



# Focal Point



September, 2014

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## Membership Meeting on September 19<sup>th</sup>



Megan E. DeCesar

As the summer is over, we are back to our regular schedule having Membership Meetings on the third Friday of each month.

The first meeting of the season will be on **September 19<sup>th</sup> at 8:00PM** at the Observatory. The speaker of the night will be Megan E. DeCesar, a Postdoctoral Research Associate at the Center for Gravitation, Cosmology, and Astrophysics of the Physics Department, UWM. Megan will talk about her research area on pulsars.

### Pulsars: The Universal Timekeepers

Pulsating neutron stars, or pulsars, are the densest directly observable objects known to exist in the universe. Every aspect of these objects is extreme—their magnetic fields are billions to trillions of times as strong as the Earth's, their cores are denser than the nucleus of an atom, and although they are as large as a city, many pulsars spin faster than a kitchen blender. The fastest-spinning pulsars keep time as well

or better than atomic clocks, and the pulses of light emitted with each spin provide a unique opportunity for astronomers to study exotic physics occurring in and around these objects. I will discuss some important discoveries that have been made through pulsar timing, and will describe how we can use pulsars to study extremely dense matter, test Einstein's theory of general relativity, and search for gravitational waves.

## The Last Public Night on October 3<sup>rd</sup>

The last public observing night is scheduled for October 3<sup>rd</sup> at 7:30PM. The topic will be **The Moon**. The evening will include a presentation by Brian Ganiere and viewing thru telescopes weather permitting.

We will collect a parking donation of \$5/vehicle. The event will be held in rain, shine, and starlight.

The kind help of MAS members during the night is encouraged and highly appreciated.



## Observatory News

At the August Board of Directors meeting at the observatory, purchase of an Advanced VX 8" Schmidt-Cassegrain Celestron was approved. This will give the general membership a relatively easy to use GOTO telescope.



Scott Jamieson mounted the new 8" Celestron goto telescope on a homemade pedestal.

And at the same meeting, Gene Hanson announced his donation (and the board accepted) of his 14 inch f/11 Celestron on an Astrophysics GTO900 mount which has complete GOTO capability.

It was decided early that the 8" scope should be placed in the ZII Observatory and the 14 inch Ray Zit Telescope



Gene Hanson with the 14" Celestron that he donated to MAS.

decommissioned because of lack of use and needed maintenance. In addition, this observatory roof is higher than the D-Shed and the Albrecht Observatory. We considered putting the 14 inch Celestron in the Tangney Observatory, but that structure wasn't quite large enough and any thoughts of using the scope visually or putting a DSLR on it would be practically impossible. It was then decided that the ZII could accommodate both scopes! And what was really great was that Scott Jamieson offered to donate a very robust pier for the 14".

The difficulty with that pier was that it was just too high for the observatory so we'd either have to cut it down, get another pedestal (we even considered an elevating pier), or raise the roof / get higher clearance. And putting both scopes did present another challenge that especially in the dark people might walk into the scopes. A simple solution was to build a small wall, but the tripod on the 8 inch presented a large footprint.

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Scott solved this by offering to donate a homemade pedestal out of a lamp that had been partially destroyed when the tornado hit his home a few years ago. But by simply changing the scope to use this pedestal, we realized that the scopes could be staggered and thus have more than enough room to make the wall completely unnecessary.

Once the two scopes were physically placed on the piers, much to our amazement both had about a 1 inch clearance. We actually expected no clearance on the 14 inch. What this meant



The new 8" scope is now ready to use for viewing and imaging with DSLR camera.

was that the piers would not need to be modified (i.e., lowered) and "raising the

roof" was relatively easy because only a few more inches of clearance was needed. "Raising the roof" is in quotes because that's not what we're actually doing. We're simply making the clearance higher (see the image above). The roof joints were raised by the width of a 2 by 4 (3.5 inches) and the front of the observatory roof modified by about that same amount. The result is a 4 inch clearance on both scopes.

Though we first thought of putting a computer right there in the ZII, weather considerations make this difficult for year round use. So for now we're thinking we can use a USB extender via a CAT5 cable that will be buried going to the Tangney Observatory and then using that conduit into the control room of the Z Dome.

But this is very much still a work-in-process so it's possible things may change. Also, we may rethink the location of these scopes in the future, especially the 14 inch. Stay tuned!

Come out to the next club meeting on Friday, September 19<sup>th</sup> and see or try these scopes for yourselves!

by Gene Hanson and Scott Jamieson

## Public Nights

The weather was not on our side during the last two Public Nights. August 22<sup>nd</sup> was a cloudy day with a promise of clearing out a little bit by sunset. We opened up the domes and sheds and were hoping for the best. There was a moderate crowd of optimistic folks with us. Sure enough, the clouds did not go away, which made impossible to see anything through telescopes. Nevertheless, Dennis Roscoe gave his presentation entitled The Wonders of Nebulae that generated big interest. He showed a plethora of images he had taken in his observatory. He also advertised a course about astrophotography he was going to hold in September at the UW Waukesha. After the presentation the visitors were given a tour of the hill.

The forecast for September 12<sup>th</sup> was a complete disaster: unusual cold, clouds, light rain, occasional showers. The whole day was gray and dark, and even worth, around 7PM it started to rain. We were absolutely convinced that nobody was going to show up. Instead, five brave people came, dressed warm, equipped with raincoats. As any outdoor activity was out of question, they were treated with longer presentations. First, Gene Hanson introduced the past and present of the MAS, then Lee Keith gave his talk about The Ice Giants: Uranus and Neptune. Later, Scott Jamieson lead the guests to the Z dome, where 5 enthusiastic latecomers joined us. Eventually, this rainy night turned out to be surprisingly successful.



## MAS Membership Renewal

Just like last year the Membership Renewal Notice will be sent out via email. Recently, the Renewal Form was integrated into the MAS website with different payment options including Credit Card, PayPal, Money transfer or Check made payable to MAS.

Open the For Members menu on the MAS website and scroll down to the Renew Membership tab on the left side, or just follow this link:

<http://www.milwaukeeastro.org/sendmsg/onlineRenew.asp>.

Please renew your membership soon.

If you joined the MAS after January 1<sup>st</sup>, 2014 your membership is active till the 2015 renewal period.

Many thanks for those members who already renewed their membership.

## MAS Observatory on a Paint



A very talented, award winning artist [Les Leffingwell](#) contacted the Observatory Director for permission to use the grounds and painted a portrait of our Observatory. Les is an art restorer, courtroom illustrator, and oil painter of "Biographical Portraits" since the 1970's. He is native of Milwaukee.

Above you can admire the amazing result which he accomplished over two days, and below the process of work.



## In the Astronomical News

### Earth's New Address: Solar System, Milky Way, Laniakea

The supercluster of galaxies that includes the Milky Way is 100 times bigger in volume and mass than previously thought, a team of astronomers says. They have mapped the enormous region and given it the name Laniakea — Hawaiian for 'immeasurable heaven'.

Galaxies tend to huddle in groups called clusters; regions where these clusters are densely packed are known as superclusters. But the definition of these cosmic structures is vague.

The new study, published in *Nature*, describes a novel way to define where one supercluster ends and another begins. A team led by Brent Tully, an astronomer at the University of Hawaii in Honolulu, charted the motions of galaxies to infer the gravitational landscape of the local Universe, and redraw its map.

The team used a database that compiles the velocities of 8,000 galaxies, calculated after subtracting the average rate of cosmic expansion. "All these deviations are due to the gravitational pull galaxies feel around them, which comes from mass," says Tully. The researchers used an algorithm to translate these velocities into a three-dimensional field of galaxy flow and density.

This method is superior to merely mapping the location of matter, because it enables scientists to build a map of uncharted regions of the Universe, says Paulo Lopes, an astrophysicist at the Valongo Observatory, part of the Federal University of Rio de Janeiro. It relies on detecting the galaxies' influence, rather than seeing them directly.

Moreover, the galaxies' motions reflect the distribution of all matter, not just that which is

visible in our telescopes — including dark matter. Discounting cosmic expansion, their map shows flow lines down which galaxies creep under the effect of gravity in their local region (see video). Based on this, the team defines the edge of a supercluster as the boundary at which these flow lines diverge. On one side of the line, galaxies flow towards one gravitational centre; beyond it, they flow towards another. It's like water dividing at a watershed, where it flows either to the left or right of a height of land.

This is a completely new definition of a supercluster. Scientists previously placed the Milky Way in the Virgo Supercluster, but under

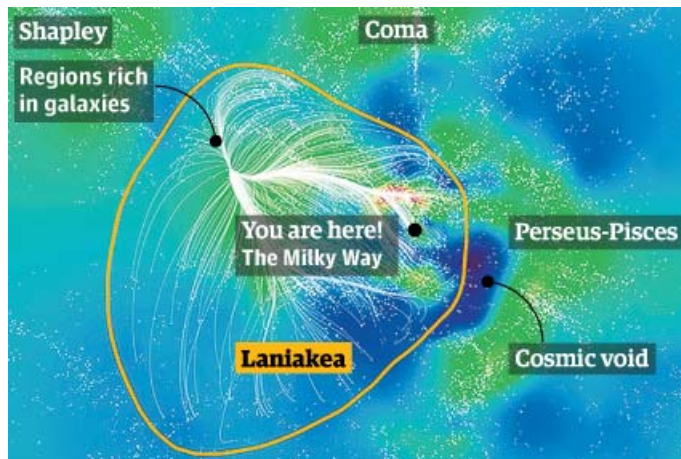
Tully and colleagues' definition, this region becomes just an appendage of the much larger Laniakea, which is 520 million light years across and contains the mass of 100 million billion Suns.

However, this work is unlikely to be the final word on what a supercluster is. Astronomers work on a different definition, based on superclusters being structures that will one day collapse into a single object. This will not happen to Laniakea because some of the galaxies

within it will recede from one another forever.

Although the map is comprehensive over the Universe around the Milky Way, its distance measurements become less accurate, and less numerous, the farther out you go, says Lopes. This is currently the technique's biggest potential source of error, he says, but adding more galaxy measurements will improve the map and could eventually help scientists to fully trace what is behind the motion of our local group of galaxies.

Elizabeth Gibney, *Nature* news



The extra line places the Milky Way in a vast network of neighbouring galaxies or "supercluster" that forms a spectacular web of stars and planets stretching across 520m light years of our local patch of universe. Named Laniakea, meaning "immeasurable heaven" in Hawaiian, the supercluster contains 100,000 large galaxies that together have the mass of 100 million billion suns

## Adopt a Telescope Program - Signup Sheet

	<b>Adoptee</b>	<b>Scope</b>	<b>Location</b>
<b>1</b>	Sue Timlin	18" F/4.5 Obsession	Wiesen Observatory
<b>2</b>	Neil Simmons	12.5" F/7.4 Buckstaff	B Dome
<b>3</b>	Russell Chabot	12.5" F/9 Halbach	A Dome (Armfield)
<b>4</b>	Dan Yanko	18" F/4.5 Obsession (Kyle Baron)	Albrecht Observatory
<b>5</b>	Tamas Kriska	25" F/3.4 Zemlock	Z Dome
<b>6</b>	Henry Gerner	12" LX 200	Tangney Observatory
<b>7</b>	Vacant	8"/14" Celestrons	Ray Zit Observatory
<b>8</b>	Vacant	10" LX 200	Jim Toeller Observatory

### At Your Service

#### Officers / Staff

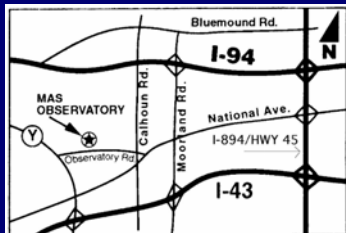
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Dennis Roscoe	608-206-0909
Michael Smiley	262-825-3981
Sue Timlin	414-460-4886
Dan Yanko	262-255-3482

#### September/October Key Holders

9/20	Tom Schmidtkunz	414-352-1674
9/27	Dan Yanko	262-255-3482
10/4	Russell Chabot	414-881-3822
10/11	Brian Ganiere	414-961-8745
10/18	Paul Borchardt	262-781-0169
10/25	Gene Hanson	262-354-0138



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