The Spectrogram

Newsletter for the Society of Telescopy, Astronomy, and Radio

June 2013

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June Meeting

The next meeting of S*T*A*R will be held on Thursday, June 6 at 8 p.m. at Monmouth Museum. This will be our annual business meeting. We will not have a speaker, but will elect officers for next season and discuss club issues. One of the issues to be addressed is sale of the club's 25-inch telescope. About two years ago the club voted to approve its sale. We now have an offer of $4,500. Since that is much less than the amount expected at the time of the first vote (about $8,000), a second vote will be taken. We will also discuss declining club finances and types of programs members would like to have next season. Be sure to attend this important meeting.

The meeting will begin at 8:00 p.m. at Monmouth Museum on the campus of Brookdale Community College in Lincroft, NJ.

Calendar

June 6, 2013 – S*T*A*R business meeting

June 13, 2013 – Star party at Summerfield Elementary School

June 14, 2013 - Rain date Summerfield star party

President's Corner

By Rob Nunn

This is the final issue of Spectrogram for S*T*A*R's 2012-2013 season. I was pleased with the club's year. We had a number of very good speakers, attracted some new members, had a good outreach program, and had several fun observing sessions. We still face some issues: Despite our efforts the 25-inch telescope has not been sold, and the club's financial situation needs to be addressed.

The most serious problem is club finances. For the first time in many years our cash flow (income minus expenses) will be negative. Since we have a good reserve in our operating fund, we are not in immediate danger. But some action will be needed. The member fees were increased just two years ago, so an increase is probably not wise. We have discussed finding a less expensive meeting place, but have not found one that would work well. We could save on expenses by using fewer external speakers, and a more consistent 50/50 program would raise some money. The best way to resolve the problem, though, is to increase club membership. The number of members has declined in the last two years. We now have a Facebook page, and perhaps we can find some other means of attracting new members.

After nearly two years of advertising, we had a potential buyer for the scope this spring. But when we set up the scope for him, we discovered that the mirror coating had suffered some damage. Selling the scope will likely require that the mirror be re-coated.

Some highlights of our meetings were Professor Robert Vanderbie's talk on the size of objects in the universe, DJ Byrne's talk on the Mars rover Curiosity, and Steven Liebers's talk on digitizing astronomical images. And member Dave Britz gave a very fun talk about where we are in the universe and our motion through it. Club members seemed to greatly enjoy all the talks.

Steve Seigel did a excellent job organizing our outreach program, with help from club members who set up star parties through contacts with schools. Russ Drum got our observing sessions going again. That is a great way to attract new members and keep the club interesting for everyone. Jay Respler and Anne Silverman-Armata provided refreshments for the breaks. Ken Legal had a nice presentation each month on interesting celestial events. Kevin Gallagher followed up leads on the scope sale. Arturo Cisneros, Steve Fedor, and Dave Britz were of great help in their jobs as club officers. And Michael Lindner continued to maintain our web site. I greatly appreciate the work that everyone did to keep the club running well.

I look forward to seeing everyone next fall, and enjoying more great programs.

May Meeting Minutes

By Rob Nunn

The May 2, 2013 meeting of S*T*A*R Astronomy club was held at Monmouth Museum in Lincroft, New Jersey. The meeting began at 8:00 p.m. and was attended by about 30 people. President Rob Nunn chaired the meeting and began by presenting the agenda and noting that the June meeting would be the annual business meeting, at which elections of club officers would be held.

Rob then introduced the speaker for the evening. Dave Britz is a long-time S*T*A*R member who has participated in the out-reach program AstroNova for 7 years, has been working on the design and fabrication of his dream telescope for 20 years, and has recently been developing his astro-imaging skills. His career work has included research in free-space optical communications and use of the quasi-optical/radio portion of the spectrum at 3000 GigaHertz.

Dave's talk was titled "Time and Motion in Space." Dave presented a fascinating history of our knowledge of our place in the universe and how we move through space. As improved instruments showed the size of the universe to be ever greater than believed, old concepts about the universe had to be discarded. The recent measurements of the cosmic microwave background radiation finally show what appears to be the boundaries of the universe. But Dave ended his talk by noting that careful analysis indicates what appears to be motion of matter through the CMB. Such a motion could indicate existence of matter outside our observable universe.

A 20-minute coffee break followed Dave's talk. The meeting resumed with a presentation by Ken Legal of "Events of the Month." On May 24 the star Beta Scorpii will be occulted by the moon. Since it is a multi-star system several occultations may be observed. In early May Venus will begin to be visible in the western sky, and on May 26 Mercury, Venus, and Jupiter will be within 2.5 degrees of each other.

The meeting concluded with new business and announcements. The nominating committee has completed its task of filling a slate of candidates for club officers. The election will be held at the June meeting. An observing session at Dorbrook is scheduled for May 3. And a school in Woodbridge is seeking a speaker for its K-4 science program for this fall.

The meeting adjourned about 10:30 pm.

Searching The Astronet

Asterisms-*Artful Eyes*

By Steven Seigel

Drawing shapes and telling stories around those shapes has been around since the time of humanity. Asterisms or what we consider today to be pieces of the 88 constellations, were used to identify the seasons. One of the most widely recognized asterism today is "The Big Dipper." Many cultures saw the Big Dipper differently due to their frame of reference. Today, for example, I see this asterism as a "Computer Mouse" where the body is the bowl and the tail as a wire. Very soon, all mice will become "wireless" and I'll have to change my geek oriented artistic talents and see it as something else that is computer related. Maybe an I Pad with an attached I Phone cord but I'd like to keep Arcturus just as it is-a jewel sitting next to the mouse or I Pad. A jewel is how the Polynesians saw it and I find myself in agreement. Bear Guardian, to me, serves it no justice.

Searching and connecting the stars to create a drawing can be done with your eyes or through any optical instrument. Take your "Go To" off and turn it to the heavens and use your imagination. You will begin to see shapes not found on any chart or book. The sky will become your own! When I do work with young people I try to relate the sky to a world they understand. The Pleiades to a group of girls from a catholic school became an "Angel" and to a group of public school children that same asterism became "a teacher teaching her students." One of the biggest smiles I get is showing them "The Space Alien" NGC 457 also known as "The Owl Cluster." Seeing the stars through imagination makes all the difference.

Web Sites:
Shows a listing of asterisms and their charts:
http://www.nightskyatlas.com/asterisms.jsp
Some modern asterisms:
http://www.jschreiner.com/english/stars/history.html

Seasonal asterisms:
http://www.uni.edu/morgans/astro/asterisms.html

May asterisms enrich your seeing so that what you see is the reflection of your heart!

Clear skies,

Steve Seigel

For comments and suggestions on articles please email me: astronomerm31@hotmail.com

Cosmic glitch: Super-dense star is first ever found suddenly slowing its spin

May 29, 2013

The magnetar 1E 2259+586 shines a brilliant blue-white in this false-color X-ray image of the CTB 109 supernova remnant, which lies about 10,000 light-years away toward the constellation Cassiopeia. CTB 109 is only one of three supernova remnants in our galaxy known to harbor a

magnetar. X-rays at low, medium and high energies are respectively shown in red, green, and blue in this image created from observations acquired by the European Space Agency's XMM-Newton satellite in 2002. Credit: ESA/XMM-Newton/M. Sasaki et al.

(Phys.org) One of the densest objects in the universe, a neutron star about 10,000 light years from Earth, has been discovered suddenly putting the brakes on its spinning speed. The event is a mystery that holds important clues for understanding how matter reacts when it is squeezed more tightly than the density of an atomic nucleus—a state that no laboratory on Earth has achieved. The discovery by an international team of scientists will be published in the journal *Nature* on May 30, 2013.

The scientists detected the neutron star's abrupt slow-down with NASA's Swift observatory, a satellite with three telescopes whose science and flight operations are controlled by Penn State from the Mission Operations Center on the University Park campus. "Because Swift has the ability to regularly measure the spin of this unusual star, we have been able to observe its surprising evolution," said Penn State astronomer Jamie Kennea, a coauthor of the *Nature* paper. "This neutron star is doing something completely unexpected. Its speed of rotation has been dropping at an increasingly rapid rate ever since the initial sudden decrease in its spin."

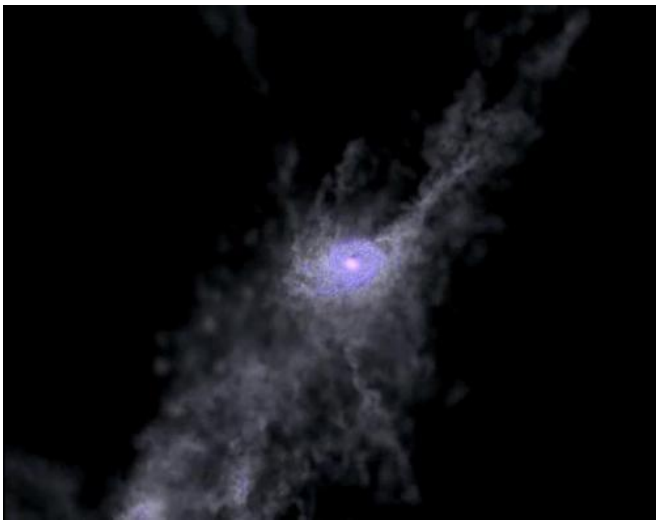
Although astronomers have observed neutron stars suddenly speeding up their spins—an event called a "glitch"—they never before had observed a neutron star suddenly slowing down. "We've dubbed this event an 'anti-glitch' because it affected this star in exactly the opposite manner of every other clearly identified glitch seen in neutron stars," said co-author Neil Gehrels, the lead researcher on the Swift mission, at NASA's Goddard Space Flight Center. The star is in the Northern Hemisphere sky in the constellation Cassiopeia.

A neutron star is the closest thing to a black hole that astronomers can observe directly. It is the crushed core of a massive star that ran out of fuel, collapsed under its own weight, and then exploded as a supernova. The matter left behind after the explosion is compressed into a ball only about 12 miles across but with a mass roughly half a million times more than the mass of the Earth. One teaspoon of a neutron star weighs 1 billion tons, roughly twice the combined weight of all the cars in the United States.

Neutron stars can reach speeds of rotation as fast as the blades of a kitchen blender—up to 43,000 revolutions per minute (rpm), and can have magnetic fields a trillion times stronger than the Earth's. But this abruptly slowing neutron star, named 1E2259+586, is an even more bizarre and rare kind of neutron star. It is one of fewer than two dozen neutron stars called "magnetars" because they have such ultra-strong magnetic fields—up to approximately 5,000 trillion times that of the Earth. Magnetars also can have dramatic outbursts of X-rays so strong that they can affect Earth's atmosphere, even if the magnetar is sending its blasts from the opposite side of our Milky Way galaxy. "Magnetars are the universe's strongest magnets and are some of the best laboratories we have for understanding pure physics," Kennea said. "The extreme conditions on these stars could never be replicated in any laboratory here on Earth."

Galaxies fed by funnels of fuel

May 24, 2013



Created with the help of supercomputers, this still from a simulation shows the formation of a massive galaxy during the first 2 billion years of the universe. Hydrogen gas is gray, young stars appear blue, and older stars are red. The simulation reveals that gas flows into galaxies along filaments akin to cosmic bendy, or swirly, straws. Image credit: Video courtesy of the N-Body Shop at University of Washington

(Phys.org) —Computer simulations of galaxies growing over billions of years have revealed a likely scenario for how they feed: a cosmic version of swirly straws.

The results show that cold gas—fuel for stars—spirals into the cores of galaxies along filaments, rapidly making its way to their "guts." Once there, the gas is converted into new

stars, and the galaxies bulk up in mass.

"Galaxy formation is really chaotic," said Kyle Stewart, lead author of the new study appearing in the May 20th issue of the *Astrophysical Journal*. "It took us several hundred computer processors, over months of time, to simulate and learn more about how this process works." Stewart, who is now at the California Baptist University in Riverside, Calif., completed the majority of this work while at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

In the early universe, galaxies formed out of clumps of matter, connected by filaments in a giant cosmic web. Within the galaxies, nuggets of gas cooled and condensed, becoming dense enough to trigger the birth of stars. Our Milky Way spiral galaxy and its billions of stars took shape in this way.

The previous, standard model of galaxy formation held that hot gas sank into the centers of burgeoning galaxies from all directions. Gas clouds were thought to collide into each other, sending out shock waves, which then heated up the gas. The process is similar to jets creating sonic booms, only in the case of galaxies, the in-falling gas travels faster than the speed of sound, piling up into waves. Eventually, the gas cools and sinks to the galactic center. This process was theorized to be slow, taking up to 8 billion years.

Recent research has contradicted this scenario in smaller galaxies, showing that the gas is not heated. An alternate "cold-mode" theory of galaxy formation was proposed instead, suggesting the cold gas might funnel along filaments into galaxy centers. Stewart and his colleagues set out to test this theory and address the mysteries about how the cold gas gets into galaxies, as well as the rate at which it spirals in.

Are you a S*T*A*R Member?

S*T*A*R meets the first Thursday of each month, except July and August, at 8:00 p.m. at Monmouth Museum on the campus of Brookdale Community College in Lincroft, NJ. Meetings usually include a presentation of about one hour by a guest speaker, a break for refreshments and socializing, a description of interesting objects to view, and a discussion of club business.

Memberships:
( )Individual...$35
( ) Family...$45
( ) Student…$15

Name_____

Address_____

City_____State___Zip_____

Phone_____

Email_____
Make checks payable to: STAR Astronomy Society, Inc. and mail to P.O. Box 863, Red Bank, NJ 07701

The club owns 8" f/8, 13" f/4.5 and 25" f/5 Dobsonian telescopes which are available for use by members. Because of its large size use of the 25" requires the supervision of two qualified operators. To borrow a telescope or become a qualified operator of the 25", please contact the Vice President.

The officers of S*T*A*R are:
President Rob Nunn
Vice President Kevin Gallagher
Secretary Steve Fedor
Treasurer Arturo Cisneros
Member at Large Dave Britz

S*T*A*R is a member of the Astronomical League (AL). Members receive the AL pulication Reflector.

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
Mu Boo	Multiple Star System	Bootes	15h24m30.9s	+37°22'38"	4.3+7.2
M5	Globular Cluster	Ser	15h18m15.4s	+02°05'00"	5.7
NGC 5897	Globular Cluster	Libra	15h17m24.0s	-21°03'26"	8.4
NGC 6207	Galaxy	Hercules	16h43m03.9s	+36°49'58"	12.1
NGC 6144	Globular Cluster	Scorpius	16h27m14.0s	-26°01'18"	9
NGC 6210	Planetary Nebula	Hercules	16h44m29.5s	+23°47'59"	9.3
A 39	Planetary Nebula	Hercules	16h27m33.9s	+27°54'29"	13.7
The Rumpled Starfish (NGC 6240)	Interacting Galaxy	Ophiuchus	16h52m59.0s	+02°24'02"	13.8
Me 2-1	Planetary Nebula	Libra	15h22m18.6s	-23°37'35"	11.6

Coordinates are equinox 2000.0