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Images by Kent Brenton.

Left: **M17**, the Omega Nebula or Swan Nebula, was taken on 7/27/11 with an 8" f/4.8 Newtonian and a vintage Lumicon coma corrector -- 3x8 minute

exposures stacked. Kent made the main mirror for this scope over 30 years ago.

[M17](#), which can be found in the constellation Sagittarius, was discovered in 1745, but not catalogued by Messier until 1764. It is about 5 - 6 thousand light-years from Earth and spans some 15 light-years across. M17 is an [H II region](#) consisting of ionized hydrogen gas -- the ionization driven by UV light from short-lived blue stars. The total mass of M17 is estimated at 800 solar masses.

Right: **M27**, the Dumbbell Nebula, was taken on ...

continued on page 5



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... 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. Scott recently created 3D drawings to show exactly where to put the mount on the new pier (see pages 3 and 4). In addition, Scott provided the following information regarding the drawings:

"The height can be adjusted, but I think the design is stable. I will bring this design to the next meeting (Sept. 20) for approval, so that production can start. We may add attachment points that would allow shelves to be attached for things like CCD equipment and lens. I would like to have the mount constructed by October so that we can start the upgrade sometime after that point. Anyone with concerns about the design should contact me so changes can be made before the next meeting."

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.

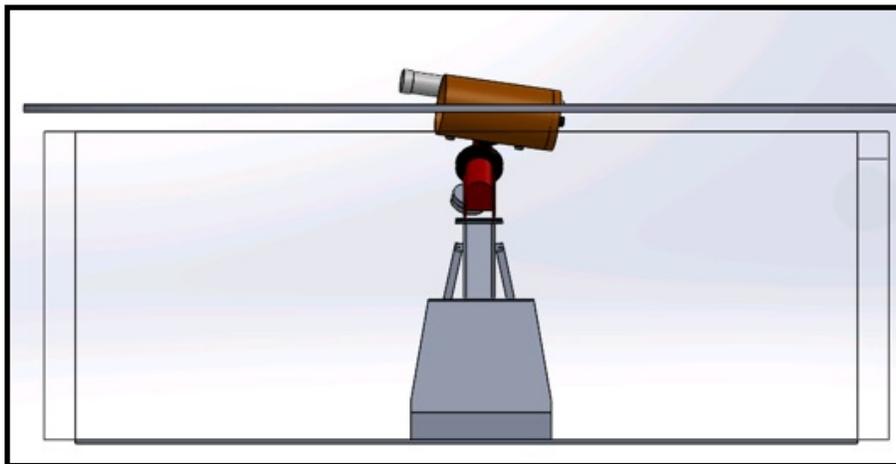
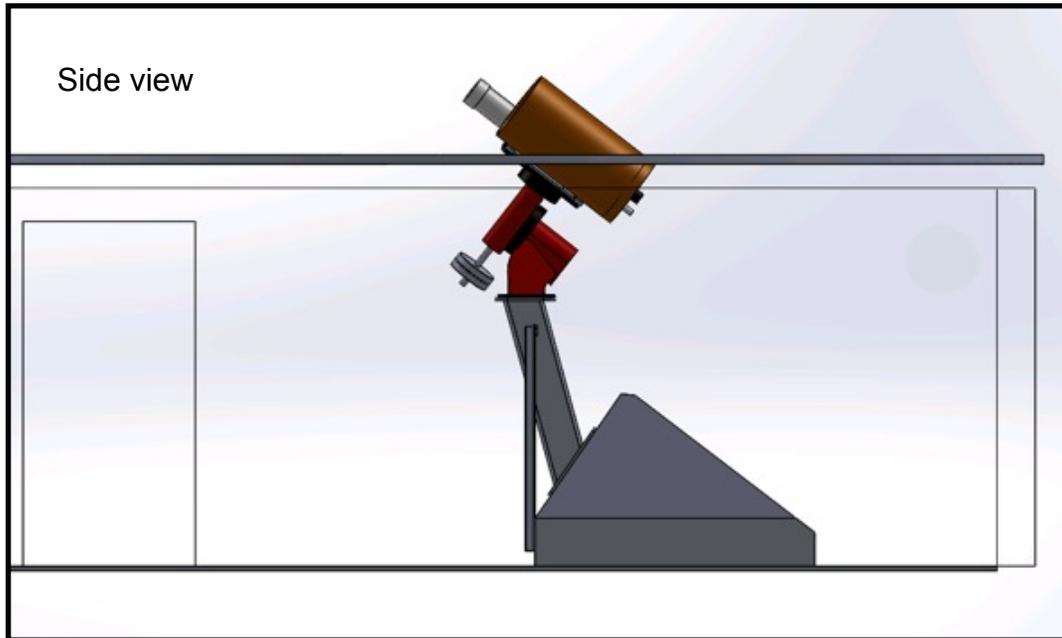
Please send your check to Scott Bishop, Treasurer, at: E.A.S., P.O. Box 3474, Evansville, IN, 47733. Or, even better, come to the next meeting (Sept. 20) and personally deliver your support of E.A.S. and its mission. Thank you.

PSW on Sep. 7th... On Saturday night the EAS held a PSW at 7:30 pm. Dave Kube, Ted Ubelhor, and I were there to do the program. I did the slide show and answered questions. Dave arrived early and mowed, got the telescope ready upstairs, and answered questions. Ted set his telescope up outside and answered questions from guests. We had a total of 16 guests and 6 members in attendance. There were clouds in the sky so we didn't really get to look at anything but there were lots of questions about the telescopes, what constellations were up, how did we know what was up, identification of some of the brighter stars that were seen through the clouds and the like. The visitors stayed around until 10 pm, hoping that they could see something in the breaks of the clouds, but little was really seen. A man from Owensboro had his 8" dob out, so just a few things were looked at briefly. Many indicated that they would be back to try it again when the skies would be clear. Hopefully, they will come to our next meeting on the 20th or the next PSW in October.

Submitted by: Ken Harris

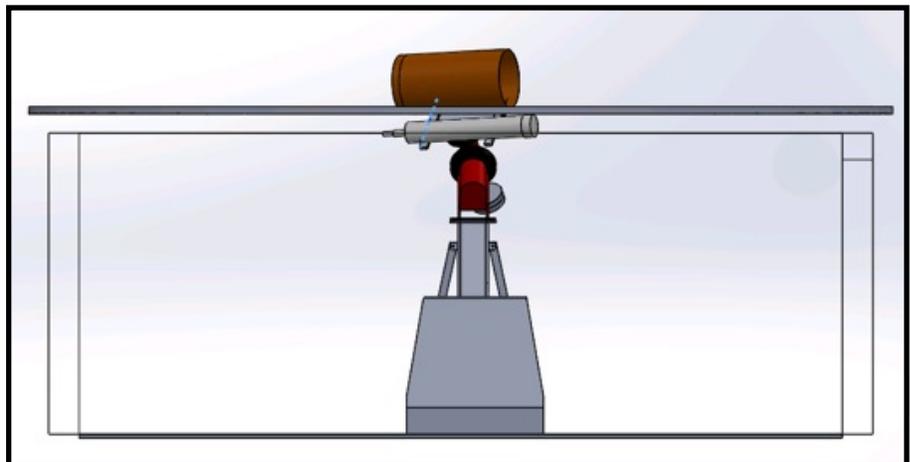
3D Drawings for Telescope Mount -- by Scott Conner

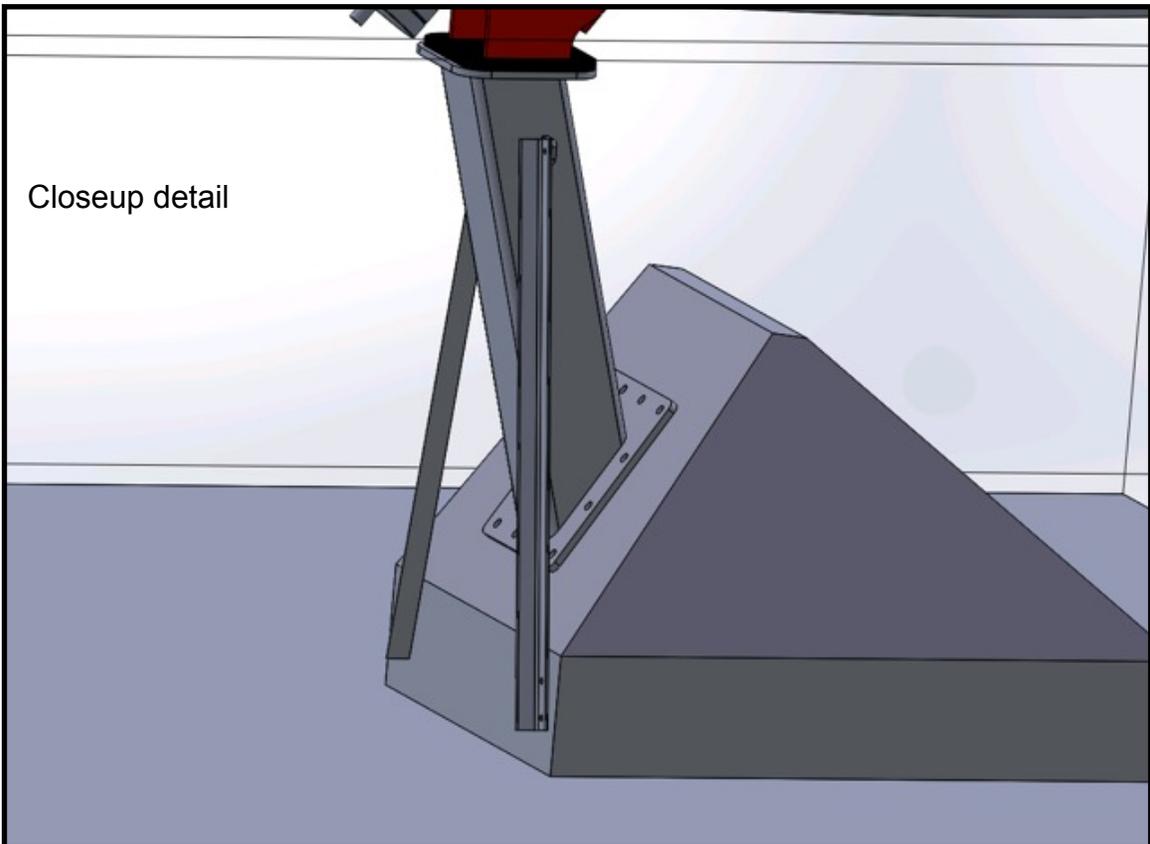
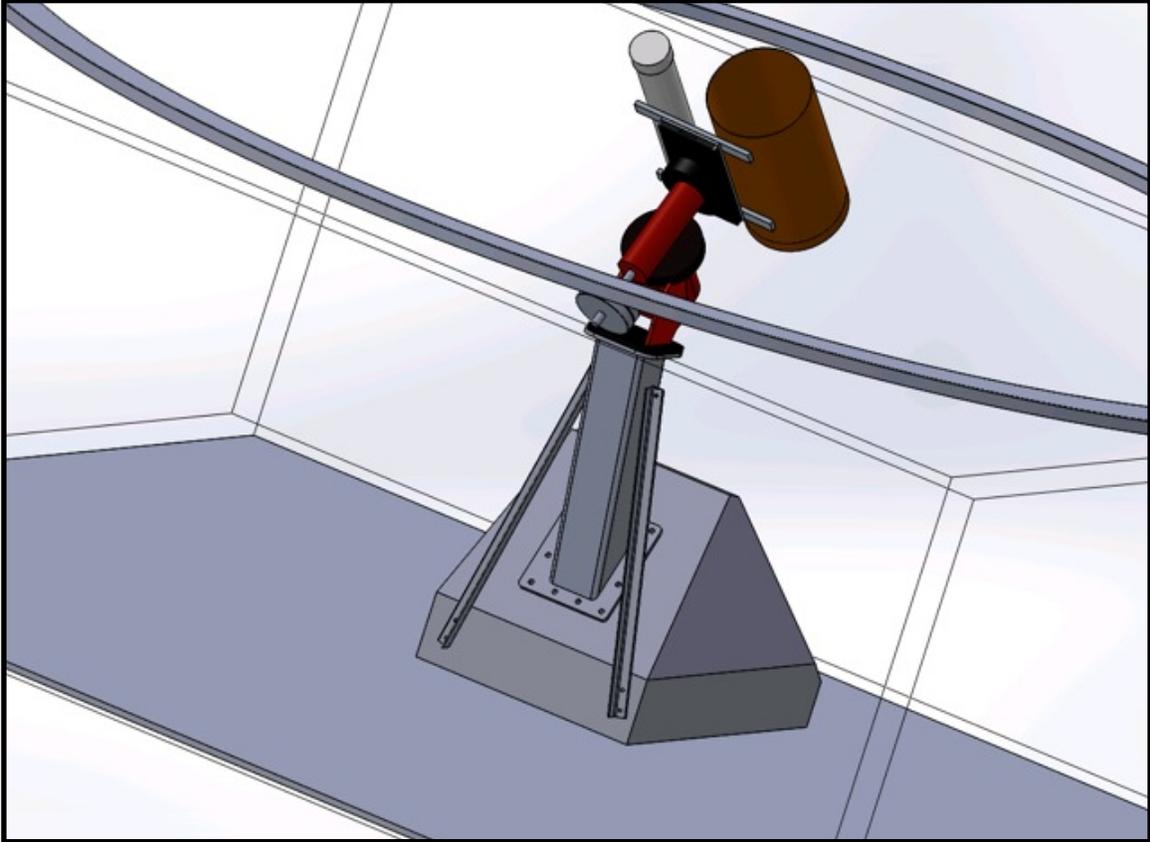
See page 2 for details regarding the drawings.



Looking west

Looking east





Telescopes and accessories for sale...

Submitted by Mike Borman:

Over the past few weeks I have been putting together a list of some of my equipment I would like to sell, and well, it turned into a big project!

I've accumulated a lot of gear after doing amateur astronomy for 30 years. I decided to put together a webpage with pictures of the equipment, asking price, and details on my personal website. I have telescopes, cameras, mounts, and other accessories for sale on there.

Here is the link:

<http://www.mborman.org/forsale.htm>

Upcoming events for volunteers...

We need volunteers to come help us man the booth at **The Ferdinand Folk Festival**. That takes place on Saturday September 21st from 11 am until at least 6 pm or later. Good Food, good Music, and good company!

Need a couple of people with telescopes to help with a program at the **Library in Tell City**. The program will be Monday November 11th at 6:45 pm. We will do an indoor presentation until 7:15 pm, then observe until 8:30 pm. If you can help out with this event please let me know.

Submitted by: Scott Conner

In addition, here's a note from Gena Garrett, Program Naturalist at **Wesselman Woods Nature Preserve** ...

We are having our annual **Harvest Festival & Hayrides** event scheduled for Saturday, October 26. We would love to have some telescopes set up on the hill at the pond for families and kids to stargaze. The event runs from 3 – 9 pm, but of course we wouldn't need you to start until the sun has set. Let me know if you think this might work for you!

Thanks, Gena

Please contact Scott if you can help with any of these events.

Congratulations to Mike Borman who had one of his solar images posted on the gallery of [Space.com](http://www.space.com) on September 5. Here's the link:

<http://www.space.com/22665-amazing-night-sky-photos-september-2013.html>

Even though prospects for a spectacular show this fall are dimming for **comet ISON**, as summarized in [Joe Rao's article on Space.com](http://www.space.com), check out this stunning Hubble Space Telescope image of the comet when it was slightly closer than Jupiter's orbit. The contrast-enhanced photo reveals subtle structure in the inner coma and dust particle release on the sunward-facing side of the comet's nucleus.



Kent Brenton images (cont. from page 1)...

8/25/11 with a Meade 10" f/10 LX200 GPS and five 8-minute stacked exposures.

M27 is a planetary nebula found in the constellation Vulpecula and at a distance of about 1400 light-years from Earth. It was the first planetary nebula discovered by Charles Messier in 1764. At its visual brightness of 7.5 magnitude, it is easily visible in binoculars and a popular observing target in amateur telescopes.

Like many nearby planetary nebulae, the Dumbbell contains knots. Its central region is marked by a pattern of dark and bright cusped knots and their associated dark tails. The knots vary in appearance from symmetric objects with tails to rather irregular tail-less objects.

Comments from Kent:

As of June 2012, I had imaged every object in the Messier list. I need to redo many of them because I took my first images with the ST8300c CCD camera in the summer of 2010 and my technique improved over time. I do all imaging with a SBIG ST8300c CCD camera (one-shot color) using Nebulosity 2 for capturing and post processing. All guiding is done with PHD (freeware).

EAS OBSERVER NEWSLETTER

October 2013

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| | | 1 | 2 | 3 | 4 New  | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 First  | 12 Fall cleanup and PSW |
| 13 | 14 | 15 | 16 | 17 | 18 Regular Mtg. Full  | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 Last  |
| 27 | 28 | 29 | 30 | 31 | | |

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September Events (reminder)....

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)

October Events...

Fall/ winter Cleanup Oct 12 (Saturday) 3:00 pm Wahnsiedler Observatory
(with member observing to follow)
PSW Oct 12 (Saturday) 7:30 pm Wahnsiedler Observatory
Regular Meeting Oct 18 (Friday) 7:30 pm Wahnsiedler Observatory
(nominations for Officers)

Moon phase times (Evansville local time)

| | | | | | |
|-----------|--------|---------|---------------|--------|---------|
| New Moon | Oct 4 | 7:35 pm | First quarter | Oct 11 | 6:03 pm |
| Full Moon | Oct 18 | 6:38 pm | Last quarter | Oct 26 | 6:41 pm |

courtesy of Time and Date

Size Does Matter, But So Does Dark Energy

By Dr. Ethan Siegel

The universe is filled with giant clusters and superclusters of galaxies. They line up along filaments, forming the largest structures in our universe -- a cosmic web of galaxies separated by great intergalactic voids. But the existence of these massive structures -- which could be as large as 4 billion light years across -- may challenge some of the most basic principles of cosmology. Do these filaments mean we have to refine our understanding of the universe, or could there be another explanation?

Here in our own galactic backyard, the Milky Way contains some 200 - 400 billion stars, and that's not even the biggest galaxy in our own local group. Andromeda (M31) is even bigger and more massive than we are, made up of around a trillion stars! When you throw in the Triangulum Galaxy (M33), the Large and Small Magellanic Clouds, and the dozens of dwarf galaxies and hundreds of globular clusters gravitationally bound to us and our nearest neighbors, our local group sure does seem impressive.

Yet that's just chicken feed compared to the largest structures in the universe. Giant clusters and superclusters of galaxies, containing thousands of times the mass of our entire local group, can be found omnidirectionally with telescope surveys. Perhaps the two most famous examples are the nearby Virgo Cluster and the somewhat more distant Coma Supercluster, the latter containing more than 3,000 galaxies. There are millions of giant clusters like this in our observable universe, and the gravitational



forces at play are absolutely tremendous: there are literally quadrillions of times the mass of our Sun in these systems.

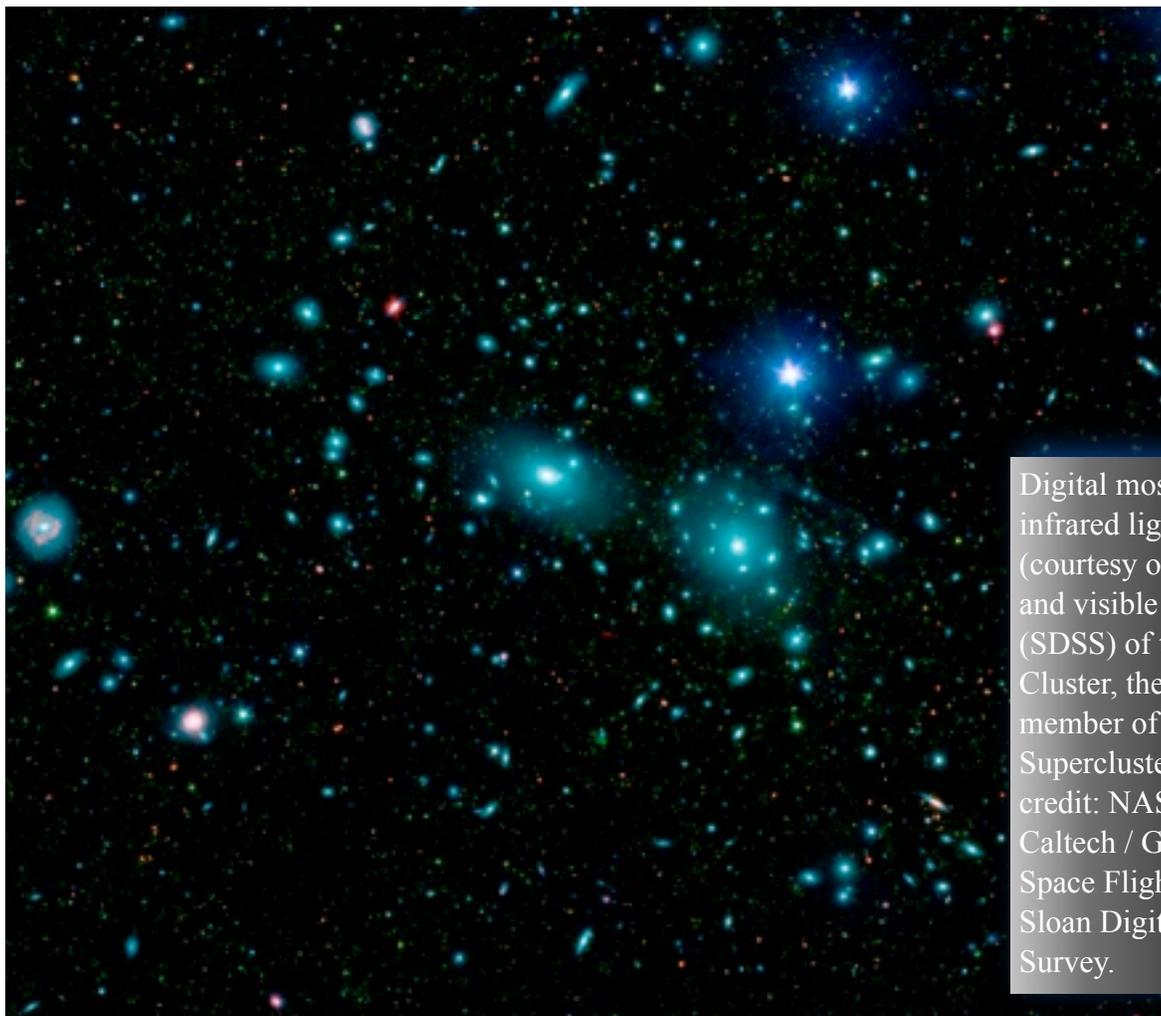
The largest superclusters line up along filaments, forming a great cosmic web of structure with huge intergalactic voids in between the galaxy-rich regions. These galaxy filaments span anywhere from hundreds of millions of light-years all the way up to more than a billion light years in length. The CfA2 Great Wall, the Sloan Great Wall, and most recently, the Huge-LQG (Large Quasar Group) are the largest known ones, with the Huge-LQG -- a group of at least 73 quasars -- apparently stretching nearly 4 billion light years in its longest direction: more than 5% of the observable universe! With more mass than a million Milky Way galaxies in there, this structure is a puzzle for cosmology.

You see, with the normal matter, dark matter, and dark energy in our universe, there's an upper limit to the size of gravitationally bound filaments that should form. The Huge-LQG, if real, is more than double the size of the largest predicted structure, and this could cast doubts on the core principle of cosmology: that on the largest scales, the universe is roughly uniform everywhere. But, this might not pose a problem at all, thanks to an unlikely culprit: dark energy. Just as the local group is part of the Virgo Supercluster but recedes from it, and the Leo Cluster -- a large member of the Coma Supercluster -- is accelerating away from Coma, it's conceivable that the Huge-LQG isn't a single, bound structure at all, but will eventually be driven apart by dark energy.

Either way, we're just a tiny drop in the vast cosmic ocean, on the outskirts of its rich, yet barely fathomable depths.

Learn about the many ways in which NASA strives to uncover the mysteries of the

universe: <http://science.nasa.gov/astrophysics/>. Kids can make their own clusters of galaxies by checking out The Space Place's fun galactic mobile activity: <http://spaceplace.nasa.gov/galactic-mobile/>



Digital mosaic of infrared light (courtesy of Spitzer) and visible light (SDSS) of the Coma Cluster, the largest member of the Coma Supercluster. Image credit: NASA / JPL-Caltech / Goddard Space Flight Center / Sloan Digital Sky Survey.

Upcoming Programs

September

Date: Friday the 20th, at about 8:15 pm, following the Business Meeting

Presenter: Dave Kube

Topic: **Perkins Observatory - A Tour and History**

... including 3 interesting and little known facts that will "WOW" you!

EAS OBSERVER NEWSLETTER

EAS Meeting Minutes -- August 16, 2013

The meeting was CALLED TO ORDER by Vice-President Tony Bryan at 7:35 pm with seventeen people in attendance.

It was moved and seconded to APPROVE the MINUTES of the previous month as printed on the EAS Internet page. (WWW.EVANVILLEASTRO.ORG)

Vice-President Tony Bryan announced the following UPCOMING EVENTS:

| | | |
|-------------------------|------------------------------|---------------------------------|
| PSW | Saturday, Sept. 7 | 7:30 pm |
| Regular Meeting | Friday, Sept. 20 | 7:30 pm |
| Folk Festival | Saturday, Sept. 21 | 11:00 pm in Ferdinand |
| Cleanup/Pot Luck Dinner | Saturday, October 12 | 3:00 pm with dinner & observing |
| Tell City Observing | Information to be determined | |

There were five VISITORS: Tim Johnson, Jim Wilkinson; Stefne Wene, Dalton Wene, and Isabel Krahling, most of whom became new members.

The Treasurer's report was unavailable.

SPECIAL PROJECTS

NSWC - Crane Division has an Educational Partnership Agreement with EAS which will help with borrowing equipment. Tony Bryan explained that they have a mirror that would be used to build a 28" reflective telescope. This has many possibilities here.

OLD BUSINESS

A PSW was held on Saturday, August 10. We had 21 guests and 9 members in attendance. The weather was good and David Kube helped. Many thanks for all who helped.

NEW BUSINESS

The new PARAMOUNT ME II mount is currently being stored at Scott's work place. He is working on the preliminary design for the pier. The final draft should be ready for approval by the next meeting. The target date for installation is in early October. Of course, the old mount needs to be removed first. We are short of collecting the pledges made for this project and ADDITIONAL DONATIONS are requested.

(The following was mentioned at a previous meeting, and I feel it needs to be re-printed at this time. ... Secy note.)

As an extra incentive, there will be a PLAQUE placed at the bottom of the stairs commemorating those who donate the following amounts:

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| | | |
|--------------------|------------------|--------------------------|
| Member | \$25 - \$99 | One plate with all names |
| Planetary Observer | \$100 - 499 | One plate |
| Solar System | \$500 - 999 | Two plates |
| Galactic | \$1000 - \$4999 | Four plates |
| Cosmic | \$5000 and above | Six plates |

The next PSW is scheduled for September 7th at 7:30 pm in the Observatory. We can always use volunteers for these events.

The FERDINAND FOLK FESTIVAL is scheduled for Saturday, September 21. We will setup about 11:00 AM. Volunteers are needed to hand out stuff and bring solar telescopes. This is our 3rd year to participate. There are good crowds and good music.

It is time to sign-up for GRASS-CUTTING duty. This activity should be done every 2 weeks, especially on the days of the meeting and/ or PSW. The list to do so can be found on the table up front.

If you are looking to PURCHASE A TELESCOPE, there are several members who have them available for sale. A list will be provided in a future newsletter.

A decision needs to be made regarding the recipient of the PORTABLE DOME that was given as a prize for those who donate to the telescope mount fund. If you have already donated to this project and want your name to be considered, let Scott know as there will be a drawing at the September meeting.

Don't forget that this month, we are COLLECTING DUES for this year. If you have not paid, please send them to P. O. Box 3474, EVV, IN 47733. The dues are \$40 per year for families and \$35 for single membership.

Tony also mentioned that one of Mike Borman's ASTROPHOTOS was printed in "Astronomy Magazine" on page 67 in the Reader Photo Gallery section. Way to go, Mike !

Next, C. C. Kaelin reported on "What's up This Month".

PROGRAM – In lieu of the planned six minute canned program entitled, "How Big Is the University", Mitch Luman agreed to present an update on the KOCH IMMERSIVE THEATER which is scheduled to open in early 2014, maybe in February. Mitch provided the attendees with a power point presentation, including a time-lapse viewing of its construction and placement of the dome.

Birk Fischer was kind and generous enough to bring 2014 CALENDARS for everyone which were distributed. Many thanks to Birk -- we are grateful to you for doing so.

The meeting adjourned at 8:15 pm.

Respectfully submitted, Charleen Kaelin, EAS Secretary