The ECLIPSE

February 2012
Volume 5, Issue 2

The newsletter of the Barnard Seyfert Astronomical Society, PO Box 150713, Nashville, TN 37215-0713

Upcoming Events

Board of Directors Meeting

February 1st at the Cumberland Valley Girl Scout Council Building – 7:30 pm

March 7th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

February 15th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

March 21st at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Star Parties

February 18th – BSAS Public Star Party at Bowie Nature Park (Fairview) - Solar/Lunar Daytime Observing – 10:00 am - Noon

February 18th - Private Star Party at Natchez Trace Parkway mm 435.5

February 25th - BSAS Public Star Party at Shelby Bottoms Nature Center - 7:30 pm

March 17th - BSAS Public Star Party at Long Hunter State Park – 8:00-10:00 pm

March 24th – BSAS Messier Marathon at Spot Observatory (backup date April 21st)

In this issue:

Monthly Membership Meeting

Wednesday, February 15, 2012
Cumberland Valley Girl Scout Council Building
7:30 pm

Join Dr. Terry Reeves and Steve Wheeler for an overview of What's Up? in the night sky. Topics will include binocular and telescope targets currently visible. See you there!

From The President

It's often said today that we live in a golden age of astronomy. NASA and the European Space Agency have spacecraft in orbit around multiple planets and even an asteroid in our solar system. The Hubble Space Telescope team keeps churning out images of celestial objects near and far with stunning resolution. And the electronics revolution ensures that the legions of earthbound professional observatories can image fainter and fainter objects, using adaptive optics where necessary to produce ultra-high-resolution images that sometimes rival Hubble's results.

So where does that leave us amateurs, lacking space probes, orbiting telescopes or meter-class 'scopes on lofty mountain peaks? Actually, it leaves dedicated amateurs poised to make real contributions to science! Much of the new electronics that has enabled discoveries by the pros is available to us, too. And the internet is opening up whole new ways for amateurs to pursue collaborative astronomy, even from home. Here are just some ways in which amateurs can work with the pros:

Internet-Based Projects: There are a cluster of "citizen science" online projects, all accessible with a basic internet connection:

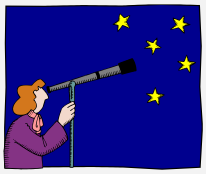
- Galaxyzoo.org is an interactive, online collaboration that trains interested members of the public to recognize galaxies by their shape ("morphology") and then enlists users to classify thousands of galaxies, in order to help determine their evolutionary stage. The images to be classified are drawn from the massive Sloan Digital Sky Survey database and from the Hubble Space Telescope archive.

- Planethunters.org is a somewhat similar project that provides the public an opportunity to learn how to spot exoplanets by watching for fluctuations in the brightness of over one hundred thousand stars, as measured by NASA's Kepler spacecraft. The trick is to look for minor dimmings in starlight caused by the passage ("transit") of a planet in front of its host star.

- Icehunters.org is a forthcoming online community, one which will permit amateur astronomers to join the hunt for icy objects at the far fringes of our solar system. Those distant objects comprise the Kuiper Belt lying beyond the orbit of Neptune. While this website is currently dormant, it will soon come alive—its goal is to help NASA spot additional Kuiper Belt Objects ("KBOs") for a possible rendezvous by NASA's New Horizons spacecraft after it passes Pluto in 2015.

- And of course, there's SETI@home, one of the oldest online collaborative efforts. It's less interactive, since it's a "distributed computing" project. By participating, you allow your home computer to help process radio telescope signals at night, in hopes of helping sort out an alien signal from the vast amounts of natural and human-made background "noise."

Continued on Page 2



" In spite of the fact that religion looks backward to revealed truth while science looks forward to new vistas and discoveries, both activities produce a sense of awe and a curious mixture of humility and arrogance in their practitioners."

Paul Davies
1946-

FREE TELESCOPES!

Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time.

We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books.

Some restrictions apply, and a waiting list may be applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear.

For information on what equipment is currently available, contact Lonnie Puterbaugh at (615) 661-9540.

Observing Highlights

all times listed are Central Standard Time

LUNAR PHASES

February 2012

02/07 FULL Moon
02/14 LAST Quarter
02/21 NEW Moon

January 2012

03/01 FIRST Quarter
03/08 FULL Moon
03/15 LAST Quarter
03/22 NEW Moon
03/30 FIRST Quarter

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Supernova Remnant:
M1, M45

Open Clusters:
M35, M36, M37, M38

Nebulae:
M42, M43, M78

Globular Clusters:
M79

From the President, cont.

Pro-Am Observing Projects: Of course, there are other opportunities that actually involve using a telescope:

Exoplanet Search: Advanced amateurs with the patience and skill to make fine measurements of starlight using CCD cameras or photometers can try their own hand at looking for exoplanets by monitoring the same fluctuations in starlight that Kepler watches for. While relatively few amateurs today participate in this work, one has already written the how-to book "Exoplanet Observing for Amateurs." A great online resource is transitsearch.org, which provides lists of candidate stars that amateurs with modest-sized telescopes and CCD cameras can monitor for those tell-tale dimmings that denote planetary transits.

Monitoring of Solar System Objects: Closer to home, amateurs willing to invest the time and effort to become skilled planetary imagers can still make occasional contributions to science. For example, Donald Parker, MD, America's leading amateur planetary imager for decades, contributed key imagery in the 1990s that helped professionals understand the cyclical growth and retreat of Mars' north polar cap. Christopher Go, a Filipino amateur, discovered Jupiter's "Red Spot, Jr." in 2005, furthering our understanding of atmospheric turbulence on Jupiter. Australian amateur Anthony Wesley discovered during 2009 that Jupiter had been struck by an asteroid or possibly a comet. Careful attention to observing and to the myriad technical details of planetary imaging is essential, but amateurs can do it, even from light-polluted areas like Nashville!

Search for Asteroids and Kuiper Belt Objects: Candidly, these are extremely demanding areas for research that require equipment beyond the reach of most of us and dark skies unavailable near Nashville. These projects require large-aperture, wide-field telescopes for surveying large swathes of space. But once again technology may come to the rescue: some telescopes-for-rent websites boast they will soon provide online access to large, wide-field 'scopes. For instance, the lightbuckets.com organization promises to soon bring online a 32 inch (0.8 meter) telescope with an F/4 focal ratio that could fit the bill.

So, whether you prefer to do your astronomy from home via the internet, or out under the stars with a 'scope, there are continuing possibilities for collaborating with the pros if you're dedicated enough. Moreover, the need for amateur collaboration is almost certain to increase, given the mismatch between today's increasingly vast flow of data streams from professional survey telescopes (all of it requiring analysis), and tomorrow's probable sharp reductions in governmental funding for professional astronomy.

Clear skies to all,

John Harrington
President

Book Review: A More Perfect Heaven

Reviewed by Robin Byrne

Another astronomy book has crossed my path, so time to review it. "A More Perfect Heaven: How Copernicus Revolutionized the Cosmos" by Dava Sobel is an interesting combination of a biography of Copernicus, a history of his scientific ideas and how they fit into the cultural history of the time, and a fictional two act play about the pivotal time when Copernicus was convinced to write his book, "On the Revolutions."

Much of the material covering the life of Copernicus has been written in other books. However, as usual, Dava Sobel manages to add so much more to the story by including the cultural history surrounding the events. As a Canon in the Catholic Church, Copernicus had many mundane responsibilities, such as overseeing transfers of land, making sure the peasant farmers supplied the required amount of goods each month to the church, and advocating for a currency standard. But, at the same time, he devotedly studied the night sky and made observations of the positions of the planets whenever possible. Because of his accurate observations, which provided a more precise measurement of the length of a year, Copernicus was consulted about calendar reform, which ultimately led to the development of the Gregorian calendar used today.

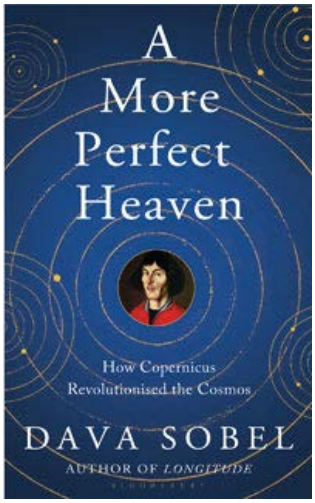
What is not known, however, is when Copernicus came to the conclusion that a much simpler explanation of the sky's motions would require a moving Earth. He did not document his internal thoughts or the process that brought him to this "revolutionary" idea. What is clear, is that Copernicus knew that all of the convoluted epicycles of Ptolemy still didn't accurately predict planet positions, no matter how many extra circles upon circles were added. This lack of accuracy, coupled with the complicated system that had grown out of the initial geocentric model, certainly were motivations for Copernicus to find a better solution.

Meanwhile, surrounding this dramatic change of thought, other dramatic changes were occurring. Martin Luther was leading a split from the Catholic Church, resulting in the formation of the Lutheran faith. Years of violence and discrimination ensued as the Catholic Church tried to prevent the inevitable divide.

It was near the peak of anti-Lutheranism, when a Lutheran mathematician, Georg Joachim Rheticus, approached Copernicus. Despite the danger Rheticus faced if he were caught in the home of a Catholic, he remained for an extended period of time, encouraging and assisting Copernicus to publish his observations and conclusions. This encounter between two unlikely colleagues is the focus of the two act play, presented in the middle of the book. Here, Sobel gets to use her imagination about the conversations they must have had, which ultimately led to Copernicus' book being published just as he lay on his deathbed. Although a work of fiction, the play does incorporate many known events from both the lives of Copernicus and Rheticus to lend it historical relevance.

Sobel goes past the end of Copernicus' life to discuss how his book was received. Naturally, many accused it of being heretical. Although never banned, presumably due to the useful tables for calculating planetary positions, the book was on a list of questionable publications. These books were required to have certain passages amended by the owner before they had permission to keep it. We even venture into the works of Brahe, Kepler and Galileo, all of whom were influenced by "On the Revolutions." Finally, we even get a taste of modern astronomers studying original copies of the book, and forensic scientists exhuming Copernicus' skull to create an image of what he would have looked like in old age.

Dava Sobel continues to produce books that are enjoyable on so many levels. Whether you simply want to know about the life of Copernicus, or wish to understand the religious turmoil of 16th century Europe, or want to indulge in imagining the conversations held by great men of the time, "A More Perfect Heaven" will provide exactly what you are looking for.



A More Perfect Heaven
By Dava Sobel

Publisher:
Walker & Company

ISBN: 978-0802717931

Board Meeting Minutes – January 4, 2012

Bob Rice, Secretary

The board of directors of the Barnard-Seyfert Astronomical Society (BSAS) met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on January 4, 2012. A sign-in sheet was passed around in lieu of a roll call. Board members Joe Boyd, Steve Cobb, Bill Griswold, John Harrington, Melissa Lanz, Bob Norling, Curt Porter, and Bob Rice were present. Board members Dr. Spencer Buckner, Kris McCall, and Theo Wellington were absent. A quorum being present, President John Harrington called the meeting to order at 7:41 P.M.

Treasurer Bob Norling reported that the BSAS had $2,090.63 in its regular checking account and $457.41 in its equipment account. Mr. Norling also displayed a certificate of appreciation from NASA awarded to the BSAS for "…its valuable contributions to its community in the areas of science, technology education, and inspiration" in 2011. John Harrington announced these upcoming star parties:

- Jan 12 – Private star party at mm 412 (Water Valley Overlook) on the Natchez Trace Parkway,
- Jan 28 – Public star party at the Edwin Warner Park from 7:30 P.M. to 9:30 P.M.,
- Feb 18 – Public daytime observing at Bowie Nature Center from 10:00 A.M. to 12:00 P.M.,
- Feb 18 – Private star party at mm 435.5 on the Natchez Trace Parkway,
- Feb 25 – Public star party at Shelby Bottoms Nature Center from 7:30 P.M. to 10:30 P.M.

Bob Rice, reporting for the Star Party Committee, presented the board with a list of proposed public and private star parties for 2012. Bill Griswold announced that he had contacted the National Park Service to obtain permission for the BSAS to use specified locations on the Natchez Trace Parkway for private star parties. Following a brief discussion, John Harrington moved to adopt the proposed star party list and Steve Cobb seconded his motion that was subsequently approved by a unanimous voice vote.

Bob Rice, reporting for the Program Committee, presented the board with a list of membership meeting programs for 2012. Mr. Rice pointed out that speakers were obtained for all of the membership meetings during the year except for the one on July 18, 2012. Steve Cobb offered to contact his brother-in-law, who is associated with the Max Plank Institutes, about speaking on that date. John Harrington moved to adopt the proposed program schedule as presented. Joe Boyd seconded his motion and, following a brief discussion, the board approved it by a unanimous voice vote. Mr. Rice also reported that he had filed the BSAS' federal income tax form for 2011. In addition, Mr. Rice - as BSAS Secretary – announced that he will be out of town and asked that someone take the minutes of the upcoming January 18, 2012 membership meeting.

John Harrington announced that the BSAS will continue to meet at the Girl Scout Council Building for the present but would probably consider alternate locations sometime in the future. The board then entered into a brain-storming session on additional plans for 2012 and beyond. John Harrington suggested that the BSAS might hold a joint meeting with the Clarksville area astronomy club along with activities at one of Austin Peay State University's observatories. Bob Norling suggested investigating similar activities at Montgomery Bell Academy's new observatory.

John Harrington noted that BSAS Past-President Mark Manner had acquired a new telescope along with other equipment and also observed that Middle Tennessee State University had a new 16 inch cassegrain telescope. He additionally suggested the possibility of having a future membership meeting at Vanderbilt University's Dyer Observatory. Vice-President Joe Boyd stated that staff at the Smyrna Public Library had contacted him about activities that the BSAS might perform there in conjunction with the Smyrna park system. The board discussed several possibilities and Mr. Boyd moved that the Society pursue holding a summer star party there. Curt Porter seconded his motion and the board approved it by a unanimous voice vote. Steve Cobb suggested that immediately following a monthly membership meeting the club might have a brief session specifically dealing with the basics of astro-imaging. Curt Porter observed that this could take place outside in the Girl Scout Center's parking lot. The board also discussed the possibility of a future program geared toward ways that amateur astronomers could participate in or contribute to real scientific research. Bob Norling suggested contacting BSAS member and noted asteroid hunter Loren Ball (who lives in Decatur, Alabama) about putting on a program. Several board members commented that since Dyer Observatory Director Rocky Alvey was already scheduled to speak at the October 17, 2012 membership meeting, we might approach him about meeting at Dyer then. John Harrington stated that he will contact the Cumberland Astronomical Society and Dr. Spencer Buckner at Austin Peay State University about holding joint meetings.

John Harrington brought up the issue of the BSAS's loaner telescopes and equipment. Steve Cobb suggested that funds in the Society's equipment account might be used to refurbish loaner equipment that required it. Curt Porter noted that obtaining a current loaner equipment inventory would be useful. Joe Boyd stated that he might have such a list from eight or more years ago that could serve as a starting point for an inventory. John Harrington suggested that the board resume the discussion of astro-imaging programs at its next meeting.

Since there was no further business to discuss, President Harrington declared the meeting to be adjourned at 8:42 P.M.

Monthly Meeting Minutes – January 18, 2012

Melissa Lanz, Board Member

Members began arriving at the Cumberland Valley Girl Scout Council Building around 7:15 P.M., for the Society's January meeting. Out-going President Dr. Spencer Buckner called the meeting to order at 7:40 P.M., and then handed over the ceremonial (rubber) gavel to incoming President John Harrington.

President John Harrington welcomed the visitors, and then called for a Treasurer's report. Bob Norling reported that we have $2,220.63 in our regular account, and $457.41 in our equipment account. We paid an insurance bill in the amount of $300. We have a web bill that will also need to be paid, for the web site we are trying to start. That will be discussed further at the next board meeting.

John announced the following upcoming Star Parties (to be held, if weather permits):

- A private Star Party was announced for Saturday, January 21st, at the Water Valley Overlook (mile marker 412) on the Natchez Trace.
- A public Star Party will be held on Saturday, January 28th, at the Edwin Warner Park, from 7:30 to 9:30.
- On February 18th, a public day time Star Party will be held at the Bowie Nature Park in Fairview. There is a map on the web site.
- A private Star Party will be held that same evening at mile marker 434.5 on the Natchez Trace.
- On February 25th, a public Star Party will be held at Shelby Bottoms Nature Center.

John then announced that Steve Wheeler is resigning as Editor of the Eclipse. John thanked him for his dedication and years of service, and called for a round of applause, and then asked for a volunteer to take over as Editor. Steve offered to share all the templates and help the new editor get off to a good start over the next few months.

John also announced that the 2012 Observer's Guide may still be ordered at the bulk rate of $24; Astronomy Calendars are available for $10, and 1 Otwell Astronomy Calendar for $24.50.

Curt Porter asked everyone to pick up their badges from the containers, and be responsible for keeping up with them. Curt will remove the badges of those who are no longer active, paying members.

John introduced the speaker for the evening, Dr. Spencer Buckner. In December, all recipients of holiday telescopes who wanted to learn more about their new instruments had been invited to bring them to his January presentation of "I Got a Telescope for Christmas – Now What?" Dr. Spencer briefly covered the basic telescope types, and then he and other BSAS members were available to demonstrate and assist owners with their new gifts.

Dr. Spencer brought two types of telescopes to demonstrate an Orion EQ 2 and a Dobsonian with a go to. His main points were:

- Dobs are the easiest and least expensive per inch of aperture.
- A Push-to star finder may have a hand-controller to tell you where to push it
- Schmidt-Cassegrain telescopes are computerized with GPS and magnetic compassing – they almost set themselves up.
- Star Maps are very helpful in finding the 110 Messier Objects.
- If you have an equatorial mount, once it is aligned with the polar axis of the earth, it is easy to track stars.
- Computerized mounts can be very helpful
- Illuminated reticle eyepiece with crosshairs for setup use, a 12 mm or larger eyepiece, is also very helpful.
- Planisphere – Guide to the Stars can help when sky glow is a problem.
- Polar – German equatorials – GPS tells it where they are and the time of day.
- There are Star Maps that contain a description of object you are looking for – no pictures – so you can see if you can match up what you are seeing with the description.
- Software – Starry Night Pro, The Sky (6.0)
- Stellarium – free software that is very good.

At that point, we gathered around the telescopes for a demonstration. Terry Reeves assisted with one telescope.

Since there was no additional business to discuss, President Harrington declared the membership meeting to be adjourned.

BSAS Affiliations

The Astronomical League
http://www.astroleague.org/

The Night Sky Network
http://nightsky.jpl.nasa.gov/

International Dark Sky Association
http://www.darksky.org/

The Hidden Power of Sea Salt, Revealed

Space Place Partners Article, February 2011

Last year, when NASA launched the Aquarius/SAC-D satellite carrying the first sensor for measuring sea salt from space, scientists expected the measurements to have unparalleled sensitivity. Yet the fine details it's revealing about ocean saltiness are surprising even the Aquarius team. "We have just four months of data, but we're already seeing very rich detail in surface salinity patterns," says principal investigator Gary Lagerloef of Earth & Space Research in Seattle. "We're finding that Aquarius can monitor even small scale changes such as specific river outflow and its influence on the ocean."

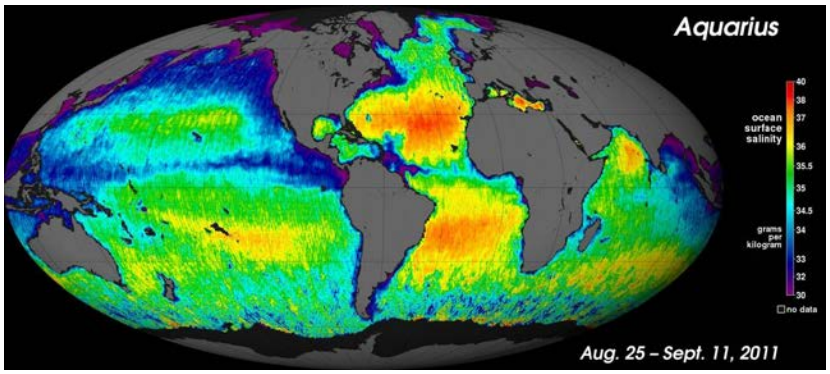
Using one of the most sensitive microwave radiometers ever built, Aquarius can sense as little as 0.2 parts salt to 1,000 parts water. That's about like a dash of salt in a gallon jug of water. "You wouldn't even taste it," says Lagerloef. "Yet Aquarius can detect that amount from 408 miles above the Earth. And it's working even better than expected."

Salinity is critical because it changes the density of surface seawater, and density controls the ocean currents that move heat around our planet. A good example is the Gulf Stream, which carries heat to higher latitudes and moderates the climate. "When variations in density divert ocean currents, weather patterns like temperature and rainfall are affected. In turn, precipitation and evaporation, and fresh water from river outflow and melt ice determine salinity. It's an intricately connected cycle."

The atmosphere is the ocean's partner. The freshwater exchange between the atmosphere and the ocean dominates the global water cycle. Seventy-eight percent of global rainfall occurs over the ocean, and 85 percent of global evaporation is from the ocean. An accurate picture of the ocean's salinity will help scientists better understand the profound ocean/atmosphere coupling that determines climate variability. "Ocean salinity has been changing," says Lagerloef. "Decades of data from ships and buoys tell us so. Some ocean regions are seeing an increase in salinity, which means more fresh water is being lost through evaporation. Other areas are getting more rainfall and therefore lower salinity. We don't know why. We just know something fundamental is going on in the water cycle."

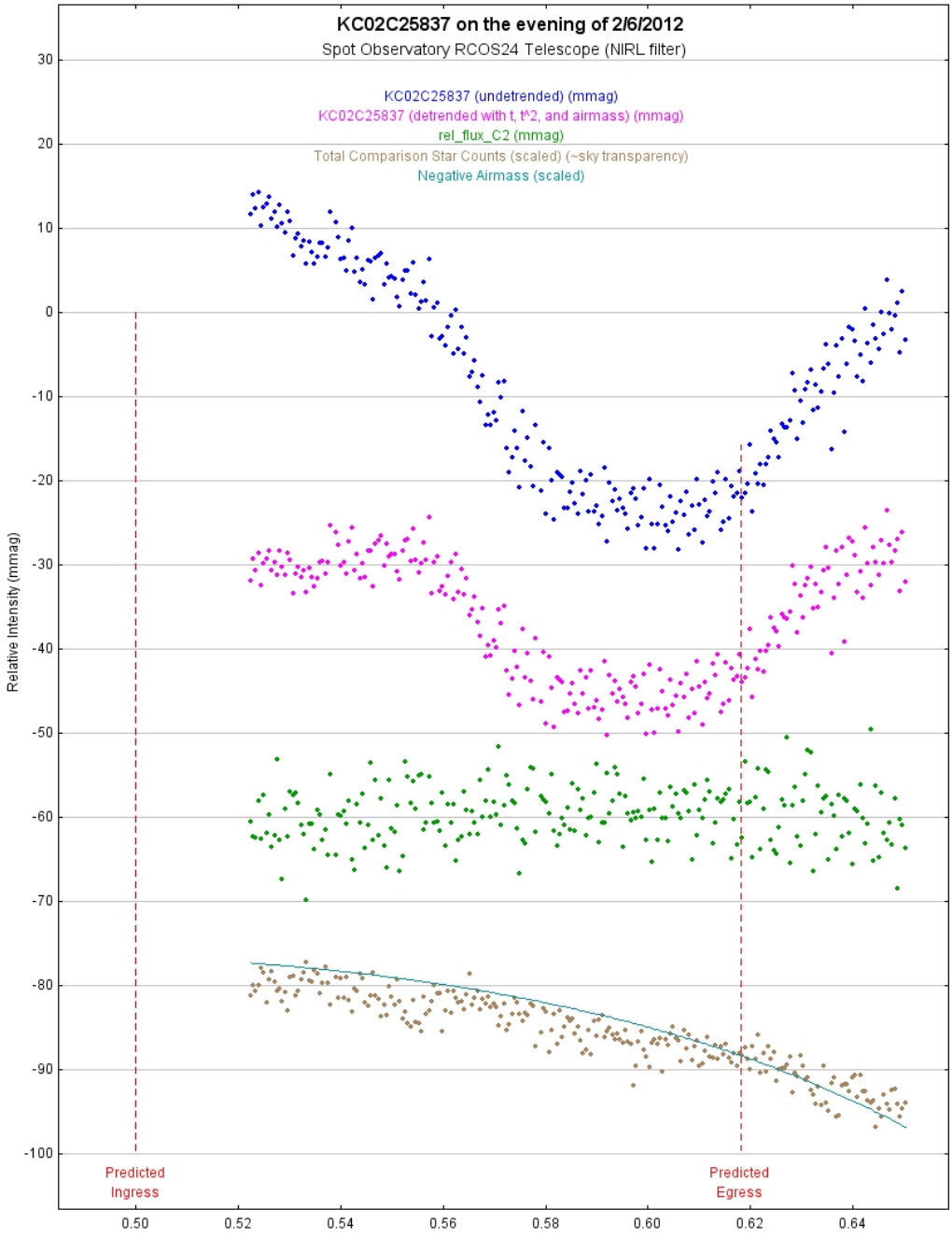
With Aquarius's comprehensive look at global salinity, scientists will have more clues to put it all together. Aquarius has collected as many sea surface salinity measurements in the first few months as the entire 125-year historical record from ships and buoys. "By this time next year, we'll have met two of our goals: a new global map of annual average salinity and a better understanding of the seasonal cycles that determine climate."
Stay tuned for the salty results. Read more about the Aquarius mission at aquarius.nasa.gov.

Other NASA oceanography missions are Jason-1 (studying ocean surface topography), Jason-2 (follow-on to Jason-1), Jason-3 (follow-on to Jason-2, planned for launch in 2014), and Seawinds on the QuikSCAT satellite (measures wind speeds over the entire ocean). The GRACE mission (Gravity Recovery and Climate Experiment), among its other gravitational field studies, monitors fresh water supplies underground. All these missions, including Aquarius, are sponsors of a fun and educational ocean game for kids called "Go with the Flow" at spaceplace.nasa.gov/ocean-currents.



Aquarius produced this map of global ocean salinity. It is a composite of the first two and a half weeks of data. Yellow and red represent areas of higher salinity, with blues and purples indicating areas of lower salinity.

Photometry from Spot Observatory



Mark Manner writes:

"I am starting to learn how to do photometry, and my first tests are [shown above]. I suppose Tennessee isn't the most conducive place for this, but the lack of a lot of clear nights means you don't risk getting burned out on it! The[image above] has an exoplanet light curve with about a 15 milli-magnitude light drop and an eclipsing binary with an approximately 750 milli-magnitude change. There is additional data analysis that can be done to the exoplanet curve in particular to smooth it out more, but I am still in the learning phase."

Become a Member of the BSAS!

Download and print the Application for membership from www.bsasnashville.com (Adobe® Acrobat Reader® required).

Then fill it out and bring it to the next monthly meeting or mail it along with your first year's membership dues to:

BSAS
P.O. Box 150713
Nashville, TN 37215-0713

Annual dues, which include membership in the BSAS and Astronomical League, and subscriptions to their newsletters, are:

$20 Individual
$30 Family
$15 Senior (+65)
$25 Senior Family (+65)
$12 Student*

* To qualify, you must be enrolled full time in an accredited institution or home schooled.

All memberships have a vote in BSAS elections and other membership votes,

Also included are subscriptions to the BSAS and Astronomical League newsletters.

IMPORTANT DUES INFORMATION

To find the expiration date for your current membership, visit our web site at http://www.bsasnashville.com and click the Renewals link.

There will be a two month grace period before any member's name is removed from the current distribution list.

We're on the Web!
See us at:

www.bsasnashville.com

BSAS on Facebook

About Our Organization

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Thursday of each month at the Adventure Science Center in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to Astronomy and Sky & Telescope at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at www.bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Joe Boyd at (615) 386-3134.

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