

Newsletter of the Baton Rouge Astronomical Society



March, 2015

Next Meeting: March 9th at 7PM at the HRPO



Hodges Gardens Star Party coming up March 18-22. Click on image for more info. Image by Jerry Lodriguss.

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President's Message

We are entering our Spring star party season for Louisiana. We have Hodges Garden Star Party in March and the Deep South Spring Scimmage and Mid-South Star Gaze in April.

You still have time to register for the Hodges Garden Star Party, March 18-22, 2015. Go here for details: <http://www.braastro.org/hgsp.html> This is BRAS premier stargazing event of the year. The skies are dark and the park is beautiful, offering plenty of outdoor enjoyment during daylight – petrified tree trunks, rose garden, nature trails, and scenic overlooks.

The Deep South Spring Scimmage is sort of a mini-Deep South Regional Star Gaze, also held at the Feliciana Retreat Center. The 2015 dates are Thursday, April 16th to Sunday, April 19th. It is not open to the public and intended for serious observing. No daytime activities. However, there will be a raffle prize. This year the prize is an Explore Scientific AR 127 achromat refractor tube assembly with a two speed focuser with finder and a tube cradle. The Spring Scimmage usually has about 30 attendees, so your chances of winning the scope are very high. Registration deadline is April 3, 2015. You will have to go here and join the Yahoo Group to get information and the registration forms. <https://groups.yahoo.com/neo/groups/Deep-South-Regional-Star-Gaze/info> There is also information in the BRAS Forum.

The Mid-South Star Gaze is in French Camp, MS, on the Natchez Trace northeast of Jackson, MS. It is on the grounds of the Rainwater Observatory and Planetarium. Unfortunately this event occurs on the same weekend as the Spring Scimmage, Wednesday, April 15 to Saturday, April 18th. Although it is on the edge of town, the skies are dark, similar to Hodges Gardens dark. They usually have fine speakers and interesting daytime activities. Plus the Rainwater staff handcrafted a very nice science park on the grounds. That stretch of road is a National Park and well patrolled. Be warned. If the speed limit sign says 50 MPH, it means 50 MPH EXACTLY. If the park police catch you going 51 MPH, you're getting a ticket! <http://rainwaterobservatory.org/rainwater/index.cfm/information/upcoming-events/mid-south-star-gaze/>

As always, if you have a topic you would like to present for a future BRAS meeting activity, let me know.

Clear skies,
Merrill Hess
BRAS President

How the Milky Way became spiral?

Astronomers have long known that the Milky Way is a spiral galaxy. But how did our home galaxy get its beautiful spiral arms?

A simulation run on the GreenPlanet supercomputer cluster at the University of California, Irvine suggests its spiral structure may have been triggered by an act of cosmic violence: a series of collisions with a dwarf galaxy.

Dwarf galaxy, big impact

Since 1994, it's been known that the Sagittarius Dwarf galaxy—named after the constellation in which it appears from Earth—is in a polar orbit around the Milky Way and in the process of merging with our galaxy. In 2003, infrared telescopes and supercomputers that traced the orbital motions of its stars revealed that the Sagittarius Dwarf had actually collided with the Milky Way twice—once 1.9 billion years ago and again 0.9 billion years ago—and that it is now coming in for a third collision in just another 10 million years.

Until recently, most investigators have been studying how the Milky Way's tremendous gravitational field and tidal forces are ripping the Sagittarius Dwarf into long streamers of stars.

In computations for his dissertation research, however, former Irvine graduate student Chris Purcell asked a different question: What effects did the repeated collisions of the Sagittarius Dwarf, with its invisible but massive halo of dark matter, have on the larger Milky Way itself?

Dark matter, visible results

Ordinary matter makes up only 4.6 percent of the cosmic density; only 0.5 percent is visible. Nearly five times that much—23 percent—of the universe is made of invisible, transparent “dark matter,” whose existence is felt through its gravitational influence. It is now known that every galaxy, including the Sagittarius Dwarf (pre-collision) and our own Milky Way, resides at the center of a giant halo of dark matter several times larger in radius and many times greater in mass.

Pre-collision, the Sagittarius Dwarf was quite large—somewhere in number of stars between the Small and Large Magellanic Clouds (the Milky Way's two irregular galaxy companions visible to the naked eye from the southern hemisphere). But its dark matter mass likely exceeded the mass of all the visible stars in the Milky Way.

“When all that dark matter first smacked into the Milky Way like a ghostly belly flop, 80 to 90 percent of it was stripped off,” Purcell explained. “But the whirling disk of stars that was the Milky Way at that time was a very tenuous, chaotic system. That first impact produced instabilities that were amplified and quickly formed spiral arms and associated ring-like structures in the outskirts of our Galaxy.”

Purcell's paper, “The Sagittarius impact as an architect of spirality and outer rings in the Milky Way,” which he wrote with four coauthors (including his Irvine dissertation advisor James S. Bullock), has been published as a Letter in the September 15, 2011 issue of *Nature*.

- Trudy E. Bell, M.A.

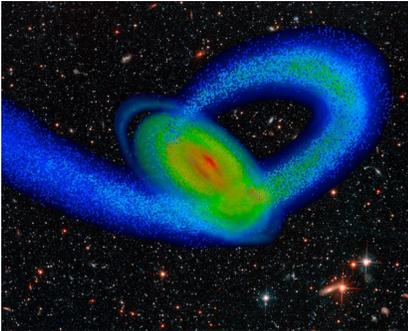
Further reading

The full reference to the *Nature* Letter is: “The Sagittarius impact as an architect of spirality and outer rings in the Milky Way,” by Chris W. Purcell, James S. Bullock, Erik J. Tollerud, Miguel Rocha, and Sukanya Chakrabarti, *Nature* 477: 301–303, 15 September 2011. The full text is available online from <http://www.nature.com/nature/journal/v477/n7364/full/nature10417.html> and from <http://arxiv.org/abs/1109.2918> and <http://xxx.lanl.gov/abs/1109.2918>. Two computer-simulation

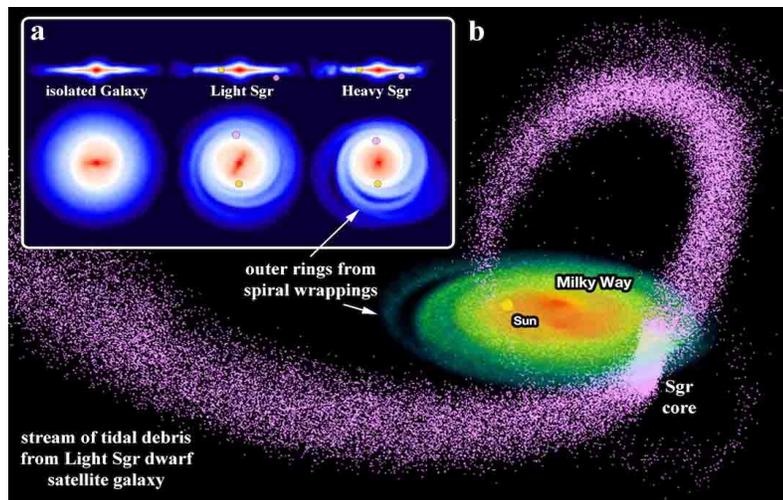
movies of the impact appear in the press release at <http://hipacc.ucsc.edu/MilkyWayImpact.html> (scroll down to the bottom).

The University of California High-Performance AstroComputing Center (UC-HIPACC), based at the University of California, Santa Cruz, is a consortium of nine University of California campuses and three Department of Energy laboratories (Lawrence Berkeley Laboratory, Lawrence Livermore Laboratory, and Los Alamos National Laboratory). UC-HIPACC fosters collaborations among researchers at the various sites by offering travel and other grants, co-sponsoring conferences, and drawing attention to the world-class resources for computational astronomy within the University of California system. More information appears at <http://hipacc.ucsc.edu>.

CAPTIONS:



Incoming third impact of the Sagittarius Dwarf galaxy (blue stream of stars) with our Milky Way Galaxy (multicolored disk) was simulated by the GreenPlanet supercomputer cluster at the University of California, Irvine, and rendered by co-author Erik J. Tollerud against a background of galaxies seen in the Hubble Deep Field. Note the simulated disk's ring-like spiral extensions in the outer Milky Way (upper left), which strongly resemble actual streams found at low latitudes with respect to the disk plane, in the nearby region of the Milky Way viewed from the Earth in the opposite direction from the center of the Galaxy. According to a Letter by Chris W. Purcell and coauthors in the British journal Nature, those spiral arms began to emerge after the initial impact of the Sagittarius Dwarf galaxy nearly two billion years ago.



Computer simulations visualized the disk of the Milky Way galaxy for three cases: no impact with a dwarf galaxy, impact with a Sagittarius Dwarf galaxy of lower mass (Light Sgr), and impact with a Sagittarius Dwarf galaxy of higher mass (Heavy Sgr). Our Milky Way galaxy is shown both edge-on and face-on in the inset panels; the sun's location is marked as a yellow dot and the present location of the Sagittarius dwarf's remnant core is marked as a pink dot, as shown after more than two billion years of isolated evolution. Shown in the background is a global rendering of the 'Light Sgr' tidal debris and the Milky Way disk.

Outreach Report

Upcoming Outreach Events:

- #1. Saturday, March 7th from 9:00AM-4:00PM at the Bluebonnet Swamp Nature Center. You need not be there the whole time.
- #2. Sunday, April 12th from 9:30AM-5:00PM at the Baton Rouge Zoo. You need not be there the whole time.
- #3. Sunday, April 19th for Louisiana Earth Day. Time and location to be found out.
- #4. Saturday, April 25th at the HRPO for International Astronomy Day. Volunteers will be needed pretty much all day. Again, you need not be there the entire time.
- #5. Open invitation to present at Glasgow Middle School for the Youth 360 program. Monday-Friday 2:30PM-5:00PM until the end of May.
- #6. An invitation to present an astronomy class for teens at the Main Library in Baton Rouge. Target months would be June or July. If interested, let me know and we'll get more details.

Please let me know if you are available/interested in helping out (if you haven't already let me know.) You can email me at tomanben@gmail.com

Recent Outreach Events:

BRAS participated in two events at Westdale Heights Academic Magnet school so far this year. The first night was a science, math, technology, engineering and art night. It was cloudy, so we just helped out inside with some general astronomy knowledge. The second night we assisted parents and their kids in building small refracting telescope kits. It was a clear night so we actually got to go out and use them afterward.

On February 23rd, BRAS participated in a Family Science Night at Friendship Capital High School. The event was fun and well attended. We were set up next to the police departments bomb squad robot! Several university groups were also present as well as LIGO.

Thanks again to the volunteers that helped out with these events: Merrill Hess, Roslyn Readinger, John Nagle, Rick Wright, Oneal Isaac, Susan Miller, Wally Pursell, Chad Thibodeaux and Ben Toman.

Secretary's Summary of February Meeting

- Don Weinell announced that the Hodges Gardens Star Party is coming up on March 18 – 22. All cabins are currently booked for the weekend, but there may be some spots still available during the week.
 - Chris mentioned that Ben made a video clip of Comet Lovejoy as well as the asteroid that recently passed close by. He also announced that Globe at Night for this month starts tonight. They are trying to build up a database on light pollution; the more measurements from different locations that are collected, the better the information will be in the database. See www.globeatnight.org/report.html to report and also for more info.
 - Chris gave us an update on the 20/20 Vision campaign. He went to a meeting out at LSU about the new upgrade to the LSU lakes area; he said that the organizers brought up full cutoff lighting before he could mention it himself. There were also 3 more EBR Parish Library Strategic Planning meetings coming up before the end of February; BRAS members were encouraged to attend. Oneal had a suggestion about tying in dark sky promotion with tourism.
 - Chris talked about the Astronomical League essay contest for young people that requires a 300 – 500 word essay on a scientific discovery. Karen said that the child with the winning essay receives \$1,000 as a prize; the teacher of the child also wins \$200. Chris had sent the information on the contest to 24 young people and had heard from 25% of them so far.
 - The main raffle prize for the next couple of months is a Meade ETX90 telescope.
 - Trey mentioned that he was still collecting dues for the current year. If you have not paid yours yet, please see Trey.
 - Dave Dawson, Mike Aaron, and Scott Luke were welcomed as new members as well as Joe Hynes who had purchased the 5-inch telescope from Astronomers Without Borders.
 - Chris Deselles was scheduled to repeat his astrophotography lecture on Feb. 19th at the Goodwood Library at 7:00 pm.
 - Merrill's lecture was entitled Pleiades: Jewels of the Winter Sky. In addition to discussing facts about this cluster, he also touched on myths and lore from various cultures around the world related to this as well as the impact on art.
- The meeting ended with the monthly raffle.**

Roslyn Readinger
BRAS Secretary

HRPO

FRIDAY NIGHT LECTURE SERIES

all start at 7:30pm

6 March: “The Pleiades—Jewels of the Night Sky”

13 March: “The Rosetta Mission”

20 March: {no lecture}

27 March: “An Introduction to Jupiter”

SCIENCE ACADEMY

Saturdays from 10am to 12pm

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

7 March: “Expedition 7”

14 February: “Jupiter”

21 February: {no session}

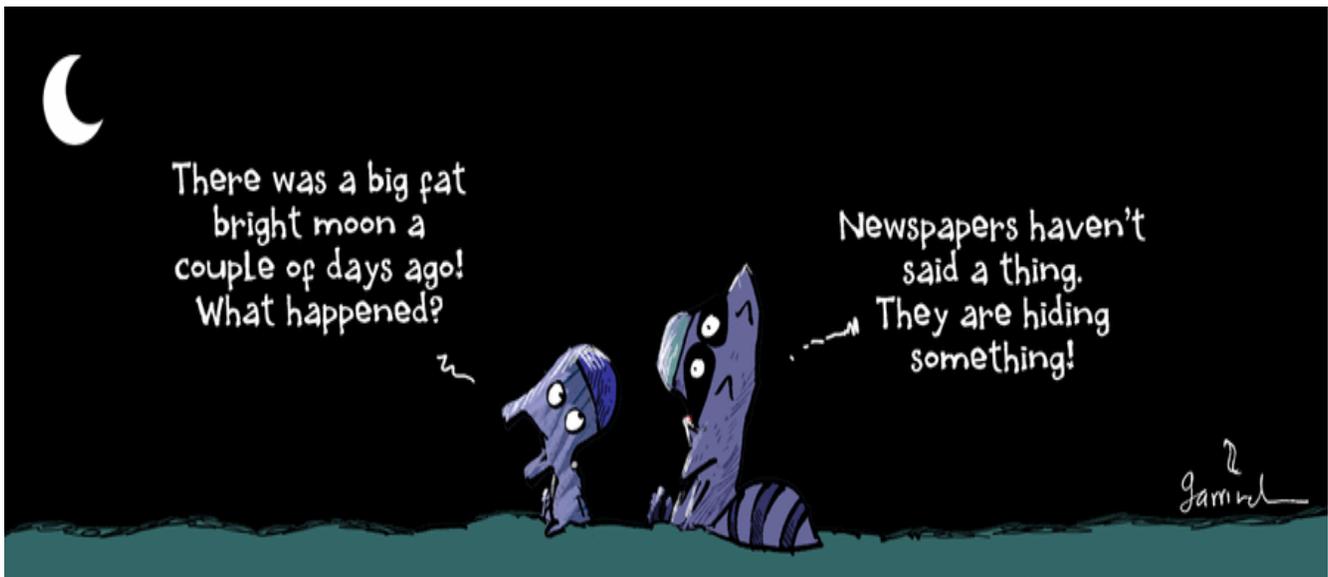
28 February: “Layers of the Earth”

CALL FOR VOLUNTEERS

*Saturday, 14 March from 6pm to 10pm. *Two volunteers in addition to regular complement.* **Evening Sky Viewing Plus.** Marshmallow roast, demo tables. Easy; training provided.

*Saturday, 28 March from 2:30pm to 4:30pm. *One volunteer.* **Solar Viewing.** Three viewing instruments. Moderate; training provided.

*Saturday, 28 April from 3pm to 11pm. *Ten to twelve volunteers for two to six hours each.* **International Astronomy Day.** Variety of tasks (telescope operation; stations; front desk; information desk.) Moderate; training provided.



20/20 Vision Campaign

Light Pollution Committee: 9 March, 6:15pm at HRPO

On 29 January there was a public function at the Lod Cook Alumni Center concerning the LSU Lakes restoration project. At least one representative of the consulting firm mentioned full cut-off lighting without being prompted.

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This Month's GLOBE At Night runs from 11 March to 20 March. Participants should use the constellation Orion.

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The SQM measurements obtained at HRPO back viewing pad from 18 January to 19 February have an average of 18.66. This suggests an increase of 0.002% in the light pollution above HRPO's domes.

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The East Baton Rouge Parish Library wants to introduce its five-year Strategic Plan to the public and receive input. One of the Plan's six goal areas is entitled "Facilities & Operations", which includes outside lighting. BRAS Treasurer Trey Anding attended the 26 February meeting at the Bluebonnet Regional Library. According to Library Assistant Director Mary Stein, there will be more meetings in March and April.

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Two BRAS members are working toward the Dark Sky Advocate certificate. If either obtains it, BRAS will be the first astronomy club in the country with two holders of this certificate.

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The Atchafalaya Trace Commission will hold its next meeting on Wednesday 4 March. The ATC always yields floor time to a BRAS representative to outline the dark-sky accomplishments we've had in the Atchafalaya Heritage Area. It would be good if there were something significant to report.



Recent Entries in the Forum

Below are selected recent additions to the BRAS Forum. There are also [nine active polls](#).

NASA [Day of Remembrance](#) was 28 January
[Space X](#) Cargo Ship Undocks
Ben Toman Nabs [Jupiter](#) with Orion Star Shoot
March Viewing Times for the [Great Red Spot](#) Now Posted
Cassini Images Titan's [North Polar Lakes](#) on 16 March
David D. Images [Triple Conjunction](#)
Concerning [Red Sprites and Blue Jets](#)
[DSCOVR Spacecraft](#) Heads to Space
[Solar Dynamics Observatory](#) Celebrates Five Years
Ben Toman Spots [Fireball on 19 February](#)
[Dawn Reaches Ceres](#) in Early March
BRAS Captures Video of [2004 BL₈₆](#)
[Twenty-Frame Video of Ceres](#) Reveals Bright Spot
Time Running Out for [Good View of Lovejoy](#)
Newly-Released Image Shows [67P's Jets](#)

Baton Rouge Culmination Times Posted for [M77](#), [Cygnus A](#), [The Mice](#) and [The Sombrero Galaxy](#).



Camelopardalis – The Giraffe

Position: RA 06, Dec. +70

Named Stars: None, it is a “modern” constellation created in 1613.

Deep Sky:

NGC 1502, mag. 5.7, 04 07.7 +62 20, 7' in size, is an open star cluster of 45 stars, with two binary stars (Struve- Σ -484, and 485), at its center, and is sometimes called “The Golden Harp Cluster”; detached, weak concentration of stars; large range in brightness; mag. of brightest star is 6.9. **NGC 1502** is located at the end of the “**Kimble’s Cascade**” asterism.

IC 342 (Caldwell 5), mag. 8.4, 03 46.8 +68 06, 21' in size, is a faint, very large, and round galaxy; very small, bright nucleus. Photos of this object shows it to have a beautiful pattern of spiral arms curving around the nucleus, oriented almost face-on, and is as perfect in form as the great **M 101** in **Ursa Major**. **IC 342** is hard to see because of dust.

Tombaugh 5, mag. 8.4, 03 47.8 +59 03, 16' in size, is an open cluster of 60 stars; detached, no concentration of stars; moderate brightness range; mag. of brightest star is 11.6.

NGC 2403 (Caldwell 7), mag. 8.5, 07 36.9 +65 36, 2.3'x11' in size, is a bright, very elongated, very large galaxy; irregular arms; small, very faint nucleus. Mottled texture visible in 8 inch and larger telescopes, similar in appearance to **M 33**. The northern arm of **NGC 2403** connects to **NGC 2404**. Two supernovas have been reported in this galaxy in the last century, SN 1954J and SN 2004 dj.

NGC 2655, mag. 10.1, 08 55.6 +78 13, 5.1'x4.4' in size, is a very bright, quite large, and slightly elongated galaxy; very bright, very large nucleus with an absorption lane on one side; very faint, diffuse outer arms.

NGC 2336, mag. 10.4, 07 21.1 +80 11, 6.9'x4.0' in size, is a pretty bright, pretty large, and round galaxy; many weak, filamentary, knotty arms; faint, very small nucleus, and is paired with galaxy **IC 467**.

IC 365, mag. 10.5, 04 07.8 +69 49, 4.6'x3.5' in size, is a pretty faint and pretty large galaxy; brighter toward middle.

NGC 2146, mag. 10.6, 06 18.7 +78 21, 5.0'x3.2' in size, is a pretty bright, large, and slightly elongated galaxy. One arm of the galaxy has a dark lane. **NGC 2146** is possibly interacting with galaxy **NGC 2146A**.

IC 3568 (PK 123+34.1), mag. 10.6, 12 32.9 +82 33, 10" in size, is a planetary nebula with a smooth disk; photo mag. 11.6; central star is mag. 13.5.

NGC 2366, mag. 10.8, 07 28.9 +69 13, 7.6'x3.5' in size, is a very faint and pretty large galaxy; weak, curved arms. **NGC 2366** contains **NGC 2363**.

SH2-205, 03 56.1 +55 12, 1.7°x1.0°, is a very faint and diffuse nebula; irregular in shape. Brightest part is centered on an 8th magnitude star.

St 23 (Pazimwo’s Cluster), 03 16.3 +60 02, 14' in size, is an open cluster of 25 stars; detached, no concentration of stars; large brightness range, involved in nebulosity.

vdB 14, 03 29.2 +59 57, 20'x8' in size, is a bluish nebula.

vdB 15, 03 30.1 +58 54, 25'x10' in size, is a bluish nebula slightly brighter than **vdB 14**.

B 8, 9, 11, and 13, 04 19.0 +55 03, 2.5°x0.5° in size, is a dark nebula complex with high opacity, and an irregular shape, and is located about 3° north of open cluster **NGC 1528** and 2° northwest of dark nebula **B 12**.

B 12, 04 30.0 +54 17, 23' in size, is a dark nebula of high opacity, and an irregular shape. **B 12** lies 2° southeast of the dark nebula complex of **B 8, 9, 11, and 13**, and about 3.5° northeast of open cluster **NGC 1528**.

MS0735.6+7421 is a galaxy cluster with a red shift of 0.216, and is unique for its intra cluster medium, which emits x-rays at a very high rate.

MACS0647-JD is one of the possible candidates for the farthest known galaxies in the universe ($z=10.7$).

Asterism – Kemble’s Cascade, 03 57.0 +63 00, 3.0° in size, is a chain of more than 20 stars, running northwest of open cluster **NGC 1502**, stretching for almost 3°. It is a celestial waterfall of dozens of 9th and 10th magnitude stars in a visually straight line; not labeled in Sky Atlas 2000.0, although its brightest stars are plotted. The

asterism was named after Father Lucian J. Kimble, a Franciscan Friar, who discovered it and wrote a letter to Walter Scott Houston (a columnist for “Sky and Telescope” magazine),

describing the sight as “ a beautiful cascade of faint stars tumbling from the northwest down to the open cluster **NGC 1502**”. Houston named the asterism as **Kemble’s Cascade** in his “Deep Sky Wonders” column in “Sky and Telescope” in 1980. Father Kemble died in 1999.

Other Stars:

Alpha Cam, mag. 4.26, 04 54 03.01 +66 20 33.6, is a blue-hued supergiant star, and is at an unusual distance (6936 light years) for a naked eye star. **Alpha Cam** is an emission line star, one losing mass very rapidly.

Beta Cam, mag. 4.03, 05 03 25.10 +60 26 32.2, is a double star. The primary is a pale yellow super giant star, and has a fainter (mag. 9.0) companion star at 80” of separation. The secondary star, component B, has a closer companion, named “b”, at 11th magnitude with a separation of 14.8”.

CS Cam, mag. 4.21, 03 29 04.13 +59 56 25.2, is a binary star consisting of a blue-white supergiant star, and a mag. 8.7 star located 2.9 arc seconds away. The star is located in the reflection nebula **vdB 14**. **CS Cam** is one of the hind legs.

BE Cam, mag. 4.39, 03 49 31.29 +65 31 33.6, is an irregular variable red giant star, on the other hind leg.

7 Cam, mag. 4.43, 04 57 17.22 +53 45 07.5, is a triple star system, and is a front leg.

M Cam, mag. 4.55, 07 00 03.85 +76 58 38.8, is an orange giant star forming the neck.

L Cam, mag. 4.76, 06 18 50.78 +69 19 12.1, is a white dwarf star forming the snout.

VZ Cam, mag. 4.92, 07 31 04.48 +82 24 41.6, is a semi-regular red giant variable star, having a period of 23.7 days.

K Cam, mag. 5.08, 05 22 33.78 +79 13 50.7, has one planet – a super Jovian with an eccentric orbit in the habitable zone. The orbital period is 388 days.

31 Cam, mag. 5.20, 05 54 57.83 +59 53 18.3, is an eclipsing spectroscopic binary star.

Σ (Struve) 1694, 32 Cam, mag. 5.38, 12 49 13.80 +83 24 46.3, is a binary star with both components having a blue-white hue. The primary is mag. 5.4, and the secondary is mag. 5.9. and is a spectroscopic binary itself. Primary to secondary separation is 80”. **Struve 1694** represents the head.

HD 104985, mag. 5.78, 12 05 14.74 +76 54 21.4, has a super Jovian planet with an orbital period of 198 days.

Σ (Struve) 485, mag. 6.0, 04 03.4 +06 21.2, is a binary star surrounded by **NGC 1502**. Component A is **SZ Cam**.

Σ (Struve) 1051, mag. 6.5, 07 20.6 +07 31.0, is a triple star system. A is mag. 6.5, B mag. 7.7, and C is mag. 7.8. AB separation is 1.1”, and C separation is 31.5”.

Σ (Struve) 484, mag. 9.0, 04 03.4 +06 21.2, is a binary star surrounded by **NGC 1502**, with the secondary at mag. 9.5, and a separation of 5.3”.

HD 32518, mag. 6.44, 05 09 36.62 +69 38 22.4, has a super Jovian planet with an orbital period of 157.5 days.

XO-3, is a hot super Jovian planet with an orbital period of 3.19 days.

There are 106 Double and Multiple stars, 32 Variable Stars, and 24 Star Clusters, Nebulae, and Galaxies in this constellation.

Meteor Showers – The Camelopardalis, from Comet 209P/Linear is the only one associated with this constellation.

Dark Sky Viewing – Primary on March 21st, Secondary on March 28th

Sky Happenings:

March 2nd – All night – The waxing gibbous moon shines near Jupiter.

March 3rd – The Moon passes 5° south of Jupiter at 2:00 AM CST.

March 4th – Venus passes 0.1° north of Uranus at 2:00 PM CST.

March 5th – The Moon is at apogee (252,516 miles from Earth) at 1:33 PM CST

Asteroid Eleanora is at opposition at 8:00 AM CST

Full Moon occurs at 12:05 PM CST.

March 6th – Asteroid Iris is at opposition at 7:00 AM CST.

March 8th – Daylight Savings Time starts at 2:00 AM local time.

March 8th – 23rd - Dusk – Observers may be able to view the zodiacal lights during evening twilight. Look to the west about 80 minutes after sunset for a tall pyramid of diffuse light, sloping to the left along the path of the ecliptic.

March 9th – Asteroid Juno is stationary at 10:00 AM CDT.

March 11th – Mars passes 0.3° north of Uranus at 3:00 PM CDT.

March 12th – The Moon passes 2° north of Saturn at 3:00 AM CDT.

March 13th – Last Quarter Moon occurs at 12:48 PM CDT.

March 14th – Saturn is stationary at 5:00 PM CDT.

March 18th – The Moon passes 4° north of Neptune at 9:00 PM CDT.

March 19th – The Moon passes 5° north of Mercury at 12:00 midnight CDT

The Moon is at perigee (222,192 miles from Earth) at 2:28 PM CDT.

March 20th – New Moon occurs at 4:36 PM CDT

Vernal Equinox occurs at 5:45 PM CDT

A total solar eclipse occurs along a narrow path that cuts across the waters south and east of Ireland.

March 21st – The Moon passes 0.1° north of Uranus at 6:00 AM CDT

The Moon passes 1.0° south of Mars at 5:00 PM CDT.

March 22nd – Asteroid Nysa is at opposition at 11:00 AM CDT

The Moon passes 3° south of Venus at 3:00 PM CDT.

Dusk – The crescent Moon shares the early evening with Venus, shining at about 4° from the bright planet on the western horizon.

March 24th – Evening – The Moon crosses the Hyades, and for observers in Alaska and western Canada the Moon will occult Aldebaran.

March 25th – The Moon passes 0.9° north of Aldebaran at 2:00 AM CDT.

March 27th – The First Quarter Moon occurs at 2:43 AM CDT.

March 30th – The Moon passes 6° south of Jupiter at 5:00 AM CDT.

Mercury – Mercury sinks low in the sunrise glow in the first half of March, scraping the east-southeast horizon, appearing a mere 3° high 45 minutes before sunrise.

Venus – As March opens, Venus and Mars hang near each other in the western sky as darkness falls. Venus shines at mag. -3.9, and shows up within 20 minutes after sunset. By 7:00 PM local time, Venus stands 15° high with Mars 4° below it. As March progresses, the apparent gap between the two worlds grows. By March 21st, 13° separate the two planets. Venus's diameter increases slightly during March, from 12" to 14" wide, while its gibbous phase wanes from 86% to 78% sunlit. A slender crescent Moon passes 1° south (to the left) of Mars on the 21st, with a slightly fatter Moon sliding 3° south of Venus on the 22nd.

Mars – Mars glimmers dimly about 4° below Venus as the month begins, but the gap between them increases significantly each week as Mars sinks lower into the twilight. By the end of March, they are 17° apart. During

March, an observer will see Venus's apparent altitude increasing to more than 20°, while Mars descends to about 5° high from the horizon. By month's end, Mars sets only about 1 ½ hour after the Sun, and shines at a weak mag. +1.4, and suffering from atmospheric extinction to boot! In your telescope, Mars appears only 4.0" wide.

Jupiter – Jupiter reached opposition in Feb, but still appears great in March. As the month begins, look for Jupiter roughly half way up in the eastern sky at nightfall. Jupiter is even higher when it transits the meridian around 10 or 11 PM standard time at the start of March, and soon after twilight at month's end. Jupiter fades a bit from mag. -2.5 to -2.3, and its apparent diameter decreases from 44" to 41" over the course of March. Jupiter lies in Cancer the Crab, in a retrograde motion. By month's end, it stands 5° east of the Beehive Cluster (M44). Jupiter's mutual events: On the night of March 5/6, three moons participate in four mutual events. Action starts at 6:19 PM CDT when Io partially occults Europa for two minutes. To observers in eastern North America, the two inner moons will appear to merge. Less than an hour later, Europa passes through Io's shadow. Europa dims noticeably at the middle of this eclipse, which lasts from 7:14 to 7:18 PM CST. Half an hour after the eclipse ends, Europa disappears behind Jupiter's western limb. Io performs a similar dance with Ganymede later that night. Io will occult Ganymede at 10:50 PM CST. At the midpoint of this 8 minute event, Io's disk appears completely inside that of Ganymede, with Callisto standing nearby. Io passes less than 3" north of Callisto at 11:50 PM CST. The night's activities wind up when Io's shadow washes over Ganymede between 12:35 and 12:46 AM CST.

Saturn – Saturn is in the "claws" of Scorpio, at mag. 0.4, throughout March. Saturn rises around the midnight hour, brightening from +0.4 to +0.3, and the width of its globe increases from 17" to almost 18" across, during March. Saturn spends the month within a Full Moons width of Nu Scorpii (mag. 4.1), the claw's northern most star. Saturn's rings span 39" and tilt 25° to our line of sight in mid March. Any scope will also show you Titan (8th magnitude) as it orbits Saturn once every 16 days. You can find it due north of Saturn on March 1st and 17th, and due south on March 9th and 25th. A handful of fainter moons show up through a 4 inch and larger scope. Look for 10th magnitude Tethys, Dione, and Rhea inside Titan's orbit. Distant Iapetus, which takes 79 days to circle Saturn, also glows at 10th magnitude, when it lies farthest west of Saturn in early March.

Uranus – Uranus is nearest to Venus on March 4th. At around 2:00 PM CST, Venus (+5.9 magnitude) passes just 0.09° north-northeast of Uranus (10th magnitude). At nightfall, look for Uranus at about 0.4° below Venus. At around that time, Venus, Uranus, and Mars form a "trio" of planets within a circle of just under 5° across. On March 11th, at around 19 hrs UT, Mars passes just 0.27° north-northwest of Uranus. By twilight, look for Uranus about 0.4° below or lower right of Mars. Mars will show a disk of 4.1" and Uranus a disk of 3.4".

Neptune – Neptune was in conjunction with the Sun on Feb. 26th, so will rise in twilight an hour before the Sun as the month closes.

Pluto – Pluto is in Sagittarius, in the "steam" from the teapot asterism.

Moon – A waxing gibbous Moon hangs well to the right of Jupiter on the evening of March 2nd, and well to the upper right of Regulus the next evening. The waning gibbous Moon is less than 3° to the upper left of Saturn at dawn on March 12th, with Antares down below them. At dusk on March 21st, the waning crescent Moon can be found less than 2° to the lower left of Mars, while on the next night (22nd), it comes within 4° of Venus. A thicker lunar crescent shows high among the Hyades on March 24th, and most of Alaska and northwest Canada will see the Moon occult Aldebaran. The waxing gibbous Moon is well right of Jupiter again on March 29th, and then in the vicinity of Regulus on the last two nights of March.

Asteroids: Asteroid **354 Eleanora** lies within a full moon's diameter of Delta Leonis (mag. 2.6), the northernmost star in Leo the Lion's tail from March 17th to 19th. **354 Eleanora** reaches opposition and peak visibility in early March, when it glows at mag. 9.6.

Asteroid **Nysa** reaches opposition on March 22nd, in Virgo.

Asteroid **Iris** reaches opposition on March 6th, in Sextons.

Asteroid **Pallas** is in Ophiucus.
 Asteroid **Ceres** is in Sagittarius.
 Asteroid **Herculina** is also in Ophiucus.
 Asteroid **Massalia** is in Libra.
 Asteroid **Flora** is in Leo.
 Asteroid **Juno** is in Cancer.

Comets: Comet **C/2014 Q2 (Lovejoy)** is on its outbound journey, crossing the background of Cassiopeia the Queen, remaining visible all month. On March 15th, **Lovejoy** (about 10th magnitude) passes 0.1° west of Delta Cas (mag. 2.7). On March 16th and 17th, **Lovejoy** appears 1° west of M103, and on the 20th, it lies 3° west of NGC 663.

When to View the Planets

Evening Sky

Venus (west)
 Mars (west)
 Jupiter (southeast)
 Uranus (west)

Midnight

Jupiter (southwest)

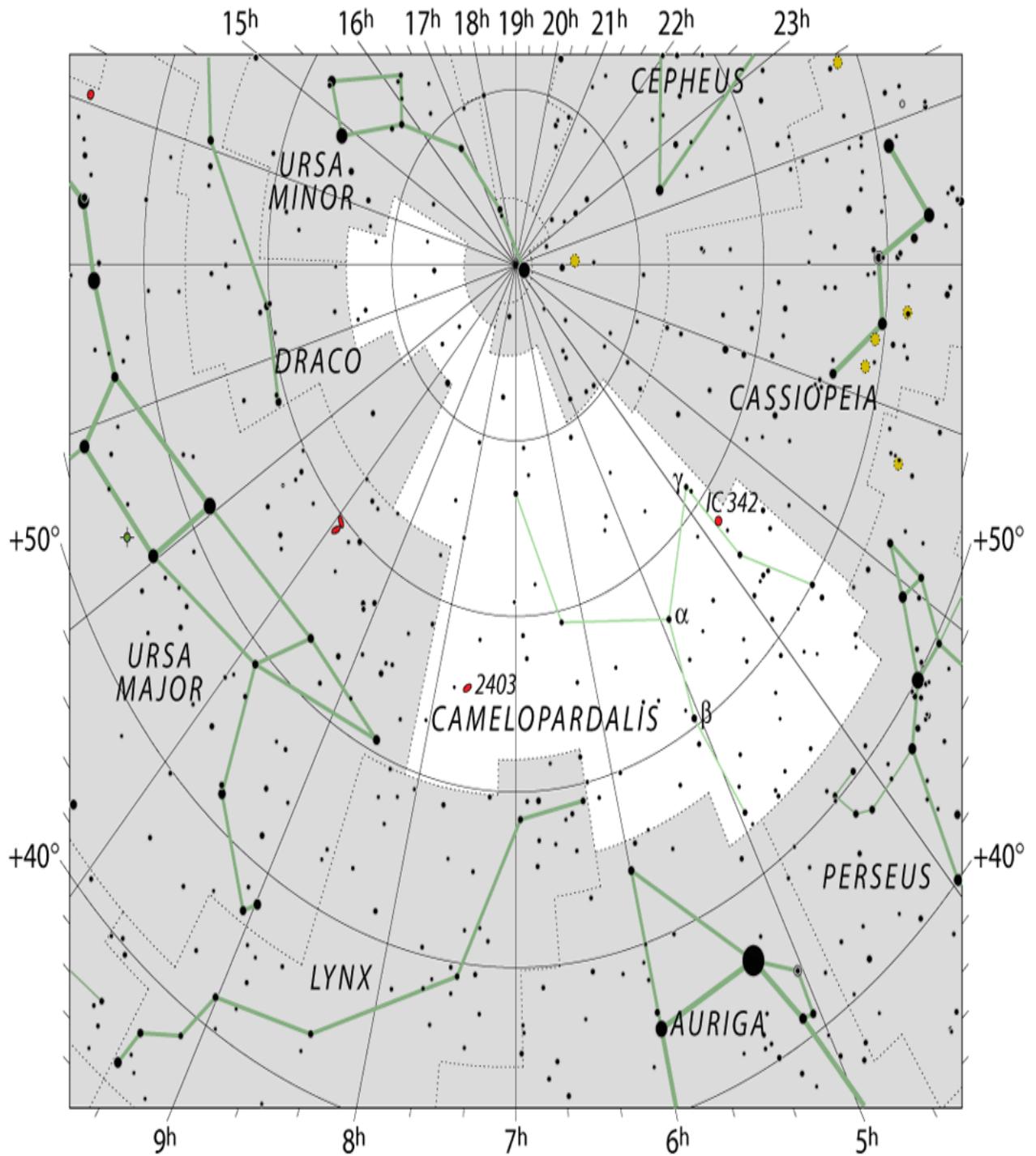
Morning Sky

Mercury (southeast)
 Saturn (south)
 Neptune (east)

Camelopardalis the Giraffe

Camelopardalis, or the Giraffe, is a large (18th largest in the sky), yet faint constellation in the northern hemisphere. It was created by a Dutch astronomer, Petrus Plancius, in 1613, and was first described by the German astronomer Jacob Bartsch in 1624. The constellation lies between the head of Ursa Major and Cassiopeia, in an area that the Greeks left blank because it did not contain any stars brighter than 4th magnitude. When he included Camelopardalis on his map in 1624, Jacob Bartsch wrote that it stood for the camel on which Rebecca rode into Canaan to be married to Isaac, as written in Genesis. The constellation however, represents a giraffe, not a camel, and the origin of its name is unclear. The Greeks, for reference, called the giraffe the “leopard camel” because it had a leopard’s spots and the head of a camel. To the early Romans, the giraffe was Camelopardalis (a camel marked like a leopard) – they thought of it as a composite creature, described as having characteristics of both a camel and a leopard.





● 0 ● 1 ● 2 ● 3 ● 4 ● 5 ● 6

