The ECLIPSE

May 2010
Volume 3, Issue 5

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

Upcoming Events

Board of Directors Meeting

May 6th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

June 3rd at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

May 20th at the Adventure Science Center – 7:30 pm

June 17th at the Adventure Science Center – 7:30 pm

Star Parties

May 8th - BSAS Private Star Party at Natchez Trace mile marker 435.5

May 15th - BSAS Public Star Party at Long Hunter State Park - 8:30-10:30 pm

June 11th - BSAS Binocular Public Star Party at Warner Park - 8:30-10:30 pm

June 12th - BSAS Private Star Party at Natchez Trace mile marker 412 (Water Valley Overlook)

June 18th - BSAS Public Star Party at Bells Bend Outdoor Center - 8:30-10:30 pm

In this issue:

Monthly Membership Meeting

Thursday, May 20, 2010
Adventure Science Center
7:30 pm

Join us for ***The History of Women in Astronomy***, the story of how women have contributed to the science of astronomy over the centuries, presented by BSAS board member and MTSU professor **JanaRuth Ford**.

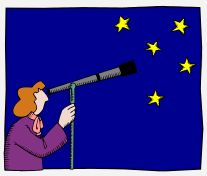
From The President

Greetings and clear skies from your president. Or should I say dry skies? The first weekend of May has seen historical rainfall in middle Tennessee and the extraordinary flooding that has come with it. I hope and pray that all members of the BSAS and their families are safe and dry. My home is on a high ridge so I have never worried about flooding. I do have to cross the Cumberland River to get to work, though, and it was frightening to see how high it was. I drive right by the new Clarksville Marina which is still under construction and it was completely under water. I don't think it will be opening on schedule after this. The river was only a few feet from the road as I came in to work Monday morning and I am hopeful it won't be across it as I try to make it home Monday afternoon.

I want to thank Kris McCall for another excellent show she gave us at the April meeting. As a young boy of 13, I had the opportunity to see the only surviving member of the Seven Wonders of the ancient world: the Great Pyramid of Cheops. I climbed part way up the structure before my Mom called me back down. Later in the year, several of my friends and I went camping in the desert near the pyramids. In the morning we would rent horses from the stable below the pyramids and ride around them and then out into the desert. On a clear day you could easily see the pyramids from the opposite side of the Nile 7 miles south of Cairo where we lived in the suburb of Maadi. The planetarium program (nor any program or image I have ever seen) does not truly convey the enormity of the pyramids. As an adult, I have managed to see a few of the new seven wonders of the universe through my telescope. In this case, though, the planetarium program is much better than the view through my telescope. Thanks, Kris, for giving us a look at The Seven Wonders.

The program for this month is on "The History of Women in Astronomy" by our own Jana Ruth Ford. I look forward to hearing the story of how women have contributed to the science of astronomy over the centuries. Women have always been underrepresented in the sciences and especially physics and astronomy. Astronomy has begun to catch up but physics is still lagging behind. While over 51% of students in universities nationwide are female, only 22% of bachelor's degrees in physics went to women according to a 2003 study conducted by the American Physical Society. Astronomy has fared better with 46% female bachelor's degrees but both physics and astronomy PhD's were far below those numbers with 18% and 26% respectively.

Continued on Page 2



"The Earth is just too small and fragile a basket for the human race to keep all its eggs in."

Robert A. Heinlein
1907-1988

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

May 2010

05/05 LAST Quarter
05/13 NEW Moon
05/20 FIRST Quarter
05/27 FULL Moon

June 2010

06/04 LAST Quarter
06/12 NEW Moon
06/19 FIRST Quarter
06/26 FULL Moon

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Galaxies:

M49, M51, M61, M63, M64, M85, M94, M101, M102, M104

Eta Aquarids meteor shower – May 5-6
radiant in Aquarius

Lyrid meteor shower – June 14-16
radiant in Lyra (E)

From the President, cont.

Things have improved in the last seven years since the study but we still have far to go. I am proud to say that the physics & astronomy department at Austin Peay is doing its part to increase the numbers of women in physics and astronomy. We have one of the highest percentages of female physics majors of any undergraduate coeducational university in the country. Our physics student club (Del Square Psi) had all female officers this year. They held elections for next year's officers last Friday and they ended the monopoly by allowing a boy to be the club Master-at-arms. The club is still dominated by young women, though. If you came out to the Adventure Science Centers Astronomy Day celebration a few weekends ago, you may have met several of our physics students who were helping out. Anything we can do to encourage girls into science, and especially physics and astronomy, should be supported by all of us.

Before I close, I want to mention our upcoming star parties in May. Our next one is a private star party on the Trace at mile marker 435.5 on Saturday the 8th. Hopefully, all the roads will be dried out by then and the skies will be clear. The next public star party is at Long Hunter State Park. I have not yet heard anything about the conditions of the observing site or roads at Long Hunter but suspect they are under Percy Priest Lake. I hope the roads and field will have time to dry out in the next two weeks.

I hope everyone has a dry next few weeks and recovers fully from the floods of last weekend. See you at the club meeting on Thursday May 20th.

Dr. Spencer Buckner
President

Book Review: Miss Leavitt's Stars

by Robin Byrne

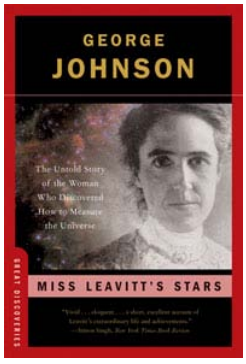
It's no secret that I am interested in the biographical histories of astronomers. So, when I saw a book titled "MIss Leavitt's Stars: The Untold Story of the Woman Who Discovered How to Measure the Universe", I eagerly snatched it up. However, as the author, George Johnson, reveals at the start of the book, there are very few documents related to Leavitt, which makes piecing together her history much more difficult. How Johnson dealt with this obstacle was to intertwine the little known information about Leavitt with the broader story of how techniques for measuring astronomical distances were discovered and built upon.

The story of Leavitt's life begins with census data about who lived in the house during her childhood and the financial status of the family. It quickly moves on to Leavitt taking a job at the Harvard Observatory, working for Edward Pickering as one of his "computers." Most of what is known about Leavitt from this time on is based upon a scant few pieces of correspondence, plus articles Leavitt published in astronomical journals. Leavitt is best known for her discovery of the relationship between the period of variability and the luminosity of Cepheid variable stars. However, that was only a minor research project on which she had worked. Pickering decided what projects each of the women in his employ would work upon. He assigned Leavitt the task of establishing photographic magnitudes of stars near Polaris, so that they could then be used to measure the magnitudes of stars photographed in other parts of the sky. An important job, to be sure, and one of Pickering's pet projects, but not one that afforded Leavitt the opportunity for research. After her discovery of the period-luminosity relationship using Cepheids in the Large Magellanic Cloud, other astronomers sent requests for her to expand the project to Cepheid variables elsewhere. In particular, there was the question of whether the same relationship held for "fast" Cepheids that worked for "slow" Cepheids (it would later be found that there was a difference). However, Pickering's photographic magnitude project took priority.

Another hindrance to Leavitt's ability to perform research were setbacks due to caring for family and her own health problems. From early on, Leavitt had poor health, including losing most of her hearing due to illness. Meanwhile, the correspondence that has been preserved indicate that much of Leavitt's time was devoted to helping relatives during times of illness and after the death of a loved one. These alone led to extended absences from her work. Those obligations were exasperated due to Leavitt frequently becoming ill while away. Letters from Pickering indicate an increasing level of frustration at the amount of time she was absent from the Observatory. He even offered to send photographic plates for Leavitt to work on while she convalesced, which, during at least one absence, he did. Continuing poor health, in this case cancer, would ultimately take Leavitt's life while she was only in her early fifties.

To flesh out the story, Johnson also tells about the quest to measure astronomical distances. Starting with parallax, and ultimately ending with Hubble's Law, he shows how Leavitt's period-luminosity relationship would hold the key to many discoveries. The work that led to the development of the Hertzsprung-Russell diagram was based, partly, on using Cepheids to gauge distances, leading to the establishment of the luminosities of the stars being studied. Harlow Shapley used Cepheids to measure the distances to globular clusters, which then allowed him to determine the size of the Milky Way and our location in it. And, lastly, Edwin Hubble used Cepheids to determine the distances to other galaxies, leading to the discovery of the relationship between a galaxy's distance and how fast it is receding from us. This finding brought with it the conclusion that the universe is expanding and began with a Big Bang.

What started as a small observation that the longer a Cepheid took to vary in brightness, the higher its luminosity, ultimately helped us to understand how our universe came into being. George Johnson's book gives us a glimpse at the life of the woman responsible for that "small" observation. However, more importantly, he puts its importance into perspective, by leading us through all of the breakthroughs made as a result of Miss Leavitt's insights.



Miss Leavitt's Stars
The Untold Story of the Woman Who Discovered How to Measure the Universe

By George Johnson
Atlas Books, 2005
ISBN: 978-0-393-32856-1

Board Meeting Minutes – April 1, 2010

Bob Rice, Secretary

The board of directors of the Barnard-Seyfert Astronomical Society met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on April 1, 2010. Board members Dr. Spencer Buckner, Bill Griswold, Dr. Donna Hummell, Kris McCall, Bob Norling, Curt Porter, Dr. Terry Reeves, Bob Rice, and Theo Wellington were present. Board members Tony Campbell, JanaRuth Ford, and Santos Lopez were absent. A quorum being present, President Dr. Spencer Buckner called the meeting to order at 7:30 P.M.

Treasurer Bob Norling reported that the Society had $2,439.41 in its regular checking account and $150.03 in its equipment account. Dr. Spencer Buckner stated that he would contact Lonnie Puterbaugh about possibly adding more to the equipment account. Dr. Buckner announced these upcoming star parties and events:

- Apr 10 – All night Messier Marathon for club members at Mark Manner's Spot Observatory
- Apr 17 – Public star party at the Adventure Science Center (ASC) from 8:00 – 9:30 P.M.
- May 08 – Private star party at mile marker 435.5 on the Natchez Trace Parkway
- May 15 – Public star party at Long Hunter State Park from 8:30 – 10:30 P.M.

Dr. Buckner said that he would contact BSAS member Mark Manner about scheduling the annual club picnic at Spot Observatory sometime during mid-June.

Dr. Spencer Buckner announced that the BSAS sponsored $100.00 first prize was awarded to eighth grader Nathan Wellington at the 58th annual Middle Tennessee Science and Engineering Fair for his astronomy exhibit on micro-meteorites. Dr. Buckner said that he would present the prize to Nathan at the awards ceremony on April 5, 2010. He further noted that no second or third place prizes were awarded.

Dr. Spencer Buckner reported that Sudekum Planetarium Director Kris McCall would present a planetarium program on "The Seven Wonders of the Ancient World" for the April 15th membership meeting. Dr. Buckner also announced that future programs would include an update on new directions for Vanderbilt University's Dyer Observatory by the new Director, Rocky Alvey, in October to be possibly followed by a program on astronomy songs also by Mr. Alvey in February 2011. Dr. Buckner noted that Dyer Observatory staff had contacted him about the BSAS' possibly providing volunteers and telescopes for an event at Camp Hillmont later in the year. Noting that this would be a wonderful opportunity for outreach and renewed association with Dyer, Dr. Buckner said that he would provide more details at the April 15th membership meeting.

Kris McCall asked for BSAS volunteers to assist with scheduled exhibits at the ASC's Astronomy Day on April 17th. She stated that training sessions would begin at 9:30 A.M. and that lunch would be provided. Dr. Terry Reeves announced that the Warner Parks Nature Center would host a binocular observing event on June 11th. Since there was no further business to discuss, President Buckner declared the meeting adjourned at 8:20 P.M.

Monthly Meeting Minutes – April 15, 2010

Bob Rice, Secretary

President Dr. Spencer Buckner called the meeting to order at 7:39 P.M. in the Adventure Science Center (ASC) and welcomed new members and visitors. Treasurer Bob Norling reported that the BSAS had $2,244.41 in its regular bank account and $150.03 in its equipment account. Dr. Buckner noted that the board was discussing the possibility of adding funds to the equipment account and pointed out that personal donations in the form of money or equipment were welcomed. He also mentioned the BSAS' loaner program as being a useful way for members to try out telescopes and other related equipment before purchasing such items. Dr. Buckner congratulated Vice-President Dr. Donna Hummell and Past-President Dr. Terry Reeves who observed 102 and 94 objects respectively at the club's recent Messier Marathon.

Dr. Buckner reported that the ASC would hold its annual Astronomy Day on Saturday, April 17th noting that this event was scheduled a week earlier than the nationally recognized date so that it would not conflict with our local Music City Marathon. He also stated that the ASC needed volunteers for Astronomy Day with training to start at 9:30 A.M. Dr. Buckner also announced that this event would be followed by a star party hosted by BSAS members that evening.

Dr. Buckner announced these upcoming events and star parties:

- May 08 – Private star party at mile marker 435.5 on the Natchez Trace Parkway
- May 15 – Public star party at Long Hunter State Park from 8:30 – 10:30 P.M.
- May 20 – May Membership Meeting "Women In Astronomy" by Jana Ruth Ford

Dr. Buckner also reported that Treasurer Bob Norling had two copies of Kalmbach Publishing Company's Mysteries of the Universe 2010 calendar for sale.

Dr. Spencer Buckner then introduced BSAS board member and Sudekum Planetarium Director Kris McCall who explained that the ASC's April 17th Astronomy Day celebration would include (among other things) explanations of planetary exploration; activities and demonstrations of Newton's laws; a presentation on "The Solar System in Your Pocket" by Jana Ruth Ford; a demonstration of impact crater making by Chuck Schlemm; and a demonstration of infrared imaging.

Ms McCall then delivered the evening's planetarium program on "Seven Wonders." This program began with the seven wonders of the ancient world with emphasis on where they were, if they were real structures or not, and what they were used for. These included the Great Pyramid of Giza, the Hanging Gardens of Babylon, the Temple of Artemis at Ephesus, the Mausoleum of Maussollos at Halicarnassus, the Colossus of Rhodes, and the Lighthouse of Alexandria. The program then shifted to what might be considered the Seven Modern Wonders of the Heavens that included Omega Centauri (globular cluster), M87 (largest galaxy), the Crab Nebula, Eta Carinae (star on the verge of going super nova), the Horse Head and Great Nebulae in Orion, Saturn and its moons, and our own wonderful "pale blue dot" the Earth.

Kris McCall stated that about 120 Girl Scouts would be in the ASC during the evening on Astronomy Day and suggested that they also might want to look through the BSAS members' telescopes at the nighttime star party. Chuck Schlemm announced that a satellite flyover would occur very shortly at 8:52 P.M. Since there was no further business to discuss, Dr. Spencer Buckner declared the meeting to be adjourned at 8:30 P.M. Kris McCall announced that she would show a planetarium presentation of "The Sky Tonight" for those who wished to remain after the meeting.

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/

A Rock Hound is Born

Space Place Partners Article, April 2010

It's tough to be a geologist when you can't tell one rock from another. Is that a meteorite or a chunk of lava? A river rock or an impact fragment? Houston, we have a problem!

It's a problem Spirit and Opportunity have been dealing with for the past six years. The two rovers are on a mission to explore the geology of the Red Planet, yet for the longest time they couldn't recognize interesting rocks without help from humans back on Earth. Fortunately, it is possible to teach old rovers new tricks. All you have to do is change their programming—and that's just what NASA has done.

"During the winter, we uploaded new software to Opportunity," says Tara Estlin, a rover driver, senior member of JPL's Artificial Intelligence Group, and the lead developer of AEGIS, short for Autonomous Exploration for Gathering Increased Science. "AEGIS allows the rover to make some decisions on its own." Estlin and her team have been working for several years to develop and upload increasingly sophisticated software to the rovers. As a result, the twins have learned to avoid obstacles, identify dust devils, and calculate the distance to reach their arms to a rock. With the latest upgrade, a rock hound is born.

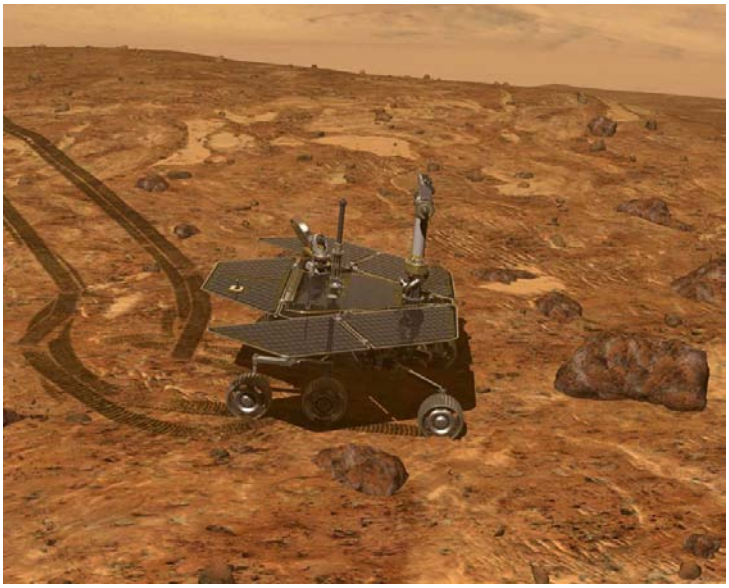
Now, Opportunity's computer can examine images that the rover takes using its wide-angle navigation camera (NavCam) and pick out rocks with interesting colors or shapes. It can then center its narrower-angle panoramic camera (PanCam) on targets of interest for close-up shots through various color filters. All this happens without human intervention.

The system was recently put to the test; Opportunity performed splendidly. At the end of a drive on March 4th, the rover settled in for a bit of rock hunting. Opportunity surveyed the landscape and decided that one particular rock, out of more than 50 in the NavCam photo, best met criteria that researchers had set for a target of interest: large and dark. "It found exactly the target we would want it to find," Estlin says. "It appears to be one of the rocks tossed outward onto the surface when an impact dug a nearby crater."

The new software doesn't make humans obsolete. On the contrary, humans are very much "in the loop," setting criteria for what's interesting and evaluating Opportunity's discoveries. The main effect of the new software is to strengthen the rover-human partnership and boost their combined exploring prowess. Mindful that Opportunity was only supposed to last about six months after it landed in 2004, Estlin says "it is amazing to see Opportunity performing a brand new autonomous activity six years later."

What will the rock hounds of Mars be up to six years from now? Stay tuned for future uploads!

Learn more about how the AEGIS software works at
http://scienceandtechnology.jpl.nasa.gov/newsandevents/newsdetails/?NewsID=677



Opportunity spots a rock with its NavCam that its AEGIS software says meets all the criteria for further investigation.

2010 BSAS MESSIER MARATHON

M16 – The Eagle Nebula
Image: Steve Wheeler

M101 – The Pinwheel Galaxy
Image: Steve Wheeler

The Barnard-Seyfert Astronomical Society 2010 Messier Marathon was held on Saturday-Sunday, April 10-11, 2010. It was a very clear night, and Donna Hummell observed 102 Messier objects using binoculars and a 10" undriven dob. Terry Reeves was the runner up with 94.

Mark Manner
Spot Observatory

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

On your Eclipse mailing label is the expiration date for your current membership. There will be a two month grace period before any member's name is removed from the current mailing list.

We're on the Web!
See us at:
www.bsasnashville.com

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 Dr. Spencer Buckner at (931) 221-6241.

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