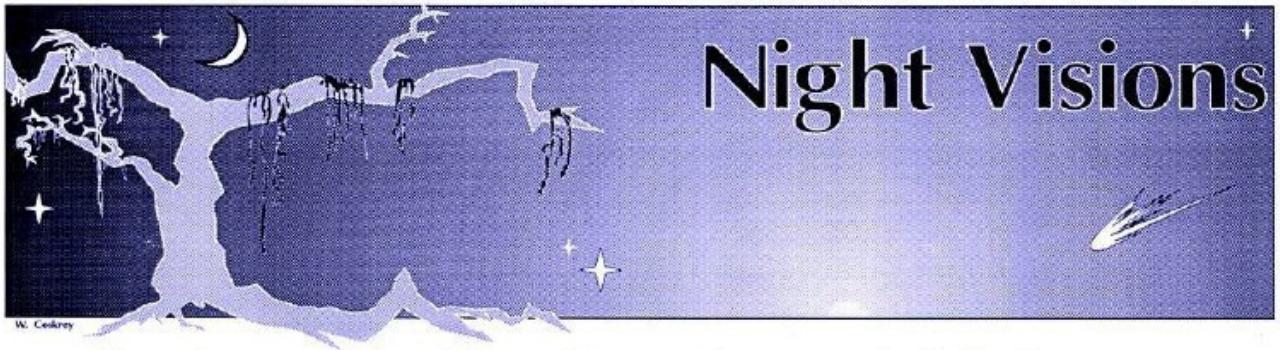
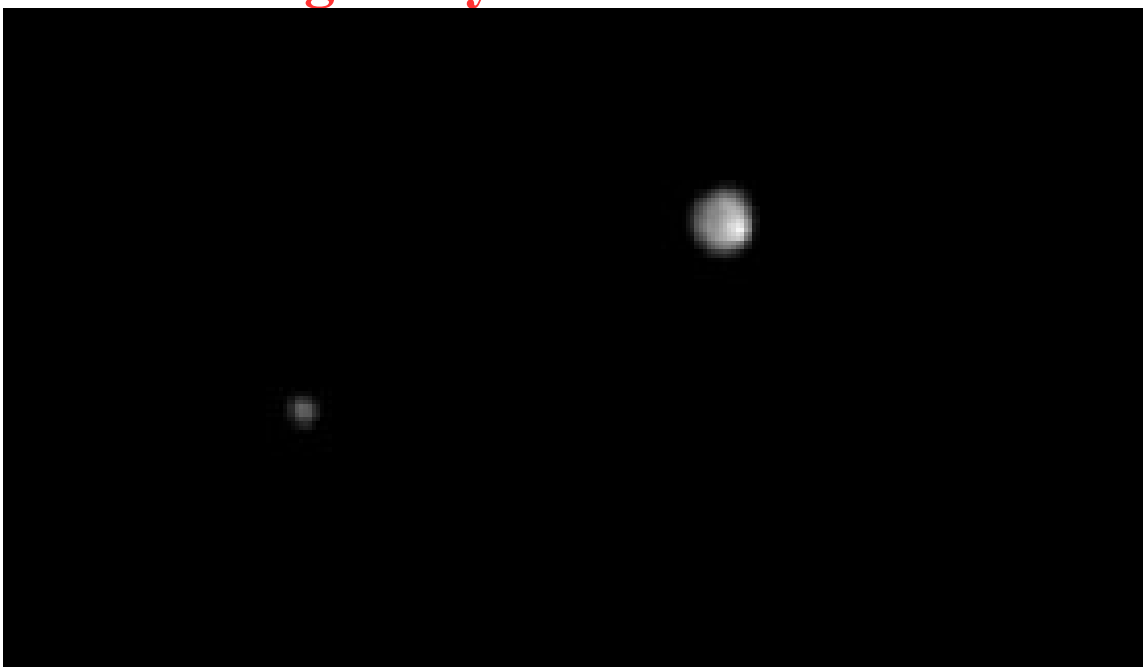


Newsletter of the Baton Rouge Astronomical Society

May, 2015

Next Meeting: May 11th at 7PM at the HRPO



New Horizons is getting closer! Find out more about these latest images by clicking on the image.
Image credit: NASA

What's In This Issue?

Vice-President's Message

Greetings All,

Our President, Merrill, has been out of the state for the last week so I am filling this space in the newsletter this month.

To begin, our next meeting on Monday, May 11th will see us hosting Dr. Brad Schaefer of LSU's Department of Physics and Astronomy. (He also happens to be a club member!) Dr. Schaefer will be presenting "Size of the Earth and Distance to the Moon, Sun and Milky Way Center." This talk will teach you how, with a 10" telescope or smaller, you can make these calculations yourself.

Dr. Schaefer is a professional astronomer and always on the forefront of important, advanced research. He also remains an avid amateur astronomer and he is always willing to share his joy and passion for the stars with us. I hope you will be able to make it out for what is sure to be a fun evening.

April was a very busy month as far as Outreach was concerned. We had successful outings at the BREC Zoo, Louisiana Earth Day and International Astronomy Day. Our deepest thanks to those that helped out by volunteering your time: Wally Pursell, Oneal Isaac, Charles Edwards, Roslyn Readinger, Christopher Kersey, Trey Anding, Cathy Gable, Craig Brenden, Marvin Owen, Bill Buck, Chad Thibodeaux, Krista Reed and Rick Wright. (I think I saw Jacob DesRoches helping to man the BRAS table at Astronomy Day for a bit, too!) I'm sorry if I missed you. As you can see, we had a lot of members helping out and it was certainly needed. In these 3 events, we may have reached at least 1,000 people in our community.

We've got a nice Summer planned and hopefully that will include some excursions to our Dark Sky Site. We still have outstanding requests for outreach this Summer (see last month's issue) and we have had one new inquiry from St. James Place in Baton Rouge. We'll be getting more information on that and then getting the request sent out.

Finally, make sure you are paying attention to the 20/20 Vision Campaign efforts. Right now, Chris is practically fighting the good fight on his own. Please take a moment and look at the Campaign checklist and consider doing some of the requested items. It's not too time consuming, but it can make a big difference. It's no fun fighting light pollution, but if we don't do it, who will?

Clear Skies,
Ben Toman- BRAS Vice-President

Secretary's Summary of May 2015 Meeting

- Merrill mentioned that there was a lot of outreach going on currently. We've done an application for NASA's Night Sky Network which provides free materials and information for outreach to organizations and individuals; the only requirement is that you have to use it once a month. LIGO has asked for our help with their outreach on July 18th. BRAS is also looking for a member of our group to help out with astronomy at the EBR Parish Library this summer.
- Ben gave an entertaining lecture on outreach entitled "Outreach, Anyone?" that encompassed the basic questions about sharing astronomy with the public. (A bonus extra was an equation having to do with the velocity of an unladen swallow.)
- Don Weinell made some remarks about Hodges Gardens; he said it was the first time in 15 years that there was not a single night that was good for viewing; it was also the first time that Public Night on Saturday was canceled. There were 14 paid registrants. In the future we will go back to prepaid, 2-tier registration for this event. There is also a question about when to have it next year with March 9th and April 6th being mentioned as possible dates. Ben thanked Don for all the work he does running this event.
- Ben mentioned the article in the Reflector talking about restoring the George telescope in Texas; this is the same telescope that LSU had at one time up near Clinton. A Gulfport company produced it; it is a twin to a scope at Kitt Peak.
- Upcoming outreach events include one on the 18th at Zachery Community Park, Earth Day on the 19th in downtown Baton Rouge, and International Astronomy Day on the 25th at the Observatory. Chris was selling raffle tickets related to IAD; these were used for the raffle after the meeting.
- Chris has been doing a lot of good footwork for the 20/20 Vision campaign. It was mentioned that we already have some ordinances in place; we just need to get them enforced.
- We had some new people in the room, so we went around the room introducing ourselves.
- It was mentioned that Melanie Haire, who was instrumental in getting the Observatory established, may be a speaker for the June meeting. She and her husband are currently living in New Mexico.
- The meeting ended with the monthly raffle.

Roslyn Readinger
BRAS Secretary

Disk Galaxies: Settling for Beauty with Age

Today, the majority of local galaxies forming stars are rotating disks, such as our own Milky Way or the Andromeda Galaxy (M31). Disk galaxies are well ordered: there is a defined plane to the galaxy and most stars and gas revolve in one direction around its center.

Many astronomers had thought that disk galaxies had largely finished forming by about 8 billion years ago, as indicated by the rates at which stars are formed in the Universe. Therefore, they assumed that distant, much younger disk galaxies are not all that different from nearby ones.

Spectroscopic observations of distant galaxies taken with the 10-meter telescopes at the W. M. Keck Observatory on Hawaii, when combined with images taken by the Hubble Space Telescope plus supercomputer simulations to help interpret the observations, however, together reveal a surprise. The motions of gas inside distant galaxies has been continuously settling down over the last 8 billion years while galaxies slowly assume the familiar flat disk shape of nearby galaxies.

This finding is announced in an article titled "The Epoch of Disk Settling: $z \sim 1$ to Now" by Susan A. Kassin and 13 collaborators, published in the October 20, 2012 issue of *The Astrophysical Journal*.

From chaos to calm

"Galaxies are like human adults," said Kassin, a postdoctoral fellow at NASA's Goddard Space Flight Center in Greenbelt, MD. "Many have had exciting youths marked by intense interactions with other galaxies, with a lot of growth spurts in mass, new stars, and heavy elements. But chaotic growth slows down as galaxies mature, and they become more organized and calmer inside."

Because looking far out into the depths of space is the equivalent of looking back in time, the redshift z is how astronomers measure both age and distance in the universe. A redshift of $z = 1$ corresponds to about 8 billion years ago, when the universe was about 5 billion years old. "It's almost like a mantra. People say that the Hubble sequence is in place by $z = 1$," Kassin said. The Hubble sequence is a diagram—originally devised by Edwin Hubble in 1926—for classifying the visible shapes of galaxies.

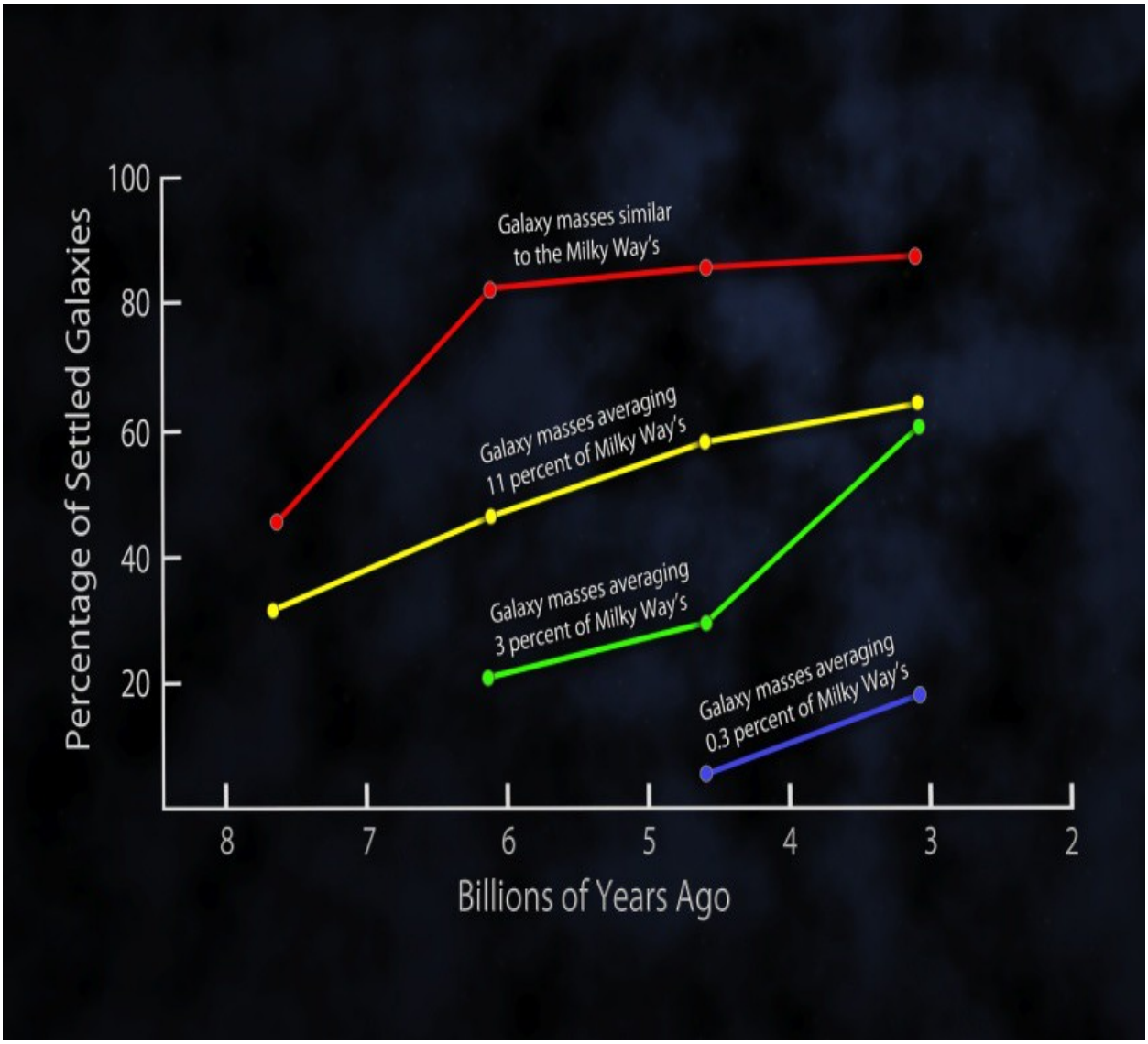
Kassin and her 13 coauthors—six from the University of California—found the observational evidence suggests something quite different. The internal motions of gas within galaxies back in time are far more disordered, moving every which way rather than neatly revolving around the centers of galaxies. Moreover, they found that the Hubble sequence of well-ordered disk galaxies gradually evolved from earlier more chaotic forms over the last 8 billion years. "It is clear the Hubble sequence was *not* in place at a redshift of 1," Kassin said.

Three keys to discovery

"Sample selection can be quite insidious," explained co-author Benjamin Weiner of the University of Arizona. In past studies of galaxy evolution, researchers typically studied only those galaxies that are recognizably disk-shaped, excluding any that are obviously disturbed. But shape criteria can bias the result. In contrast, Weiner said, "we included all galaxies bright enough to give spectra from which the motions inside galaxies could be measured."

Second, past studies examined only the speed at which the stars revolve around the centers of galaxies. "We also measured the disordered motions of clouds of gas in galaxies," Kassin continued.

Third, the coauthors studied more than 500 galaxies, yielding good statistical correlations. The collaborators also performed mock observations on computer-simulated images of merging disk galaxies in various stages of disorder and at various distances. "We followed exactly the same procedures of spectral measurements as with observations of real galaxies," explained collaborator Joel R. Primack of the University of California, Santa Cruz, "to measure the extent to which effects such as the observed sizes of galaxies and the blurring effects of the Earth's atmosphere play in the observations." *–Trudy E. Bell, M.A.*



This plot shows the fractions of settled disk galaxies in four time spans, each about 3 billion years long. There is a steady shift toward higher percentages of settled galaxies closer to the present time. At any given time, the most massive galaxies are the most settled. More distant and less massive galaxies on average exhibit more disorganized internal motions, with gas moving in multiple directions, and slower rotation speeds. *Credit: NASA/Goddard Space Flight Center*

Further reading:

Links to the paper in *The Astrophysical Journal* and to several NASA videos appear at http://hipacc.ucsc.edu/GalaxyDiskSettling.html .

HRPO

FRIDAY NIGHT LECTURE SERIES
all start at 7:30pm
1 May: "Beliefs about UFOs"
8 May: "Alien Abductions"
15 May: "The Last Flight of Amelia Earhart"
22 May: "The Asteroid Grand Challenge"
29 May: "An Introduction to Venus"

SCIENCE ACADEMY
Saturdays from 10am to 12pm
For ages eight to twelve. $5/$6 per child.
2 May: "Dawn Spacecraft"
9 May: "Venus"
16 May: "Expedition 9"
23 May: "Forces of Nature—Gravity"
30 May: "Forces of Nature—Electromagnetism"

CALL FOR VOLUNTEERS
*Saturday, 16 May from 6pm to 10pm. *Two volunteers in additional to regular complement.* **Evening Sky Viewing Plus.** Marshmallow roast, demo tables. Easy; training provided.
*Saturday, 30 May from 12pm to 2pm. *One volunteer.* **Solar Viewing**. Three viewing instruments. Moderate; training provided.

20/20 Vision Campaign

***Light Pollution Committee*: 11 May, 6:15pm at HRPO**

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This Month's **GLOBE At Night** runs from 9 May to 18 May. Participants should use the constellation Leo.

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The SQM measurements obtained at HRPO back viewing pad from 18 January to 13 April have an average of 18.67. This suggests an increase of 0.0016% in the light pollution above HRPO's domes. The April measurement raised the quality average slightly from the previous 18.66.

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The East Baton Rouge Parish Library has introduced its **five-year Strategic Plan** to the public and wants to receive input. One of the Plan's six goal areas is entitled "Facilities & Operations", which includes outside lighting. BRAS has already attended two public meetings concerning the Plan. According to Library Assistant Director Mary Stein, there will be more meetings this spring.

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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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Debra Credeur, the Director of the **Atchafalaya Trace Commission**, has stated that "skygazing" can be included as an entry on the ANHA website (provided BRAS compose the text). BRAS is also providing a target list for upcoming New Moon dates, in anticipation of the Commission requesting astronomy outreaches at ANHA sites. The next meeting of the ATC is Wednesday 6 May, 10am at the Capitol Park Welcome Center.

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BRAS member Clint Gayle is investigating the possible of having a BRAS speaker at an upcoming meeting of the Zachary Rotary Club. This would be an excellent opportunity to discuss reduction of skyglow within Zachary city limits.

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The HRPO Manager has planned a meeting with BREC's Conservation Department to discuss this year's assessment of BREC's outdoor lighting (in fulfillment of Task 6.I.D of BREC's *Environmental Sustainability Policy*).

20/20 VISION CAMPAIGN CHECKLIST

All BRAS members need to perform these simple tasks during 2015.

____Ask my community's Public Works Department to cap the streetlamp(s) nearest my home. [Record date and time of conversation, official on other end of line, and response.]

____ Thank at least one business/government entity per month for using capped outdoor lighting. [Record date, time and entity.]

____ Request at least once monthly that a business /government entity shield a security fixture that is sending light into the street. [Record date, time, entity and response.]

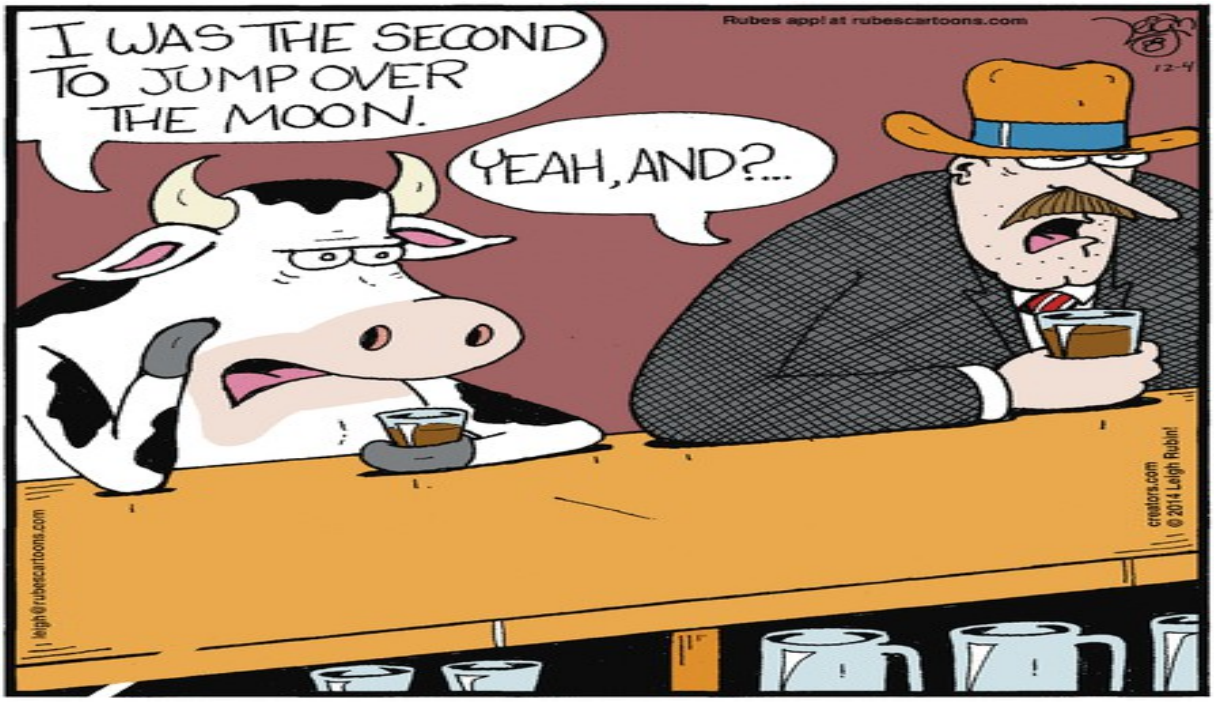
____Take measurements for GLOBE at Night at each of these places:
*personal residence
*personal workplace
*family member's school
*friend's home
*a campground
*HRPO
*LSU *or* SU *or* BRCC
*BREC facility besides HRPO
[Follow instructions on GLOBE at Night worksheet.]

This Campaign will be successful only if a majority of BRAS members take part. To this point our dark sky concerns have received sympathetic responses from EBRP Public Works, Bluebonnet Swamp Nature Center and The Atchafalaya Trace Commission.

Recent Entries in the Forum

Below are selected recent additions to the BRAS Forum. There are also nine active polls.

Sixth Dragon Resupply Mission Reaches ISS
Ninth International Astronomy Day Wet but Successful
The Origins of Edible Toothpaste
Are Pinhole Cameras Good for Astrophotography?
Earthlings Celebrate Hubble Space Telescope's 25th Anniversary
Winner of IAD Raffle Scope to Provide it to Granddaughter
Next Baton Rouge Lakes Project Meeting on 12 May
May Viewing Times for Great Red Spot Now Posted
Defunct MESSENGER Spacecraft to Crash into Mercury
Venus Viewing Took Place at IAD
Was April 4th Lunar Eclipse Total?
Io Blocks Callisto During IAD
Apollo 13 Anniversary Talk Receives Positive Marks
April Saw First Anniversary of LADEE
Five Close Asteroids Zip by Earth Over Eight Days
Naming Campaign for Pluto Features Extended Until 24th
Rick Wright Reviews Alex Filippenko Talk



The Buzz Aldrin of cows