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Big Brother to the Milky Way...

This image from NASA's Galaxy Evolution Explorer (GALEX) shows NGC 6744, one of the galaxies most similar to our Milky Way in the local universe. This ultraviolet view highlights the vast extent of the fluffy spiral arms, and demonstrates that star formation can occur in the outer regions of galaxies. The galaxy is situated in the constellation of Pavo at a distance of about 30 million light-years. NGC 6744 is bigger

than the Milky Way, with a disk stretching 175,000 light-years across. A small, distorted companion galaxy is located nearby, which is similar to our galaxy's Large Magellanic Cloud. This companion, called NGC 6744A, can be seen as a blob in the main galaxy's outer arm, at upper right. Credit: http://www.galex.caltech.edu/media/glx2013-03r_img01.html

The image was released on June 28, 2013, the same day as when [NASA decommissioned](#) its GALEX spacecraft after a decade of operations using ultraviolet vision to study hundreds of millions of galaxies across 10 billion years of cosmic time. Despite receiving the signal to shut down on the 28th, GALEX will remain in orbit for another 65 years or so before slipping into Earth's atmosphere and eventually burning up during re-entry. During the decade of activity, GALEX met its prime objectives and its mission was extended three times.

On a related note, check out this fascinating article on the **Formation and Evolution of Galaxies** on [Jay GaBany's web site](#). Accompanying this article is a terrific "Beginner Guide to the LCDM Universe", a [12-minute video](#) depicting galaxy formation and evolution (from the [Cassiopeia Project](#)). LCDM is short for Lambda Cold Dark Matter, a current model for our understanding of the origin of the Cosmos. However, as noted by GaBany, "the book of scientific knowledge is written on loose leaf pages that are revised, re-sorted and sometimes removed over time when new information is dug up. Therefore, ... nothing cosmological should be considered etched in stone because there's always something new coming to light just over our horizon." Interesting thought and well-stated. Enjoy !

The EAS newsletter, **Observer**, is published monthly. Anyone wishing to contribute articles or photos may mail them to the club's PO box: EAS, PO box 3474, Evansville, IN 47733, or e-mail them to the editor at: gneireiter@wowway.com

Local Events and Information

The **Evansville Astronomical Society** (EAS) is a non-profit organization fully incorporated in the state of Indiana. It has, as its primary goal, the advancement of amateur astronomy. Founded in 1952, the society seeks to:

- 1... maintain adequate facilities for its members and for the public in order to extensively study the skies, and
- 2... promote an educational program for those who wish to learn more about the science of Astronomy.

Meetings are held the third Friday of each month, except June, when the annual EAS picnic is held. The society also sponsors monthly Open House events during the warmer seasons that afford the public an opportunity to tour the observatory.

EAS 2013 Officers and Contacts

President - Scott Conner 812.604.7164
ssconner24@gmail.com

Vice President - Tony Bryan

Secretary - Charleen Kaelin 812.303.1711

Treasurer - Scott Bishop

Counselors - Michael Borman, Kent Brenton, and Ken Harris

Webmaster - Michael Borman

Program Director - open

Newsletter Editor - George Neireiter
812.629.7822 gneireiter@wowway.com

For more information about EAS or directions to the Observatory, visit the club's web page:
<http://www.evansvilleastro.org/>



Telescope mount upgrade status... Great News !!! On July 16, Scott Conner was notified that the new **Paramount ME II** was shipped. The mount arrived and is being stored at Scott's work place. He is currently creating 3D drawings to figure out exactly where to put the mount on the new pier. Scott will be meeting with Kent Brenton in early August to get his advice on it. Once a final design is developed, Scott will bring copies to the EAS regular meeting to get members' suggestions.

We are still a little bit short of our project's financial goal. If you haven't contributed, please help out and make a contribution. While there have been some large donations of \$200 or more, your gift of \$25 or \$30, or even \$50, would help us achieve the total amount.

Please send your check to Scott Bishop, Treasurer, at: E.A.S., P.O. Box 3474, Evansville, IN, 47733. Or, even better, come to the next meeting (August 16) and personally deliver your support of E.A.S. and its mission. Thank you. Content update from Scott Conner

Comet ISON update... Is the comet already fizzling out? A recent (July 30) article on Space.com by [Mike Wall](http://Space.com) provides some discouraging news via astronomer Ignacio Ferrin from Colombia. He noted that the comet stopped brightening last January and has remained at a constant brightness ever since.

But, as noted on July 31 by [Joe Rao of Space.com](http://Space.com), some changes could happen in the next couple of weeks as comet ISON approaches the "frost line" -- the distance from the Sun at which an object's water begins sublimating off into space. This distance is about 400 million kilometers, or about halfway to Jupiter from the Sun. When that occurs, it is anticipated that comet ISON should start to brighten.

In preparation of this activity, astronomers are meeting at Johns Hopkins University in Maryland on Aug. 1st and 2nd to form a game plan for observing and studying the new comet. Two possibilities are suggested.

If the comet is no brighter than 13th magnitude by the end of August, there is a fair chance the comet will not survive its close encounter with the Sun around November 28 when it comes within 1.2 million kilometers of the Sun's surface. A pass that close to the Sun might just disintegrate the nearly 5 kilometer wide nucleus of the comet.

On the other hand, if comet ISON does brighten greater than 13th magnitude by end of August, it could remain mostly intact during the close pass at the end of November. And so the guessing game continues.

Images courtesy of Dave Kube

Photos from
the 22nd
Patoka Lake
Stars on the
Beach
July 13, 2013



Members of the Louisville Astronomical Society (left) joined the Evansville Astronomical Society to share telescopes and astronomy knowledge with the public at Patoka Lake.

EAS OBSERVER NEWSLETTER

September 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5 New 	6	7 PSW
8	9	10	11	12 First 	13	14
15	16	17	18	19 Full 	20 Regular Mtg.	21
22	23	24	25	26 Last 	27	28
29	30					

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August Events (reminder)....

Nebraska Star Party (20th) Aug 4 - 9 Merritt Reservoir's Snake Campground, Valentine, NE
 PSW Aug 10 (Saturday) 8:00 pm Wahnsiedler Observatory
 Regular Meeting Aug 16 (Friday) 7:30 pm Wahnsiedler Observatory

September Events...

PSW Sep 7 (Saturday) 7:30 pm Wahnsiedler Observatory
 Regular Meeting Sep 20 (Friday) 7:30 pm Wahnsiedler Observatory
 Ferdinand Folk Fest Sep 21 (Saturday) 11 am - 6 pm (EDT)
Okie-Tex Star Party (30th) Sep 28 - Oct 6 Camp Billy Joe (near Kenton, OK)
Twin Lakes (24th) Sep 28 - Oct 6 Pennyrile State Forest (Dawson Springs, KY)

Moon phase times (Evansville local time)

New Moon	Sep 5 6:37 am	First quarter	Sep 12 12:09 pm
Full Moon	Sep 19 6:13 am	Last quarter	Sep 26 10:56 pm

courtesy of [Time and Date](#)



Inventing Astrophotography: Capturing Light Over Time

By Dr. Ethan Siegel

We know that it's a vast Universe out there, with our Milky Way representing just one drop in a cosmic ocean filled with hundreds of billions of galaxies. Yet if you've ever looked through a telescope with your own eyes, unless that telescope was many feet in diameter, you've probably never seen a galaxy's spiral structure for yourself. In fact, the very closest large galaxy to us –

Andromeda, M31 – wasn't discovered to be a spiral until 1888, despite being clearly visible to the naked eye ! This crucial discovery wasn't made at one of the world's great observatories, with a world-class telescope, or even by a professional astronomer; it was made by a humble amateur to whom we all owe a great scientific debt.

Beginning in 1845, with the unveiling of Lord Rosse's 6-foot (1.8 m) aperture telescope, several of the nebulae catalogued by Messier, Herschel and others were discovered to contain an internal spiral structure. The extreme light-gathering power afforded by this new telescope allowed us, for the first time, to see these hitherto undiscovered cosmic constructions. But there was another possible path to such a discovery: rather than collecting vast amounts of light through a giant aperture, you could collect it over time, through the newly developed technology of photography. During the latter half of the 19th Century, the application of photography to astronomy allowed us to better understand the Sun's corona, the spectra of stars, and to discover stellar and nebulous features too faint to be

seen with the human eye.

Working initially with a 7-inch refractor that was later upgraded to a 20-inch reflector, amateur astronomer Isaac Roberts pioneered a number of astrophotography techniques in the early 1880s, including "piggybacking," where his camera/lens system was attached to a larger, equatorially-mounted guide scope, allowing for longer exposure times than ever before. By mounting photographic plates directly at the reflector's prime focus, he was able to completely avoid the light-loss inherent with secondary mirrors. His first photographs were displayed in 1886, showing vast extensions to the known reaches of nebulosity in the Pleiades star cluster and the Orion Nebula.

But his greatest achievement was this 1888 photograph of the Great Nebula in Andromeda, which we now know to be the first-ever photograph of another galaxy, and the first spiral ever discovered that was oriented closer to edge-on (as opposed to face-on) with respect to us. Over a century later, Andromeda looks practically identical, a testament to the tremendous scales involved when considering galaxies. If you can photograph it, you'll see for yourself !

Astrophotography has come a long way, as apparent in the Space Place collection of NASA stars and galaxies posters at <http://spaceplace.nasa.gov/posters> #stars.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Great Nebula in Andromeda, the first-ever photograph of another galaxy. Image credit: Isaac Roberts, taken December 29, 1888, published in A Selection of Photographs of Stars, Star-clusters and Nebulae, Volume II, The Universal Press, London, 1899.

Upcoming Programs...



EAS OBSERVER NEWSLETTER

EAS Meeting Minutes -- July 19, 2013

The EAS Meeting for July 19, 2013 was called to order by President Scott Conner at 7:34 pm.

There were 7 visitors in attendance.

Minutes: Ken Harris made a motion to accept the minutes from the last meeting as published in the June newsletter (<http://www.evansvilleastro.org>). It was seconded by Wayne Donohoo, and the ayes carried.

Vice President: Tony Bryan reported on these upcoming events:

PSW - Saturday August 10, 8:00 pm
Regular Meeting - Friday August 16, 7:30 pm
PSW - Saturday September 7, 7:30 pm
Ferdinand Folk Festival - Saturday Sept 21, beginning at 11:00 am

The 7 visitors were introduced and welcomed.

Treasurer: Scott Bishop reported that the donation letters had not been sent out yet, but hopefully will be out in a month or so. Scott also reported that \$1,050 was transferred from the general fund to cover the cost of the mount, but other donations are still expected.

Bonds have not been doing very well the last two months, but are still better than the C.D. percentage return. Treasurer Bishop requested that anyone who has not paid dues yet, please do so soon.

Special Projects: Vice President Bryan has still not heard anything from Crane regarding the progress of the Educational Partnership Agreement between NSWC-Crane Division and EAS. He said that furloughs have slowed things at Crane.

OLD BUSINESS:

EAS Picnic –The picnic was held on Saturday, June 8. Ken Harris was the chef and had the food ready at 5:30 pm. The attendance of 16 was fewer than we used to have. Several members brought their scopes and set them up outside. The PSW started at 8:30 pm and 9 guests showed up and stayed until around 10 pm. We were really hoping to have a bigger crowd.

Outreach: Patoka Lake – This year's 22nd Annual Patoka Lake event took place on Saturday, July 13. President Conner arrived at the beach at 5:15 pm to meet with Alissa, the representative for DNR. When he arrived the weather was not looking favorable. After a couple of storms, the skies cleared. Because of the storms and the lack of children at the beach, the children's activities were not set up. A tent was set up for the night time multimedia presentation by Ken Alderson from the LAS. As evening set in, the Moon, Venus, and Saturn were viewed. The skies remained clear all night and attendees saw the many sights of the skies. Scott and Victor Lopez even viewed a couple of ARP Galaxies before tearing down for the night. Due to the earlier rain, optics fogged up quickly, which caused an early end to the night at about 1:00 am (EDT). There were approximately ten telescopes from the LAS, EAS, and Stonebelt Stargazers, and about two hundred member of the public in attendance. Thanks to all who helped out!

EAS OBSERVER NEWSLETTER

NEW BUSINESS:

Mount – The new Paramount ME II mount is complete. In fact, it is already on a UPS truck, scheduled to arrive at Scott Conner's work on Monday. Scott did not expect it so soon. The telescope attachment mount needs to be completed, and a decision needs to be made about when to start work on removing the old mount. The dome will need to be shut down, possibly for several months. Scott also reminds everyone that we are still short of collecting all of the promised donations, and still could use a few more to get the project completely in the black. He asks that if you have not donated and can spare the money, please make a donation to the EAS for the telescope mount.

PSW - There will be a Public Star Watch August 10 at the observatory. It is scheduled to start at 8:00 pm, and help is always appreciated.

Mower List – If you have not signed up for cutting the grass, that list on the table. Grass needs to be cut about every 2 weeks, especially on the day of meetings and PSWs.

Telescopes for Sale – If you are interested in purchasing a telescope, there are several available from members and other individuals. Stay tuned to the newsletter for more details.

Portable Dome – A decision still needs to be made about who gets the portable dome. It was given as a prize for people who donated to the telescope mount fund.

Dues – Don't forget this month we are collecting dues for this year. If you have not paid your dues, you can send them to: P.O. Box 3474, Evansville, IN 47733. The dues are \$40 per year for family, and \$35 per year for single.

Tell City Library – Scott shared that the Tell City Library would like to have a program on Saturday, October 26. He will contact them for more details.

PROGRAM:

The program for the night, presented by Scott Conner, was "The Asteroid that Flattened Mars."

The meeting adjourned at 8:08pm.

Respectfully submitted,

Donna Bryan
Substitute Secretary, EAS