.

- **Library:** There are also many appearances at several **local library branches this summer**. Chris Kersey has been doing these for a number of years and could always use a hand or two to help out.

- **KidCamps:** Also included are requests for outreach at the KidCamps events held at some local churches. Again, Chris Kersey will be at all of those and will need some additional help.

Please let me know if you are available to help out with any of these events.
No experience is necessary!! Also, each of these outreaches is 2 hours or more so will count toward the A.L. Outreach certificate if you are going for that.

Clear Skies
Ben Toman
BRAS Secretary,
Interim Outreach Coordinator

back

LIST OF REQUESTS:

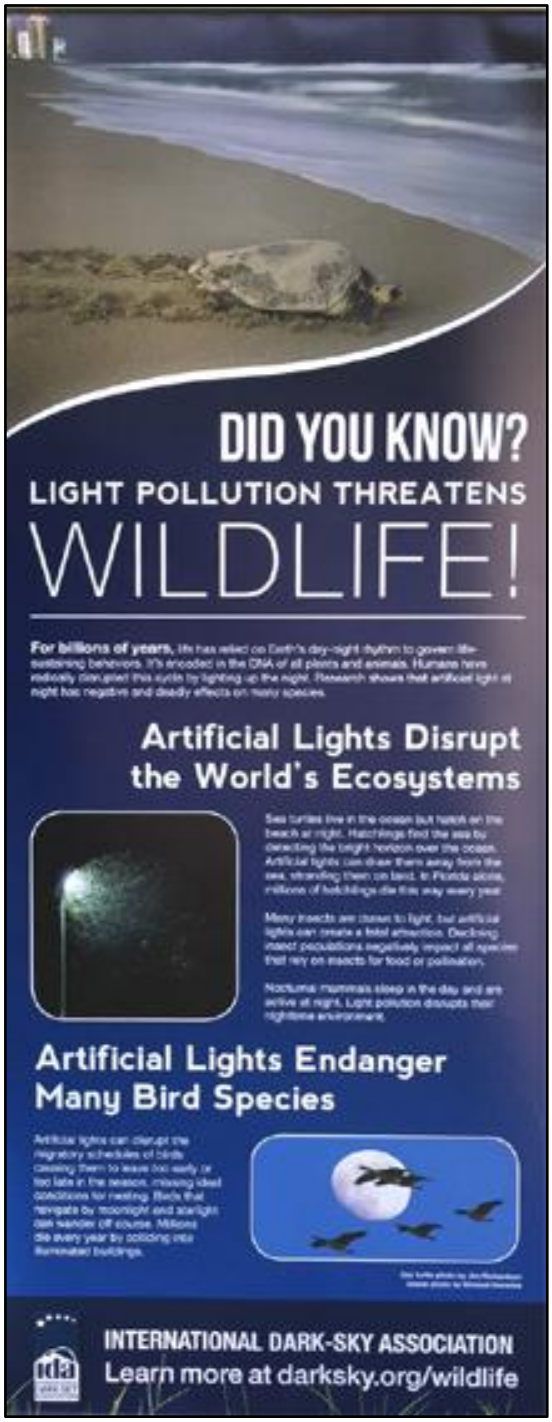
- **Saturday, June 4th, 10am-2pm**, Dino Days LASM- Baton Rouge
- Indoor event. Info/Demo table set up in the hall that has the planets hanging up.

- **Monday, 6 June (2pm to 4pm)**, EBR Main Library

- **Thursday, 9 June (2pm to 4pm),** Delmont Gardens Community Library

- **Monday, 13 June (2pm to 4pm**), Pride-Chaneyville Community Library

- **Monday, 20 June (2pm to 4pm),** Central Community Library
- **Thursday, 23 June (2pm to 4pm),** Bluebonnet Regional Library
- **Friday, 24 June (2pm to 4pm),** Eden Park Community Library
- **Monday, 27 June (2pm to 4pm),** Greenwell Springs Regional Library
- **Thursday, 30 June (2pm to 4pm),** Jones Creek Regional Library
- **Tuesday, 5 July (2pm to 4pm),** Baker Community Library
- **Wednesday, 6 July (2pm to 4pm**), Fairwood Community Library
- **Thursday, 7 July (2pm to 4pm),** Zachary Community Library
- **Monday, 11 July (2pm to 4pm),** Scotlandville Community Library
- **Thursday, 14 July (2pm to 4pm),** Carver Community Library
- **Monday, 18 July (1pm to 3pm),** St. Margaret Episcopal Church



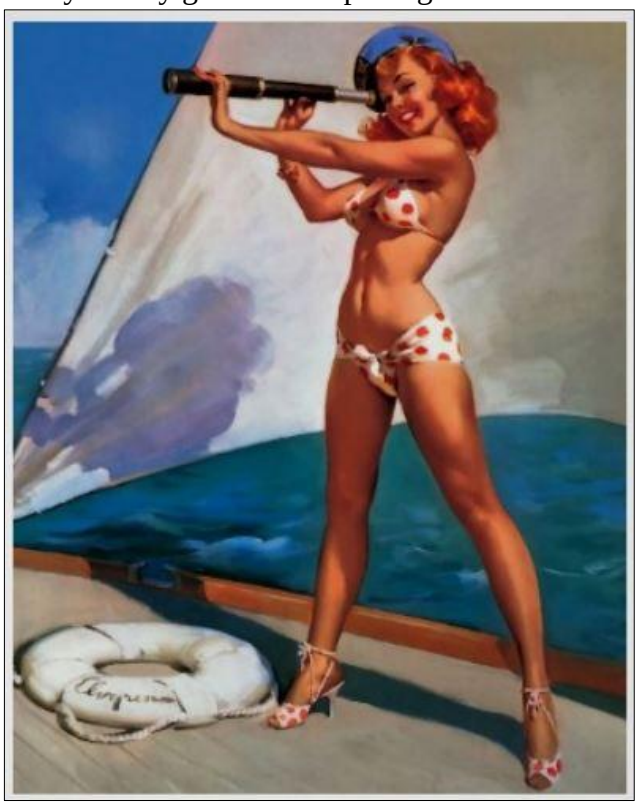
- **Wednesday, 20 July (10am to 12pm),** New Song United Methodist Church
- **Thursday, 21 July (1pm to 3pm),** First Baptist Church
- **Friday, 22 July (10am to 12pm),** Saint Paul Lutheran Church

Recent BRAS Event Summaries

Your BRAS event photos can go here. So

snap, snap, snap.

Or you may get some surprising filler material:



Got one or more BRAS event photos? Send them to newsletter@brastro.org, att'n Michele, with a caption, preferably by the 26th of the month for inclusion, (space permitting), in this newsletter. Cite photographer' credits too.

Recent Entries in the BRAS Forum

Below are selected recent additions.
There are also nine active polls.

Hindenburg Disaster Outlined at HRPO
"STEM in 30" Focuses on Kites
NASA Still Looking to Improve Spacesuits
RNASA Awards Presented for 2016
New Computational Research Facility Named for Katherine Johnson
Suggestion for Do-It-Yourself Light-Blocking Curtains
Coronado SolarMax II Used for HRPO Solar Viewing
HRPO Closed During Power Outage on 20/21 May
Winner Claims Orion 40th Anniversary XT8 Dobsonian
BRAS Member(?) Henry A. Obtains Jovian Moon Shadows
Mars Brightest in Eleven Years
June Great Red Spot Viewing Times Generated for Baton Rouge
Moon and Aldebaran Conjuncted on 5 May
At Least Two Geomagnetic Storms in Past Four Weeks
Solar Dynamics Observatory Records Transit of Mercury
Homemade Solar Projection Devices Best and Safest Solar Viewing
Roz Spots Eta Aquariid!
MARS Truck Now Ready to Roll

20/20 Vision Campaign

GLOBE at Night: 29 May to 7 June
2016 GOAL: 200 Measurements. CURRENT: 38

OBSERVATIONS NEEDED FOR SCHOOL PROJECT

BRAS is in the process of assisting a student at St. Joseph's Academy acquire raw data. She needs descriptions of views of five Messier objects—Pleiades, Orion Nebula, Andromeda Galaxy, Beehive Cluster, Whirlpool Galaxy—together with date and time, and the observing location's GaN measurement and quality of view. Parameters have been set defining whether each observation yields a poor, good or excellent view. An alert will also be sent out describing this exercise. The student needs very much this information with at least three sky views (different limiting magnitudes). The observation parameters for this project are as follows…

M45 [Pleiades] *Aperture: binocular. Magnification: 10x – 25x.*
Poor View: fifteen stars or fewer seen.
Good View: sixteen to twenty-nine stars seen.
Excellent View: thirty or more stars seen.
M44 [Beehive Cluster] *Aperture: 50mm – 70mm. Magnification: 10x – 25x.*
Poor View: indistinct blob seen.

Good View: at least ten distinct stars seen.
Excellent View: eleven or more distinct stars seen.
M31 [Andromeda Galaxy] *Aperture: at least 80mm. Magnification: 20x – 40x.*
Poor View: only core of the galaxy seen.
Good View: arms of the galaxy seen.
Excellent View: galaxy's companion (M32) seen.
M51 [Whirlpool Galaxy] *Aperture: at least 8". Magnification: 25x – 50x.*
Poor View: indistinct blob seen.
Good View: arms of the galaxy seen.
Excellent View: galaxy's companion (NGC 5195) seen.
M42 [Orion Nebula] *Aperture: at least 80mm. Magnification 60x – 100x.*
Poor View: only Trapezium (the four brightest stars) seen.
Good View: fifth star seen.
Excellent View: sixth star seen.
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.

back

LASTEST SQM MEASUREMENT FROM HRPO (SQM=Sky Quality Meter)

Between 9:25pm and 9:30pm on 3 May I took a triplet of measurements from HRPO's back viewing pad. The SQM mean was 18.67.

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Messages from HRPO

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

FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

3 June: "The Martian Mystique" The history, culture, imagination and science interwined with the Red Planet informs our society in a way no other celestial object does. This presentation is an overview of the place Mars holds in our lives. (Postponed from 27 May.)

10 June: "Gems and Minerals" The Baton Rouge Gem and Mineral Society wowed the public during International Astronomy Day, and now its giving its first Friday night presentation at HRPO!

17 June: "Cassini's Grand Finale" The lauded Cassini study of the Saturnian system has its days numbered, but it will not go gently! From now until about July of next year, Cassini will acquire some of the most important data in its thirteen years of action.

SCIENCE ACADEMY

Saturdays from 10am to 12pm
For ages eight to twelve. $5/$6 per child.

4 June: "Hot-Air Balloons"
11 June: "Kites and Parachutes"
18 June: "Helicopters and Airplanes"

ONE-TIME CALLS FOR VOLUNTEERS

***Saturday 25 June.** *Two or three volunteers.* **ARRL Field Day.** Telescope operation, physical science demonstrations. 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" to go around in preparation for ARRL Field Day. Finally, we would more than welcome any who can help for at least one or two hours anytime during Stargazers Camp. We are asking any BRAS volunteers with time to assist. Thank you.

back

AMERICAN RADIO RELAY LEAGUE FIELD DAY

Saturday, 25 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!

NOTE: There will be solar viewing from 2pm to 4pm, and evening sky viewing from 7:30pm to 10pm.

back

RECENT HRPO EVENTS

RESULTS OF TRANSIT OF MERCURY

Well, it was a bittersweet Monday the 9th. Tom, Wally, Craig, Jordan, Hayley, Barrow, Krista, Amy, Emily, John, Roz, Ben, Trey and Scott were very excited to view this rare event and share it with patrons but Mother Nature had other plans. Still, considering it was a work day and school day, and considering the (mostly) overcast skies, ninety-four visitors was a good number. Thanks to everyone who helped out. Until November 2019!

Visitor looking through Ben Tomen's 10" dob and club members Trey Anding (adjusting his scope) and Rory Bentley are in the background. You can also see the Solar System Demo provided by Night Sky Network, set up by the 16" scope dome (right rear).

Scott Louque with his scope (left), John Nagle's scope in the background, Ben Tomen's 10" dob (foreground), club members (and HRPO staff) Hayley Franklin and Jordan Cobbs in the background, and Barrow Leake with his Hydrogen Alpha solar scope in the forefront.

Photos and captions provided by Ben Tomen

"I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." ~ Sir Isaac Newton

RESULTS OF INTERNATIONAL ASTRONOMY DAY

This year's International Astronomy Day was a huge success, with **1155 patrons** visiting during the eight hours--the largest crowd in the ten-year history of the event. The sky stayed clear almost the entire time, allowing us to show the visitors the Sun, the Moon and Jupiter.

Thanks to the Baton Rouge Zoo, the Bluebonnet Swamp Nature Center, AIAA, LIGO, Metro Airport, SPS (with the MARS Truck), Gem and Mineral Society, Civil Air Patrol, Mosquito Abatement, EBRP Library, BR Amateur Radio Club, St. Joseph's Academy (with 3-D printer and robot), Dunham School (robot), Red Stick R/C Flying Club and Catholic High School (chemistry demo). Thanks to Brandon for neverending support, and Chelsea and Megan for the excellent promotion. Thanks to Angie, Lyle and BREC Maintenance for use and transport of the inflatables; thanks to BREC Electrical for the extra power. Thanks to P&E for use of the paint wheel and pacing wheel. Thanks to Mr. Jesse for the stage; members of our musical act Kitchen Session (with Rebekah on harp) actually said it was the best stage they had ever used. (And thanks to that band for the wonderful music. There were a lot of positive comments.) Thanks to 100.7 The Tiger for the ticket signup for Bayou Country Superfest. Thanks to City Gelato, Leila Lagniappe and Louisiana Lemonade for the tasty food.

Thanks to Stephanie for front desk work. Thanks to Tom, Amy, Emily, Jordan, Hayley and Justin; y'all are the hardest-working group in the park system. Thanks to Amanda from BREC HQ for a wonderful "fire-spinning" show; if you didn't see it you really missed something.

Thanks to the Baton Rouge Astronomical Society for the great raffle prizes (the winner of the 8" scope was very happy). Thanks to Charles, Krista, Roz, John, Thomas, Barrow, Scott, Trey specifically for the dozens of volunteer hours Saturday. Thanks to Merrill for the dome testing, and Briar for dome operation. Thanks to Mr. Craig for the comet making. Thanks to Ben for use of his personal tent (to cover the welcome table). Thanks to Apprentices Taylor C. and Henry W. for constant assistance. *Articles by Chris Kersey*

Please mark your calendars now:
the next **International Astronomy Day**
is **29 April 2017**, again from **3pm to 11pm**.

Observing Notes:

by John Nagle

Coma Berenices

Position: RA 12.76, Dec. +21.83°

Named Stars:

Diadem (Alpha Com), "Al Zafirah", "The Braid", represents the "gem" in the crown, mag. 4.32, 13 09 59.55 +17 31 44.8, is a binary star, both at mag. 5.1, and both are slightly yellow tinged, and both stars are in an orbital plane so close to **Earth's** line of sight – orbital tilt is 0.1° to line-of-sight. The binary stars have a period of 26 years, and a separation of 0.7 arc seconds.

There are no other named stars in Coma Berenices.

Deep Sky:

M 53 (NGC 5024), mag. 7.7, 13 12.9 +18 10, 12' in size, is a globular cluster, medium concentration of stars; a large, bright cluster. Brilliant mass of minute stars, blazing in the center. **NGC 5024** is paired with **NGC 5053**, which is less than 1° to the southeast and 1° northeast of **Alpha Com. M53** contains more than 45 variable stars.

M 64 (NGC 4826), "The Black Eye Galaxy", mag. 8.5, 12 56.7 +21 41, 9.3" x 5.4" in size, is a very bright, very large, and very elongated galaxy; extremely bright nucleus. Dark dust line (the black eye) is obvious on photographs but visually difficult in small telescopes. **M 64** is just over 1° northeast of **35 Comae**, or move 3° north and 3° west of **M 53.**

M 85 (NGC 4382), mag. 9.2, 12 25.4 +18 11, 7.1'x5.2' in size, is a very bright, round, and pretty large galaxy; extremely bright, diffuse nucleus. Paired with **NGC 4934**, and is a member of the **Virgo Galaxy Cluster. NGC 4394** is about 8' to the east of **M 85. M 85** is interacting with spiral galaxy **NGC 4394** and the elliptical galaxy **MCG-3-32-38.**

M 88 (NGC 4501), mag. 9.5, 12 32.04 +14 25, 6.9'x3.9' in size, is a bright, very large, and quite elongated galaxy; bright, very small nucleus. Two 12th magnitude stars touch the southeast extremity of the nebulous glow. **NGC 4501** has multiple spiral arms and has a super massive black hole in its center. **NGC 4501** is a member of the **Virgo Galaxy Cluster**.

M 91 (NGC 4548), mag. 10.2, 12 35.4 +14 30, 5.4'x4.4' in size, is a bright, large, and slightly elongated galaxy; bright, diffuse nucleus, with a central bar dimly visible. Paired with galaxy **NGC 4571**, and is a member of the **Virgo galaxy Cluster. M91** is 1° east and slightly north of **M 88**, and **M90** is about ¼° to the south-southeast. **NGC 4571** is just south of a distinct star about 30' away.

M 98 (NGC 4192), mag. 10.1, 12 13.8 +14 54, 9.5'x3.2' in size, is a bright, very large, and very elongated galaxy; very small, extremely bright nucleus. **M 98**, a member of the **Virgo Galaxy Cluster;** in a group with galaxies **NGC 4198** and **Holmberg 348c**. **M 98** is very hard to observe – keep the 5th magnitude star to the east (**6 Com)** out of the L.P. field. Averted vision is essential if any detail is to be made out. **M 99** is about 1.3° to the east-southeast, and **NGC 4237** is about 1° away, toward the northeast.

M 100 (NGC 4321), mag. 9.4, 12 22.9 +15 49, 6.9'x6.2' in size, is a pretty faint, very large, round, face on galaxy; very bright nucleus. **M 100** is paired with the galaxy **NGC 4312,** and is the brightest spiral galaxy in the **Virgo Galaxy Cluster.** Locate **M 84** and move 20' west and then 3° north to **M 100,** or move 2° south and ½° east to the 5th magnitude star **11 Com**. **M 100** is also located near the center of a large triangle formed by **M 85, M 88,** and **M 98. NGC 4323** is a satellite galaxy of **M 100.**
Coma Berenices Open Cluster (Melotte 111, Collinder 256), is an open cluster with about 80 stars of magnitudes 5 to 10, spanning 7.5° in the sky. The brightest star in the cluster is **12 Comae Berenices**, mag. 4.8, near **Gamma Com.**
Coma Cluster of Galaxies contains about 1000 large galaxies and 30,000 smaller ones. Brightest galaxies in the group are 13th magnitude **NGC 4889,** and **NGC 4874. NGC 4921** is the brightest spiral galaxy in the cluster.
NGC 5053, mag. 9.0, 13 16.5 +17 42, 8' in size, is a globular cluster with a low concentration of stars; pretty large, very faint, irregularly round. Stars are old and lack heavy elements.
NGC 4725, Best 31, mag. 9.4, 12 50.4 +25 30, 11.0'x7.9' in size, is a very bright, very large, and elongated galaxy; internal ring; very small, extremely bright nucleus. Paired with **NGC 4712.** Located 5.2° west-southwest of **Beta Comae** (mag. 4.26, 13 11 32.92 +27 52 33.7), with **NGC 4712** (mag. 13.1) just 12' west of **NGC 4725.**
NGC 4565, "Needle Galaxy", Caldwell 38, Best 30, mag. 9.6, 12 36.3 +25 59, 16.2'x2.8' in size, is a bright, extremely large, and extremely elongated galaxy; edge on. Located 3° southwest of **Gamma Comae. NGC 4559** is 2° to the north, and lies exactly above the **North Galactic Pole** (12 51 25 +27 07 48), 1° east of **17 Comae.**
NGC 4676, "The Mice", is two interacting galaxies at 12 46 10.2 +30 43 54.

Other Stars:

PG1247+26°, is the brightest quasar visible in **Coma Bernices.**
HD 112127, mag. 6.88, 12 53 55.75 +26 46 48.0, is a carbon star.
HD 114762, mag. 7.30, 13 12 19.74 +17 31 01.6, has one planet in orbit.
HD 107146, mag. 7.07, 12 19 06.50 +16 32 53.9, has a debris disk.
HD 108863, mag. 7.89, 12 30 20 +21 56 54, has one planet in orbit.
HD 116029, mag. 8.04, 13 20 40 +24 38 55, has one planet in orbit.
IN Com, mag. 8.70, 12 55 33.75 +25 53 30.6, is the central star of planetary nebula LoTr.
HD 108874, mag. 8.76, 12 30 26.88 +25 52 47.4, has two planets in orbit.

Interesting stars beyond mag. 10:

Feige 66, mag. 10.59, 12 37 23.52 +25 03 59.9, is a sub-dwarf star.
HZ 43, mag. 12.66, 13 16 21.85 +29 05 55.4, is a white dwarf/red dwarf binary system.
GD 153, mag. 13.35, 12 57 02.34 +22 01 52.7, is a white dwarf star.
HZ 21, mag. 14.69, 12 13 56.25 +32 56 31.4, is a white dwarf star.
GP Com, mag. 15.69, 13 05 42.43 +18 01 04.0, is an interacting binary white dwarf star.
RBS 1223, mag. 28.6, 13 08 48.7 +21 27 08, is a neutron star.
PSR B1237+25, 12 39 40.39 +24 53 49.9, is a pulsar star.

There are 61 more NGC galaxies and 2 other galaxies that are beyond mag. 10.

Sky Happenings:

back

June 1st– The **Moon** passes 2° south of **Uranus** at 9 AM CDT.
June 3rd- **Saturn in** is at opposition at 2 AM CDT in **Ophiuchus the Serpent bearer.**
The Moon passes 0.7° south of **Mercury** at 5 AM CDT,
The **Moon** is at perigee (224,402 miles from **Earth**) at 5:55 AM CDT.
June 4th- **New Moon** occurs at 10 PM CDT.

June 5th- **Mercury** is at greatest western elongation (24°) at 4 AM CDT, and very low in the morning sky.
June 6th- **Venus** is in superior conjunction with the **Sun** at 5 PM CDT.
June 9th- Evening – **Regulus** will be 7° above and to the left of the waxing crescent **Moon**.
June 10th- The **Moon** rests about halfway between **Regulus** and the distinctly brighter **Jupiter.**
June 11th- **Asteroid Flora** is at opposition at 7 AM CDT,
The **Moon** passes 1.5°south of **Jupiter** at 3 PM CDT,
The **Moon**, approaching 1st quarter, forms a triangle with **Jupiter** and a much dimmer **Sigma Leonis.**
June 12th- **First Quarter Moon** occurs at 3:10 AM CDT.
June 14th- **Neptune** is stationary at 3 AM CDT,
First magnitude **Spica** shines less than 5° below the waxing gibbous moon,
Neptune begins retrograde motion just ½° below **Lambda Aquarii.**
June 15th- The **Moon** is at apogee (251,670 miles from **Earth**) at 7 AM CDT.
June 16th- The waxing gibbous **Moon** is 7° above **Mars** in the evening sky.
June 17th/18th - All night – The **Moon, Saturn,** and **Mars** make a wide, flat triangle, with the longest side stretching about 18° to connect the two planets.
June 17th - The **Moon** passes 7° north of **Mars** at 5 AM CDT.
June 18th - **Asteroid Pallas** is stationary at 10 AM CDT,
The waxing gibbous **Moon** passes 3° north of **Saturn** at 7 PM CDT.
June 18th/19th - All night – The **Moon** and **Saturn** are 3° to 5° apart tonight. After dusk, look below and to the right of the pair to spot **Antares**, the super-giant star at the heart of **Scorpius.**
June 19th- **Mercury** passes 4° north of **Alderbaran** at 4 PM CDT.
June 20th - **Full Moon** occurs at 6:02 AM CDT,
Summer Solstice (official beginning of **Summer** in the **Northern Hemisphere**) occurs at 5:34 PM CDT.
June 25th - **Asteroid Juno** is stationary at 12 **Noon** CDT,
The **Moon** passes 1.2°north of **Neptune** at 8 PM CDT.
June 26th - Dwarf planet **Pluto** passes 2.7° due south of 2.9 magnitude **Pi Sagittarii**.
June 27th - **Last Quarter Moon** occurs at 1:19 PM CDT.
June 28th - **The Moon** passes 3° south of **Uranus** at 6 PM CDT.
June 30th - **Mars** is stationary at 3 AM CDT.

back

Planets:

Mercury – Mercury reaches greatest western elongation on June 5th, when it lies 24° west of the **Sun** and appears 6° high in the east ½ hour before sunrise. **Mercury** then shines at mag. 0.5, and shows up clearly through binoculars. **Mercury**'s visibility actually will improve a bit in the next couple of weeks as it maintains its predawn altitude but grows brighter. On June 15th, **Mercury** shines at mag. -0.3, bright enough to see with the naked eye under a haze-free sky. When viewed through a telescope, **Mercury** appears 7" in diameter and slightly more than half illuminated.

Venus – Venus is in superior conjunction with the **Sun** on June 6th (behind the **Sun**), and will not be visible until late July.

Jupiter – Jupiter dominates the southwest and western sky all evening in June. On June 1st, **Jupiter** stands halfway to the zenith as darkness falls, shining at mag. -2.1, and appears far brighter than the background stars of **Leo the Lion**. **Jupiter**'s setting time back tracks from around 2 AM local daylight time on June 1st, and some two hours earlier (about 12 midnight local daylight time) on June 30th. **Jupiter** reaches eastern quadrature (90° east of the **Sun**) on June 4th. ***Callisto***, the outermost **Galilean** moon, crosses in front of **Jupiter**'s north polar region twice this month. **North American** observers get a good view of the June 8th transit, which begins at 10:02 PM CDT. About 90 minutes later, ***Callisto*** appears half-way across **Jupiter**'s disk, with the transit ending at 1:15 AM CDT on June 9th. On the night of June13th/14th, two of **Jupiter**'s moons, ***Io*** and ***Ganymede***, will disappear behind **Jupiter** within minutes of each other. Early in the

evening, you will see ***Io*** and ***Ganymede*** near **Jupiter**'s western limb**.** ***Ganymede*** disappears at 11:35 PM CDT on June 13th, with ***Io*** following 10 minutes later at 11:45 PM CDT.

Saturn – Saturn reaches opposition on June 3rd, glowing at mag. 0.0 in southern **Ophiuchus the Serpent Bearer**. **Saturn** lies low in the southeast after sunset, and remains visible all night, peaking some 30° above the southern horizon around 1 AM local daylight time. At opposition on June 3rd, **Saturn** appears biggest through a telescope with the ring system spanning 42"; more than double the 18" diameter of **Saturn**'s disk. The rings have a tilt of 26° to our line of sight. **Saturn**'s biggest and brightest moon, 8th magnitude ***Titan***, changes position from night to night as it follows its 16-day orbit around **Saturn**. You can find ***Titan*** due north of **Saturn** on June 5th and 21st, and due south on June 13th and 29th. Closer in than ***Titan*** lies a trio of 10th magnitude moons – ***Tethys, Dione, and Rhea*** – that all take less than five days to complete an orbit. On June 22nd, the three moons line up northwest of **Saturn**. Distant moon ***Iapetus*** glows at 11th magnitude when it passes 2.1' south of **Saturn** on the night of June 1st/2nd. ***Iapetus*** brightens almost a full magnitude by the time it reaches greatest western elongation on June 21st/22nd, when ***Iapetus*** then lies 9' from **Saturn** – don't confuse it with the 6th magnitude field star **SAO 184541**, which will appear between the moon and **Saturn**. Much closer to **Saturn**, and very faint at 12th magnitude, is the icy moon ***Enceladus***. The brilliance of **Saturn**'s rings typically drowns out this satellite. The best time to look for it is when it lies near greatest elongation, as it conveniently does the night of opposition.

Uranus – Uranus rises after 3 AM local daylight time on June 1st, but it barely climbs a few degrees high before twilight starts to interfere. It is better to wait until late in the month to track it down. On June 30th, **Uranus** stands nearly 25° high in the east as dawn starts to paint the sky. **Uranus** lies in a sparse region of **Pisces the Fish**, some 4° west of 4th magnitude **Omicron Piscium**. Don't confuse 5.9 magnitude **Uranus** with a handful of similarly bright stars nearby. To confirm a sighting, use a telescope to see the 3.4" disk glowing a distinctly blue-green.

Neptune – You will have to wait until after midnight to see **Neptune,** which rises around 2 AM local daylight time on June 1st, and some two hours earlier (about midnight) by month's end. **Neptune** nestles comfortably next to 4th magnitude **Lambda Aquarii**, at magnitude 7.9 and only 0.5° away from the star. **Neptune** remains here all month, reaching its stationary point on June 14th. A telescope nicely shows **Neptune**'s distinct blue-grey color, and at a magnification of 150 or more, you will see a 2.3" diameter disk that confirms it as a planet.

Pluto – Pluto passes close to a 3rd magnitude star that will guide you right to the spot. On the evening of June 26th, **Pluto** will stand 2.7' due south of **Pi Sagittarii**. At magnitude 14.1, **Pluto** is a challenging object, barely visible through an 8-inch telescope under a clear, dark sky.

Sun – The **Sun** arrives at the **Summer Solstice** at 5:34 PM CDT on June 20th, marking the beginning of **Summer** in the **Northern Hemisphere** and **Winter** in the **Southern Hemisphere**.

Moon – The **Moon**, with dim **Mercury** just above it, is a thin crescent a few degrees above the horizon 30 minutes before sunrise on June 3rd. The **First Quarter Moon** shines to the left of **Jupiter** on the evening of June 11th. On the evening of June 14th, the waxing gibbous **Moon** is above **Spica.** On June 16th, the **Moon** is well above **Mars**, and on the next evening is about equidistant (but pretty distant indeed) from **Mars** and **Saturn**. On June 18th, the **Moon** is to the left or upper left of **Saturn**.

Asteroids **–** Two asteroids, **7 Iris** and **8 Flora**, shine as bright as 10th magnitude, and both lie in front of the **Milky Way**'s center. Slightly fainter asteroid **10 Hygeia** is less difficult to spot, residing against the galaxy's outer fringes near **Leo the Lion/ Virgo the Virgin** border. Around June 20th/21st, **10 Hygeia** will be about 1° south of 4th magnitude star **Upsilon Leonis**. With a diameter of 275 miles, **10 Hygeia** is the 4th largest object in the asteroid belt, and reflects only 7% of the sunlight hitting it.

Comets **– Comet Panstarrs (C/2013 X1)** should glow at 7th or 8th magnitude this month, bringing it within range of binoculars for observers in the southern **United States**. The comet appears low in the eastern sky about an hour before dawn. Viewing during the second half of the month will have interference from the glare of the **Moon**. Mark your calendar for Saturday morning, June 4th, when the comet's tails graze the **Helix Nebula (NGC 7293, 22 29.60 -20 48).** In the evening hours in June, you

can test your mettle with a couple of 11th or 12th magnitude possibilities. Check out **Comet 81P/Wild** as it closes in on the **Beehive Cluster (M 44)**, and **Comet 9P/Tempel** as it crosses **Virgo the Virgin**'s face.

Meteor Showers – The shorter nights around the **Summer Solstice** are bereft of any major meteor showers. Although several minor showers **(June Rho Cygnids, Northern June Aquilids, Delta Piscids, June Iota Pegasids, Sigma Capricornids, F Ophiuchids, or Pi Piscids)** populate these June nights, none generates more than a couple of "shooting stars" per hour. The best time to view these is in the early morning.

back

When to View the Planets:

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

DARK SKY VIEWING - PRIMARY ON JUNE 4TH, SECONDARY ON JUNE 11TH

Mythology:

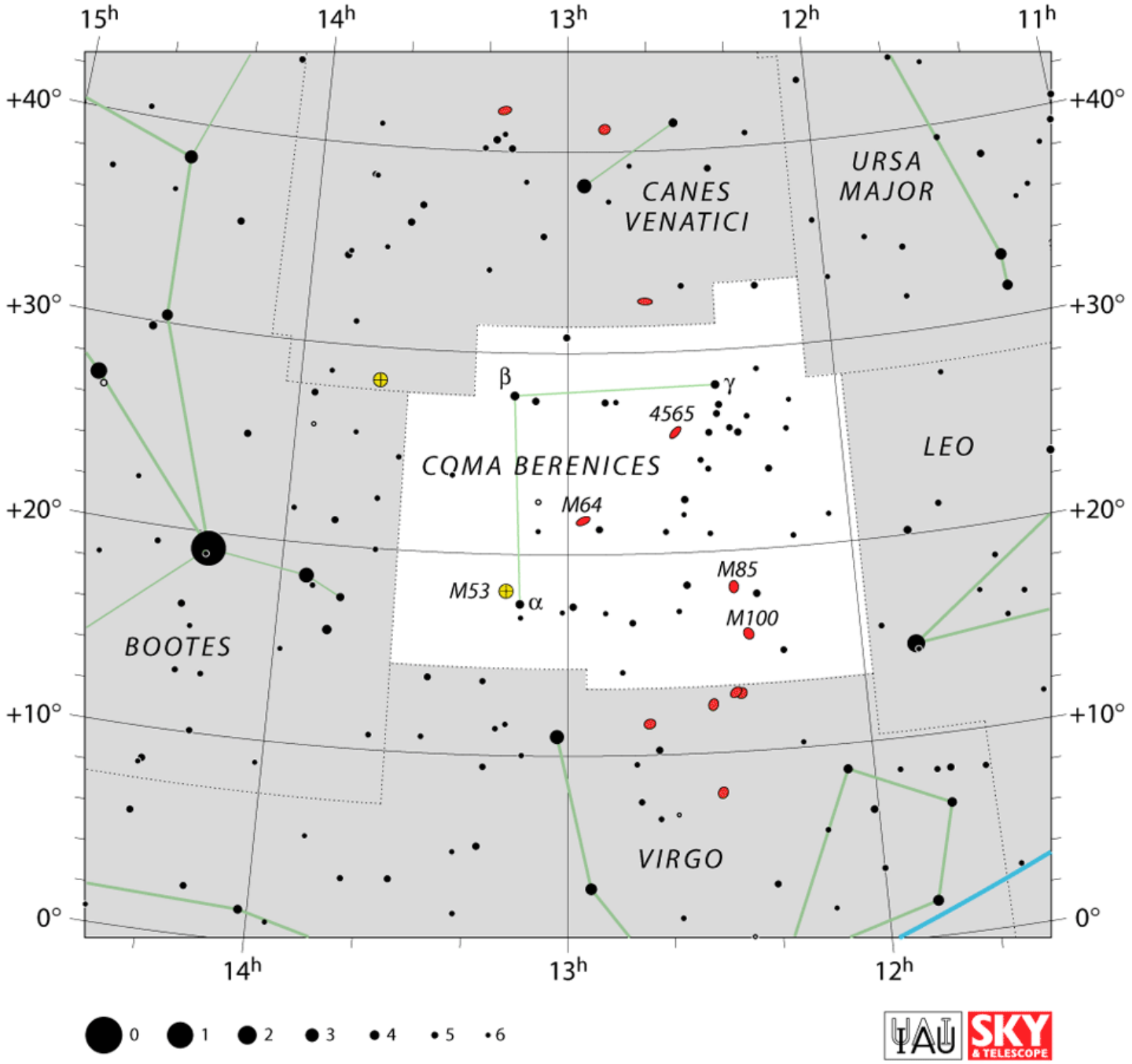
Coma Berenices – Berenice's Hair

Between Boötes and Leo lies an attractive little swarm of stars that was known to the Greeks, but was not classified by them as a separate constellation, being considered a part of Leo. Eratosthenes referred to it as the hair of Ariadne under his entry on the Northern Crown (Corona Borealis), but under Leo he said it was the hair of Queen Berenice of Egypt, as we know it today. Ptolemy referred to these stars as "a nebulous mass, called the lock" (i.e. of hair) in his Almagest of AD 150, but the group was officially made into a separate constellation in 1551 by the Dutch cartographer Gerardus Mercator, and in 1602 Tycho Brahe included it in his influential star catalog.

Berenice was a real person who, in the third century BC, married her brother, Ptolemy III Euergetes, as was the tradition of the Egyptian royal family. Berenice was reputedly a great horsewoman who had already distinguished herself in battle. Hyginus, who deals with the star group under Leo in his "Poetic Astronomy", tells the following story. It seems that a few days after their marriage, Ptolemy set out to attack Asia. Berenice vowed that if he returned victorious, she would cut off her hair in gratitude to the gods. On Ptolemy's safe return, the relieved Berenice carried out her promise and placed her hair in the temple dedicated to her mother Arsinoe (identified, after her death, with Aphrodite) at Zephyrium, near the modern Aswan. But the following day the tresses were missing. What really happened to them is not recorded, but Conon of Samos, a mathematician and astronomer who worked at Alexandria, pointed out that the group of stars near the tail of the Lion, telling the King that the hair of Berenice had gone to join the constellations.

Coin from 3rd Century, Berenice II, British Museum)

back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4565
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