

# Pegasus



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## Upcoming Events:

### IMPORTANT:

February's meeting on 2/9/12 will be held in the planetarium  
Topic: "Tales of the Maya Skies"

### Telescope Classes

Dave Brown will be holding beginning and intermediate level classes on telescope design and use at his home. at 7:30pm

Dates: 3/15/2012  
4/19/2012

Please notify Dave or send him an email if you are interested. Please bring your telescope if you own one.

March meeting 3/8/2012

April meeting on 4/12/2012  
Information on Pg 4

## Message from our President - Dave Brown

By the time you read this, 2012 will be here. Our club has a new president, that being me, Dave Brown, and I look forward to enjoying this hobby with all of you.

For the past couple years, Barb Geigle has served as a wonderful president, not only providing our members with excellent programs but also by representing BCAAS at the Museum and elsewhere with professionalism and respect. We owe her a great big Thank You, and I hope to continue that mantra.

For you new members, a little about me. I have been a BCAAS member since 1988, and I served as president for several terms during the 1990's. I am an active observer, getting out under the stars with my scope as often as life allows. There is little in this hobby I haven't tried, and I like to share experiences with others, but I will not be condescending to new members or anyone who wants to learn.

That is one reason I will be holding some learning classes this coming year for anyone who wants to learn about all the telescopes out there, as well as learn how to find your way around the sky. I have learned much over the years, including how to find deep sky objects without computer guided scopes (my scope is certainly not Go-To), and I believe joining an astronomy club should be an avenue for you to learn the basics at the very least. I will hold "telescope classes" (for lack of a better phrase) beginning in March or April at my home, as soon as I get feedback from YOU as to how many are interested. If any of you have heard my talks and

lectures you know I like to keep things fun and interesting, so don't be put off by the word "classes".

If you already have a telescope, don't miss out on the planets this spring. Jupiter has been and will continue to be in the months ahead a jewel to watch, as well as Venus and Saturn emerging in spring as "can't miss" objects. Spring is also the best time to search for galaxies, as the dense part of the Milky Way slides to the horizon and allows us to look out through the thinnest part of our galaxy to worlds beyond.

Perhaps we can get a convoy together to a really dark sky to find some of those "faint fuzzies" on some clear weekend. Sound interesting?? E-mail me if you are and we'll see what we can do. (I know some great spots to observe, and I'll share them with you if you bring coffee and donuts!)

As we begin 2012, you will hear much rhetoric about the "END OF THE WORLD". I lectured on this subject last spring to BCAAS members that this was coming, and over the holidays several programs on television were devoted to doomsday events. Trust me, December 21, 2012 will be just a regular old winter solstice like all the rest, and we should plan a BCAAS "survivor" party on Dec 22.

As gratitude for saving you all grief you can get me some real cool Christmas presents!!

Hey, it was worth a try!

Looking forward to serving as your president.

Dave brown

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## From our former President

Hi everyone! Thank you for supporting me as your President these past 3 years. I have enjoyed it, and I look forward to serving the club as Vice President.

We had a busy year in 2011 with public outreach events. Even though the Hopewell Solar Watch and Blue Marsh Star Watch were both cancelled on the regular and rain dates, we had 13 successful public events. I've already received requests for next year.

If you have an email address, and haven't been getting email notifications about club events, please contact Linda with your current information. Email addresses change, and we have a few that have been bouncing.

Finally, if you didn't attend our Holiday Party this year, you missed a fun evening with good food and great conversation. We also watched "Cosmic Collisions" and played a game. We also held our election of officers. Dave Brown will be our President for the coming year, I will be the Vice President, Jerry Zachmann will be the Secretary, and Linda Sensenig will continue as Treasurer.

Barb

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## Due's Time

It's that time of year again. Your dues for 2012 are due in January. I have good news - membership dues have not gone up. The dues are still \$20.00 for an individual and \$25.00 for a family. If you joined during 2011, I will either send you a letter or an email to let you know how much you will owe for 2012 to bring you to the end of the year. As in the past, it is still important that you pay your dues by the end of January in order to avoid that nasty \$2.50 late fee! You can pay me at the meeting or send your dues to me. Checks should be payable to BCAAS and sent to Linda Sensenig, 345 Douglass

Street, Wyomissing, PA 19610. If you have any questions, please feel free to contact me. My email address is [lindasensenig@gmail.com](mailto:lindasensenig@gmail.com).

Linda Sensenig

Treasurer



## Implications of a Spinning Universe

by: Ron Kunkel

I just read an interesting science article about an observation concerning spiral galaxies. The article was from Science News and was titled "Spinning Galaxies Offer Big Bang Clues." If you attended my recent talk about galaxies and the Milky Way, then you can understand my interest in this article. The observation mentioned in the article was about a rather simple observation, relatively uninteresting by itself, and then you realize as you read on, WOW, that has a lot of implications.

In a study of over 15,000 galaxies from the Sloan Digital Sky Survey by Michael Longo and co-investigators at the University of Michigan, the researchers report an over abundance of counter-clockwise (CCW) rotating spiral galaxies in the part of the sky toward the north galactic pole of the Milky Way and the effect extended beyond 600 million light-years. The excess is small, about 7 percent, but the chance that it could be a cosmic accident is something like one in a million according to the researchers. Now couple this new observation to a separate 1991 survey of 8287 spiral galaxies in the southern galactic hemisphere which had reported an excess number of galaxies on the opposite part of the sky, below the galactic plane, whirling in a clockwise (CW) direction.

Physicists and astronomers have long believed the universe has mirror symmetry, like a ball. It is a cornerstone of modern cosmology that the universe is homogeneous

and isotropic -- it has no preferred orientation and looks the same in all directions. Finding more CCW than CW rotating spirals could be evidence for a breakdown of that symmetry.

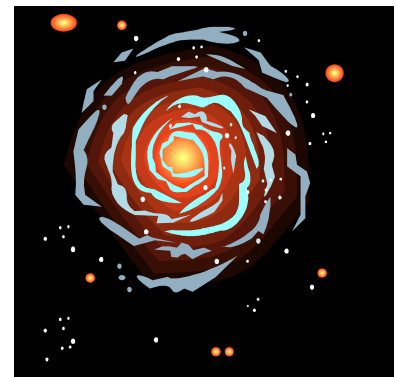
So what are the implications of this potential broken symmetry? In an isotropic and homogenous Universe, the big bang explosion should have been symmetrical. However, if the galaxies tend to spin in a certain direction it means that the overall Universe has a (large) net angular momentum. If the Universe was spinning it would create an axis, which would influence the rotation of galaxies. Since angular momentum is conserved, the implication is that the Universe must have been 'born' spinning.

This isn't the first time astronomers claimed to have observed a spinning universe. The cosmic microwave background (CMB) from the big bang had suspected anomalies that were once suggested as evidence of rotation, but were later dismissed as instrumental effects. Possibly those analysis need to be revisited.

Additionally, the Big Bang Theory assumes that when the Universe was created there was nothing outside it. The Big Bang was assumed to have created all of space-time. Therefore, for the big bang to be rotating when it occurred

suggests that it was rotating relative to something. The implication is that it was spinning relative to some larger space, according to the researchers. Since we could never see outside of our Universe in principle, if we could show that the present Universe still retains the initial angular momentum within its galaxies, it would be evidence that our Universe exists within some larger space, within a Multi-universe, according to the researchers.

Like WOW, from observing a few extra CCW rotating galaxies to possible evidence of a Multi-universe. Invoking a familiar phrase from Carl Sagan, "extraordinary claims require extraordinary evidence." So expect to see a lot more research on this in the future.



## 1/12/2012 Meeting Minutes

The meeting was called to order at 7:30pm with 23 people in attendance.

A brief discussion was had about who had been elected in December as the new club officers. The current officers are now Dave Brown - President, Barb Geigle - Vice President, Jerry Zachmann - Secretary, and Linda Sensenig - Treasurer.

Current night sky objects and happenings include Venus now being visible climbing above the horizon in the west after sundown. Jupiter is still visible most of the night and Saturn will be coming up soon in the middle of Leo. A Russian satellite is due to come crashing down to earth Sunday or Monday 1/15-1/16.

Since the new year has started, the doom and gloom predictions for 12/21/12 have continued to roll in. Dave sent an email to the Reading Eagle columnist Mary Young who wrote an article in the 12/31/2011 RE lambasting the prediction. She replied to his email which Dave read to us and passed around for anyone who wanted to read it themselves. Dave proposed that we plan a survivors party for 12/22/2012 which everyone thought was a great idea. With the Christmas holiday a few days later, it might be more difficult to get people together than if the end actually occurs.

Dave will be conducting lessons on telescope knowledge and use starting 3/15/2012 at his home. He wants to do this as a two part series for all members who want a better understanding of the workings of telescopes, what to look for when purchasing a new telescope, and how to get the most from our own. Dave would like interested members to send him an email to let him know you are interested.

Barb spoke about the upcoming Night Sky Network event on Thursday 1/19 about the transit of Venus that will occur on 6/5/2012. This will be the last transit of Venus across our sun in our lifetimes. There were 14 Night Sky Network events in 2011 and 80 events up through 2010 for a total of 94 events.

Linda Sensenig gave the Treasurer's report.

There will be a board meeting on 1/26/2012 at Barb's home starting at 7:30. The purpose of the meeting will be to formulate ideas for new events and plan meeting speakers for this years meetings.

Rick and Lora Beth Carpenter who have been long time members of the club have moved to North Carolina following a job transfer. They will be missed in our meetings. Dave mentioned that Lora Beth said that they have guest quarters in their new home and wouldn't mind hosting visitors from our club.

Ron Kunkel mentioned that he was preparing a presentation on the Sun and solar observation and would roll the Venus transit into his presentation.

Dr. Ruth Daly Professor of Physics at Penn State Berks gave an excellent presentation titled "Cosmic Curiosities" about the search for exoplanets. The information presented was very informative and interesting.

### Speaker for April's meeting

Keith Minnich has arranged to have Dr. Amy Reines give a presentation at our April meeting.

Dr. Amy Reines completed her PhD at the University of Virginia and is currently an Einstein fellow (a prestigious fellowship) at the National Radio Astronomy Observatory (NRAO) in Charlottesville. She recently made a very interesting and important discovery, that of a supermassive black hole at the center of a dwarf galaxy. A fundamental question in galaxy formation is whether black holes at the center of galaxies were formed after the formation of the galaxies, or if the black holes were there first. Most astronomers have assumed that the black holes were formed afterwards, feeding from the galaxy itself. However it does not make sense to find black holes at the center of dwarf galaxies, because there is not enough material in those galaxies with which to form a supermassive black hole. So Amy's discovery is a big, unexpected turn in the understanding of galaxy formation. She published an article in Nature, as well as Scientific American.

## NASA's Space Place Article of the Month

### Dawn Takes a Closer Look

By Dr. Marc Rayman

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter.

See Satellite Image  
on Page 6

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.

Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change.

These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit toward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth.

Keep up with Dawn's progress by following the Chief Engineer's (yours truly's) journal at <http://dawn.jpl.nasa.gov/mission/journal.asp>. And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at <http://spaceplace.nasa.gov/story-prof-starr>.

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**We're on the Web!**  
[www.berksastronomy.org](http://www.berksastronomy.org)

**Sharing the  
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*This full view of the  
giant asteroid Vesta  
was taken by  
NASA's Dawn  
spacecraft, as part  
of a rotation  
characterization  
sequence on July  
24, 2011, at a  
distance of 5,200  
kilometers (3,200  
miles). Credit:  
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/DLR/IDA*

